

Questions about how the command of emergency response operations and emergency response management can be improved are discussed energetically; and the demands on those who prepare or manage the various forms of emergency response work are growing.

With this book the Swedish Civil Contingencies Agency wants to stimulate reflection and dialogue on emergency response management and on the organised coordination of different types of emergency. The book is intended for those who work with the management of problems related to command work in critical situations, for example, decision makers in qualified management roles, system developers who work with designing management functions and other preparations, and instructors who design and execute courses on emergency management and command.

All of the chapters are based on theoretical knowledge from several research areas and on practical experience from municipal fire brigades. Emergency management and command issues are analysed and discussed from various perspectives, based on the fundamental value that the assistance needs of those in distress should be the starting point for demands on emergency management and the design of miscellaneous command functions.

Emergency Response Management in Today's Complex Society

Edited by Lars Fredholm and Anna-Lena Göransson

Emergency Response Management in Today's Complex Society

Lars Fredholm works as an emergency researcher at the Swedish Civil Contingencies Agency and an adjunct professor at the Faculty of Engineering, Lund University, Department of Fire Safety Engineering. He is presented in detail on page 6.

Anna-Lena Göransson is a Doctor of Philosophy in the theory and practice of teaching and learning Swedish, and her research interests centre on language use and the question of how to use language as a tool that can unite theory and practice in various forms of vocational training.

Unusual events are normal.

**It is improbable, however,
that an unusual event
will occur at any given point in time,
such as tomorrow.**

Allan Gut, professor in mathematical statistics,
Uppsala University

Edited by Lars Fredholm and
Anna-Lena Göransson

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Swedish Civil Contingencies Agency

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Emergency Response Management in Today's Complex Society

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Lars Fredholm works as an emergency services researcher at the Swedish Civil Contingencies Agency and has been an adjunct professor at the Faculty of Engineering, Lund University, Department of Fire Safety Engineering. He is a fire protection engineer and doctor of pedagogy and previously served as a fire officer in the Swedish fire service. He has also worked as a researcher at the Swedish Defence Research Agency and the Swedish National Defence College.

Anna-Lena Göransson, is a Doctor of Philosophy in the theory and practice of teaching and learning Swedish. Her research interests centre on language use and the question of how to use language as a tool that can unite theory and practice in various forms of vocational training.

Lars Fredholm and Anna-Lena Göransson

Introduction

In the future, greater demands will be placed on the management of emergency response than has previously been the case. One contributing factor is that society as a socio-technical system has become more complex and diverse, with various activities that interact with one another and that are dependent on one another. A second contributing factor is the perception of societal safety issues, which have changed radically since the end of the Cold War. A third is the necessity for various authorities and organisations to cooperate more during emergency response than has previously been the case. A fourth is an increase in activity on an international level and cooperation within the European Union.

With this book, we would like to stimulate dialogue on the work of emergency response management and organisational coordination during various emergencies. Dealing with all types of emergency from small everyday accidents up to disasters is key, and something that demands openness and responsiveness to society, and the ability to cooperate with other bodies. The analyses and discussions are based on the problem of exercising command at emergency response operations (fire brigade), and expanding upon this the exercise of emergency response management during emergencies other than those encountered only by municipal fire brigades. The book is intended to inspire reflection so as to enable the reader to develop new ideas and solutions. It consists of a number of chapters containing discussions and analyses of selected areas that are important when it comes to exercising emergency response management over emergency response operations. The entire array of problems that management processes involve can naturally not be covered, and this book should not be seen as a definitive answer to how various management problems should be resolved.

Several common basic values characterise the view of emergency response management that is presented in this book. What is most important is that the need for assistance should be the basis for setting the requirements for emergency response management and how management processes should be designed. Another value is that an emergency entails a crisis for systems that are affected by the emergency.

Viewing society as a socio-technical system means focusing on relationships between people; and between people and technical/physical environments. The evolution of society has meant that the extent of such relationships has increased, with regards to the breadth and the volume of the interacting relationships. The increased breadth of relationships entails, for example, that people in one region are dependent on systems in other regions and even in other countries. International companies, banking, the insurance business and food supply are all examples of such sys-

tems. The increased volume of relationships means that people in the various regions are now included in several of these systems. The evolution of society has also led to physical/technical environments having significantly more sources of risk than before. Technical development has introduced sources of risk with considerable potential for causing damage that can spread via the interdependent relationships that have developed between the various systems, both locally and internationally. Examples of such risk sources are nuclear power, hazardous industries, oil tankers, etc. The increasing extent and volume of relationships between people and groups of people also introduce sources of risk that can cause substantial negative effects, e.g., ethnic conflicts, political extremism, suspicion about authorities, social isolation, etc. Terrorism is a current manifestation of such conditions.

Since the end of the Cold War, attitudes towards societal safety issues have radically changed. Types of threat other than military attacks have gained a prominent role in safety management. A spectrum of conceivable peacetime emergencies has been a significant cause for changed attitudes during recent years. The Act on Extraordinary Events in Peacetime for Municipalities and County Councils places clear responsibilities on municipalities and county councils for making preparations for the management of major peacetime emergencies.

Municipal fire brigades represent an important element of societal emergency response management. During emergencies, the municipal fire brigades interact with other organisations. It is important, for example, to collaborate with other emergency services, with municipal authorities, with municipal or county emergency response management authorities, with county administrative boards, with the armed forces, with international humanitarian aid bodies, with electrical power suppliers and other private bodies.

The trend towards increased international contact involves the humanitarian missions that, for example, the Swedish Civil Contingencies Agency (MSB) has conducted and is conducting at various locations around the world, as well as the development and coordination that occurs in the European Union with regards to the capacities of the member states to assist one another in the event of major emergencies and crises. In Sweden, we are oriented towards participating in international response operations in other countries. It is also important that we prepare ourselves for cooperation with organisations from other countries that may be needed to provide assistance in Sweden.

All of these changes entail more stringent demands on decision makers in municipal fire brigades and other bodies that assume command roles during major emergencies and crises. These changes also place greater demands on those who make preparations for dealing with major emergencies for example, the design of command functions. Response operations conducted by municipal fire brigades are often characterised by short-term response operations, well-defined duties, direct leadership with contact with one another at incident sites, and for the most part, with only a single organisation conducting response operations. The new issues are as follows: more stringent demands on adapting response operations to increasingly complex and new emergencies; the understanding of impact to a greater societal extent than before; having better knowledge of which assistance resources may be

needed; being able to conduct management duties for longer periods and over larger areas on several management levels; designing emergency response in cooperation with decision makers from other organisations; and possible cooperation with politicians on decisions that are made during an emergency and that can be decisive for which elements of society will be prioritised for emergency assistance.

In summary, one can say that the emphasis on skill in exercising management is shifting from how municipal fire brigades or one's own organisation performs over a short period with fairly well-defined duties, to an understanding of how the course of events during an emergency develops in that part of society that is affected and how temporarily assembled teams from various national and international organisations can jointly deal with a course of events.

The intention of this book is to provide material that can stimulate reflection, and not to present factual knowledge or instructions and methods for how something should be done. In one dictionary, the following synonyms are given for the verb *to reflect*: think, consider, deliberate, ponder, mull over, contemplate, meditate and ruminate. Reflection is an important process for gaining expertise. Reflection means engaging oneself and trying to understand associations and phenomena from various points of view. Knowledge is developed in the encounters between existing and conceivable ways of understanding the world around us. Reflection over the phenomena and associations that this book covers entails, individually and with others, trying to understand, for example, what the risk society is; what is vulnerable in society; how different risks can affect society; how damage can spread through several systems in society; how people are affected by various types of emergency and crisis; what assistance needs people have during various types of incident; how various emergency response organisations view their duties during various types of emergency and crisis; whether there are conflicts between how emergency response organisations view their respective duties etc. When encountering something new, it is important to try to understand the new phenomenon and to assess it from various points of view, relating the new to one's own experiences and opinions, and determining if one should re-evaluate one's experiences and opinions.

It is our hope that this book can contribute to reflection that permits the reader to see and understand associations and phenomena from different points of view and new perspectives. This means that the book should be read slowly and absorbed in appropriate portions.

Emergency Response Management in Today's Complex Society is oriented to decision makers and coordinators who in various ways deal with problems related to management tasks in critical situations, primarily:

- Decision makers who hold qualified command positions during emergencies and disasters
- System builders, i.e. people who design management processes and other preparedness measures
- Educators, i.e. teachers and instructors who shape and conduct training for emergency response management

The work on this book has been characterised by openness to different perspectives and is a result of protracted dialogue in seminar form where practical experience from management work has been interwoven with theoretical knowledge. The authors have worked together and thoroughly discussed their various fields of expertise with one another, but each author or pair of authors is responsible for the content of their respective chapters.

Structure of the Book

The book consists of a number of chapters that invite discussion on emergency response management issues from various perspectives. In the first chapter, *Dealing with all types of emergency from everyday accidents up to disasters*, Lars Fredholm, MSB and Lund University, presents a model he developed as a starting point for expanded discussion of this area. The model and the concepts the chapter addresses can be useful in analyses of executed operations as well as when planning emergency preparedness, for the exercise of emergency response management during major emergencies, and for international comparisons and cooperation. With this model, the assistance needs of individuals in distress are seen as the determining factor for assistance operations and the allocation of responsibility during undesirable incidents.

With the model as a foundation, a number of problem areas are described and discussed that illuminate the management of emergency response operations from various perspectives.

In *Human needs and behaviour in the event of emergencies and social crises*, Ann Enander, Swedish National Defence College, provides an overview of peoples' reactions during emergencies and other types of crises from a psychological and social perspective. Enander shows that it is not the actual situation, but rather how people perceive and interpret it that determines how they are affected and conduct themselves. The starting point is that knowledge is needed about the driving forces and reactions that occur during emergencies and that this knowledge should form the foundation for society's handling of serious incidents. There are no ready solutions for optimal conduct during each situation, but this knowledge overview can serve as a foundation in the planning and preparation for, and execution of emergency response operations with the needs of victims as a benchmark.

In *Management of various types of emergency*, Staffan Harbom, MSB, provides a description of dissimilar incidents during which the need for cooperation was substantial and the municipal fire brigades were of key importance to the course of events. Case studies illuminate the problems that can arise for municipal fire brigades when incidents occur that do not fit the normal pattern of a municipality's routine tasks. They are based on interviews with personnel in management positions at county administrative boards and municipal fire brigades, and on analyses of available documentation. In all of these incidents, the need for cooperation has been substantial and the role of fire brigades an important element in a wider context. In the fourth chapter, *Incident command and decision-making*, Lars Fredholm and Matias Åström, Lund University, describe and discuss a number of models for decision-

making and the relationships of these models to incident command. They make it clear that decision-making as a process is dependent on the context in which it is conducted, and provide understanding of what decision-making entails under various conditions. Decision-making can take different forms and be described in different ways. It is more than choosing between different alternatives and is described here as a process for controlling other processes, namely dynamic, complex and diffuse situations. The varying conditions of varying contexts are crucial to how decision-making takes form and the demands that can be placed on it. Such important conditions are the amount of time available, the type of incident and the command level required.

Based on the leadership model, developmental leadership, Gerry Larsson, Swedish National Defence College, contributes in the fifth chapter with *Theoretical reflections on leadership* with the emphasis on leadership and its importance in exercising command during emergency response operations. He discusses what leadership is and how it is shaped, and focuses on the leader as a person and the context of leadership. One section addresses the influence of stress on leadership and decision-making, and in conclusion, the behavioural science perspective is related to Fredholm's operational-based categorisation of the extent of complexity in emergency response management.

An emergency response operation is not an isolated occurrence, but rather something that is commonly conducted in cooperation with other societal bodies, and which exercises various powers over other individuals and bodies in society. In the sixth chapter, *Legal grounds for emergency response operations*, Per Johansson, Swedish Defence Research Agency describes the various powers of an incident commander. Also discussed are the relationships incident commanders have to various participants during an emergency response operation as well as the command principles of these other participants. Through historical retrospect, Johansson illustrates how various powers and principles have developed over an extended period.

An important starting point for conducting emergency response operations is having basic procedures for how emergencies are dealt with tactically. In the seventh chapter, *The theory of fundamental tactics*, Stefan Svensson, MSB, discusses fundamental tactics for managing emergencies based on the concept that a tactical procedure is based on resources being optimally used with consideration to assistance needs and the other demands of the situation, for the purpose of gaining and retaining control.

Erik Cedergårdh, Greater Göteborg Fire and Rescue Service and Thomas Winnberg, Kiruna Fire and Rescue Service, describe and discuss adaptive and anticipative command during various incidents in their chapter, *Structuring a command organisation*. This chapter includes approaches and discussions that can form the basis for organisational structuring of operations conducted for rescuing people, safeguarding property and protecting the environment. The main part of the chapter is a discussion of system design in several dimensions. The description is intended to facilitate continued refinement of the ability to manage several simultaneous emergency response operations and preparedness work by creating the ability to adapt between the structuring of command work and the demands that arise as a result of

actual assistance needs in time and space. Also included in this discussion is the structuring of command tasks with other organisations.

In the ninth chapter, *Command Support*, Samuel Koelega, MSB, focuses on the problems that must be dealt with based on the question of how command support should be structured so that necessary information flows smoothly between various decision makers and levels in one's own organisation, and between decision makers on various levels in cooperating organisations. Command support should constitute support to the organisation and facilitate tasks. Good knowledge of the command system, which must be well-developed and defined, is therefore necessary when establishing command support. There is the risk that command support might otherwise be developed based on technical capabilities rather than on the command system's needs for support.

Per-Anders Berthlin, previously SRSA, now working as a consultant, clarifies in *International emergency response operations*, the specific problems that must be dealt with when managing international response operations or when resources from other countries are used in emergency response operations in Sweden. International response operations entail working with other cultures and place substantial demands on coordination and cooperation. It is not just about achieving concrete operational results in another country. It also concerns working together with others (often under unfamiliar circumstances), representing one's country and contributing to the assistance that the country in need requested. Issues such as understanding, looking at the big picture, responsibility, ethics and morals are important in this context, as are their practical realisations.

In the last chapter, *Preparing for the Future*, Lars Fredholm closes with a discussion on the conclusions he has drawn from the other chapters.

Notes from the translation editor

Due to the nature of this book with its many similar terms, the term *a rescue service* refers to the legal definition of the services a fire brigade is legally obliged to carry out. As a further aid to avoiding confusion the term *fire & rescue service* has been substituted, in all cases when not referring to a named brigade, for the equally correct, but less ambiguous term *fire brigade*. Furthermore, I have occasionally used the term *fire service* in its British sense as distinct from *fire brigade* to refer to the overall societal concept of a fire service as opposed to the physical nature of an individual operational *fire brigade*.

When I have used the British term *emergency services* (rather than emergency and rescue services) this refers to all first responder services i.e. fire brigade, police, ambulance, and coastguard.

The word *emergency*, in *emergency response management and emergencies and their consequences* applies to the whole spectrum of unforeseen occurrences from minor incidents and accidents, up to major incidents and serious emergencies, then on to periods of serious crisis that, for example, affect essential public services, and also disasters both man-made and natural.

Lars Fredholm

1. Dealing with all types of emergency from everyday accidents up to disasters

Lars Fredholm was introduced prior to the introduction on page 6.

It is rare that a municipal fire brigade acts alone during an emergency response operation. During serious emergencies, this is further accentuated. The Swedish Emergency Management Agency was established to take responsibility for ensuring that society is better equipped for dealing with extraordinary events and serious emergencies. Municipalities have been given better defined areas of responsibility. Questions of interest are what role a municipal fire brigade will be given in the emergency response management that a municipality will be responsible for, and how coordination will be conducted with a municipality's political leadership, with other administrations and departments in the municipality, the head of medical services, national authorities and the private sector.

The central aspect in developing the model presented below is the relationship between assistance needs and operational response. An operational response in time and space should be such that it optimally corresponds to the assistance needs in time and space. This applies both to everyday emergencies and courses of events which put a strain on society.

From this fundamental perspective, the model is subsequently based on how a municipal fire brigade can be a body, for example, in operational response for satisfying assistance needs during an emergency. The intention is that the model should primarily assist the participating municipal fire brigades in handling emergencies and associated problems with interfaces to other bodies in operational responses in time and space. The model can be refined to apply generally to undesirable incidents that put a strain on society.

Three basic values

Behind the formation of the model, there are certain values that I do not consider to have characterised previous views on emergency response management. The most important value is that the *need of assistance* should be the basis for demands on emergency response management and on the design of command functions. Earlier development approaches have been based on one's own organisation and how it functions in a system.

Another value is that an emergency entails a *crisis* for the public sector or systems that are affected by the emergency. Crises mean a decisive turning point or radical change of the prevailing order. In our linguistic usage, the term crisis is used to refer to negative, decisive turning points. An individual is a societal body. An emergency that causes personal injuries or property damage for an individual entails a crisis for the individual. A fire in a flat entails a crisis for a family as a societal body. A major industrial fire in a city entails a crisis for a societal body made up of individuals and groupings that are dependent on the industry for their existence. A tank wagon leaking sulphur dioxide in a marshalling yard in a city entails a crisis for the entire city as a societal body or system.

Emergency response operations conducted over the years clearly show that the resources that must be used to satisfy the assistance needs are established in *networks*. At the site of the disastrous fire in Gothenburg in 1998, firefighters, police and medical personnel worked with lifesaving. In the summer of 1999, several fire brigades, many units from the armed forces, police, etc. took part in fighting the major

forest fire on the Södertörn peninsula. Present-day thought is based to a large extent on viewing one's own fire brigade organisation as a system. From this then is determined how management functions should operate. This is ineffective. Instead one should seek principles and forms for how to manage networks temporarily assembled for the task at hand, made up of different organisational units and organisations.

Benefits of conceptual content

The reason for formulating the conceptual content for emergency response management is to find a frame of reference that encompasses both emergency response management tasks oriented to dealing with the actual emergency (command of fire brigades) and management tasks oriented to dealing with societal consequences. The intention of the conceptual model is that it should be beneficial:

- In analyses of executed emergency response operations;
- As a foundation for preparedness planning;
- As a foundation for the management of large major emergencies; and
- As a foundation for international comparisons and cooperation.

Use can be based on these various points of departure. *The primary question is how emergency responses in time and space correspond to assistance needs in time and space, and how command as a set of complex processes handles this.*

Based on a municipal risk analysis, preparations can be made for emergency response management work. The risk analysis indicates which emergencies might occur. Even with management tasks during acute courses of events, the conceptual model could be a form of support. It could constitute an aid for how one can build up management processes based on how a situation develops in time. In the European Union, international cooperation is developing more and more in the field of the emergency services. The conceptual content can be used for analyses and comparisons between the methods used by various countries for dealing with major emergencies. It can also serve as the foundation for cooperation between various countries during emergency response operations.

Problems

Past emergencies show that a clear-cut boundary cannot be drawn between management tasks that are oriented to dealing with actual emergency events (command of fire brigades) and management tasks that are oriented to dealing with the societal consequences of the emergency.

According to the Civil Protection Act the definition of a *rescue service* is emergency response operations that the state or municipalities are responsible for in the event of emergencies and impending risks for emergencies, to prevent and limit injury to people, and damage to property and the environment.

A rescue service is therefore national or municipal work oriented to dealing with emergencies.

Larger emergency response operations show that command of fire brigades cannot be isolated from the management of other operations that are intended to alle-

viate the situation for victims. A clear example is the disastrous discotheque fire in Gothenburg in 1998 that killed 63 young people. The emergency operations lasted for two to three hours. The emergency management work, apart from command of fire brigades, also involved dealing with the societal consequences of the fire, in cooperation with other organisations, both in the short-term and long-term (Räddningstjänsten Göteborg Mölndal Kungsbacka, 1998; Fredholm, 2000; Statens haverikommission, 2001).

The train derailments with dangerous goods in Kävlinge, Kälarne and Borlänge (Wolf, 2000) also show that a significant part of management processes must be devoted to work that is not defined as being a *rescue service*. Evacuation and attending to the local population were important tasks.

The flooding in Arvika and other parts of western Sweden in the autumn and winter of 2000 also illustrate the diffuse interface between command of emergency services and command of other operations in dealing with societal consequences. (Länsstyrelsen Västra Götaland, 2000). Within the local societal framework, the command tasks of the municipal fire brigade were integrated with the command tasks of other municipal administrations and with the political handling of the situation. All this was subsequently ordered into a regional management structure, which encompassed Värmland and Västra Götaland counties with their respective county administrative boards and affected municipalities.

Several municipal fire brigades were involved in conjunction with the *Estonia* disaster, assisting in the psychosocial care of people in various municipalities. Some municipal fire brigades participated in the management of psychosocial care, others participated concretely with crisis handling work and some participated in both. (Hedström, 1995).

Emergency response operations during medium-sized and major emergencies show that the management of rescue services provided at a municipal level, beyond management of one's own organisation, must be coordinated with the management of other organisations, and that these management tasks must also be coordinated with management tasks that deal with varying degrees of societal consequences that an emergency entails. It is difficult, if not impossible, to draw a clear-cut line between command tasks that are oriented to dealing with an actual emergency and management tasks that are oriented to dealing with the societal consequences of an emergency.

The basic problem that there is no linguistic construction in Swedish that embraces both command tasks oriented to the actual emergency event (command of fire brigades) and management work oriented to dealing with the societal consequences. Internationally, the terms *emergency management* and *disaster management* are used to describe command work that encompass both. The term *crisis management* has also become popular in recent years.

My intention is to frame the search for such an intellectual model in a context in which municipal fire brigades are a central part of societal emergency response management. The following categorisation of societal states presents such a comprehensive context:

- Normal societal state: Everyday emergencies occur. The municipal fire brigades respond and deal with these emergencies. The consequences affect those directly involved.
- Emergency state in a large portion of society because of a disaster or disasters (may even be caused by, for example, terrorism): Municipal fire brigades constitute primary organisations in societal crisis management.
- Emergency state in a large portion of society because of a societal-impacting, emergency event other than an accident: Municipal fire brigades constitute sub-organisations in societal crisis management.
- Emergency state in a large portion of society because of a societal-impacting, emergency event other than an accident: Fire brigade not required.

The model primarily concerns the first three states. The fundamental perspective is that based on the point of view of municipal fire brigades there is a frame of reference that comprises coordination between several authorities/organisations.

Emergency management

In international contexts, when one encounters the terms *emergency management*, *disaster management* or *crisis management* they are most often related to discussions of assistance operations that concern more than what is embraced by the Swedish concept of a *rescue service* (Cronan, 1998; Drabek, 1983; European Commission, 1999; Gevork, 1998; Heath, 1998; Kory, 1998). The terms refer to how a society deals with a severe, unwelcome event, for example, an emergency, and the subsequent situation that arises. Municipal fire brigades are a part of this. Other local, regional or national bodies are also included in such a context. The term crisis management often occurs in European Union contexts, where one refers both to military and civilian operations that are oriented to dealing with conflicts in a country along with the associated civil hardships. When the terms are used in literature and articles, their meanings vary. Certain authors use the term to refer to the handling of the acute stage of an emergency. Other authors also include prevention work and the build-up of emergency preparedness.

In a Swedish report on present-day safety and security issues, the Swedish equivalent of crisis management is used. With crisis management, the report refers to all actions that are taken before, during or after a serious crisis for the purpose of preventing or counteracting the damaging effects that the crisis causes. When only preventive and preparedness activities are referred to, the report uses the Swedish equivalent for safety and emergency preparedness tasks. When only the operations in an acute crisis situation are referred to, the report uses the Swedish equivalent for operational crisis management.

In Swedish linguistic usage, a common meaning of the term crisis management is after a traumatic event, providing care for people, and in one way or another, letting them work through their experiences, and this is usually referred to as psychosocial care (sometimes referred to as POSOM in Sweden).

There is thus considerable confusion in regards to terminology when one encounters the terms *emergency management*, *disaster management* and *crisis manage-*

ment in various texts. Below, the term emergency management is used in the context of *dealing both with an emergency's physical course of events and its consequences*.

Four principle management domains

An analysis of management problems encountered during some of the major emergencies that have occurred in Sweden during recent years indicates that emergency management can be broken down as follows:

- Dealing with the emergency as a physical process,
- Dealing with people and their social contexts
- Dealing with threatened or affected societal functions, and
- Managing resources for dealing with the above-mentioned three areas.

During the disastrous fatal fire in Gothenburg in 1998, many lives were in danger in a rapid and dynamic destructive sequence (Räddningstjänsten Göteborg Mölndal Kungsbacka, 1998; Fredholm, 2000; Statens haverikommission, 2001). The primary response operation was directed towards rescuing people from the fire as a physical process. Thereafter, actions were directed towards dealing with the fire as a physical process, i.e. limiting and extinguishing it. The response operation was later directed towards dealing with the consequences for people and the associated societal aspects. Information and care in various forms were important actions for an extended period after the fire. Resources for lifesaving and firefighting, and for providing care and informing people, were coordinated in time and space between various organisations.

The emergency response operation during the major *forest fire in Södertörn in the summer of 1999* involved handling the fire as a physical phenomenon and also handling coordination between all the organisations needed to deal with the fire as a physical phenomenon (Edstam, 1999). Tactics and logistics were significant problem areas. Moreover, the people who lived close to the affected area were informed and prepared for evacuation.

During flooding in Västvärmland and Västra Götaland in the autumn and winter of 2000, the emergency was handled as a physical process on various levels (Länsstyrelsen Västra Götaland, 2000). On the municipal level, dikes were erected to prevent the water from reaching buildings, installations for electrical supply, wastewater treatment facilities, etc. On the regional level, measures were taken to control the lake's inflow and outflow systems (opening of locks at Säffle to increase outflow from the Arvika area, increased outflow from Lake Vänern at Trollhättan). Informing affected inhabitants was an important action. The opportunity for people to receive advice and assistance in various contexts was important. People were attended to in various ways. Dealing with threatened and affected functions was a large part of the management problem. This primarily applied to various municipal technical aspects, such as electrical supply and sewage. An important area that needed to be dealt with was the management and coordination of resources over time and space to deal with all this.

After the derailments of dangerous goods trains in Kävlinge, Kälarne and Borlänge, the derailed trains remained in the marshalling yard, more or less demolished. The

primary aim of the emergency response operation was to ensure that there was no leakage of dangerous goods, and to secure the situation before and during cleanup to prevent deterioration. These derailments represent emergencies in which the physical emergency consists of a rapid, dynamic sequence that later evolves into a more static situation in a passive state. The actual response operation begins in this static passive state. In contrast to responses to emergencies with dynamic, more or less continual development, one has ample time to deal with the situation. A very significant problem to resolve in these incidents was taking responsibility for the people who might have been affected if the situation had worsened. This involved providing information and caring for those who were evacuated in various ways.

During the major *residential fire in Jönköping in 2000*, the primary management problems were lifesaving, limiting and subsequently extinguishing the fire, attending to those affected and informing those who were not at the incident site.

Needs and action domains

Assistance operations during an emergency should correspond to the need for help. In the event of a fire in a flat, the primary assistance needs can be to be rescued and protected. Thereafter the need might be to have one's property removed from danger and safeguarded. If the flat has been destroyed, there is the need to obtain help with lodging and other basic necessities. During the course of events, the needs for assistance change. Various bodies are responsible for meeting various assistance needs. The municipality or state should be responsible for satisfying certain assistance needs, while others are the responsibility of the individual. During a major emergency or societal crisis, additional assistance needs arise, for example, the provision of reliable information on the current situation and information that people need to deal with the situation as well as possible. Assistance needs also arise with those who are not directly affected. Relatives, as well as the general public, need information so that they can understand what has happened and is happening in order to best deal with the situation.

Assistance needs must be met with actions that are technical, medical, social, psychological or spiritual in character. To protect and save lives, fire brigades must use technology to fight fires. Fire brigades and ambulance personnel may need to perform life-sustaining medical measures. Social services personnel can assist with arranging the basic necessities of life in acute situations. Insurance companies can provide resources so that those affected can return to a normal life. Psychosocial teams can help people to deal with trauma. Representatives from religious or other spiritual organisations can help by meeting needs for support in dealing with grief and other existential problems.

Assistance needs can generally be categorized into the following *needs domains*:

- Need to protect and save lives
- Need to protect and save property
- Need to protect environment
- Need to provide people with support so that they can move on in life
- Need to provide support for restoration of living conditions

The areas in which measures must be taken to meet these needs can be categorised into *action domains* as follows:

- The emergency as a physical process
- People and their social contexts
- Threatened or affected societal functions

During an emergency, small or major, assistance needs arise that change with time. Various actors must intervene in the various action domains to meet the varying needs. They must coordinate their actions in an action structure that in time and space corresponds to the shifting assistance needs.

Extent of affect

Assistance needs are determined by the level to which an emergency affects society. So-called everyday emergencies, such as residential fires and traffic accidents, primarily affect individuals and families. Their immediate social contact networks, for example, relatives, are also affected. An industrial fire, department store fire, fires involving multiple residences and similar fires affect a large number of individuals who are socially ordered into families or other groupings of various types. The disastrous fire in Gothenburg in 1998 can be said to have affected all of Gothenburg, in other words, a local community. The flooding in Värmland and Västra Götaland during the autumn and winter of 2000 affected a region. The nuclear power plant failure in Chernobyl affected the entire Swedish nation, even though the incident site was not in Sweden. The *Estonia* ferry disaster, with over 800 dead, affected several countries.

Actual and hypothetical emergencies form the basis of the following categories of societal affect:

- Individual and group (for example, residential fires, traffic accidents)
- Immediate neighbourhood (for example, large industrial fires, fires involving multiple residences)
- Local community (for example, the disastrous fire in Gothenburg in 1998, the flooding in Arvika in 2000, the forest fire on Södertörn in 1999)
- Region (for example, the flooding in the Värmland and Västra Götaland in 2000)
- National (for example, a fire at an important electrical distribution point resulting in distribution problems to large areas of Sweden)
- International (for example, the nuclear power plant emergency in Chernobyl, the *Estonia* ferry disaster)

Each larger body affected includes smaller affected bodies. An affected neighbourhood includes affected individuals and groups. An affected local community includes affected neighbourhoods along with their individuals and groups, etc.

Circumstances at the start of an emergency response operation

How emergency management operates during an emergency response depends to a large extent on the preparations made, the competence and experience of the participants, and on legal preconditions. A decisive starting point for this approach is viewing acute emergency management as a process that is initiated based on the given preconditions when the emergency occurs and at the beginning of response operations. The preconditions for the process are decisive for how operations will function. In an analysis of how emergency management functions at an acute stage, the preconditions must be identified.

The legal preconditions are very important. Different countries have different legal preconditions for handling emergencies. In Sweden, there are two especially important pieces of legislation. One is the *Civil Protection Act* which regulates how direct emergency and rescue work (*rescue service*) is to be performed in the event of emergencies. The other is the *Act on Extraordinary Events in Peacetime for Municipalities and County Councils* which regulates the organisation and mandates of municipalities and county councils during peacetime emergencies.

Preparations in the form of various technical measures and organisational structures are important. This is about if and how planning has detailed how emergency management should be conducted, for example, how command structures are designed for municipal fire brigades, how various bodies organise their emergency management, and how municipalities organise their emergency management. Various forms of emergency response plans and preparations for different types of emergency are also important.

The competence of the concerned parties (both victims and first responders) is an important precondition. This includes, for example, their experience and the training they have received.

Emergency management in a societal context

This line of reasoning has so far provided data for the following model, see figure 1. The main idea is to *compare emergency response with assistance needs*. An analysis or a plan ought to be oriented to how emergency response operations correspond to assistance needs over time and space.

The type of emergency and the level of society that is affected by the emergency will determine *assistance needs*. Assistance needs can generally be categorised as needs for *lifesaving, property protection, environmental protection, survival and function support and restoration*. The type of emergency will determine the needs based on these categories.

Meeting these needs entails, in time and space, establishing response operations that are oriented to:

- The emergency as a physical process.
- People and their social contexts.
- Threatened or affected societal functions.

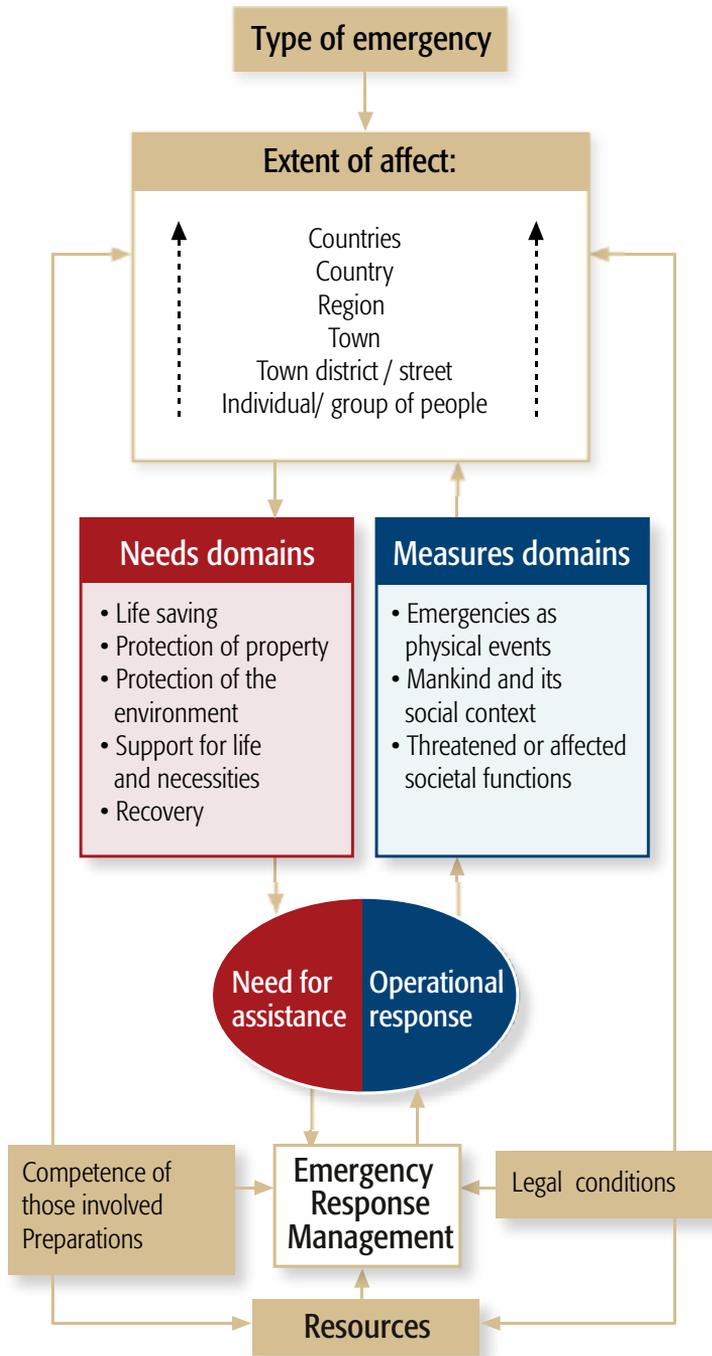


Figure 1. Model of emergency response management in a societal context.

To ensure that emergency response corresponds to assistance needs in time and space requires *management*. Emergency management defining assistance needs, and based on this, formulating response goals and strategies with consideration taken to the capabilities of available resources. Management must be coordinated between various emergency response bodies whose work is based on various *assistance needs domains* and *action domains*. These emergency response bodies conduct operations based on various pieces of legislation. Emergency response management is therefore based on a complex entirety of processes with several bodies involved. This complex entirety of processes will have varying levels depending on the level of society affected.

The primary duty of municipal fire brigades is to deal with each emergency as a physical process for protecting lives, property or the environment (*rescue service*). Measures must be taken for those directly affected. This applies, for example, to services and other forms of assistance. Measures must be taken for those who are affected indirectly, for example, providing help for relatives. Measures must be taken for those who are beyond the affected area, but who may be affected by the consequences of the incident. This applies to information and advice on the appropriate measures to be taken, or, for example, how people can continue to live normally in a more or less acute situation; in other words, measures that satisfy survival and function support needs.

Measures must be taken for dealing with threatened and affected societal functions. This applies to, for example, threatened or affected infrastructures or services. Electrical supply is usually the example that is mentioned first. Access to food, care of the elderly and educational activities can be given as other examples.

The preconditions in the form of *legal preconditions* and the *skills of participants and preparations* are of major importance for acute emergency management. This applies to resources, command functions and the affected segments of society.

The structure of emergency response management during a large response operation should be based on the needs for lifesaving, property protection, environmental protection, survival and function support and restoration. The actions for responding to various profiles of these needs aspects are oriented to the incident as a physical process, people and their social contexts, and threatened or affected societal functions. Legislation and tradition do not view all of this as a whole. Activities conducted during response operations have been fragmented. Various authorities have various responsibilities. A primary intention of the discussions and concepts above is to be able to analyse and discuss response operations, and command of response operations, by using the need for assistance measures as the starting point rather than how responsibility is allocated in legislation and by tradition.

The disastrous fire in Gothenburg in 1998 which claimed 63 lives entailed a major need for lifesaving in the initial stage of the response operation. After the primary lifesaving response operation, the fire brigades focused on protecting property, meaning limiting the fire and preventing its spread. Lifesaving was conducted by several organizations (fire brigades, the police and medical services). The actual emergency response phase lasted about two to three hours. Remaining was the task of providing survival and function support to those affected and others. This applied

both in the acute phase and in a more extended phase that became a part of everyday operations for several organisations. The fire as an emergency affected Gothenburg as a municipal body through those directly affected, as well as their relatives and other inhabitants. The various assistance organisations were also affected due to the emotional experience of dealing with an incident that resulted in 63 fatalities and many injured. There were needs for helping both those affected and their relatives in dealing with the consequences in various forms. Information was an important aspect. The main problem that several authorities had to deal with in cooperation with others was twofold: A dynamic emergency process with many lives in danger, and the consequences of the disaster for the municipality.

The major forest fire on Södertörn in 1999 illustrates another type of emergency. The fundamental need was protection of property and the environment. The fire was a dynamically expanding emergency lasting for an extended period on a municipal level. To deal with this, response operations were required from several fire brigades as well as other organisations. Coordination of these resources in combating the physical emergency was an important part of this incident's emergency operations. The response operation continued for an extended period. The capability to handle the logistical problems was an important aspect.

The flooding in western Värmland and in Västra Götaland in 2000 illustrates yet another type of emergency. The emergency gradually widened in time and space. The primary needs were property protection, assistance to people so that they could live normally, and dealing with threatened functions such as electrical supply and waste management. Coordination on the regional level between response operations within various municipal frameworks at various locations was important. An entire region was affected. The flooding situation produced an unusual emergency management situation, namely that tactical decisions were made concerning both the regional and municipal levels. The chief fire officer in Arvika was faced with the problem of handling substantial inflow and poor outflow from watercourses in Arvika. This was resolved by the county administrative board taking responsibility for the fire brigades in the municipalities of Arvika and Säffle, and appointing the chief fire officer in Arvika as the incident commander. The incident commander decided to increase the outflow from the lake system by increasing the outflow at Säffle through the locks situated there. This can be seen as a tactical decision for how the situation could be handled on a regional level. At the same time, tactical decisions were made in the municipal body Arvika by the incident site officer. These decisions related to how the dikes would be built to protect structures, transformer stations, etc. All of this in turn was a part of a whole, with the county administrative board in Västra Götaland coordinating response operations on the municipal level in the county of Västra Götaland and making the decision to release water from Lake Vänern at Trollhättan.

What was characteristic in this situation's emergency management were problems that entailed coordination on the regional level between response operations within municipal frameworks, as well as coordination between regional bodies (between the county administrative board in Värmland and the county administrative board in Västra Götaland). Tactical decisions on the regional level (outflow increase

at Säffle and increased release of water from Lake Vänern at Trollhättan) provided the preconditions for municipal tactical decisions. Within the municipal spheres, cooperation and coordination of various authorities were important aspects of the incident's emergency management.

The chief fire officer in Arvika has mentioned that he conducted daily staff briefings. He structured these so that the staff briefing that affected conditions on the regional level was based on reports from staff briefings from other locations within the municipal framework. This meant that information collection and processing of decision-making material had to be coordinated in time. Scheduling of the staff briefings and how information was collected and processed can be said to have constituted a management system with which the chief fire officer managed operations in time and space. The ability to establish such a management system during an emergency for an extended period is an important aspect of emergency management.

The train derailments involving dangerous goods in Kävlinge, Kälarne and Borlänge reflect yet another type of emergency that affected a municipality. After the actual derailments occurred, the situation was no longer dynamic, entering a static, passive state. The main problems can be said to have been to conduct damage-prevention measures (removal of the affected rolling stock without intensifying damage), issuing information about the situation and transporting a number of people to safety in the event that removal failed.

Apart from frequent usual emergencies, Sweden has, over the years been affected by major incidents. Municipalities, regions and the entire nation have been affected. Especially traumatic for the entire nation were the nuclear power station failure in Chernobyl, the Estonia ferry disaster, the assassinations of the prime minister and the minister of foreign affairs, the Gudrun storm and the tsunami in Southeast Asia. Besides the need for medical and technical emergency services action, there has been a substantial need for the handling of information, anxiety and grief. Emergency management tasks have been characterised by the problem of integrating management between local, regional, national and international levels.

The discussions about various major emergencies that have affected Sweden in recent times to varying degrees reveal the diversity of needs placed on emergency management and the complexity of the management problems encountered during every major emergency. With the starting point in the concepts that have been illustrated in the model above, it should be possible, in a more systematic manner, to analyse the assistance needs of the various affected societal bodies during various types of emergency and how these assistance needs can be met. Needs for assistance encountered in various emergency types should be possible to define with greater clarity. The complexity of the assistance needs encountered in each type of emergency should be possible to analyse better. The approach structures the relationships between important circumstances in emergency management. The basic idea is to attain response operations that correspond to assistance needs. To achieve this, emergency management is necessary.

Various extents of complexity in emergency response management

Emergency response management constitutes a complex entirety of processes with several participants who handle various problems in time and space with varying time references. The entirety of processes must be coordinated and structured in such a manner that concurrence is attained between assistance needs and response operations. Emergency response management as a complex entirety of command processes will take on various structures depending on the scale of the emergency. By going from everyday response operations to larger response operations and examining how emergency response management is conducted, a categorisation can be made of the extent of emergency response management complexity, which corresponds to the assistance needs when society is affected to varying degrees (Fredholm, 1995a; 1995b; 1997).

Emergency response management of operations during emergencies of an everyday nature:

Characteristic for this type of command situation is everyday emergencies of a fairly limited extent. It is relatively easy to gain an overview of the emergency and it is easy to recognize. The response operations consist for the most part of one or two crews from the same organisation. Car fires, traffic accidents and residential fires are examples of emergencies that initiate this type of command. The need for assistance is from an individual or a group for a short period of time.

Emergency response management of operations during more complex emergencies and of several crews from the same organisation:

It is difficult to gain an overview of the situation and it is complex. The incident site must be structured in some way. The need for assistance is based on several individuals and groups (for example, in the case of fires in terraced houses) or on an immediate neighbourhood (for example, in the case of industrial fires). The situation is of relatively brief duration. A fire in a larger building, a medium-sized industrial fire, a medium-sized forest fire can all be classified as emergencies that require this type of command.

Emergency response management of operations during complex emergencies and of several crews from different organisations:

It is difficult to gain an overview of the situation and it is complex. Several organisations are needed to satisfy assistance needs. Coordination in various respects is important. Incident commanders, police incident officers, medical team leaders, medical incident officers, etc. must coordinate operations. Management of emergency response operations in the event of train accidents, major road traffic accidents, etc. falls into this category.

Emergency response management of operations during complex emergencies with obvious and direct consequences for the local community:

This management category responds to assistance needs when a major emergency affects a large part of a local community. Actions are taken that are oriented to the emergency as a physical process and physical threat. Actions must also be taken that help people in the municipality to deal with the situation. Actions must also be taken to secure or replace societal functions

in the municipality. Several municipal leaders and authorities are engaged. Politicians may also be engaged as decision makers. The major fire in a battery warehouse in Landskrona during the summer of 2001 belongs to this category.

Emergency response management of operations during complex emergencies with obvious and direct consequences for people in one or more local communities and/or in a region: A very comprehensive response operation according to the previous category, or an emergency that affects several municipalities in accordance with the previous category, requires orientation and coordination on the regional level. The flooding in western Värmland and Västra Götaland in the autumn of 2000 is an example of such a situation that initiates this type of emergency response management. Assistance operations were conducted in several municipalities both in Värmland and Västra Götaland counties. Coordination on the regional level was conducted by the county administrative boards in the respective counties. There was subsequently coordination between the two county administrative boards. The orientation and coordination needs on the regional level, between response operations within municipal frameworks at multiple locations, are characteristic. National and municipal authorities as well as private organisations are engaged in command tasks.

Emergency response management during complex emergencies with direct serious consequences for part of a country or an entire country: Needs exist for coordination of national resources in a region, or of orientation and coordination of emergency response management tasks in two or more regions. The situation during the 1986 nuclear power plant failure in Chernobyl, the Estonia ferry disaster and the tsunami in Southeast Asia can be classified here. The physical emergency occurred outside of Sweden but its consequences affected all of Sweden and certain parts were severely affected.

Emergency response management during complex emergencies with direct serious consequences for two or more countries: This management category is for emergencies that affect two or more countries, either in a manner that the consequences affect two or more countries, or that both the physical emergency and consequences affect two or more countries. The examples in the paragraph above also apply here.

Concluding discussion

The conceptual content of the chapter presents an approach to assistance needs and assistance actions in the event of emergencies. The intention is that this approach will be able to serve as a frame of reference for the bodies that participate in the planning of response operations, in dealing with emergencies and in the analysis of emergencies and response operations. It is especially important to define the interface between different areas of responsibility, with the starting point being the assistance needs, and how this interface can be used.

Critical issues are how applicable the conceptual content is, in other words, how it reflects the reality that is constituted by an emergency, and how effective it is as an aid in dealing with emergencies. The intention is not that the conceptual content

should represent an absolute truth as to what management of an emergency is or an absolute norm for how an emergency should be dealt with. The intention is to contribute to an approach device that can be used to analyse and discuss assistance needs and how one can allocate responsibility for assistance measures. The primary intention is that the conceptual content will inspire a common approach among several response bodies (with responsibility based on the various pieces of legislation) on what constitutes emergency management.

Most important in the conceptual content is the perspective of beginning with the assistance needs of the affected bodies. Analyses of the assistance needs of various societal bodies affected by emergencies (for example, based on risk analyses) in time and space should be able to provide the supporting material for creating other and more effective action methods and organisational structures than those that presently exist, or provide supporting material for complementing them.

A common method of addressing what is referred to here as emergency management is to begin from the responsibilities of the various participants as defined in various pieces of legislation. This enables one to see the entirety of the problem to be remedied. By beginning with the characteristics of a need for assistance in time and space, one can see the problem's entirety, and based on this, allocate responsibility and discover cooperative forms.

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Ann Enander

2. Human needs and behaviour in the event of emergencies and social crises



10 September 2001: 'It stopped raining in the Sundsvall area on Tuesday morning. The flooding situation is still severe and it can get worse. The water level in Ljungan is rising rapidly and more rain is expected on Wednesday.'

Ann Enander has a doctorate in psychology, is a licensed psychologist and associate professor at the Department of Leadership and Management at the Swedish National Defence College. She conducts research on, and tutors and teaches in risk and crisis psychology, emergency preparedness, crisis management and leadership.

Emergencies and crises are about people, their social lives and the societies they live in. One of the most prominent figures within crisis and disaster research, sociologist Henry Quarantelli, points out that *all crises are social occurrences* (1998). He is referring to the fact that all emergencies and crises create social dynamics that influence and are influenced by the course of events. Knowledge of the driving forces and reactions that occur during emergencies is necessary to plan for and implement the most appropriate corrective measures. The starting point here is that this knowledge should form the basis for society's handling of severe situations. The needs of the victims should be the guiding factor. The purpose of the chapter is to compile and discuss knowledge of human reactions during emergencies and other types of crisis from a psychological and social perspective.

Providing the appropriate assistance can be seen from two perspectives. One concerns preventing and limiting the adverse consequences of the emergency as much as possible for the victims. The other concerns creating conditions to help the victims cope with their own situations. The measures and actions that best provide this support are naturally different in different situations. When life is at risk, this can concern a very firm and authoritative approach on the part of the emergency services. In the case of a diffuse, extended and uncertain situation, the most important aspect can be to address the need for information and to provide the opportunity for victims to make decisions and to act for themselves.

The needs of the victim as the starting point

There are no ready solutions for the optimal handling of every situation. The information presented in this chapter can however provide a starting point for planning for, developing and executing emergency response operations with the needs of the victims as the guiding objective. From this standpoint important key aspects can concern:

Developing the ability to form social and psychological diagnoses for emergency/crisis situations.

In this case this concerns the ability to understand and analyse a physical incident (fire, emission, landslide), and to do so also in terms of the effect of the incident on each individual and of the social context within which it occurs. Such a *diagnosis* includes judging the consequences from the point of view of the victim, for example in terms of how he or she can understand and cope with the situation. It also includes evaluating the social circumstances under which the incident occurs, where its cause, prior experiences and the reaction of society play a significant role in the development. It also concerns assessing the vulnerability and resilience of the various affected parties – who are the victims and who may need different forms of support in the short and somewhat longer terms?

Developing the ability to understand and interpret human reactions. If we do not understand how people interpret situations, we will not be able to understand their reactions either. The ability to understand and interpret human reaction is important for two reasons. First, the ability to understand means the ability to provide the appropriate

assistance, information and other necessary measures in the best possible way. Apparently inappropriate and irrational behaviour can, for example, be seen in a different light if one knows how stress reactions can inhibit physical and mental capability. Second, understanding helps one to better control one's own reactions to other people's behaviour. The aggression and irrational conduct displayed by victims can be more easily handled by response personnel that have the ability to interpret and understand such reactions.

Trying to establish realistic expectations for the conduct of colleagues and others affected. Myths concerning conduct during times of crisis live on. There are many examples of how false expectations of people's reactions have resulted in reduced effectiveness in planning response operations, in unclear information in acute situations and in misdirected efforts. Commanders have the important task of firstly developing their own understanding of conduct during disaster situations and secondly passing on this knowledge to colleagues and other affected parties.

Understanding the significance of information enquiries. Requests for information can be read as an expression of the need to understand and obtain some form of control in a difficult situation. Today there is an awareness among most players that it is important to give quick, relevant, clear and reliable information. A commander must also be aware of and be able to cope with contradictions and weigh up information while communicating during emergencies. This can concern weighing up information that is applicable to the interests of the media, the authorities and groups that are directly involved. It can concern various and sometimes conflicting needs for different interest groups.

Being aware of the human need for control and influence. The expectations placed on emergency response personnel are often high. They are expected to be able to manage severe situations also. It is a part of their role as professionals to live up to these expectations to the best of their ability (Wahlen, 2004). In acute situations where life is at risk, this approach is largely taken for granted; emergency and rescue personnel "take command". At the same time there should always be an awareness of people's basic need to be able to influence their own situation and to act for themselves. It is particularly important to allow for this in diffuse and longer lasting situations. An aspect of a professional approach can therefore be to share responsibility and decision making with the affected parties as much as possible.

Create preparedness for the handling of conflicts and negative reactions. Some types of situation and phases of an emergency tend to foster cooperation and solidarity, others conflict and antagonism between the various groups. Diffuse threats cause uncertainty and different interpretations, which in turn, can lead to conflict. Socially complex situations can give rise to the surfacing of latent problems and opinions that are difficult to handle and accept. Against a background of increasing risk situation complexity and an ever more diversified society, there is good reason to believe that conflict and antagonism will increase in the future. A commander has

the responsibility of preparing both himself and his colleagues to manage such a development.

Demarcation and structure

The relevant field of knowledge on the needs and reactions of people in the event of emergencies and crises is very extensive. It covers the reactions of many groups that are affected in different ways by an emergency, of the various needs that arise for different types of emergency and on experiences in different cultures and societies. To give a reasonable demarcation, here we focus partly on the field of knowledge within which there exists well established research and partly on areas of direct relevance for executing emergency responses. This implies a focus on the needs and reactions that are directly connected to the emergency. The extensive research on the treatment of traumatic long term effects is not, for example, dealt with in more detail in this chapter.

An emergency always occurs in a social context. The next section deals with the various ways of structuring emergencies from psychological and social starting points. Some key principles of current knowledge on human reactions in connection with severe situations are then summarised. The account is based on Swedish and international research. The various groups that are affected by the different types of emergency, as well as the vulnerability of and risk factors connected to these, are discussed. Through this then the chapter deals with the specific problems connected to the various types of situation. The examples here concern some diffuse threat situations, such as toxic emissions and some socially complex situations entailing violence and liability considerations. Some aspects relating to communication and the role of the media with respect to severe situations are also taken up. Finally the implications of the current knowledge about people's needs and reactions with regard to the planning and executing of emergency response operations and other types of societal measures are discussed.

The psychological and social perspectives of an emergency

A classification of the various risks and emergencies is often based on the physical course of events during the emergency. It can involve fires, floods or earthquakes. This kind of demarcation can be suitable in some situations, e.g. when tactical response operations or specific equipment are being developed, and the use of everyday language is appropriate. However, it is not so obvious in others such as when it comes to the study of human reactions. Modern stress theory has as its foundation, the basic theory that we *base* our interpretation of reality on our sensory impressions, our experiences and our ideas. The different ways in which we interpret a situation cause us to experience it also in completely different ways. It is our personal interpretation that lays the ground for how we react.

A psychological perspective of different types of emergency

Figure 1 shows a model for classifying stress situations based on two experience dimensions (Enander et al., 1993). The first dimension concerns the type of

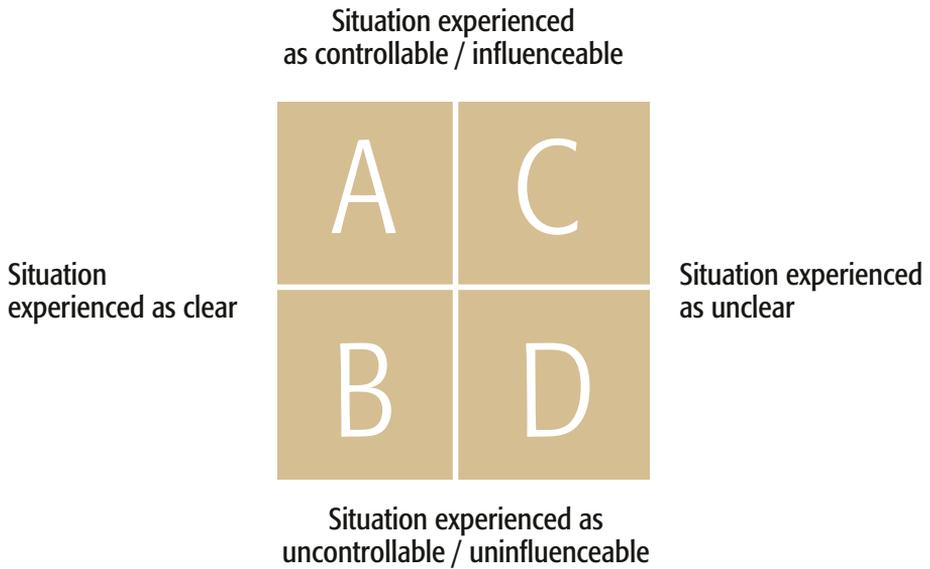


Figure 1.
Model of subjective key dimensions for understanding and explaining individual reactions in disaster situations (Enander et al., 1993).

Field A – the combination of situations that are clear and that can be influenced – exemplified by smaller fires in flats where the occupant has the capability and knowledge to extinguish the fire or limit the consequences.

Field B – situations that are clear and cannot be influenced – illustrated with cases in which an accident has occurred and those affected are entirely dependent on outside help to be rescued. This applies to people who are entrapped or stranded, such as the crew of the Russian submarine **Kursk**, which sank in the Barents Sea in August 2000.

Field C – situations that are unclear but can be influenced – illustrated with unconfirmed information that a grocery product can cause disease, for example, the alarm in conjunction with beef and BSE (mad cow disease). The threat can be experienced as unclear and difficult to interpret, but by avoiding these food products, individuals can influence their own situation.

Field D – situations that are unclear and cannot be influenced – illustrated by the environmental threats that may result from a nuclear power plant failure. It is unclear to individuals how much of their local environment has been affected, and there is nothing they can do to influence this. Farmers in the regions in Sweden who were particularly affected by the Chernobyl disaster describe their situation in terms of vagueness and a lack of opportunity to do anything about the situation. (Enander, 2000)

emergency and takes up the subjective extent of *clarity* or *comprehensibility*. The less comprehensible a situation is felt to be the more difficult it is to cope with. Consequently a new, unfamiliar or diffused, threatening situation is often experienced as especially dangerous. The second dimension concerns the possibility to handle the situation so as to affect the subjective extents of *control* or *influence*. The stress experience is reduced when you feel that it is possible to influence your own situation.

In time an emergency can be classified as belonging, broadly speaking, to different fields. A situation that initially appears to be unclear and cannot be influenced can with time become clearer as the threat becomes apparent and the individuals begin to identify the various courses of action open to them. We can say that a key measure with regard to supporting the individual during an emergency is to, as far as possible, provide information to allow him or her to understand the situation (experienced comprehension) and to influence the situation (experienced control). The feeling of powerlessness and dependence on others for assistance during an emergency can create the feeling of a loss of dignity, adding to the strain the individual is exposed to (Raphael, 1986).

The different phases of an emergency

The handling of an emergency or crises situation can broadly speaking be divided into three phases (see figure 2). Each phase can be connected to various operational measures, as well as to specific social and psychological reaction patterns and problems.

The initial phase is the period before the emergency occurs and is marked by *preventive measures and preparation*. It is within the framework of this phase that our everyday lives are led. We are aware of the fact that risks and potential threats exist, but they only exist as thoughts or assessments of what could happen. We can interpret these risks and threats in many different ways – how likely is it that an accident will occur and what could the consequences of it be? Our evaluation of these factors then affects our attitude to applying preventive measures and preparations for such an event.

The second phase includes the period from when the situation occurs until when the acute phase is over or is under control. This period is marked by measures to *combat the threat, protect life and property, and minimize damage*. When the threat is, for example, a fire, this phase can be short; if it concerns radioactive fallout, it can continue for several months or even years.

The third phase begins as the acute situation passes and proceeds until the circumstances no longer call for remedial measures. This period is marked by *rebuilding and recovery* – physical, social and psychological and ends with a return to the initial “pre” phase situation, with assessment and incorporation of experiences, preventive measures and preparation. In this way the three phases succeed one another in cycles.

In reality the phases are not as clearly demarcated as appears in the figure. They can combine with and overlap each other. This is often the case in diffuse situations and undefined threats, such as toxic or radioactive emissions. It can be difficult for an individual to decide when or even if a threat situation actually exists. In connection with the Chernobyl disaster, for example, it was extremely difficult to determine the

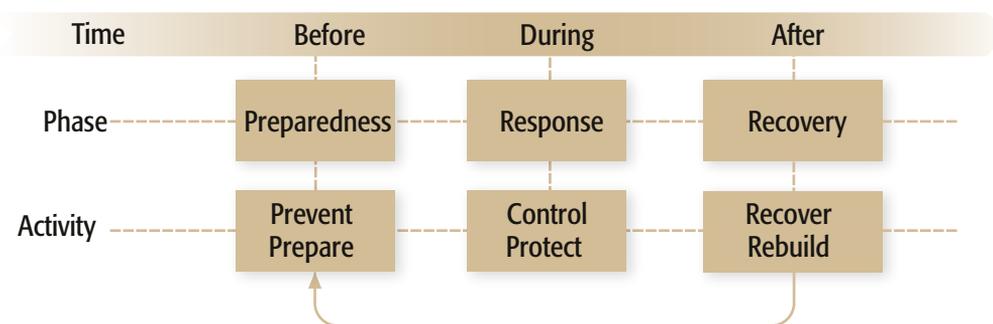


Figure 2. Three phases in dealing with a disaster or emergency.

actual situation and risk levels in the different parts of the country. It is perhaps worth recalling that it is not the actual situation, but rather how it is perceived and interpreted that determines how people are affected and how they react. In a similar way it may be difficult to determine when the recovery phase can be considered as completed. Certain events may initiate social dynamics that can influence society in a number of ways for a considerable length of time. In Sweden, for example, the murder of Olof Palme and the Estonia disaster are events for which the recovery period has been exceptionally long, with long term effects in several areas of society.

Small and major emergencies

The size of an emergency is of consequence to the emergency response operation for several reasons. It can be a question of tactics, resources, command and responsibility aspects. The difference between small and major emergencies can also be considered from a psychological and social perspective. In the event of a major emergency in which large numbers are involved collectively, a social dynamics is set in motion which also affects how individuals experience and conduct themselves. Weisaeth (2002) has summarised some of the differences between individual and collective conduct during emergencies in the overview presented in table 1.

This shows that during the influence phase of a collective trauma, there can be an increase in stress among the victims in the form of emotions relating to the witnessed suffering of others or perhaps to responsibility for it in some way. The accounts of survivors of the Estonia disaster give clear examples of how such experiences can contribute to feelings of guilt and to mental images that are extremely difficult to repress (Wallenius, 1996). The overview also shows that a significant contributory factor of collective trauma is what happens *after* the event. It is as much about the mobilisation of society's resources as the attention that is directed towards the various affected groups by the media and other parties.

Phases	Collective trauma	Individual trauma
Influence phase	<p>Deathz threat <i>intensity, duration</i></p> <p>Physical injury/ physical fatigue <i>seriousness, localisation</i></p> <p>Witness experiences relatives killed, degree of helplessness - own and others'</p> <p>Responsibility obligations Care responsibilities, impossible choices</p>	<p>In mortal danger <i>intensity, duration</i></p> <p>Physical injury/ physical fatigue <i>seriousness, localisation</i></p>
Emergency response phase	Needs > resources	Needs ~ resources
Post-traumatic phases	Symptom infection, synchronisation of stress reactions, treatment in groups, the altruistic society/ loss of or conflicts in the community	Isolated fate
Presence/involvement of:		
Media	To a high degree	To a low degree
Politicians	To a high degree	None
Royal family	To a high degree	None
Church	To a high degree	To a moderate degree
Health and medical services	To a high degree	To a high degree
Police/ fire brigade	To a high degree	To a high degree

Table 1. Individual versus collective trauma

Emergencies as psychological and social phenomena

This section views emergencies from a psychological and social perspective. An important fundamental principle that is raised is the significance of *interpretation*, i.e. that individuals behave based on how they interpret an incident and what it implies for them personally. Another important starting point is to place the emergency in a *social context*, which means that people are influenced not only by the event itself but also by the effects and responses it evokes in the community or in society. Approaching an emergency as a psychological and social phenomenon has several implications in terms of handling it.

In the first place it means that *events that are alike in a physical sense will not necessarily be interpreted in the same way by the victims.*

Secondly it means that *people with their diversification of knowledge and experience can assess one and the same risk or emergency very differently.*

Thirdly it means that *some types of event can have significant psychological and social consequences, even when they do not cause extensive physical or material damage. The effects can also be the opposite, i.e. the threat can be serious but people fail to perceive it as such or choose to ignore it.*

The significance of these three implications is developed and exemplified below.

Events with the same physical development are interpreted differently

The first time an incident occurs it can be unclear and be experienced as uncontrollable; people fail to understand it and do not know how to conduct themselves. If they are later exposed to a similar situation, they can interpret it completely differently. Research literature sometimes uses the term *crisis culture* to describe development in societies that are exposed to recurring severe emergencies, for example those caused by repeated natural disasters such as hurricanes and floods or as a consequence of accident-prone occupations such as mining.

Crisis culture consists of norms and evaluations surrounding how to interpret a threat as well as practical techniques for meeting it. The difference between how people in Sweden as opposed to those in Estonia responded to the M/S Estonia disaster have, among other ways, been interpreted in terms of differences in expectations, experiences and crisis cultures. A characteristic of a crisis culture is that it is oriented towards a particular type of crisis or emergency, and that it is based on experience from the most traumatic event of the recent past.

Another factor that influences interpretation of a collective trauma is the cause, or rather that which people take to be the cause, of the incident. Four different types of cause conditions have been classified in relation to threat or emergency - natural disaster, human error, negligence and malice. Emergencies read as caused by natural disasters are normally taken as being chance events, natural fatalism, "these things happen". Human error or negligence, on the other hand, gives rise to reproach, criticism and loss of faith. Events caused by malice in the form of direct violence or malevolence give rise to outrage and can lead to a cycle of violence in which victims feel justified in responding with aggression and retribution. Not only the event itself, but also, to a large extent, how the event is interpreted influences the reaction.

In developed societies placing blame purely on natural disaster is decreasing as it is felt that the human element plays an ever increasing role and bears more responsibility for affecting outcomes. That buildings collapse as the result of an earthquake is not only taken as being caused by extreme natural forces but is also directly related to the human involvement in terms of shortcomings (construction work) and negligence (community planning).

Different people can experience the same event in different ways

There are many reasons why people experience the same event in different ways. Generally speaking we can say that the range of variation in interpretation is greater during the pre and post phases of a major incident. A common pattern of behaviour in a community that is exposed to a major disaster is that there is relatively close agreement during the acute response phase but that disagreement and conflict increases between groups during the recovery phase.

We can say that the more indistinct the threat situation is during the acute phase, the greater is the chance that people will experience it in different ways. Studies of communities that are exposed to diffuse threat situations in connection with a possible toxic or radioactive emission also showed that the situation is often interpreted in different ways by different individuals and groups. This has in turn been the cause of conflict and mistrust between different groups.

An interview study carried out among farmers from the areas of Sweden affected by radioactive fallout from the Chernobyl disaster clearly illustrates this point (Enander, 2000). The farmers were asked about their experiences, how they related to the situation and how they would think should a similar situation arise today. Two completely different ways of interpreting their experiences were presented. One pattern is based on that there is very little you personally can do about it, that specific expertise is required to assess the situation and that it is necessary to rely on the authorities. If a similar situation should arise in the future, it is just to follow regulations and instructions: "you can't influence anything yourself, you just have to do as they say". The other pattern that was presented was based more on the personal experience gained and a critical attitude to some of the measures implemented by the authorities without a credible explanation as to why. In a similar situation we should have a more enquiring approach: "I would think more for myself and I would demand more of the authorities if it were to happen again".

A significant aspect of the interpretation of a threat is how individuals assesses their own options for responding. Even in a very clear danger situation, there can be considerable variation between individuals with regard to the possibilities they have, and feel that they have, to respond. An important effect of training and exercises seems to be that someone in a difficult situation can more easily identify and mobilize his or her own available forms of action.

Limited events with long term consequences and visa versa

It is once again the interpretation of the event, rather than what has actually occurred that affects the way we respond. This can mean that events that are not considered dangerous or to be played out by society at large, continue to evoke strong

reactions. Some types of emergency become particularly significant because of their symbolic value or the associations they signal. The atomic power station disaster at Three Mile Island (Harrisburg disaster 1979) is a good example of this, an event in which nobody was directly injured but which resulted in extremely long term psychosocial consequences for those living close by (Baum et al., 1983, Kroll-Smith & Couch, 1993). For many the event is the symbol for the situation where man loses control over machine, a thought which when expanded is subjectively threatening.

Some types of emergency therefore evoke especially strong reactions through their symbolic content or the associations that accompany them. It is important to understand the factors that can lie behind a substantial subjective reaction in the presence of some types of threat. An under estimation of these subjective reactions can result in people not receiving the support they need.

The attack on the World Trade Centre on September 11 2001 was an event which had incredible direct consequences for the USA but which also through its symbolic significance affected the whole world to an almost incomprehensible degree.

The reverse situation in which people disregard a real danger creates a problem, especially during the preparation and preventive measures phase. A number of psychological factors contribute to people reacting in this way. Some concern the way in which we assess danger at a personal level; we tend to have the 'it won't happen to me' approach (Weinstein, 1980). Threats to our health caused by smoking or poor diet are well known examples of subjectively underestimated threats, as are risk factors in our local surroundings – in our homes or in traffic. It is more difficult to acknowledge some types of threat than others. Events that are partly "invisible" or in which the negative consequences are not immediately apparent fall into this bracket. Another situation is when the course of events is separated in time and space, causing the individual not to take in the whole and understand its consequences.

Reactions during emergencies and crises

This section presents an overview of general experiences of people's reactions during extreme situations. The account is based on Swedish and international research and on the three phases of the situation's development that are shown in figure 1 (see previous section). The pre/preparation phase concerns risk acknowledgement, readiness and response to warnings. The during/response phase discusses reaction when exposed to severe threat and some myths connected to this. The section on the post/recovery phase takes up some of the consequences and post reactions.

Prior to/preparedness phase

The risks we acknowledge and how these are judged and evaluated influences our readiness and watchfulness for warning signals. The way in which people perceive risk has been the subject of research since the early 1970s. The development and application of nuclear power technology was one of the driving forces behind this increased interest. The debate on nuclear power clarified for example the differences in how risks are assessed, principally between the technical experts and the

dubious general public. Subsequently researchers have focused considerable effort on explaining differences in risk assessment – partly between different types of risk and partly between different groups of people.

Risks and risk perception

Psychological research on risk assessment has shown that people tend to use a number of approximate mental rules-of-thumb when they assess how often certain things occur. Events that occurred recently, that are easy to recall and that have serious consequences are often judged to occur more frequently than they actually do. In a study among the general public we found that people's assessments agreed relatively well with available statistics on death as a consequence of a type of accident (Enander, 1990a). In conformity with previous studies made in other countries, we found a tendency for exaggeration of unusual and dramatic incidents, as well as an underestimation of common everyday incidents.

There is a big difference in assessing the probability of different events occurring and the likelihood of being personally affected. An important and well documented study result shows that people on the whole feel that the risk is lower for themselves than for *people in general* (Weinstein, 1980; Sattler et al., 2000). We tend to think that we are less susceptible than others. This phenomenon has been explained by psychologists as optimism in terms of a person's own susceptibility and the notion of an ability to control certain risks at a personal level. The tendency is also stronger when it comes to activities that are perceived to entail a large degree of personal control, i.e. driving. But also risks that would normally lie outside this range – the risk of falling victim to some illnesses, of being injured in an earthquake and even of being killed in a nuclear attack – seem to be judged falsely optimistically. It is not necessarily the case either that somebody who has been exposed to a threat situation or been involved in an incident assesses personal risk more realistically. The errors in the way we interpret our own experiences and thereafter reinterpret the causes of the events, so called erroneous hindsight, contribute to us even then having the tendency of underestimating the risks to ourselves.

Some researches say that a degree of this “invulnerability feeling” is necessary for our well-being (Taylor & Brown, 1988). Awareness of risks also has its price – partly in direct costs for prevention and preparedness measures, partly in psychological terms in the form of, for example, increased anxiety (Enander, 1996). If you want to motivate others to be more aware of safety and emergency preparedness by increasing their risk awareness, you have to take into account that it can be difficult to break down the “invulnerability feeling” in the individual and that an increase in the feeling of vulnerability can also involve psychological and social consequences at a personal level.

Preventive measures and emergency preparedness

After the event emergencies evoke strong reactions and receive a lot of attention. On the other hand it is much more difficult to raise people's interest and incite them to apply preventive measures or prepare themselves for a possible event. This, despite the fact that we know that many incidents can be prevented and that those who

take preventive measures handle difficult situations better. Why do we not prepare ourselves better?

As has been mentioned above, an unrealistic assessment of personal risk can be one reason. Another reason for a low level of emergency preparedness can lie in the way people interpret and perceive different threat situations. If a situation is unclear it is difficult to determine what measures are reasonable, or if you feel that you have no control over a situation the application of measures feels meaningless anyway (see figure 1 on page 36).

One of the main reasons for people not taking preventive measures seems to be uncertainty – uncertainty about what one should prepare for (Larsson & Enander, 1997). On the other hand factors that contribute to the individual *taking* preventive measures are responses to personal views and in connection with public safety. Another aspect that has not been the subject for more extensive study concerns social norms and expectations surrounding risk and safety issues. These norms can differ between various societal groupings. In a study of emergency preparedness we found a tendency for safety issues to have lower social status among younger people, especially younger men. You could expect a negative reaction from your peers if you concerned yourself about safety issues.

Uncertainty can also play a part in questions of responsibility and roles. In studies of people's views regarding emergency preparedness in Sweden, there is a clear expectation that the authorities will handle any possible situation and apply the necessary measures. People generally judge the emergency preparedness of the authorities as good, even in situations where obvious mistakes have been made and there have been shortcomings in both planning and execution (Enander & Johansson, 1995). Some researchers have pointed out that there is a potential danger in this high regard for the authorities (Otway & Wynne, 1989). Their argument is that the greater the trust people have in the authorities and organisations to provide emergency preparedness and safety measures, the less aware and active they are themselves. Swedish studies have shown a connection between the great degree of confidence in the authorities and a denial or resigned approach to their own capacity to influence safety aspects (Enander 1996). There can be a degree of wishful thinking in the trust placed in the authorities and those responsible – “as I personally cannot/don't want to do anything, I assume that others are doing something”.

Warnings and warning problems

Studies of how people respond to warnings are among the more established in emergency and disaster research, particularly in terms of natural disasters such as flooding, hurricanes or volcanic eruption.

The theoretical analysis of the warning process from the point of view of the receiver can broadly be divided into two main areas: a psychological risk perception tradition based on the individual's notion of the risk/threat and an assessment of possible responses. The individual's experiences, knowledge, and interpretation form the starting point for understanding what is happening. Sociologically oriented research has on the other hand emphasized collectively evolved norms that are developed in response to new situations. This perspective emphasises the social pro-

cesses in response to emergencies. These two perspectives are not incompatible, but rather, complementary (Lindell & Perry, 1992).

For a person to receive and respond to a warning as intended, it is necessary for the warning to be noticed (heard, seen), for its meaning to be understood, for it to be believed, for the person to understand that it applies to them personally, for the person to respond correctly (Mileti & Sorensen, 1988). There is extensive empirical documentation of the problems involved in all of these parts of the process. A decisive aspect is the way in which people interpret different signals. When the VMA signal was sent in connection with a chlorine emission in Skoghall in Hammarö, there were many, for example, who misinterpreted the signal or presumed that it was just an exercise (Enander, 1990). Even warnings in the form of smoke or other (in retrospect) clear indications can be easily misinterpreted. Interviews with survivors from the Gothenburg fire 1998 give several examples of how young people misinterpreted smells and visual impressions (Statens Haverikommission, 2001).

Perry (1989) has developed a model based on four variables which has proved to be of fundamental importance for the individual's reaction to warning signals: family context, availability of an adaptable plan, experienced personal risk and belief in the warning system. The family context refers to the commonly documented fact that families respond as a unit, and that the first priority for the individual members of a family is to contact the others and then to act together. Availability of an adaptable plan - through received information, previous experience or exercises - increases response readiness. Many studies show disheartening results of the lack of willingness to make plans and preparations because, for example, of the uncertainty of what to plan for (Larsson & Enander, 1997). The perceived level of risk as well as confidence in the warning system are influenced by factors in the individual, by the signal and its source, and by the interaction between these (see Lindell & Perry 1992 for a detailed discussion).

Collectively, research shows that there are many factors which affect the possible ways an individual can interpret warning signals in a particular situation. Generally speaking the problem lies in convincing people to take alarms seriously, not in that they will overreact. A common theme within the area is the desire for confirmation and the need for developing a warning system that will facilitate this. Lindell & Perry (1992) discuss a number of different warning methods and recommend a system that combines several. According to Handmer (2000) a common basis of understanding is a prerequisite for a warning system to function well. He poses the question of whether it will, therefore, be more difficult to establish efficient warning systems in the future in a society that is characterised by increased mobility, individualism and heterogeneity.

Response phase: reactions under threat

Psychological stress theory gives a starting point for the comprehension of human reaction during acute threat situations. The stress theory comprises several different aspects (Larsson et al., 2003). One aspect that can be said to have characterized modern crisis and disaster research is based on the psychological model that was developed by Lazarus and his colleagues (Lazarus & Folkman, 1984). The theory and

its development is well documented and applied to Swedish research literature. (For a more detailed account of the theory, readers are referred to the following sources: Enander et al., 1993; Wallenius, 1996; Wallenius, 2001a, 2001b; Larsson et al., 2003.)

Stress during acute threat situations

The fundamentals of the stress theory perspective can be summed up as:

- “The truth lies in the eyes of the beholder”, meaning that the individual forms a personal picture of the world based on interpretation of sensory impression and on experience.
- The interpretation process comprises two basic questions: the first is “Is there a threat?” and the second “What can I do?”. These two questions reflect a person’s assessment of the apparent threat and of his or her possibility to act.
- Attempts by the individual to overcome the stress fill two functions. The first function is oriented towards the situation or problem, so called problem oriented stress management. The second towards the emotions that arise, for example fear or anger, so called emotion oriented stress management.

A stress theory perspective of acute threat situations has several important implications. The first is that individuals can be expected to interpret the situation in different ways and that it is the interpretation and not the “objective” circumstance that their action will be based upon. The interpretation is of both the danger and personal possibilities to act. If a person feels that no course of action is available, he or she will probably remain passive even if, seen objectively, there are possible courses of action. Another important implication is that of apparent passivity on the part of people who can in actual fact be carrying out the function of helping to cope with their emotions. Typical of such a strategy is denial, in which a person tries to ignore the danger and continue as though nothing has happened.

In their overview of stress related research, Larsson and his colleagues (2003, pp. 172–174) summarise severe stress reaction from the starting of it involving the *whole person*. Reactions include physiological and motorised changes, as well as changed mental activity in the form of affect on functions such as perception, judgement, problem solving and social adaptation. Stress reactions also involve emotions such as a fear, anxiety, anger or shame.

Common examples of tendencies caused by severe stress that are pointed out are:

- generalisation based on a small amount of information
- difficulty in taking in and assessing large amounts of information
- drawing conclusions too quickly
- over or under estimating the problem
- losing nuance, thinking in terms of either – or.

In their illustration of common stress reactions, these researchers conclude by pointing out that our reactions are in actual fact functional in the light of the types of threat the human race has been confronted with during its long years of development. But, the writers indicate:

In modern society threats are different from those that we are genetically designed to cope with. Modern threat situations are often complex and long lasting. Tunnel vision can then mean that we miss important information at the same time as out-and-out fear or aggression can point us in the wrong direction.

Conduct during emergencies

Even the social framework within which an emergency or disaster occurs has a bearing on understanding people's behaviour patterns. In cases of fire, Canter (1990) claims that people to a large extent try to follow what he calls *the script* that they were following before the incident occurred or which they would normally follow. A script is connected as much to the person's role and current activity as to their physical location. It concerns the habits and behaviour patterns that are a part of that particular role, activity and environment. A person behaves in a certain way as a colleague at work and in another way as the father of small children in a supermarket. Based on this, Canter forwards the hypothesis that the risk for not doing the best thing, paradoxically enough, can be greater in a familiar environment, where one follows a script that is familiar and firmly embedded. This does not apply, though, when conduct during emergencies is *also* well embedded in just that situation.

A well-known researcher in conduct during the event of fire (Proulx 1994, quoted in Ockerby 2001) has explained four basic principles in connection to people's conduct during emergencies. The first is *avoidance and denial*: we look for everyday explanations for the danger signals or ignore them completely. The other explains *engagement*: people tend to continue with what they are doing or usually do in similar situations. During the fire at King's Cross 1987, people continued to go down to the underground station as was their daily routine, despite the fact that smoke was pouring out of it. The third principle concerns *relationships*: people are drawn to one another; they try to find their loved ones and want to act as a group. Planning for emergencies must be based, for example, on the fact that parents will attempt to find their children. The fourth principle concerns *role* and how that is perceived. It can be the case that passengers remain passive because they expect the crew to take responsibility during an emergency.

The significance of social connections and roles for conduct during emergencies has implications for the generalization of results for various environments. A person can be expected to follow various roles, as, for example, the man taking the underground on his way to work, an employee at his place of work, a hotel guest, a patient in a hospital or a family member at home. Our preparedness to take certain action or behave in a certain way can therefore change depending on where we are and the role we are in. The script is not necessarily always clear but can change depending on how the individual sees his or her role.

Because the individual as well as the situation influence conduct during an emergency it is difficult to predict just how people will come to react during a given emergency. In one of the few studies which have attempted to quantify various types of reaction, Weisaeth (1989) has divided the victims of an explosion at a paint

factory into three groups based on their behavioural patterns. The first group in the main responded in the form of “passively following”, i.e. they followed what others did, which was basically escape behaviour. This group consisted of some 30 percent of those involved. The second group, about half, retained their capacity for social interaction and cooperation. The third group (some 10 percent) included those who took the initiative to lead.

Myth and reality

Sociologically oriented emergency research has contributed to forming a number of popular myths concerning people’s behaviour in collective stress situations. Examples of these, notes Fischer (1998), are that people flee in panic, are totally helpless and dependent on the authorities for assistance, rush to the nearest shelter on order to be cared for as much as possible and that plundering and anti-social conduct are common. Table 2 summarises myths as opposed the reality in terms of reactions in emergencies.

One of the best established myths concerns the occurrence of panic or pronounced irrational and anti-social behaviour among victims. This myth was disproved as long ago as the 1950s by emergency researcher Henry Quarantelli (1954). Through the study of empirical material, he could establish that panic is rare and arises only when several very specific circumstances are combined. Dyregrov (2002) points out that quick evacuation of a danger zone does not evoke a panic like reaction, but rather expediency. According to the same writer we can use the term panic when an individual’s conduct prevents or reduces the possibility of other people saving themselves in a life threatening situation. Situations which evoke panic have two characteristics. The first is that people think that they are in immediate danger. The second is that people think there is a chance of saving themselves, but that the opportunity will decrease rapidly.

Situations that can be characterised by panic creating factors can be fire or the capsizing of a ship. Analyses of conduct in connection with these types of emergency, such as the King’s Cross underground station fire in 1987 (Donald & Canter, 1990) and also the capsizing of the M/S Estonia (Cornwall et al., 2001) shows, however, that social structure and roles, for example, in cases of respect for people in authority or normal social contact patterns between men and women, tend to be upheld even in extremely severe situations. Based on follow up empirical research of emergencies, Feinberg & Johnson (2001) forward the hypothesis that social relationships break down only very slowly during severe threat situations. Weaker relationships, such as regard for somebody unfamiliar, break down more quickly than strong socially established relationships based on, for example, gender and age. The most stable are the primary family ties, for example, between man and wife or parents and their children.

Myth	Reality
Panicky flight	Rational behaviour
Looting	Criminal behaviour declines
Prices forced up	Necessary goods donated
State of emergency	Normal legislation applies
Psychological dependency	Capability to satisfy needs
Disaster shock	Receptive to others' needs
Evacuation – should be delayed	Evacuation – should be initiated early
Shelters – should be used immediately	Shelters – should be used in emergencies
Reliable: details about the dead/ injured and property damage	Exaggerated: details about the dead/ injured and property damage

Table 2.
Myth and reality concerning reactions to disasters (based on Fischer, 2002).

The myths surrounding conduct during emergencies are not easily dispelled. Fischer (2002) suggests that there are several reasons for this. One can be the image that is portrayed by the media, in which the term panic is commonly used to create dramatic headlines, and not least the depiction of people's behaviour we see in the popular *disaster film* genre. Another reason is that experience gained from civil unrest situations (for example riots and racial tension), in which plundering and violence do occur, tend to be taken generally as pertaining to other types of disaster also. Another reason is lack of knowledge. We tend to draw false, general conclusions that extraordinary events automatically give rise to extreme and anti-social behaviour.

The fire researcher Sime (1990) points out an additional factor that may contribute to the fact that the panic myth lives on, namely that panic, as an explanation model, places the blame for the consequences of a disaster on the individual and thereby provides a simplified picture of the problems involved in establishing remedial measures. This approach indicates that we are not far away from saying that *people have to learn to react correctly* rather than thinking about how remedial measures should be formed to comply with the natural behaviour of people during emergencies.

The existence of myths and misguided notions about how people conduct themselves during emergencies can be an obstacle to good planning and effective measures in several ways (Ockerby, 2001). Authorities that are concerned about causing panic could, for example, be unwilling to issue information or delay its issue, unnecessarily. Such action could further impair the handling of a difficult situation as people are less willing to follow advice and directions when they feel that they are unclear or incomplete (Perry & Lindall, 2003).

Evacuating

Knowledge of people's behaviour when faced with an evacuation decision is taken largely from clear-cut and relatively unambiguous situations, such as hurricane warnings, flooding etc. It is often taken from areas that are affected repeatedly.

Despite a relatively clear threat situation and previous experience within the area, distrust is still the most common initial reaction (Vogt & Sorenson, 1987). Social factors play a large role in all stages of an evacuation (see e.g. Fitzpatrick & Mileti, 1991, Lindell & Perry, 1992). The immediate reaction when faced with a situation is to look for confirmation, usually from a relative, friend or neighbour. The decision to evacuate is taken family wise, where a family with children is generally more willing to do so. Normally people prefer to move to friends or acquaintances, and tend to be more negative towards shelter provided by the authorities.

Generally speaking people are unwilling to evacuate even under extremely severe threat and tend to postpone the evacuation as long as possible. This has been established in connection with the nuclear reactor incident at Harrisburg (Three Mile Island, 1979), during which extensive spontaneous evacuation was carried out. Developments in connection with this event seem to confirm the suspicion that reactions in the face of a technological disaster differ considerably from those when faced with a natural disaster. This extensive empirical material (see van der Plight, 1992, for an overview) gives an insight into how different aspects of the situation contributed to people interpreting it in different ways. For this reason the event is worthy of closer examination.

The Three Mile Island nuclear reactor accident caused an uncontrolled emission of radioactivity into the surrounding area for a period of about a week. Ultimately the emission was discovered to be relatively small, but for a time there was great uncertainty as to the possible outcome (risk for meltdown or explosion). After a couple of days the Governor of Pennsylvania issued a recommendation that all pregnant women and infants living within 8 km of the plant should evacuate the area. The remaining residents were recommended to remain indoors and to keep doors and windows closed. Some 40% of residents within 24 km of the plant decided spontaneously to evacuate, 60% from within the indicated 8 km limit. Of the total 140,000 people who evacuated, the majority stayed with friends and acquaintances and remained away for about a week.

A follow up showed that the main reason people evacuated was that they felt that the situation was dangerous and life threatening, something that was shown to be closely connected to the fact that the information given was considered contradictory and unclear (Lindell & Perry, 1992). Another reason was that people wanted to avoid forced evacuation and wanted to protect their children. Those that did not evacuate gave mostly fatalistic reasons for this, such as, "it lies in God's hands", that they were waiting for directions from the authorities or that they did not consider that there was any danger (more common among the elderly). The event exemplifies how an unclear situation can give rise to completely different interpretations. Each family did its own risk appraisal and responded largely in accordance with its appraisal of the threat and its own responsibility to act.

One of the few examples of an evacuation in Sweden in times of peace occurred in Kävlinge in 1996. A goods train carrying ammoniac was derailed and 9000 people were evacuated for almost 24 hours. The evacuation was carried out calmly and in follow-up studies considered successful for several reasons (Jarlbro m. et al., 1997). The success was among other things attributed to good emergency planning and

well developed risk awareness on the part of both the authorities and the general public in the area (Barsebäck nuclear power plant area), and that unambiguous, relevant information was issued. Any anxiety that was shown concerned mainly the risk for plundering or burglary, and care of elderly relatives and pets.

"Post"/recovery phase

Subsequent to a severe emergency or disaster there is a recovery phase. Recovery can take place on several planes. At societal level it can concern the physical reconstruction of buildings, and infrastructure. At the individual and group level there is a need for psychological and social recovery. People have suffered various types of loss and their social networks may have been seriously affected. Some people may be suffering from various forms of distress or crisis reaction for which assistance is required.

A great deal of research into people's needs in the event of an emergency has been focused on consequences to health following the event. After a severe experience victims often suffer from mental symptoms such as anxiety, restlessness and sleeping problems. In some cases it can concern more serious mental illness caused by extreme exposure to stress (see Michel et al., 2001). The occurrence of such serious cases varies between different types of traumatic experience. Severe consequences for mental health seem to be especially common in connection with torture or concentration camps. On the other hand most studies show that such severe cases are less common in connection with emergencies and natural disasters (Rubonis & Bickman, 1991). Research into severe traumatic consequences is not discussed further in this section, rather the focus is on the more normal recovery process.

Factors of significance for recovery

Literature on recovery points out several factors of significance for people's reactions and capacity to recover. Some concern conditions and experiences relating to the individual that are established prior to the event, such as personality, prior training etc. Others can be identified in addition to these that are affected by the support society and social networks provide *after* the event. These can roughly be divided into two main types where one concerns factors that influence the person's interpretation of the event and the other concerns confirmation and symbolic handling by the public services.

Wortman (1983) observes in a research overview that a person's reactions to stress and victimisation (to find yourself in the role of victim) can be affected by various suppositions and notions of faith. Experiences during an emergency or disaster can cause a person's conception of the world to change or even be destroyed. An individual's interpretation can concern how he or she perceives the cause of the event. Self blame can, for example, result in several mental and physical symptoms subsequent to a negative event and in that the person is reluctant to request assistance. A study of victims of flooding and toxic emissions (Solomon et al., 1987) showed that the reaction to place the blame on others *inhibited* the individual's recovery when there was an active problem solving treatment available, but *improved* recovery when active problem solving was not available as an alternative. Experiencing responsibility for *solving* the problem appears generally to result in well

adjusted behaviour in comparison to experiencing being responsible for *causing it*. People who feel responsible for causing an accident may have difficulty handling their emotions of guilt and self-reproach. Efforts to clarify the course of events, such as those carried out, for example, following the discotheque fire in Gothenburg (Hassling, 2000) can therefore fill an important function in assisting victims to process their own interpretations of the event.

Expectations regarding the reactions of disaster victims or conceptions of these expectations can influence the readiness to request different forms of assistance. When members of the public were asked to comment on descriptions of reactions following a flood, they showed very little understanding for the strong emotional reactions of people who had suffered only minor *material* loss (Yates, 1992). These people were considered generally more negative and not eligible for professional help. A possible consequence of this situation is that people who experience difficulty or feelings of guilt following a disaster could be less likely to request assistance if they feel that it would not be considered justifiable in the eyes of the general public. Subsequent to a flood disaster in England, victims were reluctant to ask for help because of the risk of being socially stigmatised (Green et al., 1990). The feeling that other people fail to take your experiences seriously can give rise to strong, prolonged reactions. Even 14 years after Chernobyl, there are many farmers who recall with palpable anger the nonchalance of representatives from the authorities over their anxiety and everyday working problems (Enander, 2000).

The significance of ceremonial and symbolic events on the part of the public services has been brought to attention increasingly during recent years, both in research literature (t'Hart, 1993; Eyres, 1999) and in concrete situations in connection with various events. Respect is shown for example in the way in which fatalities are handled and transported, which was demonstrated in the work of the emergency services following the fire onboard the ferry Scandinavian Star in 1990 and in connection with the discotheque fire in Gothenburg 1998, as well as through symbolic events such as the raising of the flag to half mast and various types of commemoration ceremony. Visits by the Prime Minister or the Royal Family have now become established as a way for society to demonstrate support in times of need and sorrow, in which people suffer loss and where extensive emergency response work is involved (for example during the flooding in Arvika), or to demonstrate involvement and respect (Estonia, Gothenburg fire). The investigation following the fire in Gothenburg (SOU, 2000:13) ascertained that:

The development towards society taking greater responsibility (for mental and social care in connection with disasters) may, partially at least, be accounted for by the fact that our attitude to death has changed. In modern society death is not as close to us as it was previously. Mourning still has its place but appears to require ever more assistance from society. This is also the case for major emergencies and disasters. There can be several probable reasons for this development including a change in family social structure, increased secularisation and increased prosperity. It is perhaps also the case, to a certain extent, that social bonds and symbolic ceremonies have lost significance in modern society.

Symbolic events and ceremonies are important, but must be handled with empathy and sensitivity. If a victim is a member of a marginal cultural or religious group, there is, for example, the risk of the occasion being misconstrued, or of not having equal significance for all the parties involved. Just how various types of involvement from the side of society are perceived by different categories of victims has not yet been the subject of more extensive research, but a start has been made (Harryson, 2002).

Vulnerability and resistance in individuals and groups

During an emergency or under severe stress different groupings of people can be identified as being affected in different ways and of perhaps being in need of different forms of assistance. The following groups have been identified by Michel and colleagues (2001):

Direct victims

- fatalities
- physically injured
- survivors - physically uninjured
- people with specific responsibilities working in the incident area
- relatives and friends of the dead and of survivors
- people nearby, fellow passengers, work colleagues.

Indirect victims

- fire brigade personnel
- police
- ambulance personnel
- other emergency response personnel: military, vehicle breakdown service, volunteers and others.
- medical personnel
- social services and church personnel
- representatives from the media
- spectators and others.

In the event of an extensive emergency involving society on a large scale, different categories of decision makers, experts and those with responsibility within different organisations which may become involved may also be added to the list. The category *spectators and others* can go as far as embracing any member of the general public who may become involved through media or other channels. Certain groups in society can become particularly involved during an emergency through a geographical or work related connection. In the case of the Chernobyl disaster, it was farmers in particular in certain parts of Sweden that were affected. Following incidents like the Lockerbie disaster in Scotland or the Columbia space shuttle disaster in the USA, residents in certain areas were particularly affected because of wreckage and bodies falling into the area. In extreme cases the indirectly involved can be

considered globally, as in, for example, the terrorist attack on the World Trade Centre 2001, in which people world-wide could witness the events via the media.

Risk factors for negative reactions

A summary of experiences from research into reactions in connection with major emergencies and disasters (in the USA) shows that the risk for a negative outcome in the form of serious stress or psychological problems increases with the following profile of factors (Norris et al., 2002a; 2002b):

Individual/family related factors

- *Gender.* Negative effects are more common among girls and women and tend to be more prolonged than among men.
- *Age.* People between 40 and 60 are considered vulnerable. There can be a connection here between the greater degree of responsibility and engagement connected to this age group. However, only a few studies indicate an increased risk among the more elderly; on the contrary this group is identified as a possible resource in disaster situations.
- *Prior experience.* People with previous experience and training are better prepared and have a greater capacity to react than people without or with limited previous experience.
- *Minority groups.* Majority groups tend to cope better than minority groups. Effects of ethnicity are partly attributed to differential exposure to more difficult aspects of a disaster and partly to attitudes and ideas that can impair the handling of a situation.
- *Socio-economic status.* Lower socio-economic status is associated with more negative effects, a connection which increases as the degree of stress increases.
- *Children in the home.* There is an increase in stress among parents during diffuse threat situations, especially among women.
- *Civil status.* The presence of husband/partner in the home is identified as a risk factor for women. Stress symptoms among husbands evoke stress among wives to a greater degree than stress among wives evoke stress among husbands.
- *Previous mental disorders/symptoms.* Identified among the strongest factors for enabling the prediction of crisis related stress.

Situation related factors:

The likelihood of negative reactions increases with:

- fatality of somebody close to you
- serious injury to yourself or within the family
- death threat
- feeling of panic or similar during the event
- experience of dread
- separation from the family (especially children)
- extreme materialistic loss
- removal, being relocated

The above factors are associated with strong negative reactions. *Destruction within your local community* is, on the other hand, most strongly associated with loss of positive reactions (may cause loss of energy or reduced enthusiasm, appreciation of life and gratification). *Factors after the event* relating to the development of secondary stress and continued loss of resources may entail increased risk for more prolonged negative post-trauma reactions.

Reactions among different individuals and groups

Women and children have traditionally been seen as especially vulnerable in connection with major emergencies and crises. There is, within crisis and disaster research, quite a wide variety of literature on the reactions of children and families with children in emergency and crisis situations “(see e.g. Dyregrov, 1997, 2002; Monahan, 1997). Research into the role of women is, however, more fragmented (Fothergill, 1998). Vulnerability related to social circumstances and cultural factors is being focused on increasingly in more recent research and is beginning to take form as a specific field. Some key aspects from research on these respective subjects are described briefly below.

Gender

Critics point out that the differences that have been demonstrated between men and women within crisis and disaster research have seldom been analysed from a gender perspective (Fothergill, 1998). Some of the differences that are well documented in research literature are now summarised (van Willigen, 2001):

- women assess risks to be greater
- women are more likely to believe warnings and listen to advice from experts and authorities
- women are more disposed to plan for evacuation and to evacuate earlier
- men and women have different reaction models when faced with the same event
- evacuation or removal has a more destructive effect on a woman’s support network
- men are more often engaged in the physical rebuilding process (which gives clear result feedback); women are more often involved with emotional support measures (less clear feedback)
- women report higher levels of stress following a disaster or crisis

Interpretation of these differences is the subject of lively debate within present day research (Fothergill, 1998, Fordham, 1998). Socio-economic theory is focusing on gender related differences, where women in many societies comprise a socially and economically weaker group. Other theories are focusing on the socialisation process within society, which means men and women are raised to cope with crises and difficult situations in different ways. An alternative method of interpreting social factors emphasises the social roles and the differences in exposure to different types of stress. In most societies women have greater responsibility for the home, children and everyday tasks, which is why they are also more susceptible to certain types of

emotional strain in connection with disasters. Social roles entail that women receive more support socially, but also that it is more likely to be women that are the providers of support, causing them even more exposure to strain (Solomon et al., 1987). This is the case partly within the family network but also through the work that is mostly done by women within healthcare, schools, childcare etc. In the complex debate on gender related differences in connection with emergencies and crises, several researchers point out the importance of including the specific situation in the analysis and the implications of this for the respective groups. Studies of men's and women's handling of missile threats in Israel during the Gulf War show, for example, that women applied an active and problem oriented strategy aimed at protecting the home. Men, used to military service, on the other hand, found it more difficult to apply problem oriented strategies in this abnormal situation and applied handling strategies more to their own emotional reactions (Ben-Zur & Zeidner, 1996).

Children

Children are susceptible in traumatic situations because our psyche is more vulnerable during its development. They are very dependent on accompanying adults and have no experience base to fall back on. The reactions of children are very much steered by the reactions of their parents and other adults with whom they have a close relationship. Generally speaking, a child's sense of security and personal stability prior to the event appear to have a large effect on the child's reaction model. According to Michel and colleagues (2001) the following groups of children are especially susceptible:

- children without parents or whose parents have been killed
- children who have been injured or especially exposed
- children that have been isolated for a long period in a bomb shelter or prison
- children who have seen people they are emotionally close to injured or killed
- children who are alone and isolated
- children who are hungry and ill

There is considerable variation in children's physical, mental and behavioural reaction patterns. In the aftermath of 11 September 2001, there is scientifically based documentation summarising the normal reactions of children and youths available on the websites of several authorities and organisations as a means of support for parents and teachers etc. (see e.g. *National Center for Post-traumatic Stress Disorder* or *International Society for Traumatic Stress Studies*). Normal reactions among pre-school-age children are described as general fear and insecurity, helplessness and psychosomatic reactions (such as nightmares, bed-wetting and stuttering). Older children between six and eleven suffer from somatic (stomach pains, various aches etc.), mental disorder and problems with connection to reality, as well as, occasionally, aggressive behaviour and feelings of guilt. Some researchers consider that children between the ages of about eight and twelve are especially susceptible (Michel et al., 2001). Teenagers can show ambivalence towards their parents and have a tendency to judge themselves severely. Isolation and depressive thought are common reactions but so also are expressive and aggressive behaviour.

Some of the most important aspects to take into account when caring for traumatised children have been previously summarised by Michel et al. (2001) but here follow in a somewhat shortened, reworded form:

- inform and support parents, teachers and other involved adults to increase the level of knowledge and emergency preparedness
- try to keep children and parents together
- keep up daily routines and activities (school, nursery etc.) as much as possible
- explain to children and give them the opportunity to talk about and express their feelings and experiences
- give children open and truthful information
- allow time for thought and emotion processing through talking and questioning
- accept and allow for play
- encourage adults to show their feelings also
- allow children to partake in ceremonies such as funerals and commemorations
- talk to children about feelings such as fear and guilt
- ensure that support personnel are available if and when parents require such assistance

Social ties, cultural and ethnic aspects

The way in which different people react during emergencies is affected by past experience. There are more than a million immigrants or second generation immigrants in Sweden, many of whom have come from war situations or dictatorships where there was little or no regard for human rights (Michel et al., 2001). Memories of previous traumatic experiences can be reactivated in a new emergency or crisis situation. Previous experiences may also affect someone's feelings towards emergency response personnel and the involvement of the authorities during an emergency. Different groups in society may have different views and degrees of confidence in the activities of emergency services personnel even during an attempt to save lives. This was very apparent during the Gothenburg fire 1998, when angry and desperate youths attacked emergency response personnel and thereby impaired rescue work (Hassling, 2000).

The awareness of the vulnerability of cultural and ethnic minorities in connection with emergency and crisis situations is increasing. Efforts to support these groups (Mitchell, 2003) emphasise the importance of emergency and rescue personnel:

- identifying cultural groups in their own society
- finding methods to gain contact with these groups
- communicating with these groups
- developing an understanding for the problems and needs from a cultural disparity perspective
- developing appropriate education and training programmes
- following up and evaluating measures taken

An important aspect of characterising affected groups concerns assessing their situation in relation to their networks. Weisaeth (2002) points out that some types of incident entail that people are killed or injured far from home isolated from their social networks. This can be the case for example with major transport accidents. Emergencies close to home normally entail that a strong social network is in place, but at the same time, entail a high stress factor and the risk of social disorder especially if many people from a limited social system fall victim (Weisaeth, 2002).

Finding oneself in unfamiliar surroundings affects crisis reactions even among resourceful groups. A study of Swedes who were in the Japanese town of Kobe during the large earthquake in 1995 showed that different reaction patterns within that group could be related to how well established the individual was in Japanese society (Enander & Wallenius, 1999). People who had been living in Japan for a long time and who spoke Japanese were better prepared and could cope more easily with the situation (e.g. they understood, for example, information given). On the other hand this group experienced stronger post traumatic reactions as they felt more personally affected by the disaster than those who did not have such strong ties to Japan.

Vulnerable societies

This section has focused on vulnerable individuals and groups. Vulnerability factors can also be identified at local levels, and should be an important component in the development of municipal risk and vulnerability analysis. Factors that can increase vulnerability in a community (reworked from Sullivan, 2003) are:

Location and economy related factors

- geographical demarcation or isolation
- low level of self-sufficiency (dependence on external assistance)
- weak economy prior to the event
- low degree of mobility (impairs relocation etc.)

Social structure factors

- isolated groups within the community (weak social networks)
- low level of social unity
- dispersed families

Political and authority related factors

- inequality and elitism (risk of the will-being of some being at the expense of others)
- conflicts in the community

Risk related factors

- low degree of risk awareness
- low degree of emergency preparedness

Vulnerability and resistance

Certain groups may be vulnerable due to reduced capacity or increased physical or

mental sensitivity. In other cases vulnerability may be connected to particular activities or roles which entail an increase in risk in the specific situation. In cases of warnings for imminent danger, such as high water levels, people that are on the move may be particularly vulnerable (Handmer, 2002). This could concern people on business trips, holiday, seasonal work, or even homeless people and such like who deliberately avoid being contactable (illegal immigrants for example). Vulnerability must be seen as relative, partly as every individual or group is vulnerable in some way and partly because degree of vulnerability can vary with time, place and activity (Buckle et al., 2003).

It has been pointed out that research into the effects of emergencies and disasters mostly focuses on the negative consequences, which contributes to the fact that people who handle these situations well receive minimal attention (Buckle et al., 1998; Morrow, 1999). Within healthcare it has become apparent that it is beneficial to study what keeps people healthy, not only what makes them ill. Antonovsky (1987) points out feelings of connection and meaningfulness as central variables relating to health and the ability to cope with difficulties in life. In a similar way several studies have focused on which factors can contribute to some people coping better with crisis situations or difficulties than others, even if the emphasis of these studies has generally been on long term health effects as opposed to post traumatic reactions. Paton et al. (2001) present an overview of various indications of an individual's capability to cope with difficult situations (table 3).

Some perseverance aspects are related to the person's personality and characteristics and are therefore more difficult to influence. Other indicators are more a question of knowledge and resources, experience and social network. Logically speaking it should be possible to affect these aspects considerably through information and support of various kinds.

Specific events and problems

Certain types of event entail particular problems when it comes to reaction models and needs. Two such specific cases are discussed in this section: diffuse threat situations and events associated with conflicts and social complexity. A third section briefly discusses some questions relating to media coverage of emergencies and crises.

Personality	Endurance/vulnerability (intelligence, self-control, anxiety)
Behaviour	Information searching, networks, management strategies
Perceptions, attitudes	Risk perception, Swedish National Council for Nuclear Waste, intentions
Knowledge	Risk assessment, resources and measures knowledge
Experience	Skills training, previous risk-related experiences, interpretations
Results	Changes to perceptions and attitudes, adaptation

Table 3. Examples of indicators for individual endurance (based on Paton et al., 2001).

Diffuse threat situations

Psychologically threat can be defined as an expectation of a fear of physical or psychological injury (Salas et al., 1996). Diffuse threat is associated with some form of uncertainty. It can concern uncertainty in terms of time. One does not know when the expected incident is going to occur. A threat situation is more difficult to cope with when one knows something unpleasant is going to happen but not when exactly.

Indistinctness and ambiguity also cause uncertainty. The situation perhaps does not line up with what one had expected. The feeling of being under threat increases as the possibility to control decreases. On the other hand it is easier to cope with a threat that is predictable or is preceded by some type of warning signal. This applies even if the possibility to influence the situation is small. A warning makes it possible to prepare mentally. During a response to an alert, emergency service personnel use the time to think through the possible situations they may be confronted with on arrival at the incident site, in order to prepare themselves mentally. In the same way, people who are confronted with a diffuse threat need help to prepare themselves for it both practically and mentally.

In recent years there has been an increasing interest in how people are affected by threats that are invisible and difficult to evaluate (Vyner, 1998). The nuclear power plant disasters at Three Mile Island (1979 in Harrisburg) and in Chernobyl, as well as the toxic emission disaster at Love Canal in the USA in the 1970s have led to a degree of reappraisal of important dimensions for people's reactions in disaster situations. A specific type of disaster that cannot be perceived by people's five senses has been brought up. Instruments and sensors are required to show that they have occurred, how serious they are, their geographical extent and how long they last. Harmful effects can remain long after the actual event. These types of incident have been described as *ghost disasters*.

The absence of 'presence' implied by a ghost disaster applies to both time and space. A psychologically important aspect of diffuse threat situations is that it is not possible to identify a clear-cut end or turning point in the course of events (Berren et al., 1989). This makes it difficult for victims to process the event and *put it behind them*. An important part of processing a difficult situation is being able to establish that the actual event is over and that the recovery phase has been entered.

Some researchers consider that the emotional consequences of such diffuse incidents can be distinguished from those known from more traditional types of disaster. They have for example asserted that recovery can be particularly difficult in situations where people have been subjected to a state of uncertainty through an impending but diffuse threat for a longer period (Berren et al., 1989). Follow-up in the parts of Sweden that were exposed to nuclear fallout from Chernobyl, such as the Gävle area and some parts of Västerbotton, have reported long term social and psychological effects that have contributed to changes in behaviour patterns (for example when it comes to food and leisure time activity) for some groups over a long period (Ågren et al., 1995). Uncertainty surrounding possible exposure to toxic substances can in itself be a difficult situation to handle, especially if rumours are spread on account of ambiguous or suspected incomplete information being given. Some years after a Boeing plane from El Al crashed into a residential area in

Amsterdam in 1992 rumours started to circulate that there had been toxic and possibly radioactive material onboard. The authority's clumsy handling of the situation led to rumours spreading and attention being drawn to diffuse health problems among the residents in the area (Boin et al. 2001). The incident is taken up as a school book example of the importance of the authorities taking people's anxiety seriously and of not holding back information that those affected may consider relevant. (Boin et al., 2001).

Stressors in the event of toxic emission emergencies

Following toxic emission disasters victims can suffer from not only biological but also psychological effects (Cwikel et al., 2002; Richardson et al., 1987). Baxter (2002) describes several stress factors associated with chemical accidents, some of which are also applicable to other types of toxic emission.

Severe stress reactions. As breathing and other functions are affected, extreme exposure to toxic substances causes symptoms that give rise to excessive fear and anxiety.

Uncertainty about long term effects. When the acute phase of an incident has passed, the uncertainty surrounding long term effects remains in the form of increased risk for cancer or foetal damage.

Home and income. Toxic emissions can lead to contamination of residential environments. The thought of this alone is enough to influence house prices, or the possibility of selling products grown in the area. In connection with the toxic scandal in the Hallandsåsen Tunnel, it was extremely important that Båstad Municipality issued information to maintain confidence in the products grown there (Palm, 1998).

Media cover. Insecurity as to the effects of a toxic emergency can be increased by media reports, especially if their purpose is to portray a worst possible scenario situation and to look for scapegoats. The opinions of experts on the effects can differ, which can further cause insecurity among the public.

Social isolation. Individuals or groups who have been involved in a toxic accident may be considered contaminated in some way by others and become isolated. Survivors from Hiroshima were often received in this way as were families from the Chernobyl area. Reactions are often based on a fear of contamination or genetic damage.

Cultural pressure. Fear and insecurity can cause people to act in ways contrary to their cultural norms. Following the Seveso accident in Italy, the information given about possible effects was unclear, which is considered to have resulted in many pregnant women applying for abortions despite this being in direct conflict with religious and cultural norms.

Insufficient medical follow-up and compensation. Uncertainty about medical effects can contribute to insufficient follow-up and the distribution of compensation to victims

being unsystematic and inconsistent. Similar problems were reported following the Bhopal accident in India, and have occurred on a smaller scale in Sweden also in the aftermath of Chernobyl and the Hallandsåsen poison scandal.

Lessons learned in Sweden as a result of Chernobyl

In 1986 there were no plans in the Swedish emergency and rescue procedures to cover for the consequences of an event such as the Chernobyl disaster. The handling of the situation has been described as an information crisis. The authorities were very uncertain. The fact that the individual was not in a position to judge or handle the threat meant, at the same time, that people were referred to just the authorities, experts and media. The authorities were in the difficult situation of having to issue clear, unambiguous information and also to adapt this information to the needs of different regions and groups while lacking sufficient knowledge on which to base it. The information problem surrounding the Chernobyl disaster has been analysed and discussed in a number of reports (see e.g. Amnå & Nohrstedt, 1987; Stutz, 1987).

Several lessons were learned from the Chernobyl disaster (Andersson et al., 2002). The event revealed shortcomings in knowledge, emergency preparedness and cooperation at different levels in society and resulted in a number of measures being taken by the authorities to improve the situation. The risk information was seen as unclear and in several cases contradictory. "Do not eat parsley, but if you do it's not dangerous" is one piece of information that many remember from the time. Insecurity increased and faith in the authorities decreased.

Another lesson learned concerns understanding how people handle insecurity. Laboratory studies and clinical situations both support the fact that people prefer to be informed about and experience some form control over a negative course of events to being kept in ignorance (Enander et al., 1993). They would rather receive negative news on which to act than receive no news at all. Following Chernobyl experts were surprised over people who left in their vegetables for testing and were more worried about a negative result - i.e. that there was very little or no radioactivity present - than those receiving a positive result (Amnå & Nohrstedt, 1987). This was because they were then confronted with the uncertainty of whether vegetables from other parts of the garden could be used or not, as one knew that the dispersion of radioactive fallout was uneven. The information that the vegetables could not be used would have been clear-cut and thereby easier to cope with.

When it comes to warning information, for example alarms via the media concerning household provisions, it appears generally that people evaluate and act upon negative and positive information in different ways (Lui et al., 1998). Negative information (about something being dangerous) tends to have an immediate effect in the form of, for example, avoidance. We are psychologically oriented towards paying attention to this type of information. Positive information (this is not so dangerous) has a discouraging effect, but only slowly over a period of time. It often takes longer for us to accept information on something not being as dangerous as we first thought. Positive information is taken then as uncertain information causing people to continue to behave precautiously.

Swedish farmers who were directly affected (Hedman, 1999; Enander & Johans-

son, 2000) by the Chernobyl disaster describe emotions such as unease, fear, helplessness, depression and anxiety (Enander, 2000). One way to cope with these emotions was to mentally process the risk experience by comparing it to other risks - smoking for example - and in this way make the threat easier to come to terms with. Other ways involved activity – farmers describe how they enquired after information, participated in meetings, occupied themselves with practical tasks. This gave the feeling of having some kind of control over the situation.

Terrorism and latent threats

Since the events of 11 September 2001, the question of how we react in connection to large-scale terrorist attacks or the use of weapons of mass destruction has gained increased significance. Disaster researchers consider that reactions in such situations are in principle the same as with other types of crisis or disaster. Fear is to be expected but rarely panic and that people largely want to and can contribute to society's efforts to overcome the situation (Fischer, 2002). Researchers, at the same time, point out some specific circumstances pertaining to terrorist attacks which contribute to the situation being marked by diffusion and uncertainty (Perry & Lindell, 2003). The threat is difficult to evaluate both for the authorities and the public. Previous experience helps very little in predicting events in the new threat situation. Williams (2002) considers that these new types of risk are particularly difficult for us to understand and handle, and therefore the development of information and support means becomes especially important. Another difficulty in handling terrorism is that there can be a secondary threat in the situation, aimed at the rescue personnel. The use of biological, chemical or radioactive material as a part of the threat situation also causes added uncertainty in terms of protective measures. There is a lack of experience as to how communities would be expected to react for example in connection with a feared, deliberate spreading of infection. Experience from the threat of spreading the anthrax virus following 11 September indicates the importance of being able to balance measures to fight the actual threat with measures to influence people's reactions and understanding (Day, 2003; Babbs & O'Connor, 2003).

Support during diffuse threat situations

This section has shown several examples of how diffuse and unclear threat situations are particularly stressful and difficult to cope with. It is possible to identify, based on this experience, some important information for emergency response commanders and other public servants with responsibility in these situations (Enander, 2003):

Inform. One can hardly overestimate the need for information during diffuse threat situations. In cases where there is considerable risk for misinterpretation, information must be unambiguous and clear. It must be credible. If the information is uncertain, then say so. A problem can be that there is not much new information to give. From experience we have learned that it can then be beneficial to give information about what emergency and rescue response command is doing, how it is working to obtain information and when new information is likely to be available.

Activate. Diffusion and uncertainty in a situation lead to people experiencing a lack of personal control. The individual has little chance of initiating action and it can be unclear what line of action to take. Receiving assistance to become active and regain some control becomes important. Farmers who recall the diffusion and unease following Chernobyl point out the importance of the feeling of having done something, that one for example had the opportunity to take measures to save the harvest.

Be prepared for conflicts. Diffused risks are interpreted and understood in different ways. Some people are likely to underestimate risks and not treat them seriously. Others can become very concerned. The differences in how we interpret situations can easily lead to conflict between different groups. Those who don't take the risk so seriously feel that others exaggerate and give rise to unnecessary alarm – the chances of that happening are minimal. Those who take the risk seriously can feel that their anxiety is not being taken seriously - if something does happen the consequences will be devastating. Clarifying the background as to why we think differently may result in better understanding between groups.

Respect anxiety. Anxiety over a particular risk can in some cases seem unmotivated or exaggerated. It is, nevertheless, important that the anxiety felt by a person in an unclear situation is taken seriously. In contact with people faced with a difficult situation, respect for the reactions of the individual is the basis for gaining their confidence and being able to work effectively.

Social conflicts and complex situations

Within crisis and disaster research, different types of crisis and disaster are divided into groups with similar norms, values and priorities, and situations involving civil unrest such as riots or terrorism. The effects of the latter tend to be stronger and longer lasting, partly because they are seldom marked by a unification or solidarity phase at the start of the follow-up process. Solidarity and an influx of help are otherwise common during the initial stages following other types of incident, especially natural disasters. This was noticeable, for example, during the initial period of the snow chaos that struck Gävle in 1998, where expressions of support and solidarity were very obvious even among those directly affected.

Sweden has very little experience of conflict situations in modern times, with the exception of a number of relatively limited incidents such as those in Gothenburg in connection with Sweden chairing the European Union in 2001. The follow-up of this has, however, not focussed so much on reactions among the public but rather on the relationship between the demonstrators and the police (Granström 2002). One can, nevertheless, identify other types of situation that, in a similar way to civil unrest, are marked by conflict and disturbances in social unity. Situations that are strongly associated with blame, liability and the need for scapegoats tend to create conflicts and negative reactions among those involved. Liability issues are associated with loss of faith (Sandberg & Thelander, 1998). Here is a summary of an analysis of reactions among the residents of Hallandsåsen in connection with developments in the poison scandal as follows (Arvidson, 1998):

The strong reactions to the poisoning can be put down to several circumstances in addition to the incident itself. An important one is that modern society is in many ways felt to be too complex and difficult for the individual to have control over. The individual is therefore dependent on general structures in society – environmental departments, municipalities, large companies, information departments, the government etc. In this case these bodies failed to live up to the trust bestowed in them. There was a feeling of being let down by society, which left the local people to cope with their anxieties alone and there was a loss of faith in the support that society is expected to provide for the individual.

Other events can give rise to especially strong reactions by exposing conditions and hidden problems that people have difficulty acknowledging or accepting the existence of. The events in Arvika where a five year old boy was killed by his playmates demanded a lot of society's crisis management capacities for several reasons, particularly in the arduous recovery work. (Enander et al., 2004). A difficulty connected to this situation was that of balancing between the demands of a police investigation and protecting the needs and integrity of those involved.

Media cover during emergencies and crises

The role of the media in covering disasters and crises has drawn considerable attention in recent years. It has been scrutinised on ethical and professional grounds and received criticism for its handling of the Estonia and Gothenburg fire disasters (Englund, 2002). At the same time there is, among the involved parties, a strong awareness of the importance of how the media presents a situation. Flodin (1998) speaks of the three dimensions of a disaster: *the disaster in itself, the handling of the disaster by the authorities and organisations and the portrayal of the disaster*. With regard to information, it is emphasised that poor handling of the *portrayal of the disaster* can affect and perhaps have a negative effect on the development of the disaster itself. At the same time some researchers warn that exaggerated focus on the handling of the portrayal of a disaster may impair the possibility of drawing conclusions and of handling reactions adequately (Carley & Harrand, 1997). Put simply, it can be more important to appear to be effective than to actually be effective.

Information during emergencies and crises

Several research surveys have summarised relevant information and communication aspects in connection with disasters and serious civil disturbances (Jarlbro, 1993; Jarlbro, 2004; Nohrstedt, 2000). Some of the main points given in these surveys concern:

- The explosive increase in information needs in connection with major disasters. This can be seen as a need for environmental control (Nohrstedt, 2000).
- Spreading of rumours during the acute phase. This phenomenon is felt to be connected to information shortcomings in situations that are very much the concern of those directly involved (for example in dangerous situations).
- Communication problems between experts and laymen/general public.
- Demands placed on information during emergencies. Among these are credibility, reliability, comprehension, speed and justification.

- There a number of paradoxes involved in issuing risk information, for example, drawing people's attention to risks at the same time as attempting to maintain calm. ("*nuclear power is not dangerous but there should nevertheless be a warning system*") or that by succeeding in gaining high credibility one reduces the public's watchfulness and emergency preparedness ("*we can totally rely on the rescue services*").
- The causes of conflict between the authorities and the media as a result of their different goals and working methods.

Problems that can arise between rescue personnel and the media have previously been presented in depth by Englund (2002). A basic knowledge of disaster journalism for use by the authorities is available in the Swedish Emergency Management Agency (SEMA) training documentation (2003). Dealing with the media at the scene of an emergency is dealt with in Lindbäck & Oscarsson (2004) but isn't described in any greater detail in this context. However, from the perspective of people's needs and reactions there is good reason to briefly look into and to weigh up some aspects with regard to information and media.

Rescue personnel quite naturally sometimes feel that it is their duty to try to protect disaster victims from the media. At the same time, there are victims that accept and want to be involved in media coverage (Scanlon & McCullum, 1999). This can concern gaining attention that acts to substantiate their grief and sense of loss. In other situations it can be that victims in different ways want to use the media to raise questions of their own, liability or compensation issues for example. Getting the correct balance between protection and exposure requires then an ability to put oneself in the victim's situation.

The media can in some situations been seen as a form of support for victims. This was, for example, the case for the residents of Hallandsåsen (Sandberg & Thelander, 1998):

The media came to be seen as a separate player by the Bjäre residents who were interviewed. A player who stood by their sides in the face of the "enemy". The media uncovered previously unknown negative revelations, it "put the power brokers in their place", it took up liability issues very early on and allowed the residents to have their say. The residents felt themselves that the media was one of the few parties they could trust and rely upon during the disaster and some said that they now, subsequent to the disaster, had an increased faith in the mass media.

Handling social dynamics during different emergency response operations

The starting point for my chapter has been that emergency response operations are there to serve the public. Emergency responses have the purpose of saving and protecting them. Based on this perspective then it follows that the public's need for help should form the basis of the assistance given and the assignment of responsibility. A response operation in time and space should be such that it optimally

corresponds to the assistance needs in time and space (Fredholm, 2002).

The above perspective does not appear perhaps to be problematic or controversial. It is, of course, a prerequisite firstly that the assistance needs can be identified and then that the measures to meet them can be identified and applied.

We have seen that different groups in society can be affected in different ways, and that an individual's needs must be seen from the perspective of that individual. Another starting point is that people's needs must be seen against a background of the social dynamics that a disaster gives rise to. A disaster does not only concern physical injury and materialistic loss, but also relationships between people, social networks as well as trust, not least, in society and its representatives.

Understanding and prioritising the assistance needs is an important aspect of an emergency response operation. In many cases the needs are obvious and the prioritisation self-evident. Saving life is always the number one priority. However, needs are not always readily recognised. There can sometimes be a contradiction in terms between *society's* need to handle an incident as effectively and rationally as possible and an *individual's* need to be involved and influence the situation. The person who for example phones to support a family member who is threatened or because an incident has occurred overloads the telephone network and could impair communication between different parties involved in the response operation.

Conflict can arise between different groups also. People may, for example, have different opinions on what should be prioritised during an emergency response operation. Sometimes it can even be the case that the different needs of an individual can appear to be conflicting. The need to protect oneself, for example, by immediately leaving a burning building can conflict with the need to locate and help others. In a discussion on behaviour in connection with an industrial accident in Norway, Weisaeth (1989) points out several conflict situations arising between different criteria. Those who immediately left the area can be said to have reacted rationally from a personal survival perspective, but can suffer from guilt for having left a colleague behind them. Depending on whether one, for example, takes a biological, psychological or social perspective, different behaviour patterns can be judged as more or less expedient or desirable (Wallenius, 2001b).

A number of key aspects were formulated in the opening section that should perhaps be used as guidelines in a bid to base the planning and execution of response operations on the *needs of the public*. Some concern the capacity to understand and interpret an emergency not only as a physical occurrence, but also as a social and psychological occurrence. Other capabilities that are pointed out are oriented towards the roles of commanders within their own organisations. This concerns forming realistic expectations and being well prepared to cope with the reactions that the social and psychological dynamics that emergency and crisis situations create. One more addition can be made to the above capabilities: namely the capability to *reflect upon and analyse one's own response* in relation to the needs of the victims. This is to *develop forms for follow-up and continual learning*.

In the event of disasters and crises, people do not only react to the actual event, but also to how it is handled. Society's representatives have, therefore, through their approach the opportunity to both relieve and increase the strain people are

exposed to. Response operations are generally evaluated from an operational perspective, but not so often from the receiver's perspective on a psychological or social basis. Such follow-ups usually focus on larger disasters, as do the media and the scientific community.

The development of methods for documenting the experiences of different groups of victims, also in more common types of incident, can give valuable information on the needs that arise in connection with different types of event and increase the understanding of how emergency responses are received. Even relatively basic follow-up has been shown to give new insight into the receiver's perspective (Juratowitch et al., 2002). Commanders should develop the capability within their own organisations to evaluate and learn from experiences, including those of the victims.

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Staffan Harbom

3. Management of various types of emergency

Staffan Harbom was a fire service division officer and has previously served as a fire brigade administrator, and as the head of the operations section of Uppsala Fire and Rescue Service. As an instructor at the SRSA's College in Rosersberg he was from 1991 onwards responsible for the Advanced Emergency Services Course. Since 1992 he has worked as a project and development manager for national and regional training exercises. He has also been responsible for the training of incident commanders for emergency preparedness for nuclear energy incidents and was the course administrator for the former Swedish Emergency Management Agency's training for county administrative board duty officers. He is now retired but still does some work as an advisor for the Swedish Civil Contingencies Agency.

At the national conference on societal vulnerability in 2002, the then Minister for Defence Björn von Sydow pointed out several conceivable extraordinary events, and at the same time, asked the question, does societal development also lead to vulnerability?

“Information systems collapse, electrical systems fail, floods paralyse the country, important communications systems stop working and epidemics break out. Terrorist attacks are a real threat. Natural disasters and armed conflicts occur in a never-ending stream. Vulnerability, and consequently instability, in our society can increase at the same rate as development. Is this the way it is? Or is it becoming that way?”

Several incidents during recent years, both at home and abroad, have made people very aware that floods and other natural disasters can paralyse entire regions in countries; that electrical systems can fail and information systems can collapse. We have also seen that such events place substantial demands on the capability of the public sector to manage assistance operations; a problem that the chairman of the vulnerability committee, Åke Pettersson, discussed in his remarks before the Norwegian Atlantic Committee in May 2002:

“Vulnerability is latent. Asymmetric threats can quickly arise and affect vulnerable environments resulting in serious and dramatic consequences. This demands that the public sector has the capability to lead assistance operations. Do we have this capability?”

Command is not a goal in itself. In these contexts, command is intended to provide those in need of help with the best possible conditions for lessening the consequences of damage and suffering. The municipal fire brigades, along with the police and the medical services, can deal with what are usually referred to as ‘normal, everyday incidents’. These incidents can be residential fires or road traffic accidents. Everyday incidents are dealt with based on conventional routines and experience. Cooperation and collaboration function well with other authorities and organisations. As the complexity increases, allocation of responsibility becomes less clear. What is considered as normal and abnormal in this respect, however, is not defined in any satisfactory manner. Everyday incident can be critical for the individuals that are affected and the scale of an accident/incident is of major importance for the public sector’s capability to alleviate its consequences.

A municipality’s capability to deal with the needs of those seeking assistance can be described in terms of *alarm, time, resources and capability*.

That is to say that the preconditions for reporting an accident/incident, the time fire brigade resources need to be able to initiate operations at the incident site, the resources a municipality has its disposal with regard to the scale of the emergency and the municipal fire brigade’s capability to carry out the task.

A municipality’s level of ambition for alleviating the consequences for the individual plays a decisive role here.

Certain incidents are beyond the ‘everyday’, and when extra-ordinary events occur, a municipality must be able to take action. In this context, we often speak of

so-called *extraordinary events*. If the emergency is geographically dispersed, several municipalities and counties may be affected. It can also be the case that an emergency is so complicated that one municipality cannot deal with it on its own due to a lack of knowledge and resources. Experience from the storm Gudrun that swept over southern Sweden in 2005 illustrates the difficulties in clearly defining the difference between providing an everyday *rescue service* and responding to a disaster. Sometimes a municipality's resources for a *rescue service* can be used in situations where everyday emergency response operations do not occur. During the events in Arvika in 1998, a *rescue service* was not carried out, but Arvika Fire & Rescue Service nonetheless actively participated in this incident, which had a huge affect on the *community*. In such situations, the capability to *cooperate* between the bodies can be decisive for the outcome of the chain of events.

A problem here is that *interoperability*, meaning the capability to cooperate and command on various levels, is limited for obvious reasons, because emergencies of the type described above do not occur all that often. To improve interoperability, the capability to cooperate must be improved on all levels.

Based on the model of *emergency management in the public sector*, selected past incidents are described and discussed during which municipal fire brigades have had considerable importance for the course of events. The view is from a municipal perspective, but the problems can also be considered from a regional and national perspective. A telecommunications failure in Svealand that occurred on 2 October 2002 is described first, followed by the events in Arvika in 1998, the flooding on Orust in 2002, the snowstorm in Gästrikland in December 1998 and the experience gained during a training exercise conducted in conjunction with an Advanced Emergency Services Course conducted by the Swedish Rescue Service Agency in May 2000. Case studies illuminate the problems that can arise when events occur that do not fit the normal pattern of a municipality's routine tasks. They are based on interviews with personnel in leadership positions at county administrative boards and municipal fire brigades, and on analyses of available documentation. In all of these incidents, the need for cooperation has been substantial and the role of fire brigades was an important element in a wider context.

Controlling principles for planning by authorities

Planning by authorities should be controlled by the responsibility principle, the similarity principle and the proximity principle. *The responsibility principle* means that the person having responsibility for an operation under normal conditions should have a corresponding responsibility during emergencies and armed conflicts. *The similarity principle* means that an operation's organisation and localisation should, as much as possible, be the same during peacetime, emergencies and war. Lastly, the *proximity principle* means that emergencies should be dealt with at the lowest possible level of the public sector. The emergency management system must thus be based on a peacetime, basic perspective and be able to function regardless of the course of events, and create robustness and trust along the entire threat scale

Each municipal fire brigade must take several acts and ordinances into

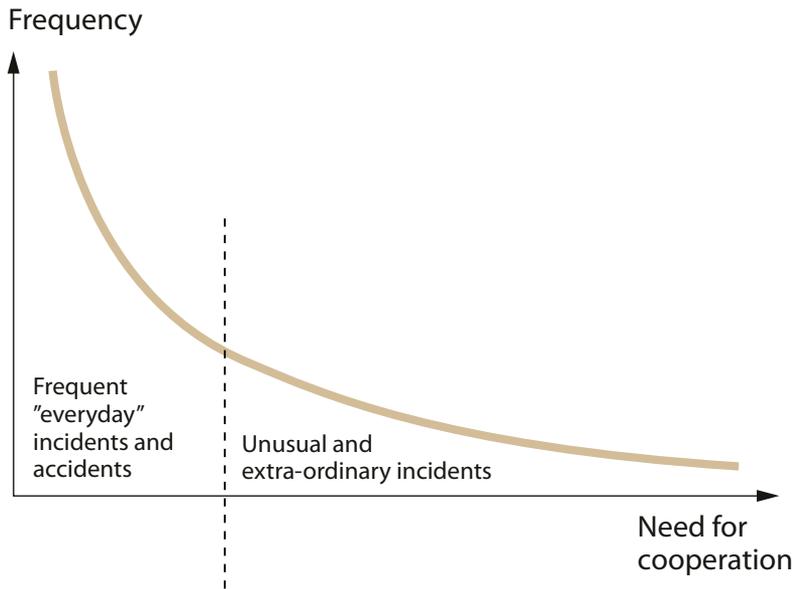


Figure 1. The need for cooperation increases commensurately with the complexity of the emergency. Certain incidents fall outside the “everyday” and also when the improbable happens the municipality must be able to respond. In this context we are referring to so called extra-ordinary incidents. The geographical spread of the incident can mean that several municipalities and counties are affected. Also, an emergency can be so complex that a single municipality isn’t able to deal with it on its own due to a lack of knowledge and resources.

consideration: the Civil Protection Act regulates prevention work and emergency response operations. The Act on Extraordinary Events in Peacetime for Municipalities and County Councils regulates municipalities and county councils and their powers during extraordinary events (political level, designated as the *crisis management board*). One should note that the Act on Extraordinary Events in Peacetime for Municipalities and County Councils is not ‘synchronised’ with the Ordinance on Measures for Peacetime Emergency Management and Heightened Preparedness. The Health and Medical Services Act can be said to complement the Civil Protection Act with regard to rescue services and damage prevention tasks. The Social Services Act regulates, among other things, the social obligations of municipalities. The Police Act is an important component in a municipality’s work involving civil protection in accordance with the Civil Protection Act. The Swedish Environmental Code, food legislation and epizootiology legislation are also examples of legislation that can influence command of various responses.

The Ordinance on Measures for Peacetime Emergency Management and Heightened Preparedness covers the responsibilities of national authorities for risk and vulnerability analyses and specific responsibilities for peacetime emergency management. There is a connection in the ordinance regulating county administrative boards that is important. The Ordinance for County Administrative Board Instructions states in section 50 that the county administrative board has responsibilities

for measures for peacetime emergency management according to the Ordinance on Measures for Peacetime Emergency Management and Heightened Preparedness. The operational responsibilities of county administrative boards are covered in point 4 – *capability to deal with very serious situations within the authority's area of responsibility*. The point of contact at county administrative boards is the Duty Officer. There is a Duty Officer service at all county administrative boards and this service is one of those that the municipal fire brigades must prioritise during collaborative contact.

In this large volume of acts and ordinances, a municipal fire brigade must be able to interact and cooperate with other authorities having different command cultures. Each authority has separate and unique responsibilities and areas of operation. They are not hierarchically subordinate to one another. This means that a well-developed network organisation is needed for carrying out tasks.

Telecommunications failure in Svealand

At 16:39 hours, 2 October 2002, voltage suddenly dropped on the power lines in Uppsala, resulting in operational disturbances on a 220 kV line. Three outgoing lines were disconnected and Vattenfall's Svea grid lost contact with the main power grid. The grid breakers failed and shut down power to the substations on the roads Dragarbrunnsgatan and Hjalmer Brantingsgatan. At both substations, backup equipment was switched on, but at Hjalmer Brantingsgatan, yet another safety device failed, resulting in immediate shutdown of backup power. An alarm was sent to Skanova's operations monitoring centre.

Landline telephony, ISDN traffic, mobile telephony and several landline connections were affected. TV broadcasts via the cable and radio base networks that are dependent on landline telecommunications also stopped working. Uppsala, the northern parts of Greater Stockholm and Tierp were affected, as well as the areas around Västerås, Sala and Avesta. Mobile traffic was primarily affected in Märsta, Knivsta, Uppsala, Tierp, Östhammar and Norrtälje. There was also limited availability for telecommunications in northern and southern Sweden. Two radar installations at Arlanda Airport became inoperable. Rail traffic was subject to major delays when a problem in a relay interlocking plant occurred in conjunction with the power failure.

By 16:49 hours, the SOS centre in Uppsala was entirely without communications capacities. Emergency calls could not be received nor alarms sent to response units, and the Coord-Com computer support system was completely inoperable. The backup centre in Västerås and the Uppsala centre could not communicate with one another. The mobile network's roaming function did not work either. (With the roaming function, if subscribers cannot establish contact with their telecom operator via their mobile telephones, the telephones automatically search for another operator.) All alternatives for communication were largely inoperable. The municipal fire brigade could not contact their personnel, could not reach the general public nor the decision-makers that were needed onsite. No one knew how long the breakdown would last or what the situation was in the rest of the county.

Moreover, the police could not establish contact with the nuclear power plant in Forsmark. Assistance alarms used in the care of the elderly and disabled did not

work either. The radio communications system at the Uppsala University Hospital was also down. The hospital had major problems in finding out what had happened and in communicating information to hospital staff. Radio Uppland directed emergency questions to the Uppsala University Hospital's telephone switchboard, something for which the telephone operators were entirely unprepared. Furthermore, hospital staff did not know who had made the decision. The social emergency service had problems in bringing in extra resources to visit people with assistance alarms. Many rumours were in circulation. Was it a terrorist attack? It was difficult to contact key bodies and to relay information within and between organisations. The CeSam group (for central coordination in Uppsala County) could not reach Skanova's management. Information to the emergency management group in Uppsala was not prioritised by Skanova. The late contact contributed to uncertainty throughout the evening because CeSam received no information on how operations were being conducted.

It took 10 hours to restore service. Fortunately, no one was injured.

A failure like that which occurred in Uppsala, according to all involved parties, should be impossible.

Participants

Uppsala County has nearly 300,000 inhabitants. There are six municipalities in the county – Enköping, Håbo, Tierp, Uppsala, Älvkarleby and Östhammar.

CeSam

The CeSam group convenes when a major emergency demands coordination of resources and prioritisations, and when legal issues result in an overlapping of areas of responsibility. The group consists of decision-makers from the municipal fire brigades, the county administrative board and medical services. As necessary, it can be complemented with personnel from authorities and organisations having expertise in the particular type of incident. The group is alerted via the duty officer at the relevant county administrative board or the duty officer at the relevant municipal fire brigade. The respective duty officers decide on the resources within their own organisation. If the response concerns several municipalities or authorities, CeSam has the right to prioritise and allocate resources. Each organisation in CeSam has a duty officer who upon transmission of an alarm from SOS Alarm AB, can acknowledge the alarm within five minutes and arrive at SOS Alarm AB within one hour.

The CeSam group consists of:

Swedish armed forces – duty officer

County council – duty officer

Uppsala County Administrative Board – duty officer

The police in Uppsala County – duty police commander

Duty chief fire officer

SOS Alarm AB in Uppsala County – manager/operations manager

Sveriges Radio AB, Uppland P4 – duty officer

Swedish armed forces

Uppsala County is in the central military district, which has the duty of, among other things, supporting the civilian components of Sweden's overall defence. The Uppland group coordinates the voluntary defence organisation in Uppland. The Uppland group regularly cooperates and trains in supporting the civilian community.

Municipal fire brigades

According to the old Rescue Services Act, section 30, and the current Civil Protection Act, the municipalities and national authorities that are responsible for providing *rescue services* shall ensure that there are instruments for alerting the emergency services. Important announcements to the general public via radio broadcasts can be requested by municipal incident commanders according to specific routines. Such information can be broadcast via siren equipment in certain urban areas. The siren should be followed by an announcement via a radio broadcast.

County council

The county council is primarily responsible for health and medical care. The largest hospital in the county is Uppsala University Hospital. In the general recommendations from the National Board of Health and Welfare, each medical facility is required to have a disaster plan that all personnel are familiar with and have trained for.

County administrative board

On 1 July 2002, the county administrative board was assigned a geographic area of responsibility. Within the county, the county administrative board is required by law to take responsibility for peacetime emergency management and to maintain heightened preparedness. The county administrative board shall keep itself informed of courses of events in such situations and strive for necessary cooperation being attainable. The county administrative board may request broadcasts of emergency information to the general public via radio. The county administrative board is responsible for providing *a rescue service* in the event of the release of radioactive substances (national rescue service) and during large-scale municipal response operations, can assume responsibility within one or more municipalities. For this task, the county administrative board has a specific alarm centre. When alerts are necessary, the county administrative board – according to the old Rescue Services Act, section 30, and the current Civil Protection Act – is responsible for their being instruments available for alerting the emergency services.

The police

According to police regulations, each police authority must establish plans for responses in the event of specific incidents. In the event of a specific incident, a postings officer (for the specific incident) is expressly appointed from the normal police organisation. When alerts are necessary, the police constitute the national authority with emergency services responsibility, according to Civil Protection Act, and are responsible for there being instruments available for alerting the emergency services.

Skanova

Skanova Networks is a wholly-owned subsidiary of Telia Sonera that operates and develops the landline and mobile telephony networks in Sweden. Skanova develops Sweden's most comprehensive network for telephony, the Internet and broadband services.

SOS Alarm AB

SOS Alarm AB is grouped with the municipal fire brigade. In Uppsala County, SOS Alarm AB is the organisation responsible for distributing alarms to national and municipal emergency services.

Sveriges Radio

Sveriges Radio shall broadcast information free of charge that is of significance to the general public if requested by an authority, for example, information that is to be broadcast after a signal is sounded for emergency information to the general public. In Uppsala County, Radio Uppland P4 is the local radio channel.

The role of Uppsala Municipality

The municipal fire brigade duty officer and duty chief fire officer state that he immediately asked the following: What can happen? How probable is it that it will happen? What is our responsibility for incoming and outgoing alarm calls? Information to the general public? Command of own resources? Command of the county's resources? Is the entire county completely vulnerable? How much time do we have until something happens? At the same time, he deduced that 'if something happens right now, we are completely unable to respond.' He also wondered how the regional bodies perceived the situation, if this was an emergency, if significant economic values were at stake and if the time available was limited. And above all: What is the role of the municipal fire brigade?

He quickly realised that the general public must be informed of the situation and have the opportunity to alert the fire brigade that a command organisation must be created and that cooperation with other organisations must be assured. Information on communications problems must be obtained and the question of who has the responsibility for the problems being dealt with must be answered, as well as the question of how much time the pertinent actions will take. He wondered if there was another organisation that took the immediate initiative.

Decisions

Initially, the duty chief fire officer decided to establish a mobile staff at the fire station that would also serve as a communications centre. The first task for the staff was to make sure that all part-time fire stations would be manned. Via e-mail, Radio Uppland was informed of the situation so as to be able to inform the inhabitants of Uppsala County of the situation in the county.

First of all, capabilities were organised so that the general public could alert various public sector functions. This was done by stationing police, fire engines, ambulances, taxis and buses at strategic locations. Communications were established

through the radio systems of the respective organisations.

It was determined that the CeSam group must convene because many authorities and organisations were involved and because the group had duties during the incident. Because the group could not be reached in the normal manner, the emergency information signal was used to attract the attention of the participants and communicate the message that they should go to the fire station, a method which proved successful. When the CeSam group met, there was no information or prognosis to act upon. No one knew what had caused the disturbance or what had happened in the county. Furthermore, there was no information as to whether any accidents had occurred in the county because the SOS system was down.

After a short briefing, the group was forced to make a number of decisions. Having access to resources was the most important and the group began building up 24-hour emergency preparedness. Assistance alarms, resources for technical systems and information management were prioritised. Radio Uppland served as the outward communications channel and relayed the CeSam group's requests and decisions. The armed forces were ordered to establish a transport organisation to pick up key persons. Radio communications between ambulances and the emergency ward at Uppsala University Hospital were set up for prioritising medical cases. Contact was established via the armed forces' telecommunications network with the ambulance stations in Östhammar and Enköping. Thirty satellite phones and satellite telephone exchanges were ordered for the county.

Systematisation of the incident

The incident was systematised as described below based on Lars Fredholm's model for emergency management in a societal context (see Figure 2 and the first chapter of this book). The heading *Accident* in the model has been complemented here with *Incident*. The model was used in principle. Because changes occur over time and space during a course of events, changes which are necessary with regard to measures, and assistance needs, competence and resources. What is needed during the initial phase is not the same as that which is needed at the end of a response.

Type of emergency

What we have here is an emergency state brought about by a societal-influencing emergency incident (other than an accident) in which the fire brigade can become a part of society's emergency management. The incident was a threat to parts of basic societal security. The incident was characterised by both the general public and authorities experiencing substantial uncertainty as to what had occurred. The general public felt apprehension over the telephones not working and the problems with TV and radio broadcasts. The use of the emergency signal with sirens created the need for information for the general public. That ingoing and outgoing alarm systems stopped working entailed major problems in maintaining preparedness for accidents and other public sector services, such as police, medical care, assistance alarms, etc., which the authorities realised. Initially, there was no information on what had happened and the information that the authorities had could not be communicated to the general public.

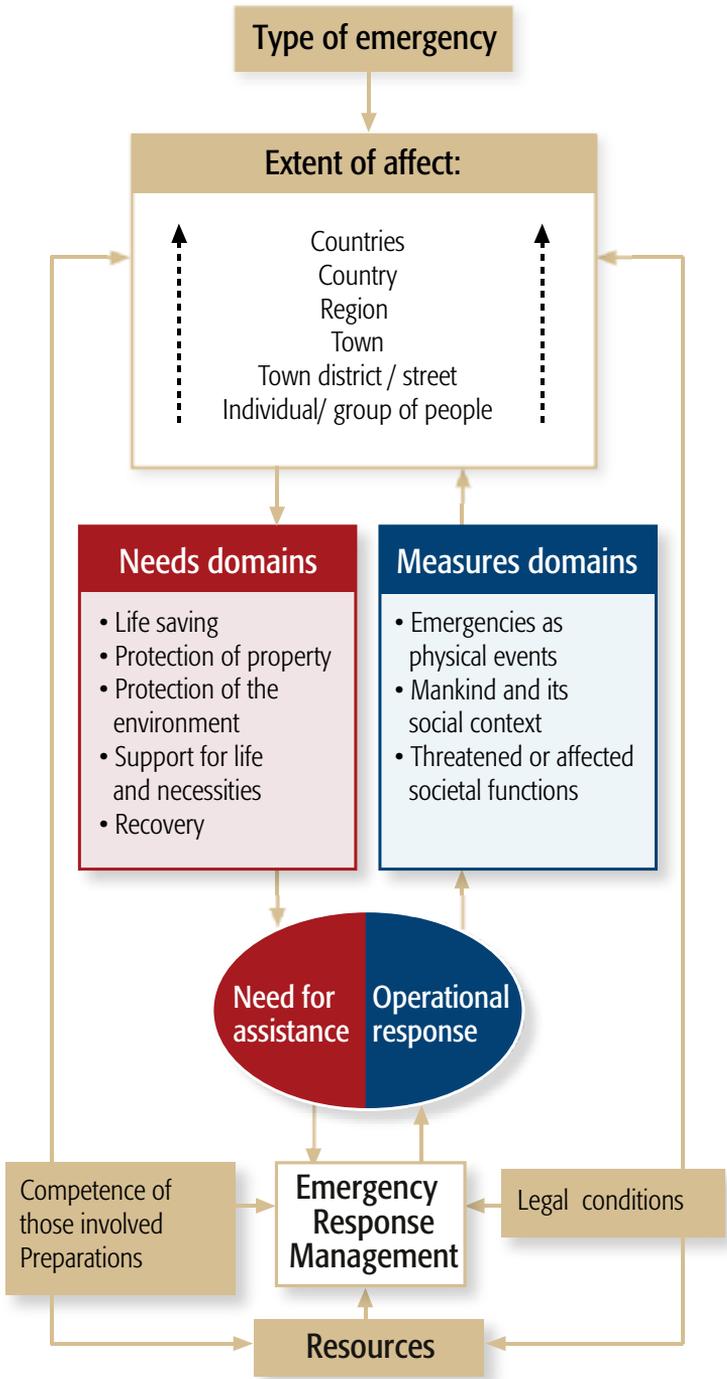


Figure 2. Model of emergency response management in a societal context.

Extent of affect

The incident affected a region (parts of Uppsala County), a municipality (Uppsala), local bodies (institutions vital to society), individuals and groups (patients at hospitals, homes for the elderly and people in need of emergency assistance from the police, medical services and municipal fire brigade). Large portions of Uppsala County and some parts of Stockholm were affected. The Forsmark nuclear power plant was without telephone communications and even Arlanda Airport was affected. People could not communicate by telephone and were thus unable to request assistance. In principle, no incoming alarm calls could be received and so the emergency services were helpless.

Assistance domains

The assistance domains that could be discerned were restored by public sector alarm functions so as to handle emergency response operations, environmental protection, property protection, function support for assistance alarms, police matters and alarms to ambulances, etc.

Assistance needs

To be able to assist the general public, telecommunications must be operable.

The authorities needed to be able to inform the general public and to dispatch fire, police and medical services to those requiring assistance. Society's normal alarm functions (incoming and outgoing alarm calls) had to be operable. A large part of the alarms from the general public went to SOS Alarm, which, however, lacked the capability to receive alarm calls during the incident. The general public's need of assistance primarily concerned information on what had happened. People who had assistance alarms had to be attended to immediately.

Competence of participants

The competence needed by participants was primarily related to knowledge of telecommunications, command and initiative capabilities, and collaborative and cooperative capabilities. Also needed were knowledge of societal structures and an established contact network. Competence in command and coordination existed in Uppsala County through the CeSam group.

Command

Initially, the duty officer and duty fire protection engineer at Uppsala Fire & Rescue Service decided that communications should be conducted from the fire brigade's command unit. In the command unit, police and the fire brigade worked jointly to establish a command & control staff. It became the operational command. With time, command was complemented with the skilled and jointly trained CeSam group, which was gathered and received a strategic role. Its primary task was to gather and survey resource needs and to try to attain a comprehensive perception of the consequences.

Resources

There was access to staff vehicles and premises with communications capabilities. The resources at the disposal of the command staff were primarily communications links via radio to SOS Alarm, the police, the county administrative board, the municipal fire brigade, medical services, the armed forces, Swedish Radio and Skanova. These resources were primarily used to provide the general public with capabilities to send alarms in the event of accidents or emergencies.

Legal preconditions

The legal preconditions that were relevant for this type of incident were extensive. The Rescue Services Act in effect at the time stipulated the municipal and national bodies that had responsibility for providing *a rescue service*, and that there should be apparatus for alerting fire brigades. For this incident, the act applied to both municipal and national emergency services (the police and county administrative board). The ordinance (2002:472) for measures for peacetime emergency management that applies to national authorities, the ordinance (1997:1258) with instructions for county administrative boards, the Health and Medical Services Act (1982:763), the Social Services Act (2001:453), and the Police Act (1984:387) constituted preconditions for command tasks.

Operational response

The operational response did not initially correspond to the assistance needs. Incidents of this type and extent were not planned for and therefore not trained for either. Thanks to the CeSam organisation with staff members that represented important bodies in the public sector and who were accustomed to working together, the need for assistance on the part of the general public could gradually be met.

Action domains

The *action domains* primarily involved people and their social contexts. Public sector services were affected and capabilities had to be established for communication between the general public and the authorities.

Discussion

The incident was a clear example of what can happen when information capabilities of authorities are restricted. At the same time, what transpired can be seen as a good example of command during an extraordinary regional incident. The CeSam concept proved its value. The CeSam group is a good example of a network structure that is based on good knowledge of people and is formalised by the Uppsala County Administrative Board. Despite no normal alarm channels being operable, the group's core was able to convene. The emergency information signal (via sirens) that the municipal fire brigade sent was perceived by the members as a summons to CeSam. The municipal fire brigade, the police, the county administrative board and the county council all participated in command tasks. According to the *proximity*

principle, one important participant was lacking, namely Skanova, which operates both the landline and mobile telecommunications network, and the broadband network with Internet services, which made the decision-making process more difficult. No authority had primary responsibility for the incident. Initially, there was no plan to follow for this type of incident. There was uncertainty in the command group as to what was going on. According to many researchers, this is a problem that decision-makers can face in similar incidents, "The problems that constitute the core of an emergency are often unstructured. Unstructured problems, in contrast to well-structured, are not clearly defined when decision making begins. There can be uncertainty in respect to goals and/or the means that should be used to achieve the goals and there is no definitive answer that is correct (Hermann 1990, p.13; Sylvan & Voss 1998, p. 11). The definition a *rescue service* is used here, as with the snowstorm in Gävle and the storm over Orust, which are described below. According to the duty chief fire officer during the incident, operations were defined 'as if it was a rescue service' and no claims for compensation from the national government have been filed. The Act on Extraordinary Events in Peacetime for Municipalities and County Councils (2002:833) did not apply at the time of the incident.

Events in Arvika, 1998

In the autumn of 1998, a tragic event occurred in the Municipality of Arvika. A four-year-old boy died while playing with other children, which initiated a police investigation that for two months and two weeks stunned all of Arvika and dismayed people all over Sweden.

Several rumours began circulating about what had happened, including that an immigrant was responsible. None of the rumours were confirmed by the police but they created anxiety and complicated the crisis with the associated risk for additional reactions in the community. According to the chief fire officer in the Municipality of Arvika at the time, the incident was perceived as very traumatic. Uncertainty as to what had happened created not only rumours but also fear and dread, primarily in urban Arvika.

In conjunction with the death becoming known, the Church called a meeting. It was then believed that it was a drowning accident, but the police soon announced that violence was involved in the death. The police initially worked based on several theories. At the beginning it was suspected that a paedophile was responsible for the boy's death, but it was soon understood that it could have been other children who had caused the death of the boy.

Participants

Mayor

Municipal commissioner

Municipal fire brigade

The police

Psychological & social care group (POSOM)

School heads

Municipal Education Department
Head of social services
Social Services & Welfare Department Värmland County Council

The role of Arvika Municipality

From the beginning, it was clear to municipal leaders that the municipality, primarily the educational system and social services, would play an important role, and that cooperation was needed with the police, medical services and the Church. It was also very important to provide relevant information to the inhabitants of the municipality and to the mass media. But because the police investigation was conducted under strict confidentiality, there was little knowledge of the content except with certain police officers and social welfare workers. When the incident occurred, there was no command and information plan in the municipality for incidents of this kind.

Initial decisions

Beyond the established contact channels that the police have with the social welfare services, the municipal fire brigade was contacted with regard to the psychosocial care group. This was how the fire brigade became involved in efforts.

For understandable reasons, there was initially some uncertainty as to how the organisation should operate, which entailed irritation in several different situations. Several decisions were made that were not in harmony with one another.

The fire brigade therefore took the initiative to hold meetings between the concerned administrations and the organisations. These meetings probably prevented further uncertainty as to how work was to be structured.

A decision was made to hold daily meetings with the media. The police inferred early on that the incident would affect people throughout Värmland, and perhaps all of Sweden, and it was obvious that interest from the mass media would be substantial. Because the incident demanded major efforts primarily by social services and the schools, the municipal fire brigade took the initiative to support and structure the municipality's work and to cooperate with the county council and the Church. The role of the fire brigade thus became to create structure in the joint efforts within the municipality.

In consultation with the concerned administrations and municipal commissioner, the fire brigade prepared a provisional information plan. It was prepared over a short period and was based on different ideas concerning structure and who should be involved in information tasks. The municipal fire brigade also initiated analysis work so as to, together with the concerned administrations, be able learn from other similar incidents that had occurred in various parts of the world.

According to the chief fire officer, teachers were hard pressed by anxious parents. The rumour that it was a sexual crime resulted in parents guarding their children and even questioning school security. Many children were interviewed by the police, which created further anxiety. It was important that all concerned received information. In many cases, tension arose. There were, for example, different opinions as to how the schools should be used in information contexts and which resources should be reinforced. Disagreements created additional pressure, and conflict situa-

tions arose in conjunction with several decisions. Accord was finally reached through daily cooperation meetings. These meetings were later perceived as very important for the work of the municipality.

On the request of the municipal commissioner, the chief fire officer was later assigned to lead a project that came to be called 'Recreating a sense of security'. The focus of the project was to investigate the needs for specific efforts in the district. Among other things, the project included a door-knocking campaign to reach out with necessary information.

Systematisation of the incident

Type of emergency

What we have here is an emergency state caused by a societal-influencing incident (other than an accident). This was an incident in which a *rescue service* was not provided. The incident created anxiety among the inhabitants of the Municipality of Arvika. The incident was primarily the responsibility of the police. With the anxiety and spreading of rumours that arose, the municipality's role became important.

Extent of affect

The extent of affect was largely restricted to the Municipality of Arvika (local body), but with the mass media's interest, the region and nation were also affected.

Assistance domains

The assistance domains that arose primarily involved restoring a normal state in the municipality.

Assistance needs

There was a major need on the part of the municipality's inhabitants to receive information from the authorities who were dealing with the incident. To avoid the spread of rumours, it was important to provide credible information to the inhabitants of the municipality. Smoothly functioning cooperation needed to be established between involved authorities and organisations so as to create trust in the municipality's actions and to coordinate information to the mass media.

Competence of participants and preparations

Preparations for a situation such as this did not exist and neither was there any clearly defined competence for leading the municipality during a similar incident. What was needed here was to establish a staff and command function adapted to the incident. It was natural for Arvika Fire & Rescue Service to take the initiative in setting up the organisation that came to dominate the municipality's actions. The municipal fire brigade in its everyday work takes command during various types of incident – most often trying and unexpected situations – and it is therefore accustomed to structuring different types of command situation.

Command

The municipal fire brigade took the initiative in establishing a command organisation and created a structure for the various tasks. The command staff therefore

came to be constituted of a mixed group of municipal civil servants with the relevant competence for the tasks at hand.

Resources

The resources used were primarily the municipal administrations, personnel from the Church of Sweden, the county council and the police. The police also worked with investigation of the incident at the same time.

Legal preconditions

The legal preconditions were constituted by the Social Services Act (2001:453), the Police Act (1984:387), the Health and Medical Services Act (1982:763) and the Municipal Act (1977:179). The Act on Extraordinary Events in Peacetime for Municipalities and County Councils came into effect after the event.

Operational response

The operational response over time and space corresponded to the assistance needs. Creating an information plan was initially an important action. (See the section under the heading Initial decisions.)

Action domains

The people of Arvika felt considerable anxiety and fear as a result of the incident. Threatened and affected societal functions were primarily the schools and social services. Responsibility rested heavily on the functions that had to deal with this. The action domains that were involved were constituted by the provision of accurate information on the situation in the municipality to the mass media, to support school personnel and to provide advice and support to the municipality's inhabitants.

Discussion

The municipal fire brigade took important and necessary initiatives during the first days.

Many meetings were conducted to create a functioning structure. In several cases, decisions were made that time restraints prevented from always being anchored in the political leadership. As the incident evolved, the fire brigade gained substantial trust and was assigned several duties, and could therefore relieve other heavily burdened administrations.

According to the responsibility and proximity principles, such a crisis is to be dealt with by the municipality. This is a clear example of when the Act on Extraordinary Events in Peacetime for Municipalities and County Councils (SFS 2002:833) would have been applied. As of the date of this text (2005), the municipality would have been better equipped if it had complied with the intentions of this act. The concept of *a rescue service* did not arise during the incident. The Health and Medical Services Act (psychiatry) and the Social Services Act are included in the legal preconditions.

The emphasis here is on the local level (municipality). The municipal fire brigade perceived that the cooperative structure was a central problem. The police were responsible for crime investigation; responsibility to the inhabitant's of the municipality was initially unclear. Here the municipal fire brigade demonstrated flexibility and the capability to adapt by taking the initiative and conducting an initial meeting with those responsible and took on the chairperson role. The fire brigade saw its duty as creating structure. The municipal fire brigade has, in my opinion, good prerequisites for such work. From a position of poor information, balance in the information situation was achieved thanks to the fire brigade's efforts.

Flooding on Orust

A thunderstorm, without warning from the Swedish Meteorological and Hydrological Institute (SMHI), hit Orust late Thursday, 1 August and early Friday, 2 August 2002. Approximately 2,500 bolts of lightning were observed and an estimated 270 millimetres of rain fell. The societal consequences were several fires and flooding of structures and roads. The roads became impassable, and the electrical and telephony systems were subject to outages.

It was primarily the western part of Orust that was affected. On Friday afternoon, the storm had passed and the situation was assessed as stable. The command staff stood down. But Orust was hit by yet another storm later in the day and at 00:30 hours, the incident commander was again alerted by SOS Alarm AB. It was now the southern part of the island that had been affected. Water volumes threatened residential districts and roads became impassable. The affected area corresponded to 25 percent of the municipality's area (of a total of 388 km³). Damage amounted to SEK 31 million.



Participants

For the most part, the entire municipal organisation.

Flextronik (telecom)

Tjörn municipal fire brigade

Uddevalla municipal fire brigade

Västra Götaland County Administrative Board

The police in Västra Götaland County

The medical services in Västra Götaland County

(The information officer from the county council held the first press conference)

SMHI

SOS Alarm AB

Sveriges Radio AB

Vattenfall/Fortum (electrical companies)

Swedish National Road Administration

Västra Orust electrical association

The role of Orust Municipality

The chief fire officer stated that when he was on the way through the rain to a fire on Mallön, another alarm was received that a building in Tvet was leaning strongly. He then decided to instead go to the affected structure but was unable because the roads had become impassable due to the rain. He said that his first thought was 'a major effort is going to be needed here in providing information to the general public'. The sky was as dark as a winter night. The rain poured down and the bolts of lightning crossed one another.

The municipality had to primarily concentrate on safeguarding property, and in one case, on a rescue operation. The chief fire officer assessed that the entire response (all separate incidents) were to be considered as a rescue service. All of the municipality's administration supported the municipal fire brigade in its work.

Decisions

The municipality had recently prepared an information and emergency management plan. Based on this, the chief fire officer gathered the municipal emergency management group at the Henån fire station. SOS Alarm AB listed the incoming alarms and relayed them to the staff for further prioritisation via fax and telephone. From the municipality's side, it was most important to ensure that no one was injured because of the storm. Among other things, tracked vehicles were put at the disposal of social services/night patrols.

Contact was made with the municipalities of Uddevalla and Tjörn so that they could support Orust if this should prove necessary. Contact was also made with the Swedish National Road Administration concerning the road situation. The chief fire officer also made all decisions that concerned the closure of roads, damaged buildings and urgent assessment issues. Issues related to political decisions or economic aspects were decided upon by the municipal commissioner.

It was decided to publish information on the municipality's website. The chief fire officer quickly realised the importance of having an open attitude to the mass

media and that the mass media, not the least local radio, would be of considerable help in information tasks. According to the chief fire officer, staff work was conducted with rapid decision-making channels.

Cooperation with external bodies

During the first night there was a major need to quickly establish contact with several external bodies such as SOS Alarm AB, the police, medical services, SMHI, the National Road Administration, Swedish Radio, etc. Several of these bodies contacted the incident commander on their own initiative. This was because of the considerable attention that Orust had received from the mass media and that the mass media had announced that there was a state of crisis on Orust. The neighbouring municipalities of Tjörn and Uddevalla began making emergency preparations.

Medical services within the Västra Götaland region joined the staff at SOS Alarm AB in Gothenburg. The police came to Orust and were attached to the municipality's staff. SOS Alarm AB handled some of the contact between the participants. The chief fire officer later said that it had been better if they had been grouped with as many external bodies as possible. The chief fire officer also was of the opinion that it would have been good if the county administrative board had a representative in the staff, as a coordinator with the external authorities and military resources, and who could handle long-term issues with regard to, for example, compensation issues and any contact with the government offices. An example of the problems was telecommunications. When the chief fire officer established contact with the responsible company and requested that they immediately correct the problems, the company claimed that it should have compensation for working Saturday and Sunday.

Systematisation of the incident

This was an unusual incident with many bodies involved. The Municipality of Orust was well prepared but other bodies took part with which no plans had been made and with which joint exercises had not been conducted. Interoperability was thus weak.

Type of emergency

A state of crisis due to an emergency or emergencies in which the municipal fire brigade constituted a major part of the public sector's emergency management. The incident was also characterised by other exceptional incidents that did not constitute a rescue service.

Extent of affect

Municipal context. The Municipality of Orust was primarily affected, but neighbouring municipalities were indirectly affected through their support to the Municipality of Orust.

Assistance domains

Rescue, safeguarding of property, life and function support, recovery. Rescue and safeguarding of property were primary duties for the fire brigade, but there were also infrastructure problems for the municipality to deal with, such as washed out roads, and interruptions to electrical and telecommunications services.

Assistance needs

The need for information was substantial, especially with regard to those affected who were in need of lifesaving operations. Threatened buildings needed to be dealt with. A functioning infrastructure – electrical and telecom systems, and roads – had to be restored.

Competence of participants and preparations

Understanding of how societal structures function, leadership, knowledge of the municipality, staff knowledge, municipal fire brigade with command training.

Orust is a well-prepared municipality in which the municipal fire brigade is a natural part of the municipality's operations. The municipal fire brigade serves on several boards. Personnel in the municipal administrations have received staff training, which significantly benefited staff operations during the storm. Well-established communications channels with the Swedish Meteorological and Hydrological Institute, SMHI, may have given the municipality somewhat clearer weather information.

Support from the county administrative board in Västra Götaland could have assisted the municipality with regard to information and coordination of organisations and authorities.

Command

Through the preparations mentioned above, the municipality had good competence for command. The municipal chief fire officer led operations during the storm with assistance from the municipal commissioner and his staff, and from the Orust municipal emergency management group.

Resources

The resources the chief fire officer had at his disposal were largely constituted by the entire municipal administration apparatus and the organisations that are described under the heading Participants.

Legal preconditions

The legal preconditions were constituted by the Rescue Services Act, the Police Act, the Health and Medical Services Act, the Social Services Act and the Municipal Act.

Operational response

The operational response naturally did not correspond to the need for assistance at the beginning, but thanks to each municipality's preparations, the operational response met the need for assistance surprisingly quickly. See the section under the heading Decisions.

Action domains

Incidents as a physical process, people and their social contexts, threatened or affected societal functions. The focus here was on assisting people who had been affected by the storm (and in one case, pure rescue), meaning restoring affected societal functions such as roads, bridges, electrical power and telecommunications, and safeguarding and protecting property.

Discussion

The municipality of Orust considers the entire emergency response, from 1 August to 5 August, 2002 as a *rescue service* and therefore requested compensation from the government. The SRSA determined that there was no continuity in time and space. The agency's interpretation was that it was a matter of two responses and denied the request for compensation.

The fire brigade in the Municipality of Orust had prepared itself with information plans and staff training of key personnel in the municipal administration. This far-sightedness was of tremendous aid in conducting the staff's work. The chief fire officer made decisions, probably necessary, in matters that concerned the Swedish National Road Administration, electrical power and telecommunications. Decisions of political/economic nature were anchored with the municipal commissioner. The chief fire officer would have preferred that authorities and organisations had been included in command operations, grouped with the municipal staff. He is also of the opinion that the county administrative board should have taken greater responsibility and supported the Municipality of Orust by, for example, participating with a representative onsite on Orust.

Here one can clearly see that the municipality, thanks to good and structured efforts in planning and training, achieved information superiority. That the municipal fire brigade on Orust worked proactively within all administrations in the municipality was a decisive factor for establishing information superiority. The individual decision-maker (the incident commander) encountered here the collective (political) decision-making. Due to well-established contact between politicians and the municipal fire brigade, this worked exceedingly well.

Snowstorm in Gästrikland

For three days in 1998 – from Friday, 4 December to Monday, 7 December – Gävle and the surrounding area were hit by a severe snowstorm. The snow soon became so deep that for a number of days, Gävle was completely isolated from the outside world. The average depth was estimated at 130 cm, but in some places the snow was twice as deep.

On Friday, about 30 cm of snow fell. All available snow vehicles were called out, totalling about 60 units. More snow fell on Saturday, estimated at 32 cm. The fire brigade provided the home-help service with four-wheel drive vehicles. Bus services in several villages around Gävle were suspended. The snowfall continued through Sunday with about 40 cm of snow.

The municipality contacted Swedish Radio/Sveriges Television so that the general public could be warned of the problems in Gävle. The Swedish Meteorological and Hydrological Institute (SMHI) warned the police and fire brigade. Tracked vehicles were requested via the fire brigade. The municipality security manager was alerted via SOS Alarm AB. The municipality's information centre was opened. The police established their staff organisation for crisis situations (in accordance with FAP 201-1). The municipal command group held its first press conference. The railway was shut down.

On Monday, 7 December, European highway E4 and the arterial roads were impassable. The schools were closed. The snow was now 131 cm deep in Gävle and the surrounding areas. The fire brigade provided medical transport, helped people who had become stranded in their automobiles and evacuated a train that was unable to push through the snow.

Participants

Swedish armed forces

Gävle Municipality

Gävle transport authority (Gävletrafiken)

County council

County transport authority (Länstrafiken)

County administrative board

The police in Gävleborg County

Swedish State Railways (SJ)

Swedish Meteorological and Hydrological Institute (SMHI)

SOS Alarm AB

Sveriges Radio AB, Gävleborg

Sveriges Television, Dala district

Swebus (a bus company)

Text TV

Swedish National Road Administration

The role of Gävle Municipality

The municipality's role was to provide inhabitants of the municipality with information on the necessary societal functions that were no longer functioning and how the subsequent problems would be resolved, and in the best possible manner, to obtain a perception of the situation and provide the inhabitants of the municipality with the necessary assistance.

Decisions

On the morning of 6th December, the chief fire officer judged that the situation had escalated in such a manner that it was a matter of *a rescue service* as defined by law. Among other things, snow had been ploughed and removed in an attempt to at least make the city accessible so as to prevent serious damage. Snow had also been removed to avoid major and perilous property damage and to enable access to those who were snowed-in and to transport home-help personnel and medicine to, for example, those who were in urgent need of insulin. Medical personnel were transported with tracked vehicles and snow scooters. Because the city was inaccessible by other means of transport, this transport was considered the same as off-road transport. One hundred people had also been evacuated from a train that had got stuck in the snow.



Systematisation of the incident

Type of accident/incident

The snowstorm was an example of a societal-affecting emergency incident with little interoperability between the responsible participants. The heavy fall of snow during a short period made the city of Gävle and the surrounding countryside inaccessible. The incident was defined as a rescue service.

Extent of affect

Parts of the region, of which the Municipality of Gävle was affected most.

Assistance domains

Safeguarding of property, life and function support, restoration. Primarily transport to medical care facilities, transport of personnel out to patients and those in need of care, property rescue, and establishment of preparedness for rescue services, medical care and the police.

Assistance needs

People in the region needed to receive information on the situation and the resources the municipality was using. The old and sick needed help and had to be attended to. Removal of snow where there was risk for slides. Transport to medical care facilities and other important public service facilities.

Competence of participants/preparations

Understanding of the societal structure, ability to compile and process incoming situational reports, information knowledge, staff knowledge, leadership. The municipal emergency management group was used, but for this type of incident, there was no detailed planning. The competence to lead Gävle during these days was primarily obtained from civil servants and politicians.

Command

Command was improvised in a network made up of the police, local radio and the municipal emergency management organisation, and with support from the municipal fire brigade, the Swedish armed forces, the county council and the Swedish National Road Administration

Resources

The resources available primarily constituted snow-vehicles from the Swedish armed forces, the municipal fire brigade's corresponding vehicles, the Swedish National Road Administration's snow ploughs, the municipality's snow removal resources, local radio for information, and personnel from medical services and the municipality who assisted with the various types of transportation provided.

Legal preconditions

The old Rescue Services Act, the Health and Medical Services Act, the Social Services Act and the Police Act. The entire incident was considered as a rescue service

according to the Rescue Services Act in effect at the time, but legislation such as the Health and Medical Services Act, the Police Act, the Social Services Act, the Swedish National Road Administration's Regulations, the Ordinance on Armed Forces Assistance to Civilian Operations, and the Municipal Act also influenced how the incident was to be handled.

Operational response

Municipal emergency management led the responses in cooperation with the municipal fire brigade. Concretely, this entailed coordinating transport, information, press contacts, situational follow-up, prioritisation of snow removal areas, etc.

The operational response over time and space initially corresponded to the assistance needs. Because no major incidents occurred in conjunction with the snowstorm, the operational response largely corresponded to assistance needs. If a major emergency had occurred, such as a fire, snow slide or train accident, the operational response would probably not have corresponded to the assistance needs.

Action domains

Incidents as a physical process, people and their social contexts, threatened or affected important societal functions. Pertinent action domains were primarily people and their social contexts, i.e. getting out information on how the municipality in various ways could help those in need.

Discussion

The cost of the responses in the Gävle area was later calculated at SEK 48.2 million. This is what the municipality reported to the national government. The SRSA thereafter stated that the national government would not contribute any funds for the conducted responses. In its statement to the county administrative court, the SRSA mentions, among other things, the following:

The SRSA maintains that [actions taken during] the snowstorm cannot be considered as a *rescue service* and that the costs incurred cannot be attributed to rescue service costs. However, during the snowstorm individual responses were carried out by the fire brigades that are to be considered as a *rescue service*. The actions taken by the Municipality of Gävle are of the nature that the municipality is responsible for regardless of its responsibility for providing rescue services. The fact that the actions have been unusually extensive or have otherwise placed specific demands on operations does not mean that they change character and become a *rescue service*.

Court findings

In the findings from the Värmland County administrative court (case no. 1253 -99) it was stated, among other things, that snowfall is a natural and common occurrence that normally does not motivate responses from the fire brigade. In this case, however, the snowfall had been exceptionally heavy and caused serious impediments in normal societal functions. When an entire city is affected in this manner,

however, there is the risk that serious incidents that cannot be dealt with can occur because of snow obstructions. A situation in which the roads in a city are impassable can entail, for example, that those who are seriously ill cannot come to hospitals, that victims of crime cannot receive police assistance and that the municipal fire brigade cannot respond to fires. When all of the individual risks in a city of Gävle's size are combined, the county administrative court maintains that it is reasonable to speak of impending danger for accidents because of the snowstorm. Additionally, the responses made in the form of snow removal in this case were conducted on the initiative of the incident commander, which according to the Rescue Services Act, and the preliminary work for the act, is assigned a central role. As a rule, the responses that the incident commander found necessary should be accepted as a *rescue service*. Following this line of reasoning, the county administrative court is of the opinion that the snowfall that fell on Gävle in December 1998 should be encompassed by the Rescue Services Act in force at the time, and that the responses the snowstorm necessitated are to be considered as one and not several emergency responses.

In the findings, one can discern the SRSA's strict view of the concept a *rescue service*, as well as the county administrative court's interpretation of the concept of a *rescue service*. The perception that exceptional measures were necessary is shared by the SRSA and Gävle Municipality. The county administrative court's position can, according to my opinion, be seen as 'the general public's perception' where the lay assessors represent the general public and its views concerning the fire brigades tasks. The county administrative court's lay assessors, judges and the SRSA's jurists consider the concept of a *rescue service* in different ways. The SRSA must naturally take consideration to the legal grounds for compensation.

It is obvious that there is a connection between level of costs for emergency and rescue responses/basis of revenue and interpretation of the concept a *rescue service*. If the Municipality of Gävle had not requested compensation for costs for a rescue service, the incident commander's decision to classify the entire response as a rescue service may not have been questioned. The conclusion is that if an incident commander determines that a response constitutes a rescue service, that this is not questioned unless claims are submitted to the national government for rescue service costs. This means that rescue service costs under a certain amount are not perceived in the same way as when they exceed the excess amount. There is unfortunately no established practice to go by in this area. More knowledge is needed, but far too often, cases are not reviewed and discussed when no financial claims are made.

The municipality's statement on the role of the incident commander "On the contrary, it is the incident commander in the capacity as the commander of emergency response operations who made the assessment that it was a matter of a rescue service and who decided to request compensation from the municipality" clarifies what in my opinion is a all too commonly held perception, namely that the fire brigade is not a part of the municipality. In the new emergency management system and in the Act on Extraordinary Events in Peacetime for Municipalities and County Councils, no distinction is made between the municipality's fire brigade and the municipality in other respects.

Cooperation problems

A problem that arises when disturbances occur in society is that the concerned bodies provide different information on the situation. In some cases, it is different assessments based on different operational areas. Sometimes it is a matter of the knowledge of the various bodies having been gained on different occasions. The information tends in some cases to quickly become outdated and thus incorrect. During the snowstorm, it was obvious that the information that came from the municipality's information centre in did not always agree with the information that was provided by, for example, Swedish Radio (Hedman 1999).

That Gävle Municipality is a part of the Rescue Services Association means that the municipality did not perceive the municipal fire brigade as a part of the municipality's own organisation (the incident commander requested assistance from the municipality). This may have had significance for the information problems the municipality initially experienced (Hedman 1999). That the county administrative board did not actively participate in supporting command tasks can with the present approach be questioned. The county administrative board, as responsible for coordinating direct contact with government offices, should have been of significant assistance in conducting command tasks.

The requirements for obtaining compensation from the national government were determined by the SRSA, which here had to determine if the incident was *a rescue service* or not according to the old Rescue Services Act. A prerequisite for the right to compensation is that costs are directly attributable to the emergency response. Compensation is constituted by the portion that exceeds the excess amount. The excess amount is calculated according to the grounds determined by the government.

I believe that the findings are well worth reading. They can provide a wider perspective of how the concept *a rescue service* can be interpreted and also serve as a basis for discussion.

Advanced Emergency Services Course seminar in May 2000

The seminar described below was conducted for the purpose of enlightening the participants with regard to the distribution of responsibility during extraordinary events between the local, regional and national levels and any delineation that can arise between various bodies. Problem areas and areas of responsibility were discussed so as to increase the ability of various authorities to take joint action. The seminar addressed the problems that arise when several counties must cooperate on resources and when decision-making at a county's authorities are of importance to another county. The municipal fire brigade needed to shift the focus from the municipal perspective to the regional perspective. Representatives from many different authorities and organisations took part in the seminar.

Participants

The county administrative boards of Uppsala, Södermanland and Västmanland (management personnel) as well as representatives and decision-makers from: the Swedish National Rail Administration, the Swedish Defence Research Agency, Head-

quarters of the Swedish Armed Forces, Central Joint Command, politicians and chief fire officers from the municipalities, county councils and county administrative boards, the Swedish Government Offices, regional radio, the Swedish National Police Board, the SRSA, the Swedish Meteorological and Hydrological Institute, Svenska Kraftnät (the Swedish national grid), the Swedish National Road Administration and the Swedish Agency for Civil Emergency Planning as was.

Scenario

The participants were to resolve a complicated cooperative task that concerned three counties based on the following scenario:

It is a few days before Christmas. Heavy snowfall (storm/hurricane) with very low temperatures hits large parts of Svealand and parts of Götaland. The snow depth is between 110 and 120 cm with deeper snow in drifts. The electrical and telecommunications systems are down. Roads are blocked by snow and hundreds of vehicles are entrapped. On several rail lines, trains have fastened and passengers cannot be evacuated, neither by automobile nor train.

Systematisation of the incident

Three counties are cooperating in an incident that affects a large part of Svealand and parts of Götaland. Interoperability is weak. Fredholm's model is applied more strictly in this example. The systemisation does not describe the incident over time and space, but rather the perceptions that arose during the seminar conclusion.

Type of emergency

State of crisis because of societal-influencing emergency incident (other than an accident). Municipal fire brigades can constitute a part of public sector emergency management.

Extent of affect

Regional

Assistance domains

Rescue, safeguarding of property, life and function support, restoration.

Assistance needs

People needed information. Those who were entrapped in cars and trains needed help. Emergency medical transport was needed, and within care of the elderly heating was needed. Electrical and telecommunications problems had to be remedied, etc.

Competence of participants/preparations

Knowledge of county infrastructure, leadership ability on the regional level, electrical and telecommunications competence, cooperative capability, information competence, analytical competence.

At present (2005), minimal preparations between the counties for severe storms that affect several counties.

Command

Each county individually; in Uppsala through CeSam, in other counties temporarily assembled command organs and staffs. There was no coordination between the counties. The matrix model (see figure 3) was tested and worked extremely well, but this model is not included in the planning of the respective county administrative boards.

Resources

The combined resources of police, municipal fire brigades, and emergency medical services in three counties, the Swedish armed forces, the Swedish National Road Administration, the Swedish National Rail Administration, the Swedish State Railways, local owners of electrical power grids and Telia AB. The use of resources was limited by access to over-snow vehicles.

Legal preconditions

The old Rescue Services Act, the Police Act, the Health and Medical Services Act and the Social Services Act. With the legislation on peacetime emergency management and heightened preparedness in force at the time, the county administrative boards in their analysis could have assessed the capability to resolve similar tasks and therefore have had improved capability to deal with the situation. In accordance with the old Rescue Services Act, the government appointed Uppsala County to coordinate responses. (The CeSam concept was a determining factor for the government's decision).

Operational responses

Operational responses were entirely dependent on who received access to armed forces equipment, primarily tracked vehicles. There was no prioritisation between the counties. The 'squeaky wheel' got the resources.

Action domains

Incident as a physical process, people and their social contexts, threatened or affected societal functions.

Working model

During the seminar, a working model was used in accordance with figure 2 (see page 84). For the respective disciplines to obtain a common perception of the situation, resources, prioritisations and command conditions in the various counties, horizontal meetings were held. In this way, the counties' specific areas and the central authorities obtained the opportunity to discuss the various problems that arose within each specific area. A good overall perception was thus obtained that the various authorities from the respective counties could use when they met at vertical meetings.

The participants thereafter met at vertical meetings in their respective home counties where each discipline presented what had come out at the horizontal meetings. At the vertical meetings, decisions were discussed and made on, among other things, which resources should be used, on resource allocation, on how contact with neighbouring counties should be handled, on long-term planning, priori-

tisations, etc. This constituted the basis for the decisions the respective counties subsequently made during the day's remaining seminar exercises.

The matrix model was used so that collaboration and cooperation between the various authorities and organisations could function both horizontally and vertically. The model was appreciated by the participants and is an instrument that I believe can be used in establishing networks between the various specific areas of several counties and regions in their preventive work prior to incidents in which several organisations and authorities cooperate.

As seen above, the principle calls for participants with the same resources/decision mandates meeting in *horizontal meetings* to clarify resources, common problems, prioritisations, decision-making information, etc. In this way, the capability is created to weigh in the experience of various participants when making decisions in home counties/regions.

Results and discussion

The seminar exercise was documented and evaluated by the participants on the Advanced Emergency Services Course who served as observers. The evaluation revealed several problems that clarify the importance of early interaction, planning and preparation. Several issues must be discussed over county boundaries and level boundaries. In this case, organisations from three counties, three police authorities, three county councils, three SOS centres, six municipalities and several telecommunications and electrical power providers were to jointly coordinate responses. The need and prioritisations of over-snow vehicles, prioritisations of electrical power and telecommunications, coordination of medical transport and joint information to the general public proved to be problems for the various authorities involved. There was discussion on within which areas, resources needed to be optimised. It was shown to be far from obvious as to what constitutes a *rescue service* and what constitutes an *extraordinary event*.

Conflicts related to laws and ordinances and how these should be applied when three counties are involved dampened creativity in the decision-making units. Horizontal coordination problems arose on both central and local levels. The central and local authorities had difficulty in jointly solving emergency problems when their territorial or functional areas of responsibility overlapped. It was difficult to coordinate decisions and prioritisations on the various administrative levels. In some cases, the county administrative boards did not seem to be aware of their regional responsibilities for this type of problem. Planning and training for similar incidents are only conducted within the individual counties.

The lack of pre-determined, joint command centres and cooperative routines led to procedural issues drawing attention away from substance deliberations. The Swedish Government Offices participated in the seminar and determined during a late phase that Uppsala County should coordinate the responses. The motivation was that Uppsala County, as a nuclear power county and with the cooperative group CeSam, should have better organisational prerequisites for coordinating the resources.

The participating municipal fire brigades used, as did other disciplines, a large amount of time in discussing whether or not it was a *rescue service*. Another topic of

discussion was who should take responsibility for information to the general public. Cooperation between the individual home counties and other county authorities had not been trained for and therefore did not feel natural. Problems also arose because of nomenclature and cultural differences between various authorities. It was unclear as to who should coordinate all of the responses within and between the counties.

Obstacles to and opportunities for improved command of rescue services in a risk-filled society

The Advanced Emergency Services seminar indicates, as do field studies, the importance of interpreting and understanding the municipal fire and service's role in the municipality from a complex societal perspective. It is important to analyse how and when the municipal fire brigade should take action based on the laws and ordinances that presently exist in the areas of civil protection, extraordinary events, and measures for peacetime emergency management. The municipalities and municipal fire brigades need to sometimes lift the focus from the municipal perspective to a regional perspective. The role of the county administrative boards in the emergency management system has been clarified with the ordinance on measures for peacetime emergency management and heightened preparedness. This has created a greater need for the municipalities to take the regional perspective.

The studies show how individual decision-making becomes collective decision-making, i.e. that an incident commander's decisions become political decisions with various interests being weighed against one another. In this area, where incident commanders and politicians meet, friction can arise. The decisions made by the municipality's civil servants are based on the orientation of the political majority. But during an *emergency* the incident commander's decisions are based on how he/she interprets the situation. That the municipal fire brigade does not always perceive itself as a natural part of the municipal administration's everyday operations can in some cases complicate command tasks. It is therefore important to let cooperation between the various municipal functions become a natural aspect of everyday operations. With increased cooperation in everyday operations, the opportunities for collaboration in difficult situations improve.

A pattern that can be discerned is that the distribution between public and private accountability becomes complicated during cross-boundary incidents. The three bearing principles – *responsibility principle*, *proximity principle* and *similarity principle* – are not all that easy in practice to merge into the decision-making process. For example, Skanova during the telecommunications failure in Svealand, and the Swedish National Road Administration and the telecommunications operators in the Orust case, did not enter the decision-making process sufficiently early to be able to facilitate operations. In case studies it is seen that many competing laws and ordinances guide command tasks. However, knowledge and understanding of the legal preconditions seems to be a neglected area in command operations.

The legal 'instrument' that the municipality (fire brigade) has at its disposal for receiving compensation from the government is the classification of accidents,

Vertical meeting

↓
↓
↓

Horizontal meeting	Area	CAB U county	CAB D county	CAB C county	National authorities
→	Municipal fire brigade	Västerås Fire & Rescue Service	Eskilstuna & Strängnäs Fire & Rescue Service	Uppsala Fire & Rescue Service	
→	Police	Police in Västmanland County	Police in Södermanland County	Police in Uppsala County	Swedish National Police Board
→	Medical services	Health authority in Västmanland County	Health authority in Södermanland County	Health authority in Uppsala County	
→	County administrative board (CAB)	CAB in Västmanland County	Södermanlands läns länsstyrelse	Uppsala läns länsstyrelse	SEMA
→	Politicians	Västerås Municipality	Strängnäs Municipality	Uppsala Municipality	
→	Armed forces	Military District Unit	Military District Unit	Military District Unit	HQ
→	Sveriges Radio (SR)	SR Västmanland	SR Södermanland		

Figure 3. Entities (from the specialist fields and the relevant authorities) that participated at the seminar. The model should be seen, primarily, as a good way in which to train/hold exercises for incidents that affect several counties.

Apart from the entities mentioned in the table the following also participated: the Swedish National Road Administration, the Swedish National Rail Administration (transport), the Swedish Rescue Services Agency (protection, rescue, relief, and medical care), the Swedish Emergency Management Agency (SEMA), the Swedish National Grid (technical infrastructure), the Swedish Defence Research Agency, SMHI (meteorology), and the Swedish Government Offices. CAB = county administrative board.

incidents and other emergencies as a *rescue service*. The MSB then reviews the decision on whether a *rescue service* was justified. When no compensation is requested, the government does not conduct a review. One can wonder if such reviews should not be conducted more often. Increased experience and more knowledge of various assessments would ensure the quality assurance of the concept of a *rescue service*. What does fast mean for example when we speak of “the need for a fast response?” During some incidents, fast can mean hours, in others minutes.

Some of the case studies demonstrate the importance of clear documentation. A municipality can sustain severe economic problems if points in time are not documented for when a rescue service began and was concluded. The demand for documentation is presently regulated by the Civil Protection Act.

It can be deduced from the field studies that it can be difficult to quickly obtain a picture of the situation and its complexity. The necessity for coordination and cooperation is initially difficult to see. There is thus a need here for assumed participants being well prepared by establishing a clearly developed form of cooperation in the municipality/region, for example, between the areas of electrical power, telecommunications, datacommunications, water, sewage, and information. The cooperating bodies will vary depending on the incident's position on the complexity curve (figure 1).

It is important to clarify *responsibility issues* in various situations at an early stage. When an emergency occurs, with many bodies affected, it is important that one has reached agreement in advance on an *ignition key* for various types of emergency. Before incidents occur, it is important to analyse and decide on who will press the alarm button.

External monitoring is a neglected area that needs to be clarified and implemented in the emergency management organisations, municipally, regionally and nationally. It can be a matter of, for example, within one's own sector, monitoring weather developments, planned major events in the municipality and criminal behavioural patterns that could lead to responses from the municipal fire brigade. It can also concern a cross-sectorial discussion to remedy social problems in certain residential areas, etc.

It is seen in studies that the role of *county administrative boards* has sometimes been unclear. It is now regulated more clearly in the county administrative board ordinance and the ordinance on measures for peacetime emergency management and heightened preparedness. A continual dialogue between the municipal fire brigade and the county administrative board is important, as is finding a good cooperative structure with the county administrative board's duty officer who is onsite around the clock and has a coordinating duty according to the county council ordinance.

The ability to establish information superiority is very difficult if there is not a well-prepared plan and organisation for this. A pre-condition is that one has a shared picture of the situation between and within the participating organisations. Such a shared picture should include a concordant consequence description. *Always consider the information aspect on each decision-making occasion.* This approach will provide the emergency management organisation with a capability for gaining information superiority. Also consider the *perspective from below*. Information to inhabitants of the municipality should be prioritised. Both the information aspect and the perspective, from below, should be considered on each decision-making occasion.

Emergency management model

In the field studies, it can be seen that municipal fire brigades are competent and can shoulder more responsibility in the emergency management system. The work of municipal fire brigades with various types of rescue service task varies on a daily

basis. Included in prevention work is the analysis of risks, threats and vulnerability. One participates in municipal planning. It is my opinion that the municipal fire brigades are well suited for having coordinating responsibility for establishing emergency management, both with regard to planning and operational tasks in the event of an incident when the emergency management organisation is to be used. Work with planning should be based on the risk and vulnerability analyses that are conducted in the municipalities.

Based on the risk vulnerability analyses, assumed participants are selected that become permanent members of the emergency management group, for example, municipal leadership, social services, fire brigade, environmental administration, roads administration, property administration, electrical power and heating distributors, etc.

Here it is important to work out responsibility relationships between the various administrations and non-municipal bodies, and establish routines in advance (compare Bakka et al. 1988) This can be accomplished through a joint 'letter of understanding' between the various bodies.

In preparatory command work, it is important to carefully survey the allocation of responsibility by following the proximity, responsibility and similarity principles. It is also important to survey and assure information channels. Planning should primarily be oriented to dealing with the most basic needs, namely electricity, telecommunications, datacommunications, water, sewage, heating and transportation (roads and streets). Power supply will become one of the most critical problems for being able to handle electronic communications. Alternatives to electronic communications must therefore be assured for emergency management. It is important to plan and prepare for various 'command centres', depending on the type of incidents. It is also important to be clear as to how external monitoring is to be handled and who should handle it. Command of response operations must be coordinated with other public sector emergency management during various societal crisis states. Cooperation requires both coordination, and planning and training.

Responsibility rests heavily on the authorities and organisations that have to deal with emergencies and crises. In such situations, citizens are forced to put their trust in the municipality/state. There is no time for political deliberations during such incidents as described above. Everything is subordinate to the emergency task of protecting human life, property and the environment. So that interoperability can be improved, it is my opinion that a widened societal perspective is needed in the training of fire officers and others with duties in the emergency management system. An example of knowledge that is lacking is that of the function of the deregulated electrical and telecommunications sector with its many players. To establish areas of responsibility between the various bodies is not all that easy, especially when they are to be grouped by geographic areas of responsibility. Public and private bodies must participate in joint exercises that involve the entire infrastructure. The goal of these exercises should be to gain a shared view of emergency management, emergency information and communication, cooperation and illumination of consequences for society.

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Personal contacts (during 2003–2004)

- Håkan Axelsson, MSB, previously with the Swedish Rescue Services Agency, and chief fire officer in Arvika Municipality
- Lennart Börs, 1st fire protection engineer, Uppsala Fire Brigade
- Stig Ekberg, emergency planning director, Uppsala County Administrative Board
- Tony Karlsson, chief fire officer, Orust Municipality
- Kjell Rognmo, chief engineer at Stockholm Fire & Rescue Service, previously chief fire officer at Gästrikre Fire & Rescue Service

Lars Fredholm & Mattias Åström

4. Incident command and decision making

Lars Fredholm was introduced prior to other introduction on page 6.

Mattias Åström is a safety engineer and human factors specialist at the LFV (roughly the air navigation services of Sweden). He has a M.Sc. in cognitive science, currently specializing in risk management and the safety assessment of air navigation systems, which consists of people, procedures and technical systems. Previously he conducted research for the Swedish Rescue Services Agency and the Swedish Emergency Management Agency with the aim of identifying conditions that support the coordinated cognitive work of decision-makers so that management functions can be better designed for the handling of the initial phases of emergencies and disasters.

Residential fires occur. The fire brigade responds. There road traffic accidents occur. Here too, the fire brigade usually responds, along with ambulance personnel and the police. Sometimes a whole block of wooden buildings is engulfed in flames. There are major forest fires during the dry summer months. Serious passenger train accidents have occurred resulting in several deaths. In 1998, 63 people died in the disastrous discotheque fire in Gothenburg. During the past decade, several major floods have occurred in various river and lake systems. Trains carrying dangerous goods have derailed. In 1986, a nuclear power plant failed in Chernobyl and large parts of Sweden were exposed to radioactive fallout. In 1998, the *Estonia* sank with over 800 dead. The intention of this chapter is to create an understanding of the variation of what constitutes decision making, depending on the type of emergency that must be dealt with.

For all of the above-mentioned types of emergency society must be able to conduct response operations of various types. Such response operations must be led. Emergency management tasks constitute a continually repeated process in which the participants are constantly working to deal with the situation by:

- Observing and understanding a dynamic, complex and diffuse external event
- Perceiving what it is that is desired to achieve in relation to this event
- Observing and having knowledge of the resources with which one can act
- Formulating a strategy for using resources to obtain set goals
- Following up and understanding results of actions
- Communicating observations, comprehension and strategies
- Communicating when conducting operations by observing, understanding and finding strategies
- In relation to the event, dealing with what is mentioned in the preceding points in such a way that one gains the opportunity to influence the event in the desired direction or to gain control.

Decision making is included in all of these emergency management sub-processes. Important questions are what is decision making and what does decision making entail in relation to the various types of emergency and crises that are described above? In the chapter, *Dealing with all types of emergency from everyday accidents up to disasters*, the scale of emergency management complexity is addressed. By going from everyday response operations to larger response operations and examining how emergency management is conducted, a categorisation is derived of the scale of complexity, which corresponds to the need for assistance when society is affected by emergencies that widen to varying degrees. The continuously repetitive processes defined above must function in situations that range from the scale of complexity covering the management of basic everyday response operations to the scale of complexity that embraces the management of major response operations with local, regional and national decision makers. What decision making covers will be dependent on various circumstances during an emergency. Three especially significant circumstances are *time considerations*, *management level* and *type of incident*. To be able to discuss decision making in relation to these circumstances, it is appropriate

to begin with the research knowledge that has been produced over the years on decision making. The intention is to show that decision making as a process is dependent on the context in which it is conducted, and to provide an understanding of what decision making covers under various conditions.

Various schools of thought on decision making

During recent decades, scientific research in human decision making has widened. Traditionally, decision makers have most often been viewed as fairly rational and autonomous individuals who make decisions in relatively static situations. Through later research, however, decision makers have come to be seen as components in an often complex context, where decision making is perceived as a dynamic and distributed process. This occurs between a larger number of participants who integrate with one another on various emergency management levels in an organisational system, or various organisational command systems in interaction with one another (Fredholm, 1997; 1998; 1999).

Instead as in traditional research in human decision making, focusing on what one should do and how one should act based on rational norms, the focus has increasingly shifted towards analysing the context for decision making, the processes in the situations that are analysed, the expert knowledge and situation awareness of decision makers, controlling processes, cooperation, coordination and communication.

The various schools of thought that currently exist for decision making can be categorised into models for decision making.

Classic decision making

The traditional approach to human decision making, which forms the basis for the present classic models for decision making, has generally been derived from how people are believed to make individual decisions based on well-structured and static problems. It has often dealt with how single individuals, and then often novices, make decisions under laboratory-like conditions, where the decision situation has been isolated from disrupting external factors. Moreover, the test subjects in the studies that form the basis of the classic models have usually had ample time to resolve problems and the goals of decision making have been clearly expressed and stable in nature. The results from such studies have usually been compared with how one should have solved problems according to some form of rational standard, and the focus has most often been on the choice of possible actions (Edwards & Tversky, 1967; Newell & Simon, 1972). The study paradigms used are partly normative models and partly descriptive instructive models (Bell, Raiffa, & Tversky, 1988).

Normative models address how people solve problems and make decisions under ideal conditions. These models are based on the choices a rational person makes in a certain situation, and are largely prescriptive.

In normative models, strong emphasis is placed on the benefit a decision maker gains by making a certain decision. A decision that leads to the decision maker obtaining optimal benefit is usually considered as the best alternative and should be

chosen. If there is uncertainty as to the results of a decision, the probabilities for different types of result must be calculated and the decision based on the anticipated benefits of the alternatives (Savage, 1972).

However, people do not always behave as rationally as the normative models prescribe. Due to people's inherent cognitive limitations when obtaining, storing and processing information, they must use, among other things, various techniques and methods to quickly arrive at solutions to the problems they encounter. This is something that the *descriptive models take more consideration to*. According to these, decision makers often use intuition instead of logical deduction. Even in practice, decision makers seem to intellectually consider or simulate what they think will happen if they choose to make a certain decision, and based on this, they can modify their plans before they are executed. This approach to how people make decisions has become increasingly popular in research on decision making.

The descriptive models are founded on decisions not always being based on the theory of anticipated benefit. They are often based instead on simplified models of reality. Simon (1957) coined the term *bounded rationality* to describe this observation.

Decisions that especially fall into the category of bounded rationality are such that are made under uncertainty. *Uncertainty* in this context refers to their not being any straightforward 'best decision alternative' to resolve a problem, or that it cannot be determined with certainty that a specific solution is right or wrong. In such situations, people tend to make decisions based on a larger number of varying strategies. The use of various types of heuristics¹ plays a major role (Klein, 1998).

Some of the researchers whose studies of decision making are used in various scientific contexts (such as in psychology, medicine, law and economy) are Kahneman, Tversky, Slovic and Sharif (Kahneman & Tversky, 1972, 1973, 1982; Sharif & Tversky, 1992; Tversky & Kahneman, 1973, 1974). Among other things, they have studied how people make decisions in everyday situations and describe how people try to anticipate and categorise future events in their decision making. Based on the mistakes made in various decision situations, they attempted to determine how people reason.

Because most classic decision models are often considered to include many incomplete explanations relating to the problems of decision making, new theoretical structures have been developed on how people make decisions in actual and concrete situations. Instead of as in the classic theories, beginning with rational methods for decision making (such as logic and various types of heuristics), studies focus on how people use their *experiences* to make decisions in natural environments and situations. One speaks instead of naturalistic decision making (Klein, Orasanu, Calderwood & Zsombok, 1993).

1. Heuristics is partly a means for discovering and cultivating new knowledge, and partly the theory of such methods. Heuristic methods are used to make probability suppositions, to choose and generate hypotheses, but in themselves, do not entail justification or an explanation of these hypotheses. In general, a heuristic method is neither precise, certain nor deductive.

Naturalistic decision making

Naturalistic decision making addresses how people, and primarily experts, make decisions in a specific context. These decisions are often made based on unstructured problems with shifting and often vaguely defined goals. They often occur in uncertain, dynamic environments, and then generally under substantial pressure in regards to time, with much at stake and many different participants involved. The focus of studies involving naturalistic decision making therefore tends to be more oriented to the decision makers' perception of the current situation, or in other words, their situation awareness, instead of the traditional focus on the choices between various possible actions (Orasanu & Connolly, 1993; Klein, 1997). Naturalistic decision making can be defined as the way in which experts – working individually or together in dynamic, uncertain and often rapidly changing environments – identify and gain control of situations, make decisions and take measures having consequences that are meaningful for themselves and for the larger organisations in which they operate (Zsombok, 1997).

Naturalistic decision making therefore tends to be more based on how decision makers attempt to identify and gain control of a situation, often based on their experiences, so as to subsequently update their awareness of the course of events through feedback. This is in contrast to the classic models, where several possible solutions are developed that are later compared with one another.

The research in naturalistic decision making suggests that rational norms and formal models for decision making cannot be established, such as those developed in controlled laboratory testing. Instead, contextual factors must be included that exist in actual situations for decision making, and consideration taken to situations continually changing. The classic models are also believed to lack explanatory and predictive aspects. In actual environments, classic decision making can even be dangerous. This primarily applies to decision situations in which time is of the essence and there is stress (Zsombok, 1997).

Naturalistic models for decision making, however, do not represent a direct counter-reaction to the traditional method of viewing decision making. They have instead arisen from a need to study decision making under actual decisions in a context where the classic theories display weaknesses. Examples of this include questions concerning how teams of experts make decisions under actual conditions (Orasanu & Salas, 1993). A team differs from a group in that members of a team each possess a specific skill. The members' unique qualifications contribute to what the entire team achieves. The whole of a team is not a simple addition of skills, but is based instead on collaboration in which information is coordinated (Waern, 1998). The research here is of an interdisciplinary character because of its substantial complexity, which, for example, expresses itself in naturalistic decision making also embracing research in situation awareness, problem resolution, ecological psychology, situated cognition, etc. (Klein, 1997).

Dynamic decision making

Another research orientation that also concerns decision making in applied contexts is the research in dynamic decision making. Characteristic for this type of

decision making is that it occurs in dynamic environments, such as when trying to gain control over a widespread forest fire, where it is largely impossible to make optimal or rational decisions based on the way described by the classic models. This is because it is impossible to know in advance, the state of the problem space that is to be dealt with (Artman, 1999). In this area, it is not the actual decision making that has been in focus, but rather the questions generated by decision making more regulating a process, such as preventing the spread of fire (Svenmarck & Brehmer, 1991). Decision making in such situations becomes more a function of various measures for gaining control (Brehmer, 1992).

Dynamic decision making also occurs as an ongoing process. The problems that have been defined by Edwards (1962), among others, as a series of decisions to achieve a goal where the decisions are dependent on one another, or in other words, that later decisions are based on previous decisions and affect them, and that the states for decision making are constantly changing, in part automatically and in part through the decision maker's actions. Metaphorically speaking, the dynamic environment changes as if it had a memory (Artman, 1999).

Rapoport (1975) has defined decision making in the same way, but also points out the important characteristic that the decisions are made in real-time. The decisions must not only be correct and made in the right order, but also made at the right time. The decision maker must deal with a system that is to be controlled by various means in real-time. Decision making therefore takes the form of regulating a process, and not individual events. Making decisions in dynamic environments means finding a way of using one process to control another (Brehmer & Allard, 1991).

Decision making in real-time also means that the situation continually demands decisiveness on the part of the decision maker, something that generally leads to stress. Most often, the decision maker must consequently find a strategy that not only controls the task but also the work situation (Brehmer, 1990).

The time aspect also means that each action must be defined according to one or more time scales (Fredholm, 1997). This applies regardless of if one is in immediate contact with, for example, a minor accident, or if one is on a staff that is coordinating actions during a larger emergency. This usually leads to the occurrence of various types of coordination problems between different command levels in an organisation's command system, but also between the command systems of different organisations (Brehmer, 1990). Decision making involves continual action, either by making decisions that can change a situation or by letting a situation change under its own power (Artman, 1999).

Distributed decision making

One can say that decision making is distributed because a dynamic environment is seldom controlled by a single decision maker but instead by a team, (Artman, 1999).

Such decision making differs from decision making in groups, where decision making revolves more around reaching a consensus among a number of persons. Decision making in groups is characterised by the group member having a relatively concordant picture of the situation that is to be dealt with. The group members as individuals, however, do not possess all information but are instead dependent on the

information being coordinated within the group. In distributed decision making, however, decision makers are only assumed to have access to a reduced intellectual model of the problem (Brehmer, 1991). For example, an expert in a specific field is not assumed to have sufficient knowledge to resolve more complex problems that are beyond his or her field of specialisation. The problem in distributed decision making is therefore in coordinating reduced intellectual models of various participants so as to attain an overall picture, or situational awareness, of the situation. But this is not to say that individual participants will necessarily attain a complete overall picture of the problem.

Because information must be coordinated between various participants, communications constitute a very important and unifying factor in distributed command of incidents. In that communications always requires resources, it is often deemed necessary to keep them to a minimum. A model for how communications function is the so-called blackboard metaphor (Hayes-Roth, 1985). According to this, a global memory functions like a blackboard, meaning that all participants that communicate with one another have access to the same information. This type of information presentation becomes very vulnerable if the global information is incorrect. Another presentation method involves individual blackboards, with different participants having access to different blackboards. When the information is coordinated between different participants, it must be interpreted and understood by the recipients. This process occurs, for example, by participants placing counter-questions, or strengthening or reformulating statements for the purpose of understanding and coordinating one another's further language actions. Understanding, or the intent, of that which is communicated is largely based on the participants having similar models of what is addressed in a communication. In these contexts, one usually says the participants need some form of common intellectual model for the speech act situation. This model is fundamental for the integrating participants being able to conduct joint actions and must it be based on a common foundation that to a large extent is associated with the discourse, or environment, in which the communication occurs (Clark, 1996). The discourse embraces our way of conversing and serves as a frame of reference that enables interpretation and a deeper understanding of that which is communicated. This frame of reference also embraces various types of resources that the participants have access to, such as background knowledge, knowledge of operations, social roles and identities, professions, etc., but also the use of objects such as books, manuals, maps, images, computers, etc. Communicating information between a large number of participants therefore takes time and constitutes a risk in that the information communicated is not always interpreted or understood as the sender of the information originally intended.

Distributed decision making arises according to Artman (1999) in dynamic situations and environments that are characterised by high information loads. The information flow in many cases exceeds the cognitive ability of individuals to monitor, interpret and analyse an event themselves. The information can also require specific expertise to be interpreted. Operations can also be geographically dispersed, which in most cases makes it physically impossible for an individual to gain access to all available information. Parallel tasks can be required when situations are

sufficiently complicated that several participants and decision makers are needed to assist one another to make decisions.

The coordination that is necessary to handle distributed knowledge processes in real-time between participants in a system therefore constitutes one of the key problems for distributed decision making in dynamic environments (Artman, 1999; Svenmarck, 1998).

Svenmarck and Brehmer (1991) maintain that distributed decision making is becoming more common due to new technical systems, with ever-increasing levels of automation, leading to constantly growing risks for personal injury and material damage. New automation demands more monitoring, diagnosing and planning. Increased automation leads to work becoming more cognitively demanding and places heavier demands on cooperation. External factors, such as economic considerations and other internal conditions, demand increasingly faster decision processes.

A distributed system should satisfy the need for communication, even if it can be costly in terms of the stress that usually accompanies real-time processes. Because there is always the risk in such a system that unanticipated events and situations can occur, communication is necessary for the system being able to recreate itself. There is therefore a substantial need to create communication-friendly organisations (Brehmer, 1991).

It is implicit in distributed decision making that decision makers must have time to reflect on their methods and make decisions in consultation with other decision makers. Effective distributed decision making is therefore considered to include a great degree of afterthought prior to decisions in comparison to individual decision making. Communications here constitute the basis for reflection by decision makers and requires time for assessment, in other words, changes must be given opportunities for development. This can entail problems when introducing new members to teams (Brehmer, 1991).

In conclusion, however, it can be said that there are no direct conflicts between the various scientific models. The naturalistic, dynamic and distributed models are largely based on the classic models for decision making, but have come about as a reaction to the limitations in the classic model in explaining decision making in actual situations in more complex environments.

Decision making in incident command

The descriptions of the various schools of thought regarding decision making provide a starting point for discussing decision making in relation to the various situations that are described in the chapter's introduction. A problem is that the scientific theories are of two types, namely normative and descriptive. Classic decision making is oriented to *how decision making as a selection act between various alternatives is conducted in the best manner*, meaning a normative orientation. This requires that one has a static situation in which there is ample time to prepare the various alternatives and that there are uniform goals for the selection act, namely that the selection leads to the greatest possible benefit based on one aspect, and that there is ample time to weigh the various alternatives against one another. Making decisions accor-

ding to this school of thought means choosing between the defined alternatives.

The other schools embrace so-called descriptive theories. This means that they are not oriented to indicating how decisions should be made, but rather to describing *how people make decisions in realistic, dynamic, complex and unclear situations*. Based on the perspective of these schools, *making decisions* is not just concentrated to choosing between various alternatives. It is rather using a mixture of more or less rapid thought and action so as to gradually attempt to gain control of a situation. Decision making means being able to quickly interpret and understand the situation and find a strategy to deal with it. One can say that decision making becomes a process with which one can attempt to control another process, namely the dynamic, complex and diffuse situation.

Bearing in mind the wide range of meanings for the term decision making, we can now discuss what *decision making* can be in incident command related to the previously mentioned emergencies and crises.

Being an incident commander at a residential fire means being able to quickly decide what is to be done. The situation is characterised by the fire spreading and that people may be in danger. There is no time to act in accordance with how decisions should be formulated according to the normative model of classic decision making. Klein (1986, 1993) describes how decision making is conducted in such a situation. Klein belongs to the naturalistic school of thought described above. He maintains that an important starting point for the incident commander is recognition. As an expert, an incident commander has experience of similar situations. He or she also has experience of a repertoire of action patterns from similar situations. In a situation where time is at a premium, the incident commander decides on an action that seems reasonable for gaining control of the situation based on his or her experience. It is not a decision concerning the best alternative, but rather a quick 'intuitive' decision to take an action that hopefully is sufficiently good.

The incident commander's decision making in a dynamic situation is conducted with the starting point in the school of dynamic decision making. The orientation is to gain control of a diffuse and unclear, dynamic situation, not to choose the best alternative among alternatives defined in advance, with ample time and in a stable environment. The incident's dynamics place demands on the incident commander's decision making abilities in real-time. The incident commander's decisions affect the incident's dynamics, which in turn affect the incident commander's next decision, which affects the incident's dynamics, and so on. The sequential process is emphasised in the school of dynamic decision making.

The type of *emergency* has significance for how decision making can be conducted. The emergency can in principle be viewed as either dynamic or static. A fire is dynamic. It spreads without actions being taken. The situation after a traffic accident, when two cars have collided and have come to a stop on the road, can be viewed as a static situation. The actual collision is dynamic when kinetic energy is transformed into other energy forms, but afterwards a state of rest occurs. Such a static response situation can be stable or instable. A stable situation means that there is no danger for change. An instable situation means that an imprudent

action can worsen the situation. After an earthquake, for example, an imprudent action can make things worse.

With accidents that result in static response situations, decision making can be conducted more in line with the approach of the classic school. After the incident in Borlänge, where a freight train with LPG wagons derailed and then came to a standstill in the marshalling yard without leakage, such a situation occurred. The tactical orientation is to secure the situation and to find a safe method for removing the damage rolling stock. There is time to carefully analyse the situation, define possible alternatives, analyze which alternatives are best and finally choose an alternative. Being cautious and taking time is well-justified in such a context.

Response situations are such that not just one decision maker can deal with the situation. Several decision makers on the same command level and on different command levels must jointly deal with the situation. The knowledge provided by the school of distributed decision making is applicable for response situations. These are characterised by decision makers acting on different command levels and that decision makers from various response organisations must coordinate their decisions on various command levels. The approach presently used in the Swedish fire service – that command is exercised by a system's tasks being structured in various components (SRSA, 1998) – is a concrete application of distributed decision making. General decisions in the normative component provide the framework for decision makers in the 'lower' components when taking actions. Decision making is distributed from the normative component downwards through the other components.²

An important circumstance is the *time horizon* that one has at one's disposal when decisions are to be made. It is usually short time horizons that are available during emergency response operations. The time horizon can be discussed in relation to decision making on various command levels. Decision making at the incident site must usually be conducted with very short time horizons, especially at the beginning of a response operation and before control has been gained over the situation. Decision making can be described in accordance with Klein's (1987) model of recognition-based decision making. On higher command levels and/or in work with higher command components, according to the Swedish Rescue Services Agency (1998), there is the requirement for being able to work with both short and long time horizons. Decision making on these levels and/or in components can thus take different forms. It can be described in the way that the schools for dynamic and naturalistic decision making specify, but in cases when the time horizons are long, decision making can also have forms that are in keeping with the school of classic decision making.

Jacobs and Jaques (1991) are two theoreticians who have interesting views on decision making and demands on decision makers on various command levels. A central aspect of their theoretic reasoning is that decision makers on high command levels must have the ability to work with *conceptual abstractions*. This means,

2. Cedergårdh and Winnberg, in their chapter Structuring Command Organisations, discuss how distributed decision making can function in command organisations.

for example, being able to work with perceptions of the overall state of an emergency and how the dynamics will develop. The decision maker should be able to perceive this without actually being able to view the entire situation. He or she should be able to construct such perceptions based on indirect information in various forms. Other perceptions that a decision maker on a higher level must work with are perceptions or working hypotheses of possible outcomes to ongoing events. With all of these perceptions as a basis, a goal orientation and an action strategy must be formulated. These are all abstractions. Such goal orientation and action strategy can then be replaced in, for example, a general decision. Jacobs and Jaques are of the opinion that decision making on high levels is more a matter of correctly introducing order in an incident's complexity, rather than choosing the best solution among a number of alternative solution proposals. The core of this line of reasoning is that command on high levels should consist of constructing an understandable frame of reference that in some manner can serve as a 'chart' of the emergency and the strategy with which the emergency is to be dealt with. This understandable frame of reference then functions as the starting point for decision making on lower command levels.

The presentation above of the various schools of decision making, and the discussion on what decision making is in various decision situations in incident command, show that decision making is something that can take on various forms and be described in different ways. The varying conditions of varying situations are crucial to how decision making can take form and to which demands can be placed on decision making. Such important conditions are the amount of time available, the type of incident and the level of command.

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Gerry Larsson

5. Theoretical reflections on leadership

Gerry Larsson is a licensed psychologist and a professor in psychology, especially leadership psychology at the Swedish National Defence College. He is also adjunct professor in work and organizational psychology at the University of Bergen. He conducts research on, and tutors and teaches in leadership, stress, crisis management, personality and health.

Some years ago a Swiss clock manufacturer advertised his clocks using a challenging expression in English, “Some people don’t even know what makes us tick!” Leadership is sometimes described in similar terms – good leadership anyway. It is something that we cannot really define, but that “makes us tick”. This chapter takes up leadership and its significance for emergency response command.

First we ask the question - What is leadership and how is it shaped? This is followed by an in depth examination of a leader as a person and the context of leadership. Subsequent to this there is a section on the influence of stress on leadership and decision-making. Finally an attempt is made to relate the behavioural science perspective to Fredholm’s operational based categorisation of the scale of complexity in leadership (see the opening chapter of the book).

What is leadership and how is it shaped?

Even if leadership as a notion is connected to industrialization, concepts of leaders and leadership have been with us for as long as we have reflected over ourselves and our circumstances. Plato, for example, describes three types of leader: (1) the statesman, (2) the military commander and (3) the businessman.

Many attempts have been made to define leadership over the years. But to date no description has been universally accepted, whether it has been proposed by scientists or practitioners. Certain themes, however, recur in several of these. They include formulations such as “to influence somebody with the purpose of achieving an aim” (see Bass, 1990, for a summary).

Leadership then is a vague concept. One way of approaching it is to identify different types of leadership. The lowest hierarchical level in an organisation is termed *direct leadership*. This involves the leader having direct contact with the people he or she is leading. They can “look each other in the eye”. In small or medium-sized emergency response organisations the majority of leadership is of this nature. According to Hersey, Blanchard and Johnson (1969/2001), it is desirable that direct leadership is carried out by people with extensive knowledge of the applicable area of operations. On the other hand it is not necessary for them to understand the whole organisation in detail.

Leadership at middle and executive levels in the organisation is often referred to as *indirect leadership*. At this level commanders have direct contact with their closest colleagues and with a smaller group of staff. Contact with the majority of colleagues is then indirect as it is clearly difficult to establish and maintain a personal relationship with up to perhaps a 1000 people. Contact is made instead, normally, via colleagues. Therefore, in the first place leadership means being a leader for leaders. Leadership that is exercised by commanders for large emergency response organisations is usually of this type. At this level the capacity to be able to overview and abstract is especially important.

At the highest organisational level – the executive level – the commander naturally has direct contact with his or her closest colleagues and with a larger staff. Contact with the majority of the organisation’s members is in the main only indirect via several levels of colleagues or can be one-way via media. The complexity

of the task is apparent in many areas. One example is the necessity of being extremely flexible: long term planning one moment and quick response to the mass media concerning an acute situation the next. An executive commander must also be able to balance between the demands of his or her own organisation and the demands of politicians or a board (Jacobs & Jaques, 1991). It is obvious that this class of leadership demands an exceptional capacity for overview and abstraction, as well as extensive knowledge of politics and public administration. Leadership of a government department can be seen as equivalent.

Leadership model - Developmental leadership

A number of theoretical leadership models have succeeded one another over the past 100 years (for a summary see Bass, 1990; Larsson, 2003). A current Swedish model known as *Developmental leadership* has been evolved by the author and his colleagues at the Swedish National Defence College (Larsson et al., 2003).

The model has been formally adopted by the Swedish armed forces and an adaptation of it is underway primarily for use within other civil defence related organisations such as the police and the fire service.

A relatively detailed description of Developmental leadership is therefore given below.

The account is taken from Larsson (2003) and those interested are referred to this source for a comprehensive presentation.

The model consists of three primary components: leader characteristics, contextual characteristics and leadership styles. A leader's actual conduct depends upon the combination of several leader and environmental characteristics. There are two parts to the area of leader characteristics: basic requirements and desired competence. The basic requirements influence the development of desired competence. So the better the basic requirements are in a leader, the greater is the capacity to develop the desired competence. The model also includes a favourable combination of these two aspects as a prerequisite for successful leadership. Neither of them in themselves is enough. At the same time they, even together, are not a guarantee of successful leadership as this is also influenced by environmental factors.

The contextual characteristics that are shown in figure 1 should be taken as *examples* of these types of conditions. The illustration shows that groups and organisations have a mutual effect on one another. The same applies to organisations and their environments.

The main area - Leader characteristics (figure 1) - is composed of basic requirements and desired competence. An account of some of the basic requirements is given further on in the section. So also are some aspects of the main area - Environmental characteristics. A comprehensive account is available in Larsson and Kallenberg (2003).

I will now move on to present the main area - Leadership styles. As shown in figure 1 the model covers three types of leadership styles: developmental leadership, conventional leadership and non- leadership.

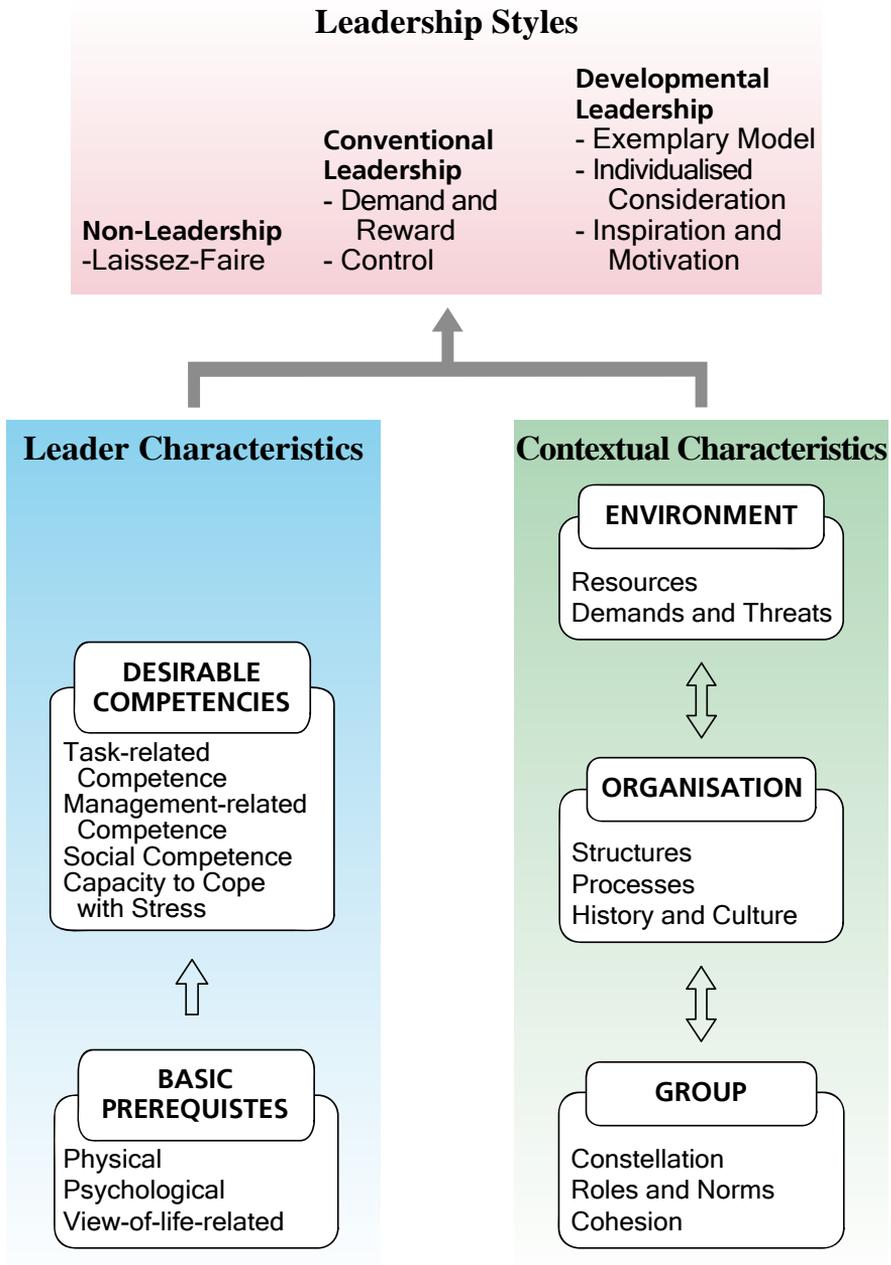


Figure 1. Leadership model Developmental leadership (Larsson, 2003).

Developmental leadership

Developmental leadership has three characteristics: (1) It is characterised by being an exemplary model, (2) individualised consideration and (3) inspiration. Setting a personal example, showing concern for one's personnel and inspiring and motivating them have, it is true to say, always been components of good leadership, but here they are given wider significance in that they are connected to several characteristics and placed in the partially new framework that modern society provides.

Exemplary model

Developmental leadership is both a mental attitude and, in relation to this, a way of conduct. The attitude aspect is especially valid when it comes to the 'good example' factor. This factor has three sub-factors. The first is called *value base* and covers conduct which is an expression of humanistic values and that one sets high demands on ethics and morals as well as loyalty. Examples of setting a good example in terms of values are to be straightforward and upright, not to go with the flow, to assert one's convictions until a decision is made and then comply with that decision, and to show consideration for colleagues who are weighing up ethical aspects.

The second sub-factor, *good example*, is characterised by words and deeds that speak the same language. A leader who says A and then does B is not setting a good example for his or her colleagues. It also concerns courage, to have the courage to lead in difficult situations also.

The third sub-factor *responsibility* covers taking responsibility for executing the organisation's tasks, for the welfare of colleagues and for the disciplinary status of the organisation, for example, that international law is followed by all colleagues in connection with international operations. Responsibility also means that as a leader one accepts full responsibility for failures and generously shares acclaim for successes.

Leaders that conduct themselves in this way set a good example and win the approval and respect of those around them. The leader's conduct is characterised by trust, which creates trust between colleagues.

Individualised consideration

Developmental leadership also finds a place in the aspect of individualised consideration. This factor can be divided into two sub-factors. The first, *support* covers emotional but also practical support in the form of assistance, guidance or training. A prerequisite is that the leader is interested in each and every one of his or her colleagues in both working and private life.

The second sub-factor means being clear and straight in a good way. This is called *confront* in the model. It is necessary to be able to confront colleagues that have underperformed and then to act constructively, restore confidence and correct shortcomings. There is a big difference between confronting a person with concern for that person and with the desire to assist, and with reprimanding a person. It also concerns criticising a colleague directly to their face as opposed to talking critically about them to others. Acclaim is naturally also desirable after achievement.

Inspiration and motivation

A leader can be an inspiration to his or her colleagues in different ways. Personal charisma is not a necessity but can be beneficial. A quiet and withdrawn person can inspire others through deeds that promote enthusiasm. With reference to the sub-factor *value base* above, the duplicity of charisma can be revealed. A high level of charisma in combination with humanistic values should be desirable, but charisma in combination with egocentric, totalitarian values can be disastrous. A first sub-factor is *Promote involvement*. This can entail encouraging involvement on the part of colleagues, formulating long term aims that are attractive, allowing colleagues extensive responsibility etc. The second sub-factor is *Promote creativity* and means encouraging colleagues to come up with new ideas, to question the present situation etc.

Conventional leadership

Leadership that we call conventional has two aspects. The first involves a leadership style that is based on demand and reward. The second involves control.

Demand and reward

The key factor in leadership that is marked by demand and reward can be summed up as, "I will be nice to you, but only if you are nice to me". This factor is known as, "conditional reward" in Bass (1998) original version. In the present model this has two parts. The first has a positive tone and is called *Seek agreement*. An example, the leader says: "Can we not do it like this now – you do X and I'll do Y?" One of the colleagues answers, "Yes, but we need some extra time with task X₁". The leader answers, "OK!" Leaders who often use this type of leadership also tend to use the leadership style discussed above, Developmental leadership.

The other part has a more negative tone and is marked by an, "if, but only if" approach. We call this the *whip and carrot*.

Two examples:

- Those of you who pass the test can have Friday off!
- Those of you who are last in will put away the training equipment.

Leaders who often use this model also often apply control oriented leadership (see below).

Control

Control leadership is marked by the leader supervising the workforce and the way it carries out tasks, correcting divergence from the plan. The directions must be followed so as to avoid mistakes being made. This leadership style is usually judged to encourage meticulousness and emphasise the negative and divergent much too much. Swedish research (Larsson et al., 2001a) finds this assumption to be reasonable. Surveys have also shown that controlling leadership often has a high goal orientation combined with a lack of individualised consideration. Being goal oriented has one significance if it is combined with inspiration and consideration but a completely different one if it is combined with a continual looking for faults and lack of consideration. The positively toned part is called *take necessary measures*. The negative part is called *over control*.

Non-leadership

Laissez-faire leadership entails, for example, that one avoids taking a stand on important issues, is indifferent and evades taking responsibility, is absent when needed, finds reasons for being away when decisions are to be made and so on.

Relationships between leadership styles

Developmental leadership and conventional leadership can be thought of as complementary rather than opposing. A common theme is that they are both oriented towards achieving goals. A skilful, conditional reward leader can be successful in a stable organisation (Bass, 1985).

There is, however, a decisive difference between developing and conventional leadership. This concerns how colleagues are motivated. The conventional leader uses more of a whip and carrot approach. He or she refers more often to duty and obligation, rules and regulations than to common values, goals and interests. This approach often results in workers carrying out the tasks, but that they have little interest in engaging themselves over and above that. The goals and fulfilling them is the responsibility of the leader. The developing leader, on the other, hand obtains a workforce that is in agreement with them over the long term goals. The driving force therefore comes from the workforce itself.

What then is the relationship between the different leadership styles on the one side and the effectiveness of an organisation and the satisfaction of its workforce on the other? Bass (1997, 1999) has summarised research and compiled the following ranking order.

1. developmental leaders
2. leaders using demand and reward
3. leaders using controlling leadership
4. laissez-faire leaders

Howell and Avolio (1993) ascertain that with a leadership style that is marked by demand and reward, it is possible, when it works well, to achieve the goals that have been agreed upon. But that with developmental leadership it is possible to achieve more. This result is substantiated in two well conducted studies with a military connection (Dvir et al., 2002; Bass et al., 2003). Their arguments are illustrated in figure 2.

The model is based upon a combination of the aforementioned leadership styles and is inspired by the model the originators (Avolio, 1999; Avolio & Bass, 1991; Bass, 1998) call A Full Range of Leadership Model. Here we shall call it *leadership styles* (see figure 2). The model places the different types of leadership in a system of coordinates with the axes *Organisational results and Individual development*. This describes a relationship between different types of leader conduct, where the leaders are distinguished by the way they show different *frequencies of these types of conduct*. The model therefore should not be taken as a typology which divides leaders into different categories. All leaders use the different styles to a greater or lesser degree. The demands of the situation naturally play a big part. So as to avoid accidents in situations using BA equipped firefighters, for example, an active controlling leadership (sub-factor - take necessary measures) is the only acceptable model.

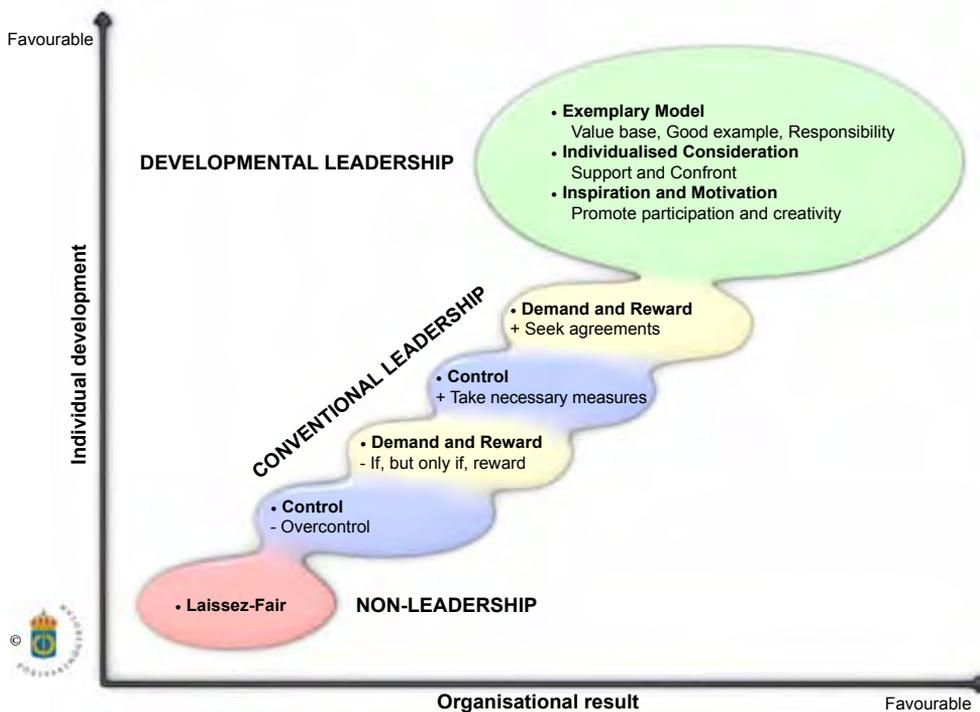


Figure 2. Leadership styles (Larsson, 2003).

Stress and its influence on leadership

In comparison to “normal” situations in which leadership is exercised, leadership during emergencies is marked, among other ways, by the following two conditions: (1) one has to handle a situation in which people find themselves in some form of crisis and (2) the operational teams and organisations can also get into crisis situations but must continue with their tasks nevertheless (Fredholm, 2003). Leadership during emergency response operations therefore is to a lesser or greater degree marked by *stress*.

A psychological stress model

There are several aspects to stress theory. The point of departure for this chapter is the primarily psychological model that has been developed by the American researcher Lazarus and his colleagues over the most recent decades (Lazarus, 1966, 1991, 1999; Lazarus & Folkman, 1984). A brief presentation of this follows. It is taken from Larsson and Setterlind (1994/2002):

“The truth lies in the eye of the beholder” is a central theme of the stress theory. This means that we have to distinguish between the external “objective” reality and the internal representation of this reality. Our image of the outside world is formed from our sensory impressions. That which we see, hear, feel, smell and

taste is transformed in our brains to a kind of mirror image of the external world. But, and this is important, the internal image is not formed automatically as a perfect reflection of the reality. We add a subjective content and meaning. Different people can experience one and the same occurrence in completely different ways depending on their disposition and experience in life and thereby find themselves in different situations. We shall return to these cause factors shortly. The central thesis is that when we form our image of the world, we *appraise* it. That which is perceived as a stressor in one person need not be experienced in the same way in another. The true lies in the eye of the beholder. In order therefore to understand stress as an isolated phenomenon, it is necessary to understand the individual's appraisal of potential external and internal stressors.

The appraisal of a given situation can be done preconsciously in hundredths of a second or consciously and painstakingly. Appraisal involves two basic questions, which are dependent on one another. The first question we intuitively ask ourselves when confronted with a new situation is, "Is there a threat?" (primary appraisal). The second question is, "What can I do?" (secondary appraisal). One and the same occurrence is perceived as having varying degrees of threat depending upon the action alternatives that are available. According to Lazarus and Folkman (1984) an individual can appraise a situation as irrelevant, benign/positive or stressful. If it is appraised as stressful, it can then also be appraised as challenging, threatening and/or undefeatable. At the same time we immediately both consciously and unconsciously try to overcome it. Attempts by the individual to overcome the situation fill two functions. Firstly we attempt to influence the actual problem, so called *problem focused coping*. Secondly we attempt to influence the emotions that arise, for example fear or anger, so called *emotion focused coping*. Both these forms of attempting to overcome the situation take place in parallel (see figure 3).

Problem focused coping includes the ability to look for information, to analyse the problem and to find feasible solutions. Being able to mend a puncture is one example. Being able, as a leader, to structure a complicated task is another. Our capability to be able to solve problems is developed through our experiences and is dependent on, among other things, our general ability.

Social competence is another aspect of problem oriented stress management, and includes the ability to communicate and cooperate with others in an appropriate and effective manner. Social competence facilitates problem solving in human relationships and provides the individual with greater control over the situation. A person with good social competence can quickly resolve conflicts and prevent stress reactions. A socially incompetent person, on the other hand, often worsens conflict situations through his or her conduct.

Research shows several different ways of overcoming the emotions that are awoken in a stressful situation, so called *emotion focused coping*. A brief description of some of the most common methods follows.

Positive thinking means that we convince ourselves of things that provide a basis for keeping spirits up. *Self control* means that you consciously hold back aggressive impulses. *Stress reduction* can be achieved, for example, through taking deep breaths. *Wishful thinking* entails an unrealistic underestimation of risks. *Distancing* can be

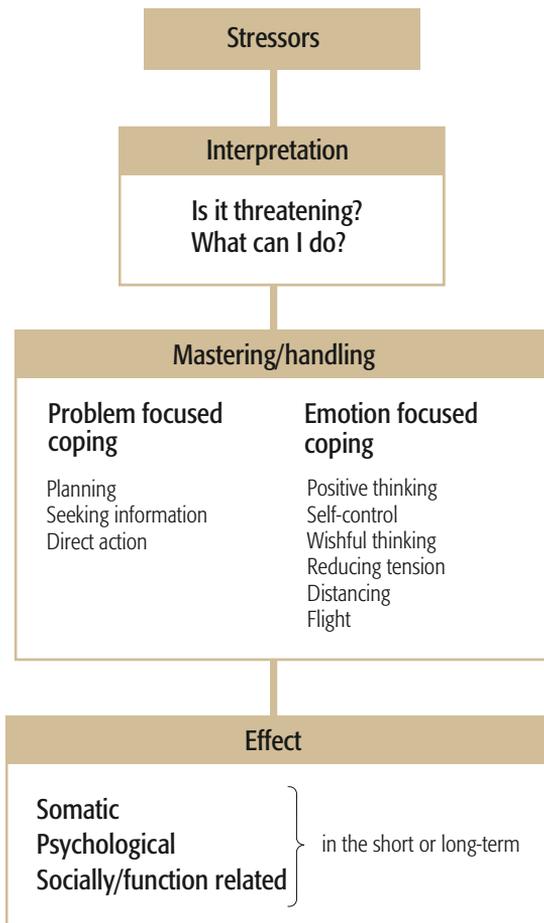


Figure 3. The effect of a stressor depends upon the individual's interpretation and ability to master it.

expressed in taking a break and applying yourself to a different task for a while when you notice that your capacity to concentrate is failing. *Escape* entails that a stressed leader avoids management responsibility when confronted with a difficult task and instead takes up something he or she can cope with. In reality everybody that finds themselves in a stressful situation uses a combination of problem and emotion oriented stress management.

Severe stress reactions

Severe stress reactions affect the “whole person” (see Ekman & Arnetz, 2002; Währborg, 2002). *The physiological changes* include, primarily, reactions among the not consciously activated (autonomous) nerve system, hormone system and immune system. The body is put in a state of alert through, among other things, the stress hormones, adrenaline and noradrenaline, that are secreted into the blood. This condition is marked by increased heart rate, increased blood pressure and tightening of the muscles. The body's resources are mobilised for fight or flight.

The stress reaction also involves motorial changes such as tightening of the muscles, which can lead to trembling, stiff and jerky motion, speech affliction and a change in stance.

Stress reactions also include *cognitive changes*. It influences functions such as perception, judgement, problem solving and social adaptation. Common examples of tendencies due to severe stress are:

- generalisation based on a small amount of information
- difficulty in taking in and assessing large amounts of information
- drawing conclusions too quickly
- over or under estimating the problem
- losing nuance, thinking in terms of either – or.

Stress reactions also involve *emotions* such as discomfort, fear, anxiety, anger, shame and guilt.

Severe stress reactions should not be taken as only negative. They have an obvious “survival value”, see figure 4, which illustrates the connection between severe stress reaction intensity and human performance capabilities.

The figure shows that stress has both positive and negative effects and that achievement capability is highest at a medium stress level. This applies to both physical and mental achievement.

Research into the connection between achievement and stress has shown that too low or too high a stress level is associated with lower achievement, while moderate stress levels optimize the achievement capability. If stress reaction, on the other hand, becomes excessive, attentiveness is reduced to the extent that even relevant signals from direct surroundings are not taken up, resulting in reduced achievement capability.

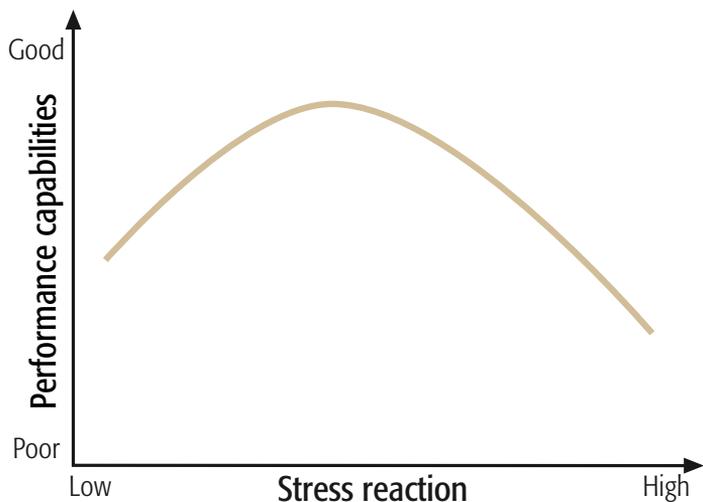


Figure 4.
*Connection
between stress
reaction
intensity and
performance
ability.*

Professionals who are specially trained to cope with difficult situations react largely as others during major emergencies and crises (Dyregrov, 1990). At a cognitive level reactions arise that reduce the capacity for thought and, in a worst case scenario, cause confusion. Emotionally reactions can be helplessness, fear or irritation. Many experience a feeling of unreality while the work is going on. This can help in trying to hold emotions at bay through total concentration on the task at hand. The physical conduct can be marked by a decreased or exaggerated level of activity, withdrawal or exaggerated jocularity. Cooperation and command problems are not unusual. Even if professional groups suffer from stress reactions initially, this does not usually influence their performance negatively. Feelings of chaos, helplessness and confusion are quickly replaced by pragmatic action (Lindström & Lundin, 1982; Shalit, 1983; Wallenius, 2001; Weisaeth, 1989).

Many of the problems that commanders have shown indications of during emergency response training exercises can be related to the above mentioned limitations. Common problems are that commanders:

- are unable to gain an overview,
- become operational and thereby lose the broad perspective,
- think about what has happened instead of thinking forwards,
- fail to use time correctly by trying to do too many things at the same time,
- lose sense of time – prioritise poorly and focus on things other than the principal aim,
- fail to delegate and fail to use all available resources,
- fail to actively search for information but only passively take into account information that is forwarded,
- give orders that are too complex or are unclear to colleagues.

Following this more general description of stress, the remainder of this section will deal with research based knowledge of leadership under severe stress. This will initially be looked at from an individual leadership perspective. Following on from this, decision making in groups under stress will be illustrated.

Leadership under severe stress

Figure 5 presents a model of leadership under severe stress. The model shows that leadership under severe stress can be understood against a background of several combined factors. The interplay between the characteristics of the commander and the organisation form the everyday leadership model. These conditions influence the adaptation to the demands of acute situations and the leadership during these.

The observant reader has no doubt noticed the strong similarity between the model for leadership under severe stress (figure 5) and the general leadership model which is the central theme of this chapter (figure 1). This is not a coincidence. The model presented here (leadership under severe stress) was one of the sources of inspiration behind the development of the general model. For the sake of space I will not here go into the background of the terms Leader characteristics and

Organisational characteristics in figure 5. The contents match essentially that which was presented earlier in the section. For further detail refer to the original account (Larsson et al., 1999, 2001b).

Everyday leadership

It should be pointed out initially that the purpose of figure 5 is not to illustrate everyday leadership generally (this is done in figure 1). Figure 5 illustrates the aspects of everyday leadership that, based on information received, appear to be significant for leadership under severe stress.

Trust-building leadership

A dominant theme in issues surrounding leadership under stress is the significance of mutual trust between the leader and the led. The answers to a number of the questions posed in a survey show convincingly that this trust is something that is established during the course of everyday leadership. The following types of survey answers have been identified. Taken together they form the category confidence-inspiring leadership: *visibility, respectful handling of individuals, open-mindedness, values, morals and sincerity* as well as *competence*.

During an interview an officer in the marines said, “to be trusted you have to trust”. A prerequisite for inspiring confidence is *visibility*. Here is a quote from one of the psychologists interviewed:

Visibility implies open leadership at a workplace and to, as the person at the top, not only sit in your office behind a closed door but to present yourself to your personnel, and make yourself accessible. This I believe also contributes to the formation of trust and respect. Loyalty and trust are not things you can demand, they have to be earned.

A UN soldier said how important it is that high ranking officers show an interest in their troops, that they talk to the soldiers and that they are prepared sometimes to share the soldiers lot, in terms of accommodation, risks etc. An officer who served as a battalion commander in Bosnia-Herzegovina mentioned the importance of allowing time for chat within the framework of formal meetings.

A similar set of answers could be called *respectful handling of individuals*. This concerns handling personnel as individuals, being just and consistent, showing concern for the individual and the group and not thinking of yourself, being aware of an individual’s potential and knowledge, being adaptable to the needs of the group, modesty, having a sense of humour and a sparkle in your eye.

A third type of answer can be called *open-mindedness*. A psychologist said that, “It is during everyday procedures that you set the standards for an organisation, an organisation with a good working environment and with light, open communication.” An officer pointed out that commanders that are used to strict, stereotype control during everyday procedures often lack the ability for improvisation and adaptation when it is really needed. Another psychologist commented on the tension that can arise between assessment and development. If assessment is given too much space, there is a risk of it discouraging personnel from trying new things.

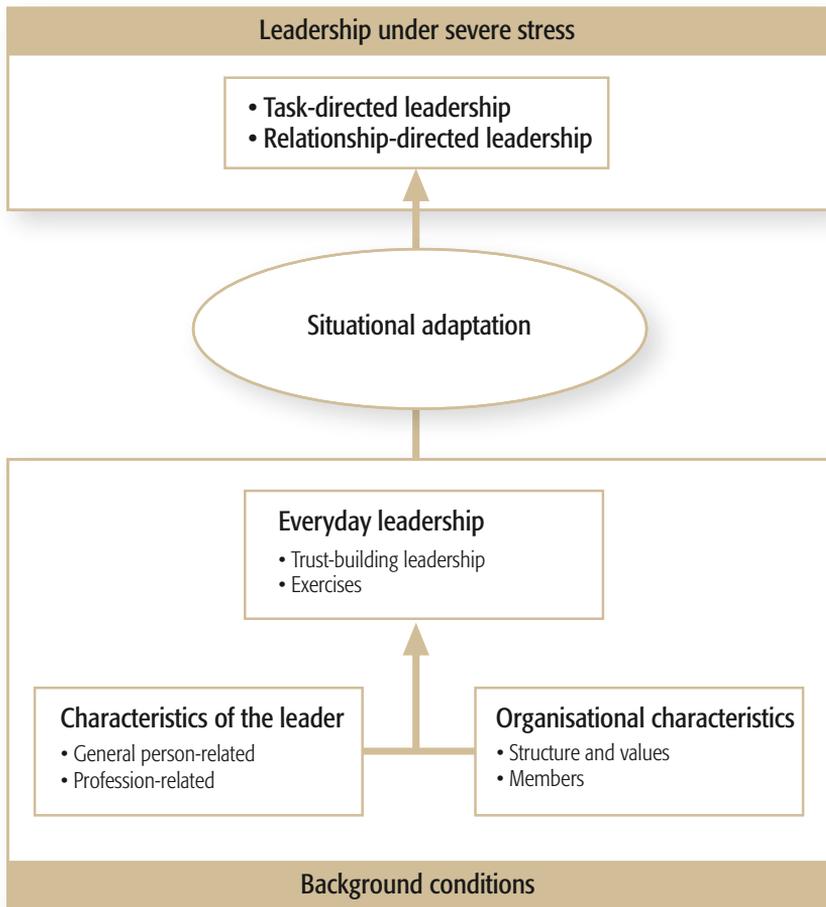


Figure 5. Model of leadership under severe stress and its underlying circumstances (based on Larsson et. al., 1999, page 17).

Instead they do what they believe their superior wants them to do.

A similar situation is that of how a leader reacts when a colleague does something wrong. To be able to, as the superior, acknowledge your own mistakes appears to increase the group's confidence in authority. It can be strengthened through a superior allowing a group member who has greater knowledge than he or she in a specific area to take over instruction. A fortification of some type is to be cast, for example. The commander gives a wrong instruction. A group leader who is a construction worker comments on this. The commander acknowledges the mistake and asks the group leader to take over. If somebody makes a mistake it must, naturally, be brought to attention but in a constructive, encouraging way.

A fourth group of answers in the survey consideration *values, morals and sincerity*. A leader should, to win confidence, demonstrate his or her values, show what they stand for on an everyday basis. It is important that leaders are honest, courageous, upright and set a good example.

A fifth group of answers to the survey questions on inspiring confidence concerns *competence* within the relevant area. The significance of competence becomes greater in connection with leadership under severe stress. Israeli studies show that the most significant trust-building aspect in combat situations is the faith of soldiers in the professional competence of their commanders.

Exercises

A daily aspect of leadership is that of carrying out exercises in which one deliberately tries to incite a high level of stress. Generally speaking it is the case that the more realistic the training is, the better prepared the individual will be to cope with the real situation.

Stress exercises have both positive and negative sides. On the positive side, you know what you have to do even if you are afraid. You respond without needing to think so much and you build an *experience platform* which enables you to feel safer.

The negative side is that exercises can give a *false impression of safety*. It is not possible to train for every situation. This negative aspect can to a degree be compensated for by sometimes adding a new, unexpected dimension to the exercise.

Leadership under severe stress

Mutual trust between the leader and the group is a recurring theme in the answers to the questions on what characterises successful leadership under stress. With regard to content the same points that we saw under everyday leadership appear here also. However, here the significance of the leader's competence is strongly emphasised, partly with respect to the task, partly with respect to leading the group.

Task oriented leadership

The category task oriented leadership is based upon five sets of circumstances:

- initial overview
- forward thinking
- risks with recklessness
- handling personal emotional reactions
- clarity with superiors

Initial overview means waiting a moment prior to making important decisions, if only for a few seconds. A study of police officers showed that an experienced officer on entering an apartment to break up a fight stopped for a moment before advancing. Through doing this they have a better chance of seeing if there are knives, escape routes or other aspects that could influence the course of events. Inexperienced officers, on the other, hand were affected by stress and went directly into the fray (Larsson, Kempe & Starrin, 1988). Through focus on detail they lose the chance of gaining an overview and thereby failing to see alternative courses of action or not even being able to assess the consequences of their own action. Naturally there is also a risk of underestimating the seriousness of the situation. In high stress situations it is important to gain such an overview so as to be able to determine when there is no way back and what critical decisions have to be taken

at that point. This was shown clearly in studies of Australian and Swedish pilots who were forced to eject from their planes to survive (Larsson & Hayward, 1990).

Another indication of good task oriented leadership under stress is *forward thinking*. Leaders must be able to quickly overview a situation and then think forwards (proactively). The opposite can create the risk of a leader looking back in time instead. Selecting a task that only calls for previously gained knowledge, but which you feel safe with, can be an example of lack of proactive thinking. In psychological terms this can be seen as a form of regression.

Other expressions of regression are that a leader becomes paralysed or gives up. Another example of lack of proactive thinking is that a leader shows distinct insecurity when confronted with what should be done next. This creates insecurity in the group. The inability for constructive forward thinking can also lead to exaggerated consideration for the group and insufficient focus on the task - "kindness can kill". Fear for a superior's or mass media's reactions can also result in a leader paying more attention to covering his own back than to thinking and acting proactively.

A third type of answer concerns *risks and recklessness*. Egoistic and reckless leaders under stress become unaware of their limitations and can cause problems for a whole group. Those who think of themselves as infallible can often only see a single aspect when under extreme stress. They don't listen to others and don't trust the group. Even if these leaders are very competent within their respective areas, they take much too much on themselves and risk very quickly becoming mentally exhausted.

A fourth aspect concerns handling *personal emotional reactions*. Research suggests that leaders should show that they are also human and affected. If they put on a face of total indifference, or, on the other hand, are unable to handle their emotions, one easily loses confidence in them. Uncontrolled emotional reactions also often result in reduced authority. Vocal pitch and intonation are important instruments for mitigating stress. If a leader fails to maintain their calm, it is better that they admit to this but handle it in an optimistic and task oriented manner. This kind of positive attitude can spread through the group.

The fifth task related aspect is *clarity with superiors*. Swedish soldiers and officers who served in Bosnia-Herzegovina point out that some commanders were afraid to question orders they felt were unsuitable. They were also afraid to ask for clarification even when they felt that an order was unclear. This could result in mistakes and the group being exposed to unnecessary risk.

Relationship oriented leadership

The category of relationship oriented leadership is composed of four groups of answers:

- clear leadership role
- ability to motivate group members confronted with a task
- individualised consideration through activation
- crisis management following acute situations

A *clear leadership* role means that the leader is willing to take responsibility, is not afraid to give orders and, as necessary, be authoritative. It concerns the ability to move from a democratic leadership style to a more controlling style and do this in such a way that the group members understand the need for it. During officer training, this is often expressed as “Dare to be the boss”. Studies that have been carried out show that inexperienced leaders often have problems establishing their authority in severe stress situations.

The second group of answers concerns *motivating group members confronted with tasks*. The importance of information before an assignment is emphasized, for example, in that officers mentally prepare their troops as to what they can expect to happen. It concerns motivating them when confronted with an assignment and doing so in a way that creates a positive atmosphere, “We can do it”.

Another important aspect is *individualised consideration through activation*. A Norwegian psychologist suggests that, “Consideration does not necessarily mean patting people on the shoulder and consoling them. It can just as well entail keeping them active by giving them a task to carry out”. Meaningful tasks mitigate anxiety.

The fourth and final group of answers take up *crisis management following acute situations*. It is important that a leader can handle emotions such as doubt, anger, sorrow and guilt after severe stress situations. Leaders “should also be able to go in and have in depth conversations with their group members” as one officer expressed it. Just as important is a leader’s symbolic function when somebody is injured or killed. The leader gives the event a face and represents the group when it comes to handling the media and other interested parties.

Hypothetical synthesis of theories

This section involves an attempt to synthesise the *theories* that have been discussed up to this point. The separate components involved in the attempt have a verified scientific grounds. The synthesis is, on the other hand, untried and, at present, should be considered as a conjecture or hypothesis.

Firstly a brief repetition of the fundamental theoretical elements taken up in this section. This is in very concise form:

- Leadership theory – as a whole comprising the model *Developmental leadership* (in addition to leadership styles among other things personality, group and organisation theory, see figure 1).
- Stress theory – cognitive phenomenological stress theory gives a deeper understanding of leadership, situation comprehension and decision making under stress.

Personality tests and leader style surveys are traditionally applied in a way that could be described as *profile oriented*. This means that considerable importance is placed on the profile, or pattern, that is formed by combining all the given dimensions, rather than on focusing the result on a single dimension. Example:

Leaders A and B have both been judged by their colleagues to be competent within their areas. They have also both been judged to be very controlling (in terms

of both Take necessary measures and Over control, see figure 1). When it comes to Individualised consideration they are judged to be different. A is judged to show consideration whereas B is lacking in this area. Research shows that A's profile is OK in terms of the team's effectiveness and the well-being of group members.. B's profile, on the other hand, reveals low effectiveness and lack of well-being.

In this effort at theoretical synthesis an attempt is now made to: (1) introduce a comparable profile within the domain Contextual characteristics (surroundings, organisation and group, see figure 1) and (2) relate the profiles with regard to Leader characteristics, Contextual characteristics and Leader styles (see figure 1) to each other.

Contextual characteristics seen from a profile perspective

Initially it must be emphasised that forming a profile within the domain *Contextual characteristics* is done to facilitate analysis of *relationships* between the Leadership model's three fields (leader characteristics, contextual characteristics and leader styles). It is not then to better understand environmental conditions in themselves. This aspect is already comprehensively documented. This, in one sense, wider focus, means that a simplified model has to be accepted, otherwise the analyses based on the profile concept would be too extensive to work with. A suggestion as to choices of environmental conditions is given in figure 6.

Several of the conditions chosen probably need no further explanation. However, to facilitate better understanding, a brief presentation of some aspects follows.

Vertical differentiation concerns the number of hierarchical levels in an organisation. *The horizontal differentiation* concerns the degree of similarity – dissimilarity between the assignments and the competence that is required of people at the same hierarchical level. Many leaders can, for example, feel that it is easier to lead a large group (large control scope) in which the members all have similar tasks and levels of competence than a smaller group in which the members' tasks and competence profiles are very different. *Spatial differentiation* concerns the degree of geographical extent of the organisation's tasks (Robbins, 1990).

The variable - *degree of routine control of risk filled operations with high demands on process reliability* - is based on research carried out on high reliability organisations (typical examples are air-traffic control and nuclear power plants; Klein, Bigley & Roberts, 1995; La Porte, 1996; Roberts, 1989, 1990). It is also based on studies of vulnerability in high tech systems in which a fault often creates a series of faults (known as tight coupling; Perrow, 1984; Rijpma, 1997). The concept behind this is that some operations are so complicated and risk filled that their execution must be tightly controlled. This naturally reduces the space for tactics and local cultural variation.

Local organisational cultural variation concerns the degree of "*small-talk interpretation tradition*". The concept here is that the intentions of the central organisation and higher organisational levels are interpreted at a local level through small-talk. Some are approved and carried out. Others are not and are reinterpreted. Ekman (2003) writes:

Environment	<p>Degree of effect of environment, e.g. existence of obstacles/possibilities concerning:</p> <ul style="list-style-type: none"> • dynamic stressors (e.g. fire, flooding, terrorists, enemies) • geographical and climatic conditions • legal aspects (e.g. official regulations, international agreements) • infrastructure • environmental aspects • third person (e.g. victim/involved local population) • media contacts
Organisation	<p>Responsible authority's (e.g. government, municipal committee) demands/resources situation</p> <hr/> <p>Amount and complexity etc.</p> <ul style="list-style-type: none"> • vertical differentiation • horizontal differentiation • spatial differentiation <hr/> <p>Degree of formality, e.g.</p> <ul style="list-style-type: none"> • regulation of authorization (e.g. centralization – decentralization of the commander's formal authority) • routine control as a result of higher demands on process reliability in risk filled operations with complex technical systems • occupational aspects, e.g. acceptance requirements (e.g. training, legitimation etc.) <p>- scientific proof of the what and how of operations – sanctioning systems</p> <hr/> <p>Cultural characteristics of the organisation, e.g.</p> <ul style="list-style-type: none"> • degree of "small-talk interpretation tradition" • degree of tradition of role based influence (e.g. based on sex, age, competence, union support)
Groups	<p>Solidarity and moral</p> <hr/> <p>Quality of group processes (e.g. communication, conflict management)</p>

Figure 6. Selection of environmental, organisational and group conditions.

Small-talk is the key to modern leadership. If leaders want to lead they have to take part in informal conversations and through this test the confidence of their colleagues. A lot more can often be gained from small-talk around a coffee table than through strategy documents and formal meetings, at least for those leaders wishing to lead full out.

Summing up, there are two considerations behind my choice of conditions included in figure 6. One is the availability of empirical support; verification requirement. The other is the assumption that the conditions can be described in lower and higher extent profiles; applicability requirement.

Example: Let us consider an emergency and rescue organisation in a medium sized municipality. In a response operation involving a high risk for extensive dispersion of chlorine gas, the organisation orients strongly towards the dimension Formalism – routine control because of high demands on process reliability in risk filled operations with complicated technical systems. A wrong decision could have disastrous effects in both the short and long term. When the same organisation is training on a daily basis there is also a degree of risk involved but at a much lower level. The consequences then of a wrong decision are limited, normally, to some embarrassment and remedial measures.

Relationships between profiles

The theoretical synthesis is based on that a matching of profiles regarding Leader characteristics and Contextual characteristics will allow for the identification of normative, desired leader profiles for different sets of circumstances. If the concept proves to be credible, it will provide more nuance to the understanding of “leadership during emergency response” compared to a general assertion such as “it is good with trust and developmental leadership in combination with necessary control”. In the next section a similar profile matching is tested for some typical operation based situations.

Typical operation based situations illustrated through a hypothetical theoretical synthesis.

Let us consider the following situation. The fire brigades in several municipalities have been heavily engaged on forest fires after a long, dry period at the end of July. Lightning has caused one of the most aggressive forest fires in Sweden’s history. As this is going on, a serious fire is reported at an old-people’s home in one of the affected municipalities. And, on top of all this, a couple of school-tired youngsters have managed to set their hated school ablaze.

There is rather a shortage of news otherwise, it being the holiday period. This contributes to the throng of national and local media closely following the events and the efforts to overcome them. It is under these circumstances that we meet the Operations Officer during a direct interview with Channel 1 News:

Reporter: How would you describe the situation just now?

Svensson: At present we have none of the triple stressors – the forest fire, the old-people’s home fire or the school fire – under control.

Reporter: Why not?

Svensson: Partly because we have three strong dynamic stressors, partly because we have a complicated operational organisation.

Reporter: What do you mean by the last thing?

Svensson: As I’m sure you understand, there are a lot of people involved. The fire services from several municipalities, a large number of police and a number of military officers are involved. And in addition to this, medical staff and lots of volunteers.

Reporter: Are you saying that old people are dying in their home because you cannot cooperate?

Svensson: No, but this kind of vertical, horizontal and spatial differentiation, combined with a high stress factor places high demands on command staff.

Reporter: Um, what do you mean?

Svensson: Well just take the situation with this temporarily combined emergency response organisation where orders are received via the Internet but in the field decisions are taken between the commanders of the various operational teams. At the same time as we are under strength, resource wise. Under these circumstances it is easy to misjudge parallel time scales, end up in group-think and micromanagement, and that you impair the self-synchronisation of local units.

Reporter: Ah, yes, I suppose so. Yes, well, thank you very much.

Do you recognise this situation? Probably not at all. My point is that the leadership research landscape is very different from the dominating operational landscape which marks the praxis followed in the description and analysis of incidents and accidents. An organisational theoretical concept such as “horizontal differentiation” can, for example, be of great significance for leadership. At the same time, in a single case, horizontal differentiation can be greater in an incident with a limited scale of complexity, expressed in operational terms, than in a incident with greater scale of complexity.

My conclusion of this discussion is that knowledge gained from leadership research does itself most justice when related using its original forms of expression. Results may therefore be “translated” to the terminology of the operational oriented landscape.

This scenario is not limited to leadership research. We find, for example, a similar situation within psychotraumatology. The operational oriented way of looking at things is marked by what is known as agent specificity. There is, for example, a distinction between traffic accidents and accidents involving hazardous goods etc. Within psychotraumatology another basis for division is more relevant. If you have

lost a child it makes a lot of difference whether this was caused unintentionally, through negligence or through deliberate violence.

Five typical cases of leadership

Figure 7, see the next page, shows a hypothetical profile result for different levels of command in connection with incident command. The scales in the figure are intended to illustrate to what extent the commander's conduct is affected by the different variables (geographical and climatic conditions etc.).

As is evident from figure 7, three different profiles are formed. The profiles of the two incident commanders are similar. The profiles of the cabinet minister/under secretary of state and the county governor are also similar. The chief fire officer lands consistently exactly in between these two groups.

The incident commanders are marked by higher values for geographic and climatic conditions, infrastructure condition, dynamic stressor, third parties, routine control, small-talk interpretation tradition, tradition of role related influence, group unity and atmosphere and quality of group processes. The Cabinet Minister/Under Secretary of State and County Governor show higher values for legal conditions; environmental awareness; media; organisational demands and resource situation; emergency response organisation's vertical, horizontal and spatial differentiation, as well as formally controlled commander authority.

The illustrated positioning of the different leaders is naturally open to discussion. This would probably vary to a degree depending on the type of response operation, and should therefore be seen as plausible positioning pending empirical research.

Seen this way, a preliminary interpretation can be made of the demands the different profiles place on leader characteristics and how leader style profiles for the three different profiles could be shaped. An attempt at this is made in the next section.

The outlined levels of leadership and the profiles can also be "translated" to Fredholm's (2003) rank order of scale of response operation complexity in the following way. The incident commander can be involved in all seven types of scale of complexity. The Chief Fire Officer becomes involved from and including the second type (command of operations in the event of more complex emergencies and of several teams from the same organisation) or the third type (joint command of operations in the event of complex emergencies and of several teams from different organisations). County Governors can become involved from and including the fifth type (joint local and regional command of operations in the event of complex emergencies with obvious and direct consequences for people in one or more municipalities and/or in a region). Cabinet Ministers and Under Secretaries can become involved in the event of operations of a national or international character.

Differences between the typical cases

An obvious difference between the profiles in figure 7 is the different demands on dynamic stressors (incidents) on acute/tactical decisions as opposed to longer term/strategic decisions. The other noticeable difference is the proportion of direct – indirect command as well as the importance of group processes functioning well.

Environment

Degree of dependence on environmental conditions	Of little importance	Of great importance
Dynamic stress factors	▲■	●■■
Geographic and climate related conditions	▲■	●■■
Legal conditions	■■	●■▲
Infrastructural conditions	▲■	●■■
Physical environmental consideration	■■	●■▲
Third party	▲	■●■■
Media contact	■■	●▲■

Organisation

Responsible authority requirements/Status of resources	■■	●▲■
Size and complexity		
Vertical differentiation	■■	●■▲
Horizontal differentiation	■■	●■▲
Spatial differentiation	■■	●■▲
Degree of formalization		
Regulation of power	■■	●■▲
Guidance of routines/procedures	▲■	■■●
Professional aspects	■■●	■▲
An organisation's cultural characteristics		
Tradition of interpreting small-talk	▲■	●■■
Tradition of role-based influence	▲■	●■■

The group

Cohesion and spirit	▲■	●■■
Quality of group processes	▲■	●

- ▲ National emergency management level; minister, state secretary
- Regional emergency management level; for example, county governor
- Chief fire officer
- Incident commander, major incident
- Incident commander, small incident

Figure 7. Hypothetical profile results for various commander levels during incident command.

Desired competence (see Leadership model, figure 1) for incident commanders includes technical expertise, social competence and an ability to handle severe stress. Desired basic characteristics (see figure 1) include among others good physical condition, high values for emotional stability and an out-going personality. With regard to leadership style, all the factors embraced by the dimension Developmental leadership are desirable. This also applies to the positive side of the factor Control (take necessary measures).

Desired competence for a Cabinet Minister/Under Secretary of State and County Governor includes leader competence (both within and outside the organisation, see Larsson, 2003) and good stress management ability. When it comes to personality, high levels of emotional stability and purposefulness would be desirable. And in terms of leader style, three aspects stand out as being especially important. These are the factors Exemplary model from the dimension Developmental leadership and the two positive parts of conventional leadership: Strive for agreement and Take necessary measures. The Chief Fire Officer lands exactly in between, once again.

Jaques (1976) has formulated an organisational theory in which the different levels of hierarchical organisations place different qualitative demands on those holding the positions. From low to high level the work tasks change from simpler to more complex, from short to long term and from concrete to abstract. Jaques has tied five qualitatively different, successively higher levels of cognitive abstraction ability to five such levels. The last mentioned can be seen as an important aspect of intelligence and is relatively constant and measurable. The reasoning is that people who lack cognitive abstraction ability will not be able to carry out important tasks connected to high levels of management in a satisfactory way. It is therefore important to select candidates carefully.

Similarities between the typical cases

Even if there are several differences between the profiles in figure 7 there are also similarities. Were it an everyday response operation instead of one marked by dynamic stressors, the picture would, for example, be different. The clearest example of similarity within the domain Leader characteristics (see figure 1) is probably the desirability of the personality dimensions of emotional stability and good stress management ability. In terms of leader style, the factor Exemplary model and the sub-factor Take necessary measures are desirable at all levels of leadership.

The degree of indirect leadership differs considerably between the five positions. From limited for an incident commander to almost total for a Cabinet Minister or Under Secretary of State. An on-going study of indirect leadership shows, provisionally as yet, that successful indirect leadership embraces significant elements of developmental leadership, skilfully conveyed via "links" (for example hand picked middle management) out into the organisation (Larsson, Sjöberg Vrbanjac & Björkman, 2005).

Finally, the various management positions seem to differ mostly in terms of intelligence requirement, the ability to handle severe stress and technical and leadership expertise. In terms of leader style the similarities are in the majority.

Summing up

In the course of continued development of leadership in organisations that operate within the acute phases of emergency response operations, it is important that a historical analysis of the conditions that have contributed to the growth of the organisations we have today be carried out (fire service, police, emergency medical services). In a military connection, Danielsson (2002) and Lind (1993) point out that such analysis is an embedded part of military culture, dating back to the 1600s, and still the norm today. The conditions are probably similar in other public services too. Is this form of organisation not in agreement with what is demanded of modern society with respect to emergencies involving a wide range of complexity? The question is complicated and my feeling is that some changes are necessary. It should also be obvious that developmental leadership is not the answer to all the problems. Developmental leadership is good, probably very good, but it needs to be complemented by measures of political and organisational character.

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Per Johansson

6. Legal grounds for emergency response operations



Per Johansson is a research manager at the Swedish Defence Research Agency and has been actively involved in studies and investigations since the beginning of the 1990s. In addition to having led and participated in studies of the command and control functions of the Swedish armed forces, he has worked with the development of emergency and crisis management functions for the Government Offices, the police, the fire service, and the medical and health services. He has worked on, among other things, the compilation of the SRSA's publication *The Elements of Command & Control*, and is the author of the SRSA's publication *Effective Operational Command for the Police and Fire Services* (in Swedish only)

In this chapter, Swedish legislation is presented that primarily concerns actual command of emergency response operations. The presentation is oriented to municipal fire brigades. In several cases, references are made to previous legislation and the comments on these. This has been done to increase understanding of the pertinent provisions and to show that the provisions that regulate an incident commander's actions have in several cases evolved over an extended period. Many rules in current legislation have been 'inherited' from earlier legislation.

I have endeavoured to describe the considerations that are behind enactment of several provisions, and in some cases, described various alternative solutions. It should be noted, however, that it is impossible to provide exact and unambiguous answers as to how provisions are to be applied in various situations. It is always up to the incident commander in the actual situation to weigh the various interests against one another and compare the intentions of legislators with the pertinent situation. I believe that a good understanding of the establishment of the rules and regulations facilitates such deliberation.

To be able to attain a safer society, public sector bodies must work together and towards the same goals. An emergency response operation is not an isolated occurrence in society, but rather something that takes place in close cooperation, and in some cases, direct collaboration with various bodies and societal functions. The emergency services are divided into various bodies and it has not been possible to identify the preconditions for collecting the various branches of these services under a single responsible authority or fewer bodies. This reinforces the need for coordination in the emergency services.

According to chapter 1, section 6 of the Civil Protection Act, the municipalities and government authorities that are responsible for operations in accordance with the act are to coordinate operations and cooperate with each other and with other concerned parties. A corresponding stipulation was included in the Rescue Services Act from 1986 but not, however, in previous fire service legislation. This cooperation has been viewed as a prerequisite for operations being *effective*. In preliminary work for the Rescue Services Act from 1986 and the Civil Protection Act, it was emphasised that coordination of operations is to be conducted both administratively and in planning and preparations, as well as *operatively* (author's italics) (Prop. 1985/86:170, beginning on page 64, and Prop. 202/03:119, page 103).

Even under earlier constitutional forms, there were general rules stipulating that authorities were to 'lend a hand to one another' (section 47, Swedish constitution from 1809). In the Administrative Procedure Act from 1986, a stipulation for cooperation between authorities was reintroduced. In section 6 of the Administrative Procedure Act, it is stipulated that each government authority must provide assistance to other authorities within the framework of its own operations. We should note that the provision in the Administrative Procedure Act also applies to the field work of authorities.

Under special conditions, the following is stated in regards to the pertinent provision:

It applies not only to incident management but in principle to all activities of the administrative authorities and in the courts' administrative activities. It also embraces *field work* (author's italics) and similar activities within the framework of the authorities' actual operations.

An incident commander not only has duties to perform with regards to his or her own commanders and personnel, but also in regards to, for example, other authorities and public services. An emergency response operation does not just involve those who are directly affected, but also those with rights that the incident commander may need to infringe upon and those who are requested to participate on an emergency response operation.

A municipality can use the municipal fire brigade even in situations where an emergency response operation is not formally conducted. Such situations can include, for example, extraordinary events for municipalities and county councils, where important public sector functions that the municipalities and county councils are responsible for, are significantly threatened, without emergency response operations being necessary. Fire brigade commanders can in such cases serve as commanders both for their own personnel, and commanders and supervisors in other municipal bodies. However, it is important to emphasise that any role as an incident commander, with the various powers that he or she has during an emergency response operation, does not exist.

An incident can simultaneously be an exceptional circumstance for a municipality or county, and an incident that requires one or more emergency response operations. A larger forest fire, that threatens structures, etc. and that requires response operations beyond those of the fire brigade is an example. But there need not be a connection between extraordinary events and emergency response operations. The occasional fire is not normally considered to be embraced by the provisions for extraordinary events for municipalities and county councils. In a similar manner, a threat to, for example, medical and health services, energy supply, water and sewage, or road networks can constitute an exceptional circumstance without it consequently necessitating a fire brigade operation.

Society can also be subjected to severe pressure. A severe strain is not an individual incident in itself, such as an accident, act of sabotage, etc., but rather a state that can arise when one or more incidents evolves or escalates to affect several elements of society. The public service organs: the fire service, the police, and the health and medical services are fundamental for reducing societal consequences if and when severe strains occur.

Command of emergency response operations in general

In the preliminary work both for current and previous legislation in the fire brigades field, we can trace some important starting points established for how command during emergency response operations is to be organised.

When the Rescue Services Act from 1986 was written, one of the intentions was

to create an effective fire service. We can read the following in the preliminary work for the act above:

For emergency response operations to be effective, a simple and fixed command organisation is required. In the event of an emergency, or when imminent risk exists (for an emergency – author’s comment), no valuable time may therefore be expended on determining who or which body will command the emergency response operation. This must be clear in advance.

An important starting point is thus that it must be clear in advance as to who will command a presumptive emergency response operation.

Assurance of rapid response operation is also included in the referenced preliminary work. Also mentioned in the preliminary work is the legality of incident commanders’ infringements upon the rights of others (SOU 1971:50, page 180). It is stated that the purpose of specific enactments may be considered to primarily assure rapid response operation. There must be no doubt as to the powers of those involved, with ensuing time delays as a result.

The incident commander has, from a societal perspective and in relation to other participants, been given a strong position and this has been deemed as a way of achieving an effective fire service.

It can be noted that in command of an emergency response operation, several different roles and elements are included. For example, mentioned in the preliminary work for the Fire Services Act from 1974 were a technical-tactical element and an organisational element (SOU 1971:50, page 93). It can be observed that the more extensive the emergency and the more numerous the bodies that participate in emergency operations, the greater is the significance of the organisational element of command.

Needed for organisational command are organisational capabilities, overviews and access to communications, as well as certain powers. It cannot be assumed that the various demands that should be placed on command always exist or that they can be brought together in a single body or person.

However, even if the concerned leaders are in agreement in regards to the execution of fire brigade tasks, a homogeneous command function can be necessary and it must be possible to decide upon who has command and responsibility in specific cases. Measures such as infringing upon the rights of others, should originate from a public authority, which is designated in advance and that has clearly defined powers and responsibilities. It is conceivable that, for example, the incident commander’s authority to infringe upon the rights of others could be allocated to other commanders in the system. Because a simple and fixed command organisation is preferable, such alternatives have been rejected by legislators (Prop. 2002/03:119, page 78).



Chief fire officer, incident commander – various operations.

The relationship between chief fire officers and incident commanders

According to chapter 3, section 16 of the Civil Protection Act, the chief fire officer is the incident commander but may appoint someone else who satisfies the qualification requirements that are prescribed by the government or the authority that the government specifies as the incident commander.

The relationship between the chief fire officer and an incident commander that he or she has appointed was not directly discussed in preliminary work for the Rescue Services Act from 1986, however, it was discussed in the preliminary work for the current Civil Protection Act (Prop. 2002/03:119, page 79). We will now look at what was said in this preliminary work. It should be noted that even if the chief fire officer has appointed another person to be the incident commander, the chief fire officer retains overall responsibility for operations. The appointed incident commander must follow the instructions and directions issued by the chief fire officer.

If the incident commander does not comply with the issued instructions, the commission can be withdrawn. If several emergency response operations are underway simultaneously, the chief fire officer has overall responsibility for all operations. The chief fire officer must in such cases, among other things, decide upon a suitable distribution of resources. It is important to note that the chief fire officer according to the above has the overall responsibility both when one or several response operations are underway.

Official duty

Chapter 6, section 1, paragraphs 1–2 of the Civil Protection Act stipulate that:

When necessary, everyone who turns at least 18 years of age but no more than 65 years of age during the calendar year is obliged to participate in a rescue service, if so requested, to the degree permitted by his or her knowledge, health and physical abilities. Official duty is executed after a request from the incident commander.

This obligation has existed for a long time in legislation surrounding early fire-fighting and later for the modern day fire service. As far back as the provisions concerning forest firefighting in legislation from 1734, there have been provisions stipulating the duty of citizens to assist in forest firefighting (see, for example, Prop. 1914:123, page 18).

With enactment of the Fire Services Act from 1944, official duty has also encompassed women. One reason for this was that call-ups for emergency military service had entailed a major reduction of the number of people available for firefighting duty in the home districts (Prop. 1944:265, page 65).

There were previously separate provisions for official duty in regards to various types of fire brigade. With the enactment of the Rescue Services Act from 1986, a common provision was created for official civic duty concerning all the various types of fire brigade.

When we look at the previous separate provisions for official duty for various types of fire brigade, we see that the instrument that official duty constitutes was intended to be used very restrictively. In the preliminary work for the Fire Services Act from 1974, official duty was described in the event of nuclear emergencies or comprehensive emergency response operations, where a county administrative board had assumed command, as an 'emergency measures when personnel needs in a precarious situation are unable to be satisfied in any other way.' It was stated in the preliminary work for the Fire Services Act from 1974 that:

It can naturally be questioned as to whether official duty in the event of fires should be subject to the same conditions as for official duty in the event of other emergencies. A specific reason for retaining the present official duty for firefighting, however, is that official duty cannot be avoided with consideration to the need for firefighting personnel during fires in those cases when the need cannot be met by the efforts of volunteers. (SOU 1971:50, page 188)

In the subsequent government bill it was stated that:

...even if circumstances are such that the county administrative board should assume command, needs for firefighting personnel can arise that cannot be met with the assistance of military personnel and volunteers, especially in the event of forest fires. (Prop. 1973:185, page 171)

While such restrictiveness is not explicitly stated in the current provision for official duty, there is actually nothing expressed that would indicate relaxation of this restrictive position to official duty. Consequently, we can likely view official duty even at present as an instrument used by incident commanders only when the need for firefighting personnel or other rescue personnel cannot be met with sufficient speed in any other way.

Official duty in firefighting in previous legislation embraced those who had turned at least 16 years of age but no more than 65 years of age during the calendar year. According to chapter 5, section 2, paragraph 1 of the Work Environment Act, a minor may neither as an employee nor in any other manner be engaged to perform labour before the calendar year during which the minor turns 16 years of age. The minimum age for official duty in the event of a nuclear power plant emergency was 18. According to section 16 of the Radioactive Protection Act, individuals under 18 years of age may not be engaged in activities that are associated with ionizing radiation. With the enactment of the common statute for official duty, the minimum age was set at 18 years of age. This setting of the minimum age was made with consideration to the possibility of release of radioactive substances or other hazardous materials (SOU 1983:77, page 550).

For official duty in firefighting, there was a restriction as to those 'present in the area'. For official duty in regards to fire brigades led by a county administrative board, the area was in principle limited to the concerned county. With enactment of the common provision for official duty, no local restriction was included.

In the preliminary work for the Rescue Services Act from 1986, it was reasoned that it should be the incident commander and not, for example, the county

administrative board, that requested official duty so that the provision could be applied as smoothly as possible and so that an emergency response operation would have the prerequisites for being conducted effectively (SOU 1983:77, page 550 and Prop. 1985/86:170, page 53).

Which tasks can those subject to official duty perform? In the preliminary work for the earlier fire acts, not just actual firefighting tasks are mentioned, but also such things as guarding, answering telephones, courier service (SOU 1971:50, page 185), directing traffic and meal service (Prop. 1944:265, page 65).

Previously, when transport of the injured over difficult terrain in conjunction with an emergency response operation was considered as a *rescue service*, the official duty rule could be used to cover the need for personnel for this task as well. Because the statutes in the Health and Medical Services Act can be considered to embrace all types of transportation for the ill and injured (see the section *Health and Medical Services*, on page 178), the provision can no longer be formally applied in this manner.

The person making decisions on execution of official duty shall in accordance with chapter 6, section 6 of the Civil Protection Act document the decision in writing. Furthermore, according to the section mentioned above, it must be specified as to when and by whom the decision was made, and the reason for the decision and to whom it applies. In regards to the written documentation, the following was stated in the act's preliminary work:

To avoid misunderstandings, such a decision shall be documented in writing. Furthermore, the requirement for written documentation is intended to contribute to a careful assessment being made that the necessary preconditions as prescribed by law are fulfilled. (Prop. 2002/03:119, page 120)

Appeals of decisions on the execution of official duty may be submitted, in accordance with chapter 10, section 5 of the Civil Protection Act, to the county administrative board. At the same time, consideration should be taken, according to chapter 10, section 4 of the afore-mentioned act, that the decision can also be appealed. These provisions were also included in the Rescue Services Act from 1986. At the suggestion of the Council on Legislation, the stipulation was included in the Rescue Services Act of 1986 that the decision applies even if appealed, so as not to jeopardise the effectiveness of emergency response operations (Prop. 1985/86:170, page 95).

According to chapter 10, section 3, page 5 of the Civil Protection Act, anyone who intentionally or through negligence, and without due cause, fails to perform official duty that he or she is under obligation to perform, shall be fined.

Infringement on the rights of others

An incident commander has the right to make certain infringements upon the rights of others. According to chapter 6, section 2 of the Civil Protection Act, the incident commander may infringe upon the rights of others if risks to life, health or property or environmental damage cannot be averted in any other way. The infringing-

ement must be justifiable in regards to the nature of the risk, the damage inflicted by the infringement and circumstances in other respects.

The act provides a number of examples of infringements upon the rights of others, namely:

- Effect entrance into another's property for oneself and participating personnel
- Cordon off or evacuate areas
- Use, remove or destroy property

Examples of concrete measures mentioned in previous legislation (section 12, Fire Services Act from 1962) and preliminary work (SOU 1971:50, page 182 and Prop. 1973:185, page 163) are:

- Use of working machinery, equipment, telephones or vehicles
- Use of wells or water conduits
- Cutting down trees
- Demolition or removal of structures, stocks or other property
- Use of boats
- Confiscation of timber and similar materials for shoring and abutments
- Digging and excavation tasks
- Removal of gravel, sand and earth

We can trace some form of legal regulation of fire officers' rights in regards to infringement and disposition far back in legislation. For example, in fire regulations from 1874, it is stated in section 13, paragraph 1 that: 'In the event of fire, the head of the fire brigade tasked to prevent the spread of fire may, without consideration to objections, demolish structures, fencing or similar objects...' In paragraph 2 of this section, it is also stipulated that 'water for forest fighting may be taken from private wells or other sources of water when so ordered by the head of the fire brigade or any other fire officer.'

In chapter 24 of the Swedish Penal Code, there are provisions concerning general grounds for exemption from criminal liability. It is stipulated in section 4 that an act committed by someone during an emergency only constitutes a crime if in consideration to the nature of the danger, the damage inflicted upon another and the circumstances in other respects are unjustifiable. An emergency exists when there is a threat to life, health, property or any other significant interest protected by the legal system.

The provision regulating incident commander infringements upon the rights of others can be viewed as a specific case of the general emergency powers principle (SOU 1971:50, page 179). An alternative to the present regulation of incident commanders' powers would have been to refer to this emergency powers provision. It should be noted, however, that the Penal Code's emergency powers provisions do not allocate powers to public bodies and individuals.

Some of the intentions of the applicable provision are mentioned in the preliminary work for the Fire Services Act of 1974 (SOU 1971:50, page 180). One intention of the legal regulation of infringement upon the rights of others can be assumed to assure rapid response operations. To avoid delays in taking action, those concerned

must be certain as to the extent of their powers. Another intention was to increase the effectiveness of fire brigades by increasing the powers of incident commanders with regard to those subjected to infringement. This especially applies if it is a matter of people who are not directly affected by the fire or the threatening or occurred incident.

The present provision also seems to have been motivated with consideration to the wish to grant fire brigades the authority to infringe upon the rights of other to a greater extent than what is stipulated in the general emergency powers provision. This has been satisfied partly by the authority to make such infringements being presented in a positive tone, and not just that it is exempt from criminal punishment, and partly by not expressly requiring that infringement be enforced under distress (Prop. 1983/84:111, page 132 and Prop. 1973:185, page 164).

Regulation of the right of incident commanders to infringe upon the rights of other is thus not just an expression of positive regulation, but also for the creation of greater operating latitude than what the provisions for emergency powers alone provide.

Two conditions for applying the provision are:

- That there is a threat to life, health or property, or damage to the environment that cannot be properly averted in any other way.
- That the infringement is found justifiable in a weighing of interests between the value of that which is threatened and the damage inflicted upon others through infringement.

The signification of both conditions was discussed in the preliminary work for the Fire Services Act of 1974 (SOU 1971:50, from page 181). We will now examine the first condition. For an infringement to be imposed, it cannot be required that it be entirely self-evident that the danger is impossible to ward off in another way. The act states that 'The infringement should be imposed if disproportionate efforts or sacrifices would otherwise be necessary to ward off danger.' Let us now look at how the infringement can be deemed justifiable. Consideration should be taken on the one hand to the value of what is threatened by the event that caused the emergency response operation and the risk for its value fully or partially being lost if the infringement is not imposed, and on the other hand, the damage that the infringement would inflict. It is further stated in the referenced preliminary work that the interests threatened and that are to be protected must always be of considerably greater importance than the interests that would be sacrificed through the infringement.

Lastly, we should ask ourselves if the provision has local restrictions – whether there are any restrictions in regards to, for example, compulsory requisition of specific materials that are not available in the area. In previous studies (SOU 1971:50, page 181), it has been stated that local restrictions should not be considered.

The police, according to chapter 6, section 3 of the Civil Protection Act, are to provide the necessary assistance when infringement is imposed according to the rule above. In previous legislation, the wording was used that the police should provide the requisite support. Stating instead that the police are to provide the necessary assistance is not due to any changed relations between incident commanders and the police, but rather to a modernisation of the language (SB PM 2004:1, page 8).

Just as for decisions on the execution of official duty, the requirements for decisions on infringement upon the rights of others are that they:

- Shall be documented in writing.
- May be appealed.
- Apply even if appealed.

The reason for including a provision that the decision applies even if appealed is the same as for the corresponding stipulation for decisions on the execution of official duty (see the last part of the section 'Official duty' on page 163).

Moreover, according to chapter 10, section 3, page 6 of the Civil Protection Act, anyone who intentionally obstructs or attempts to obstruct a measure decided upon according to the provisions on infringement upon the rights of others or who otherwise disregards such a measure without an acceptable reason, shall be fined. A provision regarding individuals who obstruct or attempt to obstruct infringement upon the rights of others was already included in previous fire services legislation.

Involvement by government authorities and municipalities in emergency response operations

A government authority or municipality, in accordance with chapter 6, section 7 of the Civil Protection Act, is obligated to participate in emergency response operations upon the request of an incident commander with personnel and property. However, such obligation only applies if the authority or municipality has appropriate resources and if involvement will not seriously hinder normal operations. The provision applies for involvement in the event of clean-up after the emission of radioactive substances.

This provision was enacted through the Rescue Services Act of 1986. It has no counterpart in previous fire services acts or in other legislation associated with the fire service. It should be noted, however, that a provision for so-called firefighting assistance between the municipalities was enacted in the Fire Services Act from 1944. According to section 9 of the Fire Services Act from 1944:

Upon notification by the head of a fire brigade in a municipality, where a fire that has become or threatens to become widespread, another municipality is obligated to provide firefighting assistance to the degree that the head of the fire brigade in this municipality deems reasonable without jeopardising the safety of the assisting municipalities.

This provision was retained in the Fire Services Act from 1962 and in a somewhat modified form in the Fire Services Act from 1974.

The intention of this present provision on involvement in emergency response operations was to enable emergency response operation resources to be used more effectively. Many government and municipal authorities that are not responsible for fire brigades or clean-up of radioactive substances have significant resources that they use in their operations and that can be of importance during an emergency response or clean-up operation. The provision enables these resources to be used. (Prop. 1985/86:170, beginning on page 81 and Prop. 2002/03:119, page 120)

The obligation to participate in operations with personnel and property does not apply if involvement seriously hinders the authority's normal operations. In the preliminary work for the Rescue Services Act from 1986, the department head wrote that:

Requisitioning of other authorities' resources can naturally not be conducted without restrictions. It is my opinion that it should not be required that an authority participate in emergency response operations if involvement would seriously hinder normal operations. It should be up to the authority to determine whether this is the case. (Prop. 1985/86:170, page 45)

We should thus note that it is the individual authority and not the incident commander that determines if involvement in emergency response operations seriously hinders normal operations. At the same time, it should be noted what was written in the Fire brigades Committee's comments prior to the Rescue Services Act from 1986.

When an incident commander requests assistance from various government or municipal authorities and bodies, requests for assistance shall not be denied unless the operations of the authority receiving the request *absolutely* (author's italics) prevent this. The matter of whether assistance shall be provided or not shall not be dependent on whether or in which form reimbursement will be made for the emergency response operation. (SOU 1983:77, page 547)

Can we find any general criteria for when an authority can refuse to participate in an emergency response operation? We can look at what was written on this subject in the preliminary work for the Civil Protection Act:

The obligation to participate in operations with personnel and property does not apply, however, if involvement seriously hinders the authority's normal operations. It is impossible to specify this more precisely in a general rule. There must be a weighing in each case between a government authority's or municipality's needs for resources for its own operations and the capability to contribute with resources during an emergency response operation or during clean-up operations. (Prop. 2002/03:119, beginning on page 120)

We can thus not establish any general criteria for how an authority is to act upon receiving a request from an incident commander for involvement in a specific situation.

Can a government authority or municipality that is requested to participate thus make tactical considerations as to whether the emergency response operation is sufficiently extensive that involvement is actually needed, or whether the incident site is too distant for assistance to arrive within a reasonable time and similar factors? Prior to enactment of the previous provision on firefighting assistance it was stated that such assessments should be made by the chief fire officer for the fire brigade in the municipality where the fire is underway (SOU 1942:10, page 84). Furthermore, we can see that it is stated there that:

Should the deputy chief fire officer have the right to assess the suitability of sending assistance based on factors other than the issue of what the safety of his own municipality can permit, there is the risk that the procedure would become too complex, which could entail that the purpose of mutual assistance would not be fulfilled (paragraph A and in Prop. 1944:265, page 63).

Lastly, we should also note that it is the authority or municipality that takes part. The personnel that the authority or municipality participates with are not 'extracted' from their 'home organisation', but rather continue to work in their own government authority's or municipality's organisation.

It is also important to observe that an incident commander's right to request involvement in emergency response operations does not apply to businesses. However, there is nothing that prevents a fire brigade, on a civil law basis, entering an agreement with a business having resources needed in emergency response operations. Moreover, the incident commander can use his or her power to infringe upon the rights of others and to request the execution of official duty.

Additionally, there are no formal legal grounds for an incident commander to request assistance in, for example, health and medical services in conjunction with emergency response operations.

Regional command of municipal fire brigades

According to chapter 4, section 10 of the Civil Protection Act, in the event of large-scale emergency response operations, the government may permit or even order a county administrative board or other government authority to assume responsibility for the fire brigades in one or more municipalities. The government has exercised this authority, and in chapter 4, section 33 of the Civil Protection Act, stipulated that when large-scale emergency response operations involving municipal fire brigades are appropriate, the county administrative board may assume responsibility for the fire brigades in the municipalities affected by response operations.

If we examine the preliminary work for the Fire Services Act from 1974 (SOU 1971:50, page 77) and the preliminary work for the Rescue Services Act from 1986 (SOU 1983:77, page 278), we see that large-scale emergency response operations are required when one or more of the following criteria exist:

- The emergency entails or threatens to entail significant injury or damage to people or property.
- Local or nearby fire brigade resources are insufficient.
- Several important societal functions are directly affected and the public sector must therefore invest a significant portion of its resources in emergency tasks.
- The response work requires infringement upon the rights of others.
- The response work requires decisions of economic significance both for individuals and society.
- Cooperation in response work is necessary across municipal boundaries – and in some cases, across international borders.
- Large-scale cooperation is necessary between various forms of fire service or between a fire brigade and another public sector organisation.

One should note that the assumption of powers applies to full responsibility for the fire brigades in one or more municipalities, and not just the pertinent emergency response operation. This was mentioned in, for example, the preliminary work for the Rescue Services Act from 1986. The following is a comment by the department head:

In the event of large-scale emergency response operations in which different fire brigades participate – possibly with an authority having responsibility for the fire service nationally – the need may arise for a command body at a higher level. In such situations, it is important that the emergency resources be allocated in a suitable manner with consideration to preparedness in regards to new emergencies. If new emergencies occur, it is preferable that there is a command body that has a sufficient overview to determine from a wider perspective whether new emergency response operations are needed. In my opinion, it is not enough that there are rules for a command body on a higher level that would be able to assume command of certain larger emergency response operations. The body that can use emergency response operation resources in this manner within a larger area must also be able to assume responsibility for the fire brigade in this area. (Prop. 1985/86:170, page 44)

In previous legislation, there was a provision that when large-scale emergency response operations involving municipal fire brigades were appropriate, that the county administrative board would assume responsibility for fire brigades in the municipalities affected by operations (Fire Services Act from 1974 and Rescue Services Act from 1986). The new role for county administrative boards was addressed by, among others, a study by the SRSA and in preliminary work for the current Civil Protection Act. It has been held that the primary duty of county administrative boards should be to contribute with various measures and even conduct other duties, when the municipal fire brigades in their entirety are commanded by an overall incident commander and the individual emergency response operations are commanded by a municipal incident commander (SOU 1998:59, page 117). It is further stated in the referenced text that the county administrative board can provide the concerned municipalities with, for example, command support and information services without the necessity of a formal transfer of responsibility. However, it has been deemed that the *opportunity* to assume responsibility for fire brigades must exist.

Even in other emergency management and in the event of various types of pressure on the public sector, the county administrative board should have a coordinating role and not have direct powers (see, for example, Prop. 2001/03:158, page 57). According to section 52, paragraph 1, clause 5 of the provision with intra-county instructions for county administrative boards, for example, the county administrative boards shall provide municipalities and concerned authorities, organisations, religious establishments and businesses with support and information for their peacetime emergency management and emergency planning.

It is stated in the preliminary work for the Civil Protection Act that a county council, in its overall command role, is responsible for:

- Prioritisation and allocation of supporting resources.
- Support to incident commanders with additional command resources in the form of personnel and material.
- Provision of information to the public and other authorities

(Prop. 2002/03:119, beginning on page 79).

It may seem that it is not entirely clear and unambiguous as to how a county administrative board is to handle these roles without some form of legal authority in relation to the concerned bodies.

The provisions concerning a county administrative board's assumption of responsibility for municipal fire brigades have a long history. An embryo for such provisions can be found as far back as in section 10 of the Forest Fire Act from 1914, where it is stated that 'if the fire has become widespread, the royal commander shall be appointed as the commander'. Similar provisions have since been included in the various fire services and emergency services acts.

A reason for the original inclusion of a provision that a county administrative board, or previously, a county governor, was to appoint a commander to lead response operations was so that the operations could be commanded by more highly skilled fire officers than those serving on the local levels. Moreover, the then contemporary issue of the right of command being transferred between civilian and military authorities, when military assistance was to be provided to a county administrative board, was viewed as being 'best resolved by the His Royal Majesty's commander (the county governor) taking command (Prop. 1914:123, beginning on page 19).

We have discussed here the assumption of responsibility by county administrative boards for municipal fire brigades. In the Rescue Services Act from 1986, just as in the Civil Protection Act, there is a provision concerning government powers stating that in the event of large-scale emergency response operations, the government may permit or even order a county administrative board or other government authority to assume responsibility for the fire brigades in one or more municipalities. In the preliminary work for the Rescue Services Act from 1986, the specific justification regarding this was: 'The stipulation provides the opportunity for the government itself to assume responsibility for fire brigades and to appoint incident commanders.' (Prop. 1985/86:170, page 81) Also mentioned was that a decision for a county administrative board or some other authority assuming responsibility for fire brigades can involve assumption of responsibility for municipal fire brigades or a national rescue service or all emergency services.

One should note that even if a county administrative board has assumed responsibility for fire brigades in one or more municipalities, they are still municipal fire brigades, subject to the associated requirements and rules.

We will now return to the pertinent provision in chapter 4, section 33 of the Civil Protection Act. The formulation here is that a county administrative board, when large-scale emergency response operations involving municipal fire brigades are needed, may assume responsibility for fire brigades in the municipalities that are *affected* by the response operations. A question could be asked here as to the signification of the phrase '...the municipalities that are affected...' A self-evident and unambiguous definition of the word *affected* is difficult to ascertain. Does it mean

the municipalities that are physically and directly affected by an emergency, or the municipalities that are affected due to their resources being needed for emergency response operations in another municipality? We can only deduct that both interpretations occur.

County administrative boards are also responsible for rescue services in the event of the emission of radioactive substances. The provision was enacted in 1960 and been retained, via the Rescue Services Act, in the Civil Protection Act and statutes concerning civil protection. It should be noted here that county administrative boards previously had a number of command duties in regards to 'blue light services'. Up to 1998, county administrative boards were the highest police organs at county level. County administrative boards had this role even prior to nationalisation of police forces in 1965. County administrative boards had the authority to assume command of police forces in the counties either fully or in part, and county governors could in the event of serious civil disorder or other specific incidents, take direct command of police personnel in the counties. Previously, the county administrative boards were also regional civil defence authorities, and in the event of war, had certain command duties within health and medical services.

Command of supplementary fire brigades

An incident commander has several duties and roles. In previous sections, we have discussed the powers of incident commanders in requesting official duty, infringing upon the rights of others and requesting the involvement of government authorities and municipalities in emergency response operations.

Incident commanders lead the units that participate in emergency response operations. In the preliminary work for the Rescue Services Act from 1986, it was stated that: 'An incident commander obviously has the right to command personnel participating in response operations' (Prop. 1985/86:170, page 43).

That the incident commander has the right to command personnel from his or her own fire brigade should be self-evident and is addressed in the quote in the paragraph above. Command conditions in relation to supplementary units are discussed below, partly in general terms and partly in regards to units from the Swedish armed forces.

Fundamental principles

The following may participate on an emergency response operation:

- Units from the fire brigade in the 'home' municipality
- Units from other municipalities' fire brigades
- Units with personnel and equipment from municipal authorities other than the fire brigade in the home or other municipality
- Units with personnel and equipment from government authorities
- Individuals carrying out official duty
- Volunteers

We can assume that a fundamental principle is that the incident commander also exercises command over supplementary units. When the provision on firefighting

assistance was enacted in 1944, a rule was also enacted concerning incident command in such circumstances. According to section 8, clause 2 of the Fire Services Act from 1944: 'When firefighting assistance is obtained from another location, the commander who has received the assistance shall exercise command unless otherwise agreed.' The following is from the preliminary work:

A conclusion of the study is that it is necessary to create a specific rule for command in cases where a municipality provides another municipality with firefighting assistance. Experience has namely demonstrated that problems can arise due to command relationships not being determined in advance. In regards to the question of which of two commanders should exercise command, the study has determined that the commander receiving assistance should be superior to the other. This is because this commander has led firefighting efforts from the beginning in the case in question, and can also be assumed to have good knowledge of local conditions. (SOU 1942:10, page 112)

At the same time, one was open to modifications of the main rule. The rule stipulated that the commander who received the assistance would exercise command 'unless otherwise agreed.'

The following is from the preliminary work:

However, it is conceivable that, for example, a city with a professional fire brigade might provide firefighting assistance to a nearby rural municipality, in which case it would be entirely natural that the commander providing the assistance would take command. The main rule above has therefore been supplemented with the amendment that both commanders might be in agreement on another order with respect to the right of command than that which is normally anticipated. (Paragraph A)

It can thus be noted that a chain of command other than that of the assisting commander exercising command can be agreed upon, but there are no compulsory rules.

Within the police, police reinforcements occur between police districts. There is a corresponding provision for the police that 'assisted commanders exercise command.' The topic of police reinforcements is addressed in chapter 3, section 11 of the police regulations as follows:

The commander of personnel serving as police reinforcements is the county commissioner of police at the police authority that *has received* (author's italics) reinforcements, if not otherwise agreed upon in each particular case.

In the government bill on the Fire Services Act from 1974, the department head recommends, according to the proposal from the fire service study, a chain of command that signifies that it is always clear as to whom exercises command of the emergency response operation in its entirety (Prop. 1973:185, page 143).

The department head also states in the document referenced above that such a rule does not entail that the incident commander is to assume the duties of the com-

manders for the various fire brigades that participate in operations. One can wonder here as to what is meant by *fire brigade* in this statement. Here the assumption has been made that one refers to bodies that *participate* in actual emergency response operations, and not units from collaborating bodies, such as the police and medical services. In elaborating on the statements, the department head said that the duty of the incident commander is primarily to decide upon the orientation of operations on a general level and to be responsible for coordination tasks. The commanders of the various participating fire brigades should to a considerable degree exercise direct command, over their own personnel.

The above statements should be able to serve as guiding for the relationship between the incident commander and any supplementary units from government authorities and other municipalities. Such units are annexed to the command of the incident commander, but direct command of the units' personnel is exercised by the units' own commanders.

Involvement of the Swedish armed forces

The relationship between the incident commander and personnel from the Swedish armed forces who participate on an emergency response operation has been discussed in the preliminary work for the Fire Services Act of 1974. The commander-in-chief mentioned in the comments he submitted having read the report from the Fire Service Committee that the chief fire officer should only have the right to issue instructions to over military personnel who participate in emergency response operations, whereas the right of command over these personnel should remain with their military commander (Prop. 1973:185, page 144).



Incident commander Military liaison officer.

Back then the term *instructions* occurred in Swedish armed forces terminology. The term *instructions* meant messages to subordinates or equals or authorities with ordinances governing certain activities that they are obliged to perform. These *instructions* were to be so formulated as to permit a certain degree of freedom of execution.

The department head stated in the bill above that during the period that a military unit is assigned to participate on an emergency response operation, it should be under the incident commander's command in such a manner that the incident commander exercises command over the unit's activities through *instructions* to the unit commander. With consideration to the specific instructions that exist in regards to obedience circumstances within the armed forces, the head of the department felt, however, that the incident commander should not exercise the right of command over the personnel in the military unit (Prop. 1973:185, page 144).

Both the police and Swedish armed forces use the legal term *supervisor*. The right of command in the Swedish armed forces concerning personnel is regulated by chapter 3 of the rules and regulations of the Swedish armed forces. This chapter states that the right of command includes the right and the duty of military personnel to exercise command over other military personnel and that a person with the right of command over another is this person's supervisor. It should also be noted here that in chapter 3, section 2 of the rules and regulations mentioned above, it is clearly and unequivocally stated that, 'The right of command over another commander also includes the right of command over the personnel who are under this commander's command.' There is no corresponding written stipulation of the extent of the right of command for the police, fire brigades or health and medical services, for example.

That the Swedish armed forces can participate on an emergency response operation with regular personnel should be self-evident. It has been suggested that the provision on the involvement of authorities in emergency response operations only embraces regular personnel and not those performing compulsory service. It is stated in chapter 1, section 4, paragraph 2 of the National Total Defence Service Act that compulsory military and alternative civil service encompass basic training, refresher training, emergency preparedness service and active service. In the report on serious emergencies in peacetime (SOU 2000:21, page 504), it is maintained that those performing compulsory service should not be required to participate in a civil task that the Swedish armed forces is to take part in unless they have received specific training. It is further stated in the referenced study that in *other cases*, involvement on the part of those subject to compulsory service must be on a voluntary basis. In an emergency those obligated to perform official emergency duty that are on active duty for basic training or refresher training are to participate in emergency response operations according to the provisions regarding official duty in the Civil Protection Act).

Cooperation with other community bodies

As mentioned initially in this book and in this chapter, an emergency response operation is not an isolated occurrence, but rather something that takes place in close cooperation, and in some cases, in direct collaboration with other societal functions.

Two societal functions that are nearly always involved during an emergency response operation are the police and health and medical services. I will now describe in greater detail what has been said on the subject of cooperation between fire brigades and these two societal functions, and the rules and principles that regulate their work.

Police

A police response operation often involves several rules of law and branches of law, and the police usually have several duties when an incident occurs. For example, in conjunction with an emergency response operation, the police may be called upon to:

- Provide necessary assistance when an incident commander infringes upon the rights of others (chapter 6, section 3 of the Civil Protection Act).
- Monitor and prevent disruptions to civil order and safety in the vicinity of the incident site (section 2, page of the Police Act).
- Conduct criminal investigations (section 2, paragraph 3 of the Police Act and chapter 23 of the Penal Code).
- Provide protection, information and other assistance to the public (section 2, paragraph 4 of the Police Act).
- In the event of aviation, shipping and railway accidents, as well as other serious accidents, provide assistance to the government authority investigating accidents (section 9 of the Accident Investigation Act).
- Upon the request of the incident commander, contribute with personnel and equipment in emergency response operations (chapter 6, section 6 of the Civil Protection Act).

The primary duties of the police during emergency response operations are considered to be, among other things, directing traffic, cordoning, evacuation, registration and identification of the dead, collection, registration and identification of property safeguarded, notification to relatives and investigation of incident causes (SOU 1979:6, page 80).

Fourth on the bulleted list above of various tasks for the police, in accordance with section 2, paragraph 4 of the Police Act, is 'Provide protection, information and other assistance to the public.' In the government bill on the Police Act, in reference to this provision it is stated:

This concerns the police's assistance activities, which constitute a part of what usually is referred to as service activities. To attain clarification in relation to what is expected of other authorities – such as social and medical services – it is stated that the police's obligation to provide the public with protection, information and other assistance applies when such assistance can be suitably provided by the police. This primarily applies in situations when no other societal body has provided assistance. *During emergencies, the police must sometimes obviously take action even when the assistance in principle is the responsibility of another body* (author's italics). It may be necessary, for example, to transport an unconscious or seriously injured person to a hospital, even though an ambulance may have been requested. (Prop. 1983/84:111, beginning on page 56)



Incident commander. Police incident officer.

In section 8 of the Police Act, it is stated that a police officer shall take action in a manner that is justifiable with consideration to the action's purpose and other circumstances. Furthermore, the same section stipulates that if force must be used, this shall only occur in the form and to the degree that is necessary for the intended results to be achieved. This provision is an expression of the so-called proportionality principle and the so-called necessity principle. These are basic principles that apply for all infringements by the public sector on rights and freedoms. The necessity principle means that a police action may only be conducted when it is necessary for avoiding or eliminating an immediate danger or disruption. The proportionality principle means that the damage and inconvenience that an action can entail for an opposite party may not be disproportionate to the purpose of the action.

The Police Act assigns powers to police to execute a number of actions. Police actions can be seen as clearly defined action types. With the enactment of the current Police Act, several actions were defined and codified that had not previously been regulated. Regulation of a police officer's powers is exactly the same as regulation of an incident commander's infringement upon the rights of others – partly so-called positive regulation, partly so-called facultative regulation. Regulation is positive due to the stipulation of which actions are permitted and not which actions are forbidden. That regulation is facultative means that one has created latitude so that the individual police officer may decide on the pertinent actions. The opposite would be compulsory regulation, with the police officer being obligated to take specific actions in specific situations. When it comes to the police, the view has been adopted that through the facultative formulation of police officers' powers, one further emphasises that the police officer shall always choose the least infringing action to resolve the task at hand (Prop. 1983/84:111, beginning on page 98).

Several of the actions, such as house and body searches, can be appropriate for various ends and situations. In legislation, there has been a desire to create clear and

specific relationships between ends and means. We can conclude that a fundamental principle is that there should be no uncertainty as to the grounds for an action being taken.

Examples of actions and interventions that police officers may conduct according to the Police Act are:

- Refusing entry to, removing or temporarily detaining individuals (sections 11–13 of the Police Act)
- Detaining individuals for identification (section 14 of the Police Act)
- Searching someone when necessary from an order and safety standpoint (section 19 of the Police Act)
- Stopping vehicles or other means of transport (section 22 of the Police Act)

A police officer may also, in accordance with section 21 of the Police Act, affect entry into a building, room or other location if there is reason to believe that someone has expired or is unconscious or otherwise unable to call for help. The police thus have the authority, for example, to enter a building and other areas to search for casualties without requiring a decision from an incident commander for infringement on the rights of others. This can be appropriate, for example, when police or ambulance personnel arrive at a location that is not the subject of concern for fire brigades.

Moreover, there are actions and interventions that may normally only be performed subject to approval from the police. And those that a police officer may only perform without the prior approval from the police when time is of the essence. An example of such an action would be, in accordance with section 20 of the Police Act, the right to search a building and similar actions to detain a person who is subject to arrest. Furthermore, section 23 of the Police Act grants the right under certain circumstances, to avert or prevent criminal action:

- Affect entry into a building, room or other location to search for explosives, weapons or any other dangerous objects.
- Cordon off, evacuate or forbid entry into a building, room or other location.

Besides the powers in the Police Act, the police are granted other powers by the Penal Code in criminal investigation activities. Examples of such activities are:

- Conducting interrogations, and detaining individuals for interrogation (chapter 23, 3, sections 6–8 of the Penal Code)
- Making arrests (chapter 24, section 7 of the Penal Code)
- Seizures (chapter 27, section 1 of the Penal Code)
- Cordoning of crime sites (chapter 27, section 15 of the Penal Code)
- Searching premises during surveillance and criminal investigation operations (chapter 28, section 1 of the Penal Code)
- Bodily searches and checks of individuals (chapter 28, sections 11–12 of the Penal Code)

Within the police service, there is a regulated chain of command. A supervisor for a specific activity is defined in chapter 4, section 3 of the Police Act as the person who in relation to another, leads and has responsibility for the activity.

An important fundamental principle is constituted by the provisions in chapter 4, section 4 of the Police Act that stipulate that the person in charge shall be established either through application of the chain of command or issued orders for tasks that police officers perform jointly. It is also stipulated that in other cases, the person with the highest rank is in command. If several police officers have equally high ranks, the commander is the person who has held the rank the longest, or if they have held the rank for the same amount of time, the person who is oldest assumes command.

In the Civil Protection Act, the incident commander is assigned various powers, and the act also includes descriptions of the preconditions for an emergency response operation being conducted. The position of police incident officers in the event of an extraordinary event is not actually legally stipulated in the same manner as for incident commanders. The title *police incident officer* and the principles for this position are in a general advisory document from the National Swedish Police Board (FAP, article 201-1). Defined in this document are a number of terms, such as incident, police response operations and police incident officer, and it is stated that during extraordinary events, a police incident officer should be appointed who leads police operations. Exceptional events are defined in the referenced general guidelines document as: 'Anticipated or occurred events, which involve criminal action or other disturbances to civil order or safety, and which are so extensive or serious that for the police to be able to carry out their duties, they must organise, command and use their resources in a specific structure.'

The police incident officer becomes the supervisor for the police officers who take part in the operation and has the powers granted by the law to all police officers. Moreover, the police authority can have delegated decisions to him or her that individual police officers are not authorised to make, only police authorities. The police incident officer's powers can thus differ from one county police to another.

Several bodies to which the study that preceded the Fire Services Act of 1974 was referred to for consideration brought up the issue of the relationship between incident commanders and police personnel who are active at an incident site. Some were of the opinion that problems in cooperation need not arise. A larger group thought that police personnel, for a number of reasons, cannot be placed under the command of other than police supervisors. The department head stated in the government bill that police activities at an incident site should in principle be viewed as activities conducted alongside actual rescue work and that are led by a police commander and not the incident commander (Prop. 1973:185, page 145). Furthermore in the bill mentioned above, it was stated that cooperation between the two commanders was necessary. Even if the rescue work's orientation, which the incident commander decides upon alone, is a determining factor, the incident commander must ensure that the police receive satisfactory opportunities to carry out their duties, just as the police commander must through his or her actions, support actual rescue work.

In this context, it should be noted that for peacetime there are currently (2005) no provisions regulating command relationships when police personnel jointly participate in certain activities with other personnel.

In conjunction with addressing cooperation between fire brigades and the police, it can also be appropriate to examine the relationship between emergency response operations and police response operations. A *rescue service*, according to chapter 1, section 2 of the Civil Protection Act, refers to the emergency response operations that the state or municipalities shall be responsible for in the event of emergencies and impending risks for emergencies so as to prevent and limit injury to people and damage to property or the environment. In the preliminary work for the Rescue Services Act, it was stated that:

Emergency refers to suddenly occurring incidents that have entailed or can entail injury and damage. Included here are incidents that are caused by forces of nature or that occur without the involvement of people. Incidents caused by the action of individuals or their failure to take action are also considered as emergencies. This applies regardless of if the action or failure to take action is intentional or not. (Prop. 1985/86:170, page 62)

We can thus note that incidents that are caused by peoples' actions or their failures to take action are considered as emergencies, and that fire brigades must respond regardless of how the emergency or hazard has *arisen*. We can take a bomb threat as an example. This is a situation in which it can be considered that there is a significant risk that a crime, which involves serious danger to life and limb or extensive destruction of property, will be committed at a specific location. In this section, we have previously mentioned section 23 of the Police Act. According to this section, the police may, among other things, affect entry into a building, room or other location to search for explosives, weapons or any other dangerous objects, and cordon off, evacuate or forbid entry into a building, room or other location. One should note that it is the duty of the police to search for and disarm the explosive charge or bomb (see Prop. 1985/86:170, beginning on page 65). At the same time, it can be considered that there is an immediate risk for an emergency and the fire service's involvement is thus required (RPS Skr VKA-128-5358/96, section 4.5). It has thus been recognised that there is an element *rescue service* during a bomb threat, and this is the reason why formally, an emergency response operation can be underway simultaneously as a police response operation.

In conjunction with the discussion above, it is also of interest to discuss the behaviour of a fire brigade if personnel are threatened by violence or the risk of violence. According to chapter 1, section 2, paragraph 3 of the Civil Protection Act, the government or a municipality is responsible for conducting emergency response operations only if this is motivated with consideration to the need for rapid intervention, the value of that which is threatened, the costs of operations and other circumstances. An unambiguous answer as to what is required in this case is found neither in the preliminary work for the Civil Protection Act nor in previous rescue service or fire service legislation. In one context, however, it has been stated that the SRSA is of the opinion that a prerequisite for being able to conduct emergency response operations is that there is no risk that personnel will be subjected to violence or threats of violence (Ds 1994:140, beginning on page 45).



Incident commander Medical incident officer.

Health and medical care

The work of health and medical care personnel at an incident site should be viewed as work that is conducted alongside the emergency response operation and under the command of their own supervisor, such as a medical incident officer.

In principle, the incident commander has no right of command over health and medical service personnel. Certain statements on the relationship between incident commanders and health and medical service personnel have been made in the preliminary work for the 1974 Fire Services Act (Prop. 1973:185, page 145). It is stated there that health and medical service personnel must naturally accept working under the conditions necessitated by the overall structure that the incident commander establishes for an emergency response operation. In the same way that an incident commander must strive to facilitate the work of health and medical service personnel, they must conduct their work in a manner that does not unnecessarily hinder emergency response operations. Even if the incident commander does not have the right of command over health and medical service personnel, the need for mutual adaptation and influence should be noted, as well as the latitude to ensure this. It is entirely clear, however, that the incident commander may never influence actual medical response activities nor the health and medical service personnel who are not working at the incident site.

One should also note that the employers of medical and health service personnel have a responsibility for the working environment that can never be transferred to, for example, a fire brigade.

In certain situations, it can be difficult to determine an exact and clear delineation between a fire brigade and the medical services. It can be seen here, however, that in the government bill for the 1986 Rescue Services Act (Prop. 1985/ 86:170, page 64) it was stated that medical care at an incident site that is intended to ascertain and retain vital functions, such as respiration and circulation, must be consid-

red to be under the jurisdiction of health and medical services and be encompassed by the area of responsibility of the head of medical services.

Medical transport is also considered as medical and health care. The responsibility for medical and health care services for medical transport has been discussed, for example, in the preliminary work for the Civil Protection Act (SOU 2002:10, beginning on page 235 and Prop. 2002/03:119, beginning on page 82). The so-called emergency services study maintained that all forms of medical transport, regardless of if conducted in conjunction with an emergency response operation or in other cases, should be embraced by a collective responsibility on the part of the county council for the entire care and transport chain. Exceptions should, however, be made for medical transport from ships. The study has subsequently determined that the provisions of the Health and Medical Services Act should be considered to include a responsibility on the part of the county council for all types of medical transportation, even over rough terrain. It is stated in the pertinent government bill, however, that it should be emphasised that the county council's responsibility does not entail that they must obtain all personnel and material resources that are needed to conduct operations unaided. It should instead be considered as a precondition that the county council has the opportunity to use resources existing at other bodies.

The regulation of command relationships in health and medical services has adopted greater latitude for the decision making of the respective heads of medical services. The currently applicable instructions clearly identify a duty to develop a command organisation that satisfies the requirement for high patient safety, high quality and application of cost-effective medical methodology, while detailed design of the command organisation and skill levels vary depending on the orientation and scale of operations. In health and medical services, there were previously a number of positions and the relationships between them were specified. The term *clinic physician* can be found in legislation dating as far back as the 1800s. At the close of the 1800s, most hospitals were not divided into clinics. But during the 1900s, it became more common with several clinics at hospitals, and in rules and regulations, we could see descriptions of titles and positions such as hospital director, chief physician, senior physician, assistant senior physician, ward physician, assistant physician and nurse, as well as the relationships between them. In the 1970s, the opportunity was opened for having several senior physicians at the same clinic and the position of clinic department head was added. At the beginning of the 1990s, the position of chief senior physician was introduced – a specialist who had responsibility for the collective leadership of operations at a clinic.

Today, only the position of hospital administrator is regulated. In section 29 of the Health and Medical Services Act, it is stipulated that within health and medical services, someone is to be responsible for the organisation (hospital administrator). The hospital administrator represents the care provider and the care provider is responsible for appointing hospital administrators for all health and medical services that the provider conducts. The expertise of hospital administrators varies depending on the orientation and scale of operations, and the responsibility they have (Prop. 1995/96:176, page 57). At departments where medical diagnoses and treatment constitute the dominating content of operations, it is appropriate that

the medical care of patients be led by a person with good medical expertise in the pertinent field (SOSFS 1997:8, the section '*Ansvar för enskilda ledningsuppgifter*', which covers responsibility for individual supervisory tasks). The hospital administrator always has the *collective* responsibility for operations, but can and should in certain cases perform other tasks as dictated by his or her expertise. Hospital administrators can naturally not involve themselves in individual patient cases if they do not have the requisite medical, care or psychological expertise (Prop. 1995/96:176, page 57). Each hospital administrator has the responsibility, within the framework of staff and other resources that the care provider places at his or her disposal, to lead operations and to distribute tasks by type and degree of difficulty and with consideration to the needs for expertise and professional experience. The hospital administrator is responsible for personnel who conduct various duties having the requisite skills. (SOSFS 1997:14, the section '*Arbetsledning*' on staff management)

There is no legal regulation of, for example, who should command health and medical service personnel at an incident site. Similarly, there is no regulation of how command relationships between management staffs at hospitals and personnel at incident sites are to be structured. Such relationships must be regulated through agreements, arrangements, local ordinances, job descriptions and similar means.

An incident commander can request that an authority or municipality participate with personnel and materials in an emergency response operation, request performance of official duty and infringe upon the rights of others. A person in a management position in health and medical services does not have the same opportunities to exercise compulsory command over personnel and equipment or infringe upon the rights of others. For the police, section 10, paragraph 2 of the Police Act stipulates that even when police officers are off duty, they are obligated to take action on their own accord to safeguard public order and safety within the police district to which they are assigned. There is no corresponding legally regulated responsibility *during peacetime* for health and medical services personnel.

Summary

In Swedish law, one has elected to combine various roles and powers for command of emergency response operations into a single position, namely the incident commander. The incident commander has, from a societal perspective and in relation to other participants, been given a strong position and this has been deemed as a way of achieving an effective fire service. A distinct command organisation that also permits rapid intervention has been one of the starting points and arguments when the incident commander role was created.

At municipal fire brigades, the chief fire officer is the incident commander, but he or she can appoint someone who satisfies the prescribed eligibility requirements to be the incident commander. The relationships between the chief fire officer and an incident commander that he or she has appointed, was first addressed in the preliminary work for the current Civil Protection Act. It should be noted here that even if a person other than the chief fire officer is the incident commander, the chief

fire officer retains overall responsibility for operations and may issue instructions to the incident commander.

The incident commander may, when so needed, request official duty. There have been provisions corresponding to official duty in the event of forest fires since the 1700s. Everyone between the ages of 18 and 65 is obligated to participate in a *rescue service* upon request from an incident commander to the degree permitted by his or her knowledge, health and physical abilities. This is an instrument that is to be used with restrictiveness and in principle only when the need for personnel cannot be satisfied in any other way. A decision on performance of official duty may be appealed, but applies even if appealed.

The incident commander has the legal right to infringe upon the rights of others during an emergency response operation. This provision provides latitude for a number of actions. Legal regulation of fire brigade officers in infringing upon the rights of others can be traced back to the 1800s. An infringement may be made if disproportionate efforts would otherwise be required to avert danger. Furthermore, the interests threatened and that are to be protected must always be of considerably greater importance than the interests that would be sacrificed through infringement. A decision on infringement upon the rights of other may be appealed, just as a decision on performance of official duty. Here as well, the decision applies even if appealed.

Government authorities and municipalities are obligated to participate with personnel and property in an emergency response operation upon the request of an incident commander. Such a provision was enacted in legislation during the mid-1980s and was a part of several measures for creating a more effective fire service. The obligation to participate does not apply if involvement would seriously hinder the body's normal operations and it is up to the requested body to determine if this is the case. This legislation does not appear to permit a requested body to take consideration, for example, as to whether the emergency response operation is of such a degree that involvement is actually needed or whether assistance can arrive within a reasonable time.

In the event of large-scale emergency response operations, the government may permit or even order a county administrative board or other government authority to assume responsibility for the fire brigades in one or more municipalities. The government has exercised this authority and stipulated that when large-scale emergency response operations involving municipal fire brigades are appropriate, the county administrative board may assume responsibility for fire brigades in the municipalities affected by response operations. An embryo to similar provisions can be seen in the Forest Fire Act from 1914. It should be emphasised that current provisions apply to assumption of full responsibility for the fire brigades in one or more municipalities, and not just the pertinent emergency response operation. It has been recognised that with consideration to preparedness for new emergencies in the pertinent areas, that it is important that emergency and rescue resources be allocated in a suitable manner. In the event of other emergencies, it is therefore important that the command body has a sufficient overview so as to be able to make appropriate weighings from a wider perspective. This has been considered to

support a county administrative board in assuming full responsibility for emergency and rescue services within the pertinent area.

An incident commander may command not only resources from his or her own fire brigade but also from other brigades and other emergency services. The fundamental principle is that the incident commander exercises command over his or her own fire brigade as well as supplemental units. Such provisions can also be seen in older fire service acts. At the same time, it should be emphasised in regards to supplemental units that the duty of the incident commander is primarily to decide upon the orientation of operations on a general level and to take responsibility for coordination tasks. When units from the Swedish armed forces participate, the incident commander leads operations through instructions to unit commanders; however, the incident commander should not exercise the right of command over the personnel in a military unit.

The police at an incident site have a number of varying tasks to perform. Police operations at the incident site should be viewed as operations conducted alongside actual rescue work. The police have a clearly regulated chain of command and during operations conducted jointly by several police officers, it shall be clear as to who is in command. According to the general guidelines from the Swedish National Police Board, in the event of extraordinary events, a police incident officer should be appointed who leads police operations. One should note, however, that there is no legislation concerning any additional powers specific for the police incident officer, but rather he or she has the same powers granted to all police officers and any powers that a police authority has delegated to him or her.

Health and medical service personnel's work at an incident site should be viewed as work that is conducted alongside the emergency response operation and under the command of their own supervisor, such as a medical incident officer. In principle, the incident commander has no right of command over health and medical service personnel. However, health and medical service personnel must naturally accept working under the conditions necessitated by the overall structure that the incident commander has established for an emergency response operation. Just as an incident commander must strive to facilitate the work of health and medical service personnel, they must conduct their work in a manner that does not unnecessarily hinder emergency response operations. Even if the incident commander does not have the right of command over health and medical service personnel, space must be provided for the mutual adaptation and influence necessitated by joint operations. It is entirely clear, however, that the incident commander may never exercise control over actual medical response activities or health and medical service personnel who are not working at the incident site.

The regulation of command relationships in health and medical services has adopted greater latitude in decision making by the respective heads of medical services, and the various physician positions, such as assistant physician, senior physician or chief senior physician are not described in legislation as previously.

There is no legal regulation of who should command health and medical service personnel at an incident site. Similarly, there is no regulation of how command

relationships between supervisory staff at hospitals and personnel at incident sites are to be structured. Such relationships must be regulated through agreements, local ordinances, job descriptions and similar means.

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Stefan Svensson

7. The theory of fundamental tactics



Stefan Svensson started his career as a firefighter in the Swedish Air Force in 1986. In 1989 he earned a Bachelors degree in fire protection engineering and in 2002 a PhD at Lund University in Sweden. During the last sixteen years he has been involved in experimental and theoretical investigations on firefighting tactics, including firefighting methods, as well as problems related to command and control. The safe and effective use of firefighting resources is a particularly important feature of his work. He is also the author of several books, scientific articles and reports. He is involved with his local fire brigade as a firefighter/crew commander, and as such has the rare ability of being able to apply his scientific knowledge in a very practical manner.

Tactics are based on using resources effectively with consideration given to the need for assistance, the dynamics of the situation and the requirements of the situation primarily, for the purpose of gaining and maintaining control. With a few introductory lines as a starting point, we shall discuss below a tactical approach as the basis for emergency response, i.e. in situations where society provides resources to assist in connection with emergencies or impending danger of emergencies.

The emergency and the damage it has caused shall be dealt with, and normality, to as a great a degree as possible, shall be restored. The emergency generates an emergency response operation, which regardless of the size of the incident or the response operation, involves taking measures to ensure that victims can be returned to normality as far as is possible, from the perspective of the victims.

When these measures are taken, society has resources available in the form of personnel and equipment. It is of course important that these resources are used as effectively, considering the circumstances of the incident that has occurred. At this point we can begin to think in terms of tactics.

The term tactics is often used in connection with sports and sporting events, most commonly in connection with group activities. We can also talk about tactics in connection with, for example, chess or with party games. The various pieces on a chess board can only be moved according to certain rules, i.e. according to certain set patterns, and the situation must be handled according to these rules. The pieces have different tasks in the game and the players have to use their pieces in the best possible way, by making optimal use of their different qualities. These qualities must be applied effectively, partly in terms of each piece and partly in terms of all the pieces as a unit. This can be compared with the situation at an incident site where different team members can have different qualities or properties – BA equipped firefighters can work in dangerous environments, the pump operator ensures that sufficient water is supplied etc.

Put in simple terms, tactics is about applying the right thing at the right time, as well as possible (Svensson, 1999). Put another way, tactics is a pattern of thoughts and actions applied to achieve the best possible result (Fredholm, 1990). An emergency response can be likened to the game of chess, with both pieces and rules.

A tactical approach

An important starting point for executing emergency response operations is to have a fundamental approach to how one tactically handles emergencies, i.e. how one in basic terms should handle emergencies, and the development of an emergency using resources to provide the victims with the best possible assistance. This is what we can call a tactical approach.

In simple terms, tactics concerns creating a functional and effective body made up of parts, a body concerning processes, not structures. Tactics therefore encompasses what and how something is to be done, not who it is to be done by. Within this basic idea one can identify five essential aspects, with their associated phenomena, which must in different ways be taken into account.

- Measures
- Optimisation
- Context
- Dynamics
- Control

A tactical approach is about handling all the phenomena that are associated with these aspects simultaneously and continuously in time and space.

It is also about building the aspects into a system with the result that the parts collectively give more than simply the sum of the separate parts. The relationship between these parts is at least as important for characterizing the properties of the system as the parts are in themselves.

Measures

To, in any way, achieve results in connection with emergency response, i.e. to provide assistance to those requiring it, resources must be provided. When resources are used in different ways, for example, at an incident site, it can be said that we initiate, coordinate and execute certain measures. The measures are executed therefore by the resources allocated to the task. (In some cases a resource is called a “unit”, which is an organisational designation for the resource, i.e. the resource is tied to a specific place in an organisation.) Such a unit is normally made up of people (personnel) and machines (technical aids). And it is normally with the help of units that measures are performed.

An extinguishing measure is an example of a measure, consisting of a task (extinguishing the fire) and the resources for this (a firefighter, water, hose and nozzle). Other examples can be making holes in a roof to ventilate combustion gas (ventilation measure), releasing vehicle occupants trapped as a result of road traffic accidents (extrication) and the sealing of a damaged tank that is leaking carbon disulphide (sealing measure). Measures can also be of a more abstract nature or have a more general function, i.e. obtaining more resources, organising distribution of resources between two different emergency responses or in various ways informing the public of a course of events. Note also that “command” can be taken as a measure in itself, i.e. as a type of resource with the task of controlling, distributing resources, adaptation, correction and handling of measures that have collectively been initiated, coordinated, and executed in connection with the emergency response. Such a “command measure” shall, in addition, handle itself and adapt itself to suit circumstances.

In this context in which we are considering tactics, measures can be thought of as the smallest parts of a larger whole, a system, and it is only through initiating, coordinating and executing the measures that results are achieved. Note that even a “non-measure”, i.e. not doing something, can be just as significant, providing that it is the result of a conscious decision. Such “non-measures” can be just as important for the outcome of a response operation as the executed measures.

As, then, it is only through applying measures that a result can be achieved, decision makers should, with respect to emergency response, have a thorough know-

First, each separate measure must be executed as well as possible. This requires, for example, that the resource that the measure is based on is appropriate, functional and sufficient, that the personnel are competent and that the measure is adequate in relation to both the resources and the desired result. It is, for example, not effective to obtain equipment, if one does not, at the same time, ensure that it can be used, e.g. through training and exercises. It is also not effective to assign tasks that are unreasonable in relation to the resources available or the expected result. Assigned tasks must also be logical with regard to the prevailing circumstances.

Secondly, in most cases when a measure is initiated, coordinated and executed, it is done so in combination with other measures. This involves that the order of events or the pattern by which the measures are initiated and executed must be such that the result of the combined measures is the best possible. In addition it is important to ensure that when two or more measures are applied they do not affect one another negatively in any way.

The result of an emergency response is consequently based on the initiation, coordination and execution being as effective as possible, with regard to, among other things, other measures and the prevailing circumstances at the incident site or generally with respect to the response operation. In this connection we can use the term optimisation, i.e. Determining the best solution for different types of problem. Tactics can thereby be thought of as an optimisation problem.

Context

The measures that are initiated, coordinated and executed must be placed in a context. Also here there are two aspects to consider (Svensson, 1999). Partly the collective measures that are initiated, coordinated and executed constitute a context. Each individual measure shall be included in that context, i.e. together with other measures. Consequently, when a measure is initiated, coordinated and executed it must be done bearing in mind the other measures. The collective whole that is initiated, coordinated and executed should, logically, have some effect on the result.

The measures shall partly be initiated, coordinated and executed with regard to the greater context, i.e. in relation to the situation. The purpose of initiating, coordinating and executing the measures is to solve one or several problems. The measures shall therefore be initiated, coordinated and executed in a context that is essentially made up of the problem(s) that need to be solved, i.e. in a particular situation. The context is an important basis for which measures should be initiated, coordinated and executed and in which order. It is therefore important to be able to identify the context and the problems that have to be solved, in the short and long term. The context influences both the choice of measures and how and in what order they shall be applied.

Dynamics

The purpose of applying different types of measures is to physically affect the development of an incident or accident in different ways, i.e. physically influence events and solve problems. During firefighting, for example, water is used to cool down the fuel, prevent pyrolysis (arrest the build up of flammable gases) and thereby prevent

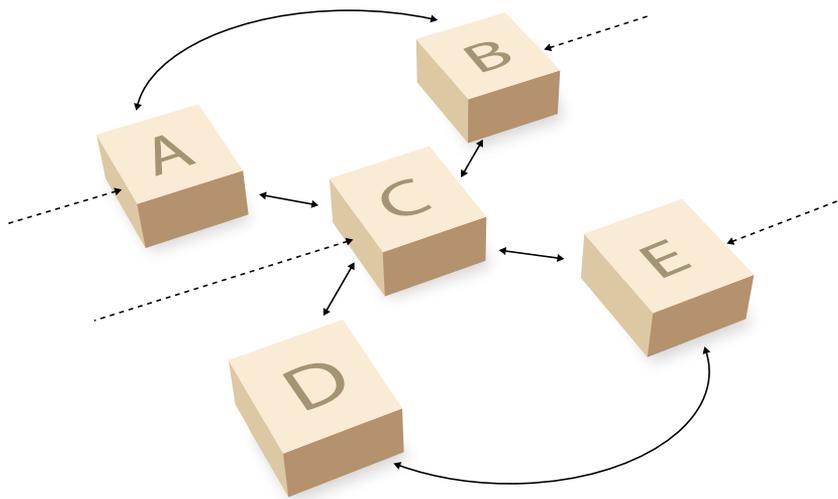


Figure 2. Measures exist in a context in which the context and the measures can vary in time and space.

further combustion. Even the distribution of resources between several simultaneous response operations essentially concerns influencing the physical development of the respective response operations. When resources are distributed between several simultaneous operations, consideration must be taken for how this will influence the course of events of the individual operation.

The measures that are initiated, coordinated and executed together with the development of the emergency create a dynamic situation, i.e. a time and space dependency, between different types of measures, between the respective measures and the course of events of the incident, and between several measures and the course of events of the incident. It is perhaps worth reminding ourselves that the incident or accident will develop whether the measures are initiated, coordinated and executed or not. It is in this dynamic situation, i.e. in the interplay between the measures taken and the emergency that tactics come into play. Tactics concern, consequently, the process in the system, not the structure.

Handling the resources and measures can be thought of as taking place in a dynamic context. Both the initiation of a specific measure and its coordination and execution must be done based on the context, which depends partly on the situation and partly the collective measures. The choice also depends, naturally, on the result that is expected to be achieved by as much the individual measure and the measures collectively. Similar reasoning also applies to resources in a larger perspective.

It is very important that all those involved in an emergency response are very familiar with the dynamics that influence the development of an incident or accident, whether measures are taken or not. It is also important to link these dynamics with the effect of the emergency on the victims, on property and on the environment, as it is the assistance requirements consequent upon the emergency or impending danger of one that must be in focus.

We should also bear in mind that the dynamics in a system, to a large extent, is governed by the system's energy and mass balances. The energy balance for a system shows how energy is supplied, transformed and removed in the system. The mass balance for a system describes the balanced relationship between the mass that is supplied to the system, the mass that flows out of it and the change in mass within it. The dynamics can often be described, explained or understood through basic principles of physics.

Control

The purpose of executing emergency response is to answer a call for assistance that has arisen due to the occurrence of an emergency, by initiating, coordinating and executing measures to gain and maintain control over it. Here we can take up the general purpose of emergency response operations – to gain and maintain control (Svensson, 2002).

To gain and maintain control it is normally necessary to meet four general conditions (Brehmer, 2000):

- There must be a goal (goal conditions).
- It must be possible to determine the status of the system (observation conditions).
- It must be possible to change the situation in the system (change conditions).
- There must be a model of the system (model conditions).

It is only through control that the progress of events can be steered in the desired direction, and it is through initiating, coordinating and executing measures that control is gained and maintained.

Control can also be described as how actions are decided upon and executed, where the degree or possibility to influence the system and on different levels through a particular measure is an important aspect. From this aspect four characteristic grades of control or levels of the function can be identified (Hollnagel, 1993):

Scrambled control. In this mode the event horizon is limited to the present, meaning that past events and future possible outcome are not taken into account. The choice of the next measure/event appears to be a random one and only one goal at a time is taken into account. The scrambled mode includes the extreme situation of zero control.

Opportunistic control. The event horizon contains one measure/event that is chosen to match the present situation and with only minimal consideration for long term effects. Previous activities are taken into account to some extent in that the next one is chosen to match the previous one. Opportunistic control mode is when the constructs are inadequate, either due to lack of competence, an unusual state of the environment, or detrimental working conditions. In addition full advantage is not always taken of feedback.

Tactical control. Here the effects of a measure are taken into account in the light of what has previously been executed. The next measure/event is chosen (to a degree)

carefully in detail, based on plans and with consideration for its potential effect. More than one goal is taken into account. In this mode, performance more or less follows a known measure or regulation.

Strategic control. In this mode the decision maker/commander is fully aware of the course of events and makes careful plans for handling the situation, which requires initiation, coordination and the execution of specific measures/events. The event horizon includes previous events and future developments, even if the number of stages that can be planned for may be limited, even for experts. In strategic control mode the functional dependencies between task stages and interaction between multiple goals will also be taken into account in planning.

The scrambled and strategic control modes represent two extremes, while the opportunistic and tactical control modes are the most commonly applied levels. The purpose of using these control modes is mainly to be able to describe how execution changes between the control modes, depending on both the outcome of measures and events and the time available. Other parameters that can influence the control mode are the number of simultaneous goals that are set, available plans, understanding of the event horizon and the condition at execution level. Note that these control modes are theoretical constructions. In reality the degree of control varies continuously. Important aspects that should be taken into account are:

- The transition between control modes and the reasons for such transitions.
- The characteristics of a given control mode.
- The interaction between competence and control.

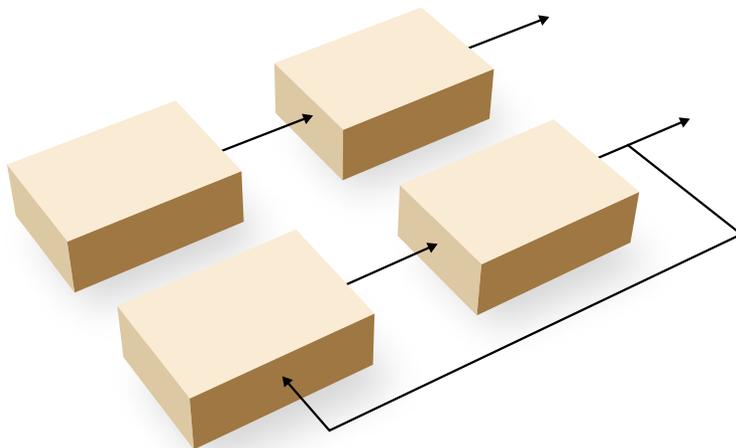


Figure 3. Control via feed-forward (top) and control via feedback

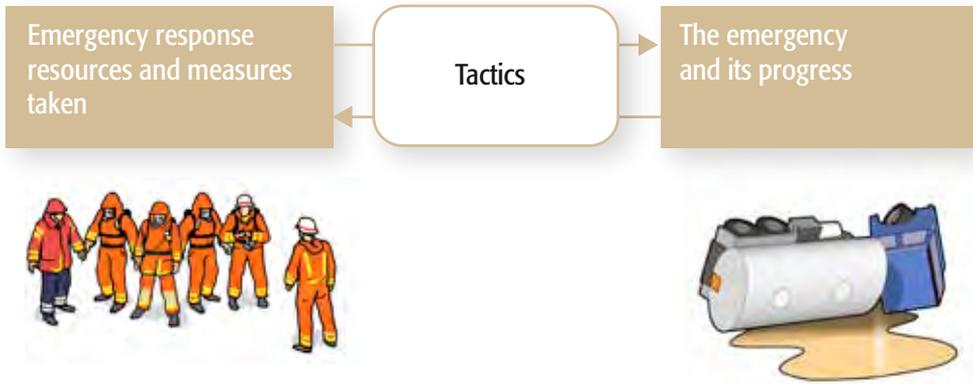


Figure 4. Tactics are the link between the resources engaged and the emergency.

Here aspects such as *feedback* and *feedforward* can be of significance. Normally, opportunistic control is motivated through feedback, i.e. based on a continuous flow of signals that are given by the system. This means that feedback is critical, i.e. that it may be necessary to correct signals and relevant information coming from the system. In a similar way, we can say that strategic control, to a large extent, is motivated by feedforward, meaning, in simple terms, that one acts according to a plan and without information from the system. A simple example of feedforward is planning for future activities that one really has no information about. With time, as events unfold, information is gained and one can then adapt plans to suit the actual situation. The situation then becomes influenced to an ever increasing degree by feedback. Acting on the basis of feedforward generally requires greater competence than acting on the basis of feedback, as this requires the creation of accurate models of the system to be controlled.

In addition we can say that greater competence increases the likelihood of control being maintained in the system both in the short and long term, regardless of how the system is defined. Finally we can add that there is a connection between control and available time and space. That is to say, the less time there is available or the greater the space there is, the more difficult it is to obtain a greater degree of control. However, it is very often the case that it is more important to gain greater control, the shorter the available time is and the greater the space is.

Miscellaneous

The reasoning around measures, optimisation, context, dynamics and control is applies regardless of the size of the system and how it is defined. In the same way as it applies to a single emergency response operation or even a small part of a single operation, it also applies when the needs and division of resources have to be managed, for example, between several simultaneous emergency responses. Also in this situation, measures should be optimised based on, among other things, the need for assistance of the various response operations, the need for maintained emergency preparedness and assessment of risk. The control aspect is applicable also in this context, where the degree of control (in time and space) will vary.

A tactical approach should always be strived for, regardless of the type of organisation, physical location, and system limitations. (Svensson, et al. 2005)

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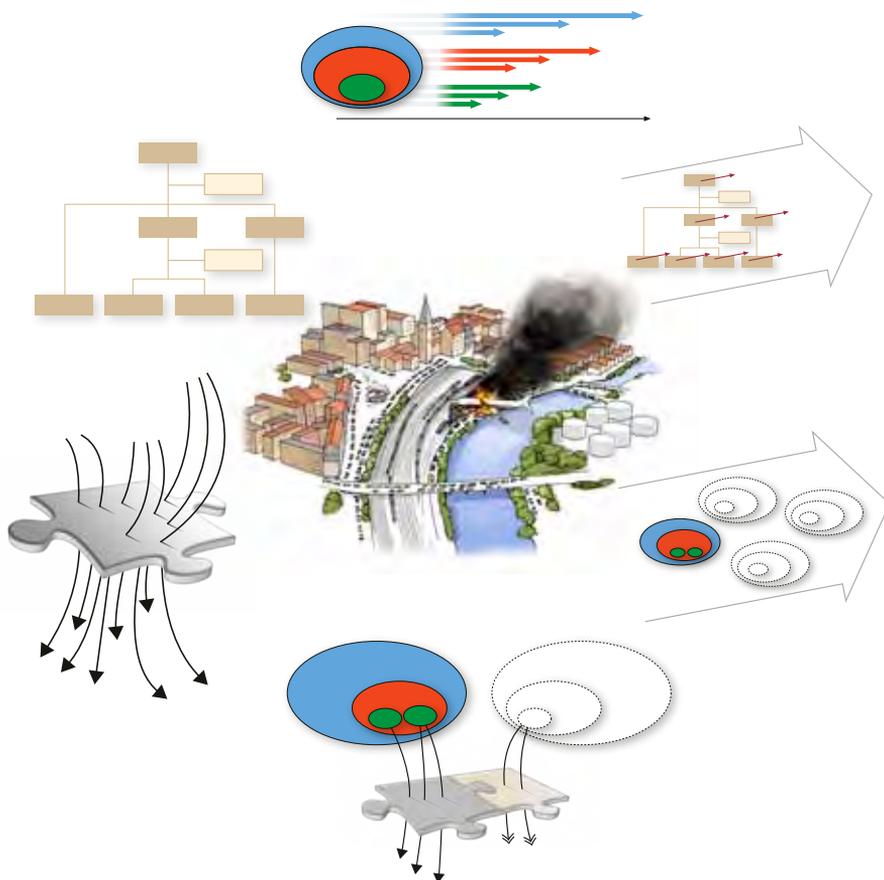
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**Erik Cedergårdh &
Thomas Winnberg**

8. Structuring a command organisation



Erik Cedergårdh is a fire protection engineer and a command analyst tasked with developing command capacities in the Greater Gothenburg Fire & Rescue Service. Erik also works with the development of cooperation between different organisations in the field of crisis management. Erik has worked as an incident commander since 1985 and currently serves as a chief fire officer. For many years he was involved in the national development of the municipal fire brigades on different projects for the SRSA; and now works for the MSB on similar development projects. He is a co-author of *The Elements of Command & Control - the general principles of command & control in fire and rescue operations*, and *Tactics, command, leadership*.

Thomas Winnberg currently works as a chief fire officer in Kiruna. He worked as an incident commander and staff officer at Södertörn Fire and Rescue Service for a number of years. His duties included emergency prevention and emergency response activities. Since 1996 he has participated in the national development of municipal fire brigades on different projects for the SRSA. He is also involved in the training of personnel for international emergency response operations. He is a co-author of the book *Tactics, command, leadership*.

A prerequisite for effective *rescue services* is the capacity to execute measures and apply resources in order to provide for different needs for assistance and risk and threat assessments. We regard the municipal fire service and its operations as a part of society's management of disturbances and emergencies with the view that society's collective response must be structured to form a total body that can meet all assistance needs. Through involving other bodies at an early stage the need for assistance can be addressed in an anticipative manner. Exercising command involves integrating different, complex and dynamic processes to the purpose of achieving a result, which through executing measures, will meet an assistance need. An assistance need is in itself a dynamic and complex process. Exercising command concerns being prepared for the need for assistance that can arise as a result of current risks. It also concerns gaining and maintaining control over destructive events at the same time as creating the conditions to allow victims and affected organisations to respond on their own accord.

Descriptions of what we feel are some of the most tangible developments and requirements within the municipal fire service follow. This is followed by a discussion on whether or not society's collective capacity is required to meet the total need of assistance and its consequences. Here we describe what we have chosen to call anticipative command. The main part of the chapter is a model with a system design including several dimensions. The model is based on the operational developments which are currently discernable in municipal fire brigades and is meant to serve as an aid to allocating authority within the area of response operations. Our central theme is that development in this area concerns creating the ability to adapt between command structure and the demands placed by the immediate needs for assistance in time and space. Action preparedness is needed for possible alternative incident developments and to redirect operations. Finally we explain the importance of cooperation between command processes in the various organisations with different assignments in society (public services) and that are involved in the complete spectrum of assistance needs. The descriptions are based on municipal fire brigades, but the majority of our reasoning is applicable to other organisations also. The chapter is based on literature on the subject and practical experience from municipal fire brigades. The section that describes command system structure is based on the book *Effective Operational Command* (Johansson 2000) and *Elements of Command & Control* (Swedish Rescue Service Agency 1998). The part concerning organisational aspects has been compiled with the help of Erna Danielsson and her research.

Command development

Over the years various measures have been taken to reduce the amount of injury and damage inflicted on society. The measures have been based upon the problems of the respective periods. For example extensive town fires were reduced through, among other things, a reappraisal of town planning, which resulted in building in blocks. Fires within blocks were reduced through the introduction of stricter building material regulations and firewalls. Buildings became better protected through improved fire cell division. During the 1960s the discussion turned to room fires,

which, among other things, resulted in stricter regulation of the materials used.

The working methods of the fire service have developed in response to these changes. Most fires are now limited to the start object. Many of the changes that are now underway within the fire service are aimed at improving the effectiveness of tackling fires at the start object, through, among other things, improving the ability of individuals to take measures on their own accord at a very early stage. There are still many older buildings in existence and even new buildings can be complicated from a fire technology perspective and can contain large amounts of flammable material. This means that extensive fires can develop if they are not limited to the start object. If measures can be executed at an earlier stage of a destructive sequence than the present “10 minute approach”, the damage caused can be greatly reduced.

In addition to the fire service gaining and maintaining control over the spread of physical damage, the victims of the event need different forms of help and support. The ongoing development aimed at strengthening society’s ability to handle different forms of disturbance and emergency is an incitement for the fire service to develop its command capability. The increase in technical complexity as well as indications from the authorities of the need to develop the command aspect of emergency response operations in the event of major emergencies is reason enough for the fire service to develop its command capability. When major emergencies occur, the Swedish fire service increasingly takes in additional resources from both within and outside the country. It is therefore important that command has the approach of taking in the whole spectrum, covering small to major incidents, and that it is capable of managing emergency responses and other responses involving other public bodies in which the fire service is perhaps just one organisation among several.

Based on the above description of trends, we shall now present some development possibilities within command operations and at the same time discuss some problematic aspects which, in our opinion, are in need of improvement.

Disturbances and emergencies in society

Society’s collective capacity to handle disturbances and emergencies is under development, and in connection with this there will certainly be an increase in the expectations for the fire service command organisation, within the framework of Sweden’s emergency management system. This, among other things, concerns improving the ability to, in cooperation with other societal bodies, provide for the complete spectrum of assistance needs, which involves command organisations being able to assess assistance needs across a broader horizon than simply the technical ones. This could concern expressions of empathy or handling the consequences as a result of the affects on societal infrastructure.

The structure of overall command is often based on the work load placed on one’s own organisation. In the event of social disturbance, overall command for the fire service needs to be operational even if no fire brigade resources are directly involved. A command operation involving several bodies in addition to the fire service can need to be implemented when there are indications of social disturbance. In addition, active involvement is expected in various crisis management contexts even if the incident is not considered legally to be the responsibility of the fire service.

Future development may perhaps entail making continual threat analyses for the whole municipal sphere. Command staffs need therefore a good understanding of how disturbances and emergencies affect other societal bodies and society at large.

Assistance needs in focus

Development of command operations tends, to a large extent, to be limited to routines and coordination within the direct organisation. This is naturally necessary, but fire brigades need also increasingly to focus on assistance needs and what they accomplish. The key aspect is to gain early control over the destructive sequence. The task of command is to implement tactics that will address the immediate need for help. But tactics and control concepts are still not well enough developed within the different levels of the fire service; they are more oriented towards the work of the incident commander. In our opinion a common approach as to how to handle tactics at every level in the organisation could benefit development. A focus on gaining and maintaining control over the destructive sequence and taking responsibility for all assistance needs, should permeate the whole organisation.

The development of municipal fire brigades as one body among several in a larger societal perspective should form a basis when assistance needs are to be met. In addition to technically oriented measures, the fire service should, as a representative of the municipality, be able to address other assistance needs. This could involve encouraging victims to take initiatives or to function as a link to other help organisations. At the same time as separate and different organisations develop their own emergency management capability, the fire service should develop its ability to adapt the measures it applies to take into account the measures taken by the victims. What we mean by this is that fire brigades need to focus their efforts on both the victims and the destructive sequence (e.g. the actual fire) to a greater degree than they have in the past.

Assistance needs affect the structure of command work

Municipal fire brigades often organise themselves on the basis of one and the same structure, regardless of the nature of the emergency and the relevant command requirements. There is a need to improve the ability to identify assistance needs and command requirements in order to adapt operations to suit the situation at hand. The demands placed on command can also vary between different phases of an incident. Sometimes the exercise of command tends to come to a standstill after awhile. When initial measures prove inadequate in relation to the destructive sequence, it can be necessary to apply new measures to meet the current need for assistance. Even working methods and organisational structure need to be flexible during an incident, to be able to adapt and respond to command requirements.

The municipal fire service needs therefore to be structured so that it can rapidly gather force and resources in the event of major incidents and be able to increase resources relatively quickly to address incidents that become more extensive. There must be a capability to handle everyday as well as major emergencies and incidents that put a strain on public services.

The development towards small *unit*, at the same time as the risk situation still encompasses the possibility of major emergencies, means that fire brigades must be able to 'change up a gear' as the need arises. Division into units is one way of making resources manageable, not least when time is short, for the command organisation. Each unit should be able to function independently. Normally fire brigades organise themselves into pre-determined units. We mean though, however, that to create flexibility with respect to the assistance need, it is necessary to be able to adapt the formation of the units to suit the particular type of situation. We think, in the future, that the term units will probably be used to mean *abstract units*, i.e. several conceivable combinations that are known throughout the whole organisation.

Senior command for response operations tends essentially to work with logistics, information and emergency preparedness. It is therefore necessary to develop active command work, oriented towards the whole organisation. In some cases measures are initiated too late in relation to the course of events of an incident. Consequently it is necessary to develop an anticipative method of accommodating different assistance needs. This implies having the ability, at all levels, to implement measures based on indications of needs *before the problem arises*.

Sometimes the course of events develops in a way not anticipated by the command organisation. It is then especially important to have gained the ability to assess conceivable developments, plan for and execute measures to counteract them and try different approaches to, as necessary, redirect one or more emergency responses.

The future may see many alternative working methods. More and more information is being issued to individuals and organisations to enable them to apply measures at a very early stage in the event of an emergency. This could result in resources from organisations other than those normally involved today, being included in the planning and becoming involved successively during the course of an emergency. This kind of flexibility would probably place a greater demand on command during the initial stages of an emergency response than is the case today. It could among other things involve increasing the ability of the fire service to adapt its operations to suit measures that have already been taken by those who arrived at the site of the incident earlier.

Sometimes it is said that individuals in the command organisation should "back off" when involved in a major emergency response operation. To "back off" often implies to act on a larger scale geographically, organisationally and time wise, which can result in placing unreasonable demands on that individual. Command operations therefore need to be developed so that the change up in gear is reasonable in relation to abilities of the individuals involved.

Emergency preparedness adapted for emergency response production

The approach to emergency preparedness within the fire service has traditionally been relatively unaffected by changes in risk and threat assessments. Increased knowledge and a more developed view of how a risk situation changes with time, over a 24 hour period for example, illustrates the need to actively allocate resources to cope with these changes. This involves a command organisation allocating resources during emergency preparedness production that are based on long term follow-

up of operations and continual investigation. It could then, for example, with the help of comprehensive statistics, be possible to establish when and where an emergency is most likely to occur within a municipality. By *emergency preparedness production* we mean here a capability to, as required, allocate the resources necessary to execute an emergency response operation. Preparedness production also includes the fire service, other bodies and individuals being given the opportunity to prepare themselves for different situations that could arise from prevailing risk and threat assessments.

Meeting assistance needs

According to Lars Fredholm (see the first chapter of this book) the need for assistance constitutes different *needs domains* in the form of rescuing people, safeguarding property, protecting the environmental, survival and function support as well as restoration. In Fredholm's opinion command operations need to be designed to handle *various measures domains* in the form of incidents or emergencies as physical occurrences, people and their social contexts as well as threatened or affected societal functions. The fire service should become involved at a point where it is unreasonable to expect an individual or organisation to handle a situation themselves. In the event of emergencies the assistance needs that arise must be met, this is achieved through applying different measures. A *measure*, in the broad sense, can be defined as an activity executed to achieve a particular result. To inform affected tenants, distribute information to the general public via the media, contact other authorities and, with the help of equipment, have an effect on a chemical emission are all examples of measures. The fire service produces measures to correspond to the physical, destructive sequence, partly with the help of mobile resources, personnel and equipment, partly by using active systems at the incident site, e.g. fire-gas vents, fans, sprinkler systems. To prepare a possible future emergency response operation or to decide upon a particular level of emergency preparedness can also be considered as a measure. The assistance needs that arise in different situations is met through measures in several dimensions.

Even everyday emergencies, which are considered "minor" by the fire brigade, are often dramatic events from the perspective of the victims. It is perhaps the only time in their lives that they receive assistance from the fire service. The victim can be in need of help to initiate his or her own relief process and support to mentally process the events that have taken place. It can concern support in handling the actual experience of the emergency and it can concern more concrete measures. The fire service needs to remain involved until both affected individuals and organisations can themselves manage the problems resulting from the emergency. This needs to occur during the course of the emergency response and continue after the fire brigade has completed its assignment. Larger organisations usually have some form of emergency management facility of their own to cooperate with.

Different public bodies are responsible for providing for the various aspects of an assistance need. The contribution of the different bodies shall, taken together, meet the total assistance need. To meet the total need it is necessary to identify not only

the affected context, but also the elements making up the context. The needs in the affected context influence the measures to be taken and in a longer term the social services that need to become involved.

Affected context

An emergency affects and influences people and their environment physically, mentally and socially. When a person becomes the victim of an incident or accident, his or her social context is also affected by relatives and friends. Even the general public is affected, e.g. by the way in which information about the incident is presented. (See the chapter by Ann Enander in this book.) Emergencies give rise to threats and cause damage to different types of site, for example, offices, houses and flats, process industries, hospitals and clinics, water supply and other aspects of social infrastructure. Disturbances in important societal functions can also occur for other reasons. The consequences for society vary depending on the type of object that is affected. For example, a fire in a crude oil supply installation that is important for Sweden's fuel supply could have serious consequences for society at large. An emergency can also cause different types of physical damage. It could for example involve a chemical emission, fire, landslide or water discharge. Different kinds of damage can occur in different objects. A shopping centre could, for example, suffer from a fire or from flooding. A dynamic situation changes and can for example become more widespread. It could also not expand but become more complex.

There can be many consequences of an emergency, in addition to the most obvious ones, such as personal injury, the spread of fire through a building etc. To create as wide an association horizon as possible, we have therefore decided upon the term *affected context*. As mentioned above people's social situations are also affected, and people are affected by consequences such as a reduction in societal functions. Many can be affected by closed roads or interruptions in electrical supply and telephone services. If, for example, a fire destroys a factory in a smaller community, the whole district may be included in the affected context through, among other things, the threat posed to jobs. An emergency can have consequences for the affected context over a long period.

Aspects of an affected context can be:

- social context
- consequences for those affected, different organisations or for society at large
- geographical scope
- the nature of what has occurred
- dynamics and complexity of the situation

As a fire brigade is often involved at an early stage in an incident, it is important that it has the ability to clearly identify the affected context. Through involving other affected societal bodies at an early stage, the conditions are created for addressing the total need for assistance in an anticipative way. By establishing early contact, society's ability to manage the consequences of different situations within the framework of the emergency management system is strengthened.



Figure 1. An emergency results in various consequences for a community.

Production of measures and the context of bodies

It is necessary for the public sector's various bodies to establish which needs in the affected context they shall address. In our model we use the terms *production of measures* and *context of bodies* in order to discuss how society as a whole can meet the needs of the affected context. The term *production of measures* encompasses all the measures that any organisation in society needs to take, for example an affected business, voluntary organisations and various public sector bodies. We shall focus on the measures executed by public sector bodies.

Public sector bodies need to assess which measures they would most probably apply in a certain situation. It can be the case that measures need to be taken on the part of society even though no single body is legally responsible for doing so. An incident or accident can also have consequences in the affected context that no public sector body can possibly manage.

Different bodies execute different measures in an affected context. An emergency pays no regard to administrative and legal boundaries. The discussion surrounding which public sector body "owns" an emergency is of little significance as several bodies responsible for addressing different consequences in the affected context. The Civil Protection Act (2003:778) stipulates which authority is responsible for "the rescue service function" in different situations. Emergencies often involve injuries that



Figure 2. The measures taken by society encompass both the emergency and many of its consequences for that which has been affected.

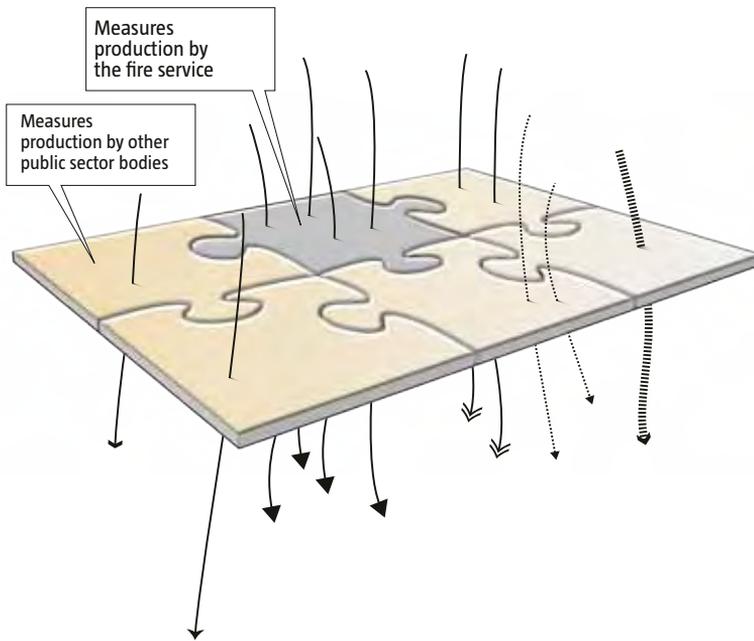


Figure 3. Public sector various bodies respond in parallel and execute miscellaneous measures. We have applied the term “context of bodies” to the activated organisations and the measures production they are responsible for in a given situation.

require medical attention, at the same time as the police need to carry out their investigations. Other victims not suffering physical injury can require assistance from the social services. Several public sector duties need to be executed simultaneously during an incident. To ensure that assistance needs are addressed as well as possible it is important that there is good coordination between the various bodies. The term *context of bodies* in our model implies the current grouping of involve organisations in a certain situation and the collective production of measures they are responsible for. It is the joint activity of these bodies that results in measures being executed in such a way as to address the need of the situation. As the capacity to and the duty of executing different measures is divided up in society, production of measures needs to be carried out through cooperation across administrative borders. Many bodies can become involved if the whole of the affected context and its consequential need for assistance is to be addressed. To influence a process and provide for a need in a dynamic context means being able to organise and execute different measures in time and space.

Anticipative command

The verb to lead can mean to “convey, command” or alternatively “set in motion” (Johansson 2000). To command means, among other things, to consciously influence a system comprising of people and technology (SRSA 1998). It can be seen as a complex and dynamic process to the purpose of, with the help of measures, influencing a dynamic and very often complex sequence of events in the form of a need for assistance (Fredholm 1997). Command is a process aimed at executing tasks in an effective manner to accomplish the overall purpose and intentions of an operation. This process is made up of many different parts. The command process needs to result in the realization of an operation’s goals and purposes in different situations. Other aspects of the command process can concern evaluating through analysing various factors and then compiling them, through syntheses, to form the grounds for decision making. It is often described as a continuous cycle of planning, decision making, application and follow-up (Fayol 1965). The work of command includes being able to define tasks, obtain and manage resources as well as ensure that these resources are used effectively in relation to the situation. Coordination ensures that work is not repeated and that no problems are overlooked, thus enabling work to be carried out more effectively. It concerns managing and preventing friction between different bodies involved in an operation, through adjustment and correction. Coordination is achieved through synchronization of activities, revision of resource distribution, adjustment of areas of responsibility or that the execution of a task is adjusted to suit the situation in some way. Coordination in many cases occurs directly between parallel bodies in an organisation, which should be encouraged in order to relieve higher levels of command. On the other hand higher levels are responsible for ensuring that there is coordination. The various aspects of the command process exist at all levels in a command organisation. During a dynamic sequence the interplay between the different bodies in an organisation is often complicated, which causes the command process not to follow a linear pattern. This complex situation

means that command has to gradually steer operations towards the goal. Through carrying out the process to execute measures before problems arise, command becomes anticipative.

Decision making

Decision making is an important part of command work. Decision making in this context means deciding what will be done, how it will be done and who it will be done by. In the fire service, as in most organisations, it is important that decision making can be divided between various individuals, depending on the demands of the situation.

Leadership is often seen as only being executed by “managers” or “chiefs”. This is how, for example, a decision by the authorities in the form of an “encroachment on an individual’s rights” is made by an incident commander, and commanders at different levels are in a position as the employer’s representatives to formally make decisions and decide which measures should be taken and how they should be executed (Iseskog 2001). But in addition to formal decisions, many and varied decisions are made by everybody involved in an emergency response. These decisions do not relate to the thought process behind employer and employed, but have more to do with, for example, how to execute a task. To take advantage, in practice, of different people’s capacities and creativity to meet the huge diversity in assistance needs, this type of broader application of the term decision is needed to take into account these informal decisions as a complement to formal decisions (Simon 1997). Command then concerns integrating different people’s decisions so that local initiatives benefit the overall outcome. By promoting an organisational culture in which people’s creativity is used, the conditions are established to execute command through *goal oriented control*. Goal oriented control also creates an organisation that can adjust to quick changes in a dynamic sequence of events. In order for it to work successfully under stressful conditions, this approach needs to have been established during the emergency preparedness stage (Zetterling 1995).

It is important that commanders can identify and decide upon different types of *task*. We think of the execution of a task as an activity that is undertaken by one or more people in the organisation. There can be different types of task. For example in a certain situation, a decision could be made on a task involving the whole fire brigade. Another decision could concern a task that involves one or more measures being taken to achieve a goal in relation to physical damage that is being caused. Another example could be a decision on tasks to deal with the anxiety of tenants in a block of flats over an attic fire.

Proactivity

When exercising command during dynamic situations it can be difficult to see, sufficiently early, which measures should be taken. Sometimes measures are instigated too late in relation to the sequence of events. The exercise of command can sometimes be steered by the direct situation, in the meaning that the measures taken are essentially a reaction to direct observations and short term (Fredholm 1997). There is a tendency for neither the structuring of command organisations nor the exercise

of command in general to happen sufficiently quickly or effectively (Fredholm 1994). Exercising command during dynamic situations entails taking measures in good time, sometimes on the basis of weak indications, in a bid to pre-empt a problem. Depending on the context, different terms are used to express an ability to take measures in good time. *Proactive command* and *push instead of parry* (Johansson 2000) are examples of expressions for anticipative command.

A significant factor in exercising command is dealing with different issues in different time horizons. Discussions surrounding exercise of command often take up time scales where different time horizons are referred to. The term *time scale* can be thought of as the relationship between the point in time when a situation or problem is identified and when information is gained about the result of the measure(s) taken against it (Fredholm 1998). A time scale though is not only a measurement of the degree of long term planning, time wise. A time scale can also be described as a measurement of reaction speed from impression or information, via assessment and decision, to feedback of the result (SRSA 1998). Work in short time scales entails that the planning – execution – follow-up cycle is relatively short. Work in long time scales entails these phases being more drawn out. An incident involves several problems with different inbuilt time related demands. Consequently every incident needs to be managed in terms of several time scales (Johansson 2000). At the same time as certain measures have to be managed in real-time, future measures must be planned for. A command organisation therefore must be able to handle several time scales simultaneously (Jaques 1976). (See Bronner (1982), Edlund (1992) and Svensson et al. (2005) for a deeper discussion.)

Developing anticipative command also entails “lengthening time scales” in the exercise of command during emergency responses. The organisation needs to be able to manage both short and long time scales. To be able to work on a longer time scale it is necessary to work on the basis of how a situation will develop. This means taking in and acting upon signals before the incident fully develops. Through identifying the factors that are steering the situation a model of the course of events can be established (Johansson 2000). If decisions are taken on the basis of this model, measures can be executed in good time before problems arise. In this way the time it takes to execute various measures can be compensated for at the same time as a situation is expanding. Through breaking the chain of the negative events causing the damage, control is gained over the situation (SRSA 1998).

Actively taking preventive measures against recognised risk and threat assessments establishes the conditions for a well executed emergency response in relation to the assistance needs that can arise. This type of proactive working method is an important part of the approach to command of emergency response operations while it is also a part of the working method aimed at connecting different phases within the civil protection area.

Action preparedness

At the same time as work is being carried out on one or several response operations in a specific way, one should be aware that it could be advantageous to change tactics. When exercising command it is important to be able to reflect upon non-trans-

parent patterns and the ways in which a course of events may develop. It can be necessary to create action preparedness in order to redirect operations. It must also be possible to handle warning signals of more dramatic changes in the development of a situation. Even if a situation develops as expected, the initial measures taken may not give the sought after result, in which case new tactics and methods must be worked out and applied during the course of the response operation.

Dramatic, unexpected developments can be difficult to handle as they create “operational surprises” (Fredholm 1997). Regardless of how well the command organisation is prepared, situations can always arise that have never been planned for previously, or even considered possible. One occasionally hears such thing as “the incident was very unusual” or “we are not equipped to handle this”. But even if one’s own organisation, during the initial phases, is underdimensioned with respect to resources for a particular type of emergency, the fire brigade is still able to provide for the greater part of the assistance needs via cooperation. It is important to occasionally prepare oneself mentally even for extraordinary eventualities and thereby reduce the effect of being taken unawares. Instead of thinking that a particular type of emergency could never happen, it would be perhaps better to contemplate over how such unlikely situations should best be handled. As people have a defence mechanism for coping with exceptional external stimuli, this type of natural reaction may need to be compensated for by establishing different routines in an organisation. If several command resources are available, one should, for example, detail somebody who was not at the incident site at an early stage, so that he or she can better overview the situation and assess operations. Even higher levels of command have the important task of assessing operations.

Organisational culture

The ability to anticipate, which has been sketched out above is a characteristic that should permeate the whole organisation. In an anticipative organisational culture knowledge and experience is passed between the different phases during work within the area of civil protection. A reflective way of working and a great degree of individualistic initiative taking are important characteristics of such a culture (Senge 1995). When working with a longer time scale, it is necessary, as mentioned above, to be able to create a model of the course of events. The factors affecting the development of an incident must be identified as early as possible. This requires knowledge of human reaction patterns, how different factors work together in a dynamic destructive sequence and how different resource capabilities are formed. However, again as pointed out above, not all problems can be foreseen, no matter how anticipative one is. The ability of the fire service to execute emergency response operations is also required in an anticipative culture.

Command system structure

The command system is made up of organisation, technical command support, management and command, norms, approach and principles. To enable different dimensions to be handled simultaneously, the exercise of command requires an organisa-

tion with clear cut lines of authority between individuals. Our model describes a command system with the following *levels*. To describe the expectations placed on the individuals in the organisation, the allocation of authority for the respective *levels* in the system is described in terms of *decision domains*. The links between the decision domains and time scales as well as control problems are also dealt with in this section. The model is formed for use in the development of command capability within the municipal fire service and can be applied to both small fire brigades and larger, joint fire brigades. It can also be used to analyse the function and capacity of command organisations in the event of different types of emergency response, from a minor to a major response operation and for one or more ongoing response operations.¹

It should be noted that the model simplifies the complexity inherent in command work and that it only concerns response operations. Emergency response operations concern the work connected to incidents and accidents and the imminent threat of them. Even *emergency preparedness production*, i.e. preparation in concrete terms for emergency response and the capacity to maintain a degree of emergency preparedness for possible incident developments and potential incidents, is included in response operations. The description of command system structure is based on that part of assistance needs that the municipal fire service provides, in accordance with the Civil Protection Act (2003:778). The municipal fire service can though, as one body in the total emergency management system, execute tasks that it is not, according to chapter 1, section 2 of the Civil Protection Act, legally responsible for. The exercise of command within the municipal organisation for the fire service can essentially be structured according to the model even if levels of authority as stipulated in the *Civil Protection Act* cannot be applied.

Command system levels

The command system is divided into *system levels*. A system level is a subsystem, which, like the total system, contains technology, norms, organisation etc. The system levels constitute an intermediate stage for identifying different areas of authority, i.e. *decision domains*. Each system level clarifies a specific characteristic in the exercise of command. The three system levels belong to the same system and are subsystems to each other. They are called:

- to execute tasks
- to carry through emergency response operations
- to provide municipal rescue services

The system level to *execute tasks* entails command of groups of resources and the measures that are taken by these resources. From a command perspective a *task* is an activity executed by a resource with the aim of influencing a sequence of events. A task can involve taking one or several measures simultaneously or successively. Resources are grouped on an emergency response operation to execute tasks, i.e. achieve various goals in time and space for different aspects of the assistance need.

1. There is a detailed description of the model in the book *Tactics, Command, Leadership* (Svensson et. al. 2005).

The system level *to carry through emergency response operations* entails command of a single emergency response. System levels are stipulated in chapter 3, section 16 of the Civil Protection Act (2003:778). This emphasises the importance of clear and expedient command of emergency responses and the effective carrying out and completion of emergency response operations. All emergency response measures that, through various tasks, address a total need for assistance should be integrated into an expedient, total solution called an emergency response operation.

The system level *to provide municipal rescue services* entails overall command of emergency response operations within the stipulated geographical area. Within this area one or more simultaneous emergency responses can be executed at the same time as emergency preparedness production is maintained. This system level has the task of uniting the emergency response operation in its entirety and optimising activity in relation to various assistance needs and the prevailing risk and threat assessment.

Decision domains

As mentioned above, the division of the command system into system levels is aimed at stipulating the scopes of authority on which the exercise of command is based. The organisation requires different scopes of authority to be allocated to different individuals in order to allow for individualistic decision making. We identify a decision domain for every system level:

- Task command for the system level “to execute tasks”
- Operational command for the system level “to carry through emergency response operations”
- System command for the system level “provide municipal rescue services”.

Note that the various parts are subsets of each other. This entails that system command has a responsibility for the whole and can affect everything that lies within the system, which is to say operational command and task command. Each decision domain needs to be active in order for the system to react to changes in circumstances.

Task command

Task command entails leading an organisational part of the execution of a divided task for a part of the assistance needs aimed at having an effect locally. This implies, for example, ensuring that one or more measures are executed as effectively as possible in relation to a part of the destructive sequence and to coordinate execution within the organisational part.

Grouping the various measures into tasks entails among other things making optimal use of different people’s knowledge and ability. Task allocation creates the opportunity of solving different parts of a problem through optimal use of personnel. Different measures are often connected in several ways. For example certain measures may need to be applied collectively to a part of the destructive sequence. It can sometimes be the case that some aspects of the execution of measures need to be synchronised in such a way that they are applied as a collective task. Even the affected object’s condition influences how the tasks should be compiled. By grouping resources they become manageable for the command organisation at the same time as the allocation of decision making in the production of measures is accomplished.

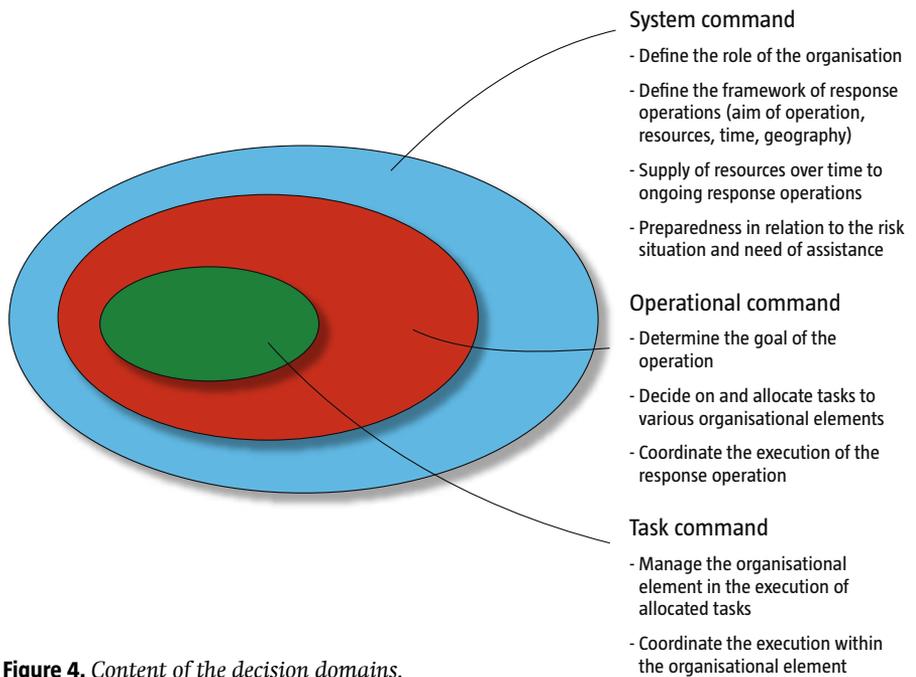


Figure 4. Content of the decision domains.

A task is often described in terms of what is to be achieved, what is to be executed, where and within what time frame something is to be executed and what resources are to be used. Depending on the form of control applied, the method of execution can sometimes be decided upon by superiors (detailed regulation) and sometimes by the task commander, who is allowed a greater degree of freedom (goal oriented or assignment control/tactics) in executing the task (e.g. working method). But even when a task is detail regulated the execution is commanded by those responsible for the decision domain task command. Task command should not be confused with the term assignment command, which is a form of control.

The decision domain task command arises in every phase in which a task is allocated. Task command can arise in different degrees of detail resulting in several decision domains being embedded in one another. A firefighter who, with the help of a tool, forces open a door to search through a flat, executes a task. Another aspect of authority within the same emergency response operation can, for example, apply to the commander who has been allocated the task of searching through all the flats that have become smoke filled, in which the firefighter who forced open the door is a part of the task. By connecting the reasoning to geographical aspects (damage and object) as much as to resource and organisational aspects, we can distinguish between different degrees of distribution of task command.

Different activities, for example, executing various measures, need to be coordinated so that they function well collectively. One aspect of task command is to ensure that the different parts of the execution of the task are coordinated.

Operational command

Operational command is the command of the ongoing emergency response operation “within the framework”. *Framework* entails the resource availability and limitations with regard to time and location. Operational command has to define the degree to which the assistance needs are to be addressed and what the emergency response as a whole is to achieve physically, within the framework of the intentions of system command. This entails deciding upon a goal together for the emergency response with the framework (MMI).

Command of an emergency response operation entails shaping the execution of the collective measures in time and space (production of fire brigade measures) in relation to the dynamics of the total assistance need. Depending on the manageability, the measures in the tasks are connected to different organisational parts. This concerns the tasks that are described above under the heading *Task command* being executed optimally in time and space in relation to the dynamics of the total assistance needs that the emergency response is to address. Operational command decides upon and allocates tasks to the various organisational parts of the emergency response. It is however normal that task command needs to be handled via several stages of distribution. In such cases the superior decision domain task command allocates tasks to the decision domain task command that lies within it.

The assistance needs change during the course of an emergency response, for example, through changes in the physical destructive sequence. Therefore operational command needs to adapt tasks successively in order to steer operations towards gaining and maintaining control. The various tasks also need to be adapted to each other during their execution. This means that the execution of tasks must be coordinated. The tasks shall be formed to harmonise with each other and in relation to the assistance need. Resources need to be applied in such a way that the production of measures is continuous. We have given the person responsible for operational command an official mandate and title, that being *incident commander*. The incident commander is responsible for the overall command of the emergency response within the framework provided by system command.

System command

System command entails among other things interpretation and decisions with regard to the role of the organisation. Applicable laws and ordinances need to form the basis for this, in combination with social and professional values. The role of the organisation in a particular situation is also affected by the roles of other public bodies. System command entails decisions on the working methods for the whole organisation and on establishing general policy. The organisation’s role can sometimes need to be reassessed during the course of an incident. We have given this form of command the official title of *chief fire officer (CFO)*. The chief fire Officer or the person nominated by and to stand in for the chief fire officer, is responsible for

the overall command of fire brigade response operations.

The framework within which emergency response operates is established by system command. System command must also be in a position to influence the goals of an emergency response operation. This implies that the intention of the emergency response is included in the framework of emergency response. It may also be necessary for system command to decide upon the extent to which assistance needs are to be addressed in a particular situation.

In order for command to be anticipative, the provision resources for an ongoing emergency response must be guaranteed (planned, acquired, distributed) over a period of time. In order to balance the provision of resources with one or more emergency responses and emergency preparedness, it is necessary to assess the current assistance needs and weigh them up against the prevailing risk and threat assessment. The weighing up of resources between emergency response and emergency preparedness, such as the intention of different emergency responses, can require phasing to optimize the effect of fire service operations in terms of total assistance needs in the municipality. A degree of coordination between emergency responses is also necessary. In order for operations to function in response to changes in circumstances, surveillance of circumstances plays an important role in system command.

Decision domains and time scales

As the problems involved in a situation can be related to different dimensions just as much as different time horizons, it is possible to identify the need for handling both short and long time scales for each decision domain.

If the work load is reasonable, the commander of the relevant decision domain can handle issues that must be addressed on both the short and long term. But with a greater work load, extra manpower may be needed to handle issues entailing both short and long time scales (see the section *Increasing command capability*).

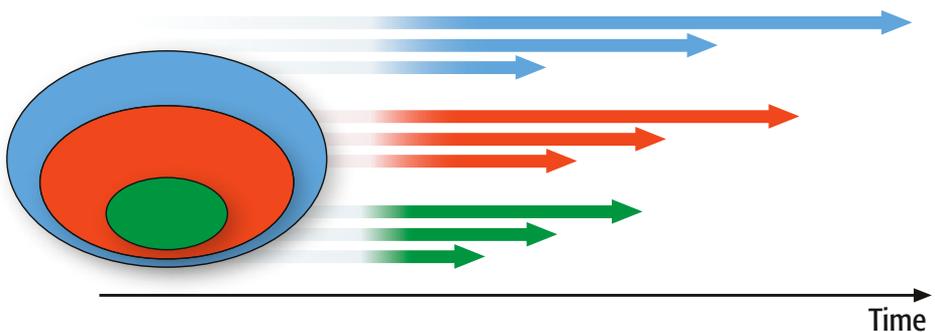


Figure 5. Since decision domains represent different dimensions there can be a need to handle both short and long time scales for every domain. In order for the system as a whole to be anticipative, the longest time scale in a surrounding decision domain must be longer than the time scales that exist within it.

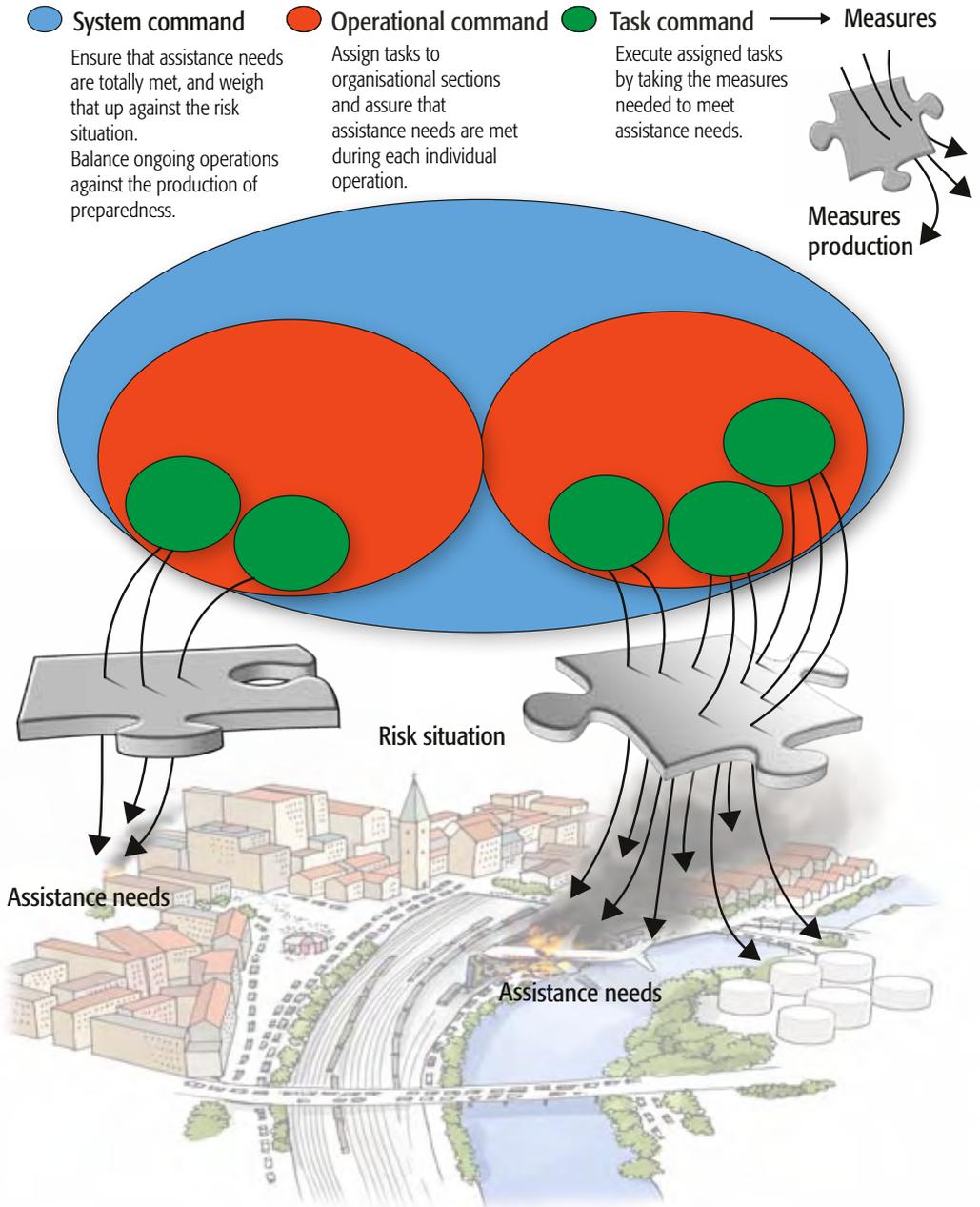


Figure 6. Several assistance needs and risks must be met and taken into account from all the decision domains.

The time scale sets the limit, and for the system as a whole to be predicative the longest time scale in the higher decision domains must be longer than the longest time scales of those within it (Johansson 2000). If this is not the case, the system as a whole loses its proactivity.

Limitations can for example arise for the commander in a particular decision domain if one assumes that certain resources can be allocated without conditions being set. If the outlying decision domain gives short notice of the fact that the resources being considered are unavailable, there is no advantage in forward planning.

The connection between decisive action and decision domains

One command task, among others, is that of producing measures in time and space that will break the negative chain of events of the destructive phenomenon. The purpose of the measures applied against the physical destructive sequence is to interrupt this negative development and steer events in such a way as to minimize further damage. To influence events so as to gain and maintain control, measures must be executed in time and space sufficiently well (see Stefan Svensson's chapter in this book). An important aspect of exercising command is that of taking decisive action to gain and maintain control of, for example, a physically destructive cycle of events. Control begins to be gained when the emergency response measures steer the development of the situation to a greater degree than the destructive elements. Decisive action entails gaining and maintaining control over the situation and turning a negative situation into a more favourable one for those affected and for society generally.

The decisions taken in every decision domain are aimed at forming and achieving the tactical intentions. Consequently, tactics exist in every part of the command organisation. This entails distributing resources on the basis of their capacity in time and space to oppose the destructive sequence of events and address the remaining assistance needs. On the other hand there is considerable variation between the "degree of distribution" in the different decision domains in terms of object, damage (degree of concreteness, geographically etc.) and resource. All commanders in the command organisation must in different ways act and work towards using resources as effectively as possible.

The tactics within the decision domain task command concern gaining control locally over the destructive element. This can, for example, entail initially executing a certain measure to reduce the effect of the destructive element and then execute a follow up measure against the damage caused. Operational command is concerned with allocating tasks in time and space in such a way that the goal of the emergency response is achieved and control over the destructive element is gained and maintained. System command has the task of making the tactical assessments surrounding the distribution of resources in time and space, with regard to capacity and achievement and in relation to the destructive sequences in the municipality as a whole. This can entail transferring resources at an early stage to provide for a possible need for a rapid increase in resources (changes in resource capacity over a period of time at a certain location) for one of the ongoing emergency responses.

A tactical move by system command may also entail revising the intentions of respective emergency response operations in order to achieve a phasing of activities. The degree of distribution in handling resources also varies between the different decision domains. Resources are distributed in time and space within each decision domain on the grounds of capacity and in relation to the destructive element, but in different dimensions. Control must be gained and maintained, as much in the event of an everyday response as in that of a major emergency, for the system as a whole, for every individual emergency response operation and for every task.

Organisational aspects

The design of a command organisation is based on various organisational and legal grounds as well as on the allocation of resources. A prerequisite is that the work is allocated carefully and reasonably between the individuals in the organisation. Bearing this in mind; we would like next to illustrate the factors influencing the different ways of organising command to effectively provide for the assistance needs.

Organisational foundation

The design of the fire service as well as other bodies is governed by legislation and regulation. There is an answerable authority; and in the case of the fire service this is the municipality, which must operate the service in accordance with the Civil Protection Act. The municipal fire service is a *hierarchically structured bureaucracy*. An advantage of a hierarchical bureaucracy is that it is easy to understand and follow. But hierarchy and bureaucracy are today negatively loaded terms, often associated with being complicated, ineffective, inflexible, to the letter etc. One can easily forget that it was originally associated with order, reliability, predictability, equality and other positive values (Weber 1987).

A hierarchical system of organisation is normal in authorities and most large organisations. The various authorities organise themselves in this way to provide

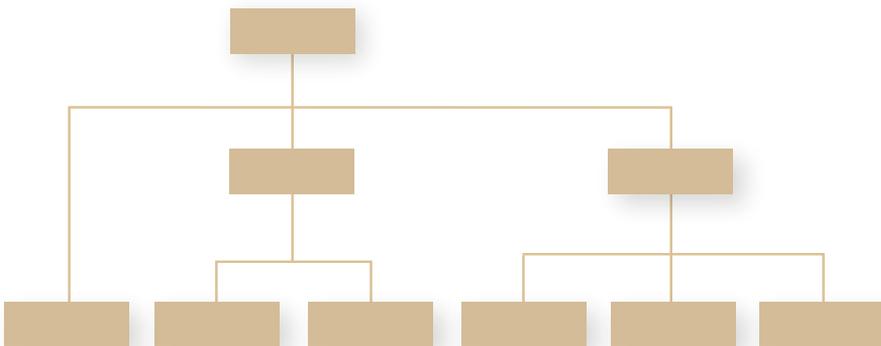


Figure 7. Hierarchical organisation structure.

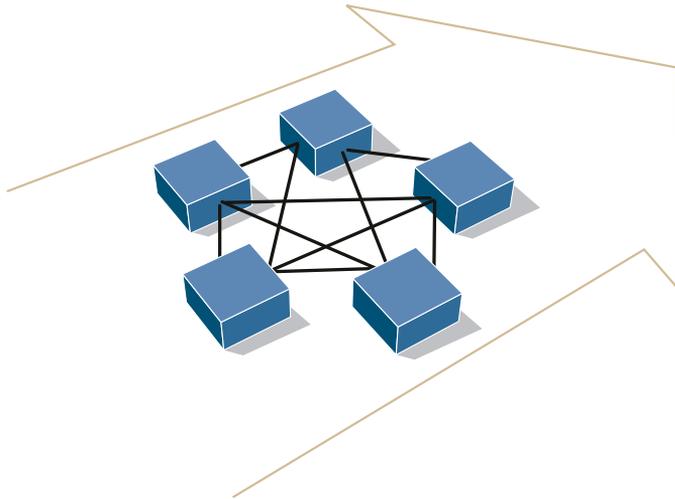


Figure 8. Public sector bodies co-operate in a network. Co-operation is required to achieve a common aim and direction when responding.

for the transparency that is a necessity within public administration and because, for legal reasons, it must be possible to identify decision makers and obtain information. There is for the Administrative Procedure Act and the Official Secrets Act a general demand for documentation and keeping journals. The fire service is a place of work just like any other in Sweden and must consequently follow labour market legislation. In this hierarchy the municipal committee, the chief fire office and the incident commander along with their associated duties and areas of responsibility have been pointed out. The reason for this control is to ensure, among other things, that certain standards are upheld for fire service operations. As the fire service is a public authority, clear lines of authority are called for within it.

On the basis of these conditions, the respective organisations can and should establish their own structures based on the needs of the municipality they are serving. The more detailed the regulations and directions are the less freedom of choice the individual has, resulting in organisations falling into the bureaucratic trap. One can, however, also decide upon a network type of working method in a hierarchy.

Networking is often described as being the opposite of a bureaucratic or hierarchical structure. The thought is that everybody included in a network is at the same level and partakes under the same conditions. Control is maintained through counsel and common objectives rather than through rules and regulations. Engagement and personal initiative taking is encouraged. Responsibility, authority and competence areas are not strictly laid down.

Network organisations can be experienced as indistinct, which sometimes results in greater clarity, and more order and control being requested. Paradoxically, in this form of organisation decision making can take longer than in a bureaucratic organisation. On reason for this is that it is difficult to navigate in an organisation without a clear structure. It can be difficult to know what others in the organisation are doing and who is responsible for different decisions.

The term network is sometimes also used in discussions on cooperation between different public bodies in the event of an emergency. But here also it is not a pure network organisation that is prevalent, as the legislation itself constitutes a control of the affected authorities. Legislation dictates that a number of public authorities shall cooperate in the event of emergencies, and each authority shall be responsible for its own area. Consequently, there is no voluntariness when it comes to cooperation between the authorities that should participate in an emergency response operation. One can say that this is also a question of a hierarchy, but in which the overriding authority is not a decision maker in the particular situation but rather prevailing rules and regulations. Authorities should support each other to assist their respective counterparts to fulfil their obligations. (See the chapter by Per Johansson in this book.)

Role logic

A command organisation can sometimes be designed to allow for a commander or decision maker, when over extended, to “back off when it becomes too much”, i.e. work with tasks that are different from his or her normal tasks. It can be difficult for a commander in a stressful situation to accept a task that he or she is not familiar with. A stress can cause tunnel vision, a hereditary phenomenon which increase focus in stressful situations (Larsson et al. 2003). To then be able to change perspective and work with more general and abstract issues is not so easy.

To attempt to back-up, entails consequences for role expectations throughout the whole organisation and this is unreasonable in a stressful situation. If a commander backs his or her normal tasks still have to be executed. These then would quite possibly have to be taken on by somebody who is not familiar with them. The consequences can become extreme if an organisation is based on a predetermined structure which cannot be adapted to suit situation requirements, e.g. if a basic design with a number of sector commanders involved in the initial stages of an emergency response is followed up by the addition of further resources in the respective sectors, causing an expansion of operations, without regard for the command organisation. In the end the demands placed on the individual sector commander become unreasonable in comparison to what they are recruited and trained for.

When a command organisation is structured it is necessary to consider how the different command functions are to be applied in different situations. A command function here refers to one or more people with some form of task within the command organisation. For the command organisation as a whole to handle different situations, flexibility is required. This means that a command function can be used for different tasks and take on different roles in different situations. A role can in a certain situation make the same demands of a commander in another role in a different situation. For example the task of commanding an emergency response operation for a house fire as incident command (operational command) places the same demands as for a sector commander at an industrial fire (task command). The expectations placed on one and the same role can vary depending on the situation. For example, different demands are placed on operational command for a vehicle fire applying small resources and a surveyable damage situation, compared to a major fire in a shopping centre, applying

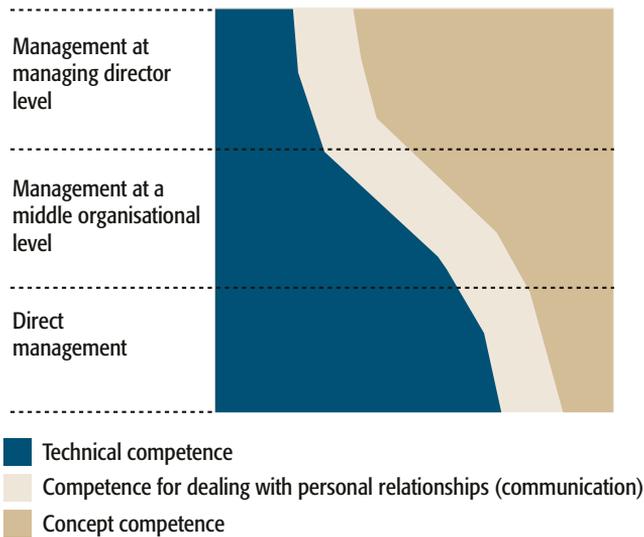


Figure 9. *The need to be able to work with abstractions increases as organisational levels increase. Working at an overall level does not require as much hands on technical ability as commanding units does. The need for social skills is however similar at all levels.*

extensive resources, involving several bodies and having a more dynamic destructive sequence.

Demands placed on decision making and leadership characteristics are also different in different parts of the command organisation. According to the model that is taken from Executive command (Department of the Army 1987), there is a greater need to be able to work with abstract concepts at higher levels. Working at higher levels does not call for so much hands-on technical knowledge. But on the other hand an ability to use abstractions as working tools is required, to compile working hypotheses of possible future situations, analysis and synthesis etc. (Fredholm 1994a).

The higher up in the organisation the commander is, the more he or she needs the ability to work on a longer time scale. The higher the level one is working at the greater is the demand for being able to create a model of the course of events (Jaques 1976). There are also differences in the way decisions are reached at one and the same level. As an example, there are even at higher levels, apart from the more general and long term issues, tasks that must be handled quickly and the decisions based on experience. (See chapters 4 and 5 in this book.)

The tasks assigned to the individual commanders shall, in different situations, be similar in terms of perspective, time scale, and degree of concreteness and content, so that it is deemed reasonable to carry them out. We have decided to call this uniformity in role expectation *role logic*. Role logic implies also that expectations for any one person should be similar during different phases of, for example, an emergency

response operation. When a command organisation is structured and manned it is important to consider that the expectations placed on those making decisions must be reasonable in several different situations. It is also important to ensure that the tasks a person has when not engaged in a response operation create the correct conditions for the person to function well when an emergency response situation arises (Jacobs & Jaques 1991, Hersey & Blanchard, 1969/2001).

Distribution of resources

The optimal situation for the fire service in terms of resource utilization would be if the command organisation could always ensure that only that firefighter with that specific, required equipment is sent to the incident site. As the fire service continues to improve its ability to identify and assess threat situations, it increases its ability to, in advance, allocate and distribute resources for the most probable situations. Despite this development the problem still remains that almost anything can happen next time around. The organisation must be continually prepared to meet different types of new situation. In addition there is always urgency when an emergency occurs, at the same time as the organisation is often acting on diffuse information. Therefore, in order for the command organisation to manage the resources, they are divided into units.

The term *unit* here refers to an organisational part comprising one or more firefighters that with the help of equipment have the capacity to execute measures against one or more destructive sequences. Units can also carry out many other tasks. Each organisation needs to define its unit concept when designing its operations. The size of a unit needs to be based on local conditions. In the following discussion we take a unit to be something that is defined prior to the start of an emergency response.

As the reason for division into units is to create a manageable situation, it can also be described from the perspective of the command organisation. This concerns what the term unit means to the different parts of the command organisation. For the command organisation as a whole, a crew is the smallest unit in a response organisation. In other words it is the lowest common denominator in the compilation of alert plans and other routines. This means that the concept can be used in communication between different levels when establishing the distribution of resources. A unit is defined through describing the parts that make it up: personnel, equipment, measures it can execute and its endurance. The different measures that a unit can execute are included as *possible measures* when a unit is sent to an affected area. Dividing into pre-determined units creates the opportunity to specify the capacity of a resource. The knowledge of command personnel of the capacity of units is a prerequisite for correspondence between the distribution of resources and the measures requirement during an emergency response operation. In addition the possibility is created for making tactical assessments based on the type of damage and the capacity of the resources. The division of units then makes it possible for command to shape in a structured way an emergency response operation at an early stage and then increase the resource distribution as required.

This type of unit formation also enables large numbers of resources to be managed more easily. For example, command can formulate relief plans for several simultaneous emergency responses. By relieving units the emergency response work can be continued over a long period. When operational command and system command communicate about how relief should be carried out, the resources can be held in their respective units. The units can then be divided between the different sectors in the emergency response. During a relief changeover, for example, a unit arrives in a certain sector at the same time as one leaves it. In this way unit formation makes it possible to handle large resources. On the other hand, in a particular sector, it could be more beneficial to group personnel in a way not based on the original unit division. This must be made possible as it is the need for assistance that is central and the division into units is only a means to an end.

For the purpose behind unit formation to be achieved it is advantageous if the units can execute their tasks independently, so that the commander at the level above has no need for direct contact with the respective individuals in the unit. The independent action needs to function even when a part of the unit executes a task or when several combined units execute a task together. Independent execution relieves the level above. Independence, however, requires that somebody in the unit, or in the combined units, is detailed to distribute work within the unit(s). This person does not normally require incident command authorization, but labour legislation must be taken into account. When designing units it is necessary to weigh up the extent to which the commander can execute practical work in terms of fighting the destructive sequence. It is important that it is not to an unreasonable extent, both within the unit and for the immediate superior commander, who has responsibility for several units. The degree of independence a unit has in carrying out its activities influences the design of the controlling command organisation.

Resources therefore need to be divided into organisational parts, partly to make them manageable when time is a factor, but also to make their distribution flexible with regard to the assistance need. For example, as mentioned above, it needs to be possible to combine units to apply them to a common task. It also needs to be possible to detach firefighters from a unit so that they can work individually. Developments will perhaps lead to there being several combinations in different units within an organisation. Having several possible designs provides the flexibility required to handle different situations. If they are common to and known by everybody in the organisation, the personnel will, without directions, be able to group themselves to suit the need. These *abstract units* take pressure of the command organisation and make resource distribution manageable and flexible.

Span-of-control

There are limitations to how much information human beings can take in and process. Consequently, there is a limit to the number of problems a person can manage in a particular space of time. This has to be taken into account when organizing response operations.

In organisation theory we talk of the width of an organisation in relation to its height. This is usually referred to as *span-of-control*. The governing factor is the num-

ber of personnel a commander has directly under him or her. During an emergency response decisions are often based on incomplete information, the tempo is high and there is a risk of the individual concerned getting too involved in particular issues that he or she considers important. The norm in military organisations is to have a span-of-control of five subordinate officers - four officers and a chief of staff. This number is set at a maximum of five in order to provide the organisation with reserve capacity should it be confronted with unfamiliar tasks or situations.

It must be possible to change the span-of-control (SRSA 1998) to suit the situation. It is not possible to establish a permanent design for an organisation. Interplay requirements and the need for control between commander and subordinates determine the span-of-control. That is to say that the more independently subordinates can work, without the need for continual supervision and interplay with the commander, the greater the opportunity of widening the span-of-control and increasing the number of subordinates under the commander. The greater the need for interplay and supervision, the smaller the span-of-control (SRSA 1998).

Adjustment to manageable spans-of-control must apply to the whole organisation. A commander should, therefore, ask him or herself whether his or her subordinate commanders have the ability to cope with the command tasks demanded of emergency response, and design the organisation appropriately. If a higher commander in a difficult situation adapts the organisation to suit his or her needs for a manageable span-of-control, there is a risk of subordinate commanders being left with a span-of-control that is too large.

Increasing command capacity

As discussed above, each decision domain needs to be active in order for the system to react to changes in circumstances. In addition there is often considerable pressure on all or part of the command organisation during dynamic situations. In other situations events that do not in themselves increase the work load can involve problems that need to be managed by personnel with specific competence. For example, it may be necessary to involve a commander at a higher level. Command capacity can be increased in several other ways also.

In addition, it is possible to divide the work load between different individuals by changing the structure. Today an emergency response operation is normally divided into sectors. These sectors can be formed into groups to form larger sectors, each being placed under separate command, and thereby increase command capacity. This kind of solution can relieve commanders at all levels and create the conditions for increased command capacity. When appointing commanders for these larger sectors, however, it is necessary to take into account, among other things, span-of-control and role logic. This kind of expansion gives rise to an increase in the range of decision domains and task command.

Another way of increasing command capacity is to use the parts of the organisation that are not being used out in the affected area. Personnel in the directly affected organisation or another fire brigade can carry out tasks and work with suggestions for solving problems. Such a task could be, for example, calculating the amount of water being used. Other tasks that an individual could carry out could

include looking into the fire science technology aspects of buildings or attending uninjured victims within the affected area. Another could be to examine and assess situations through an active search for information. Assisting in the emergency response operation of a different authority can involve more than executing tasks at an incident site. For example different fire service personnel can carry out tasks from a different location. As there is seldom a heavy work load on all fire brigades throughout the country at the same time, there is at a national level substantial capacity available. There is in this area considerable potential to develop cooperation, even if, naturally, there are a great many tasks that cannot be carried out from a distance.

Command capacity can also be increased by allocating a *staff* to a commander at a particular level. There can be several groups of staff at different levels in an organisation. Staff members could support and stand in for the commander or decision maker when he or she is exercising command. Through this a heavy work load and different problems involving different time scales could be managed. It is also possible by staffing to provide the commander with competence that he or she is in need of. Apart from the decisions made by political bodies, all the decisions made by authorities are tied to individuals. As, then, no joint decisions are made in this context, the support provided by staff can only apply to certain aspects of the command process. The staff can increase command capacity by, for example, compiling information on which to base decisions and by forwarding suggestions. It is, however, a fundamental principle that the decision is made by the commander. Note that it is the chief of staff who directs the individual staff members with regard to executing concrete tasks. That is to say that it is not the chief of staff we are referring to when referring to the decision maker who is ultimately responsible for the decisions made within a decision domain. On the other hand staff members can implement the

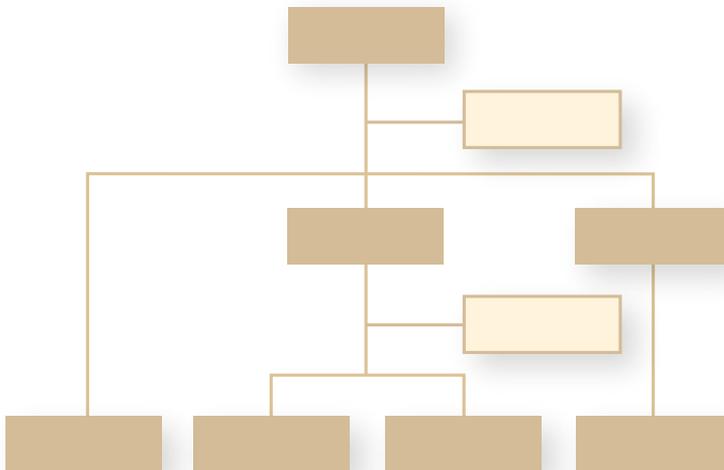


Figure 10. One way of increasing command capacity is to allocate a staff to a commander. Different staffs can exist at several levels in an organisation.

decisions made by distributing them in the form of tasks to subordinate commanders etc. Staff can, additionally, compile incoming reports and obtain information to assist in the follow-up of operations. It is, of course, important that the effects of measures taken can be assessed by the commander and decision maker. Solving problems and compiling decision making material and suggestions can, to some degree, be done collectively by the staff. The individual members that make up a staff can when required be divided into different organisational sections. A staff can also be organized in such a way to accommodate different time scales being managed within the same decision domain that the staff is working with. (Fayol 1965, Johansson 2000)

Different parts of the staff operations can concern different aspects, e.g. resource logistics, personnel allocation, information. The staff work that is more directly concerned with how the situation should be handled needs to be able to assist with appraisals of how the problems can be solved. In addition, an ability to review the execution of operations and to identify needs for and create action preparedness for alternative approaches is required. It is consequently important that the applicable competence is present in the staff, concerning the area of operations the organisation is working with (Johansson, 2000). If an emergency response operation is being executed to a particular purpose, it is important that somebody in the staff has an understanding of the problem area. Otherwise there is the risk of the staff work being simply an administration of incoming reports and outgoing decisions, which would not result in any noticeable increase in command capacity. Most importantly, it would not lengthen time scales to any significant degree.

It is sometimes the case that a function in the organisation that is associated with system command, for example a main command centre, has some authority over a situation. This could concern assessing incidents and ensuring a goal oriented resource allocation between the incidents and emergency preparedness at an early stage. Such authorisation must be formulated in terms of the legislation concerning public sector services.

It should be pointed out that a commander representing a particular level should not act as a member of staff at a lower level. Working as a member of staff demands loyalty to the decision made by the individual who is ultimately responsible for the decision domain. A loyalty conflict therefore arises if a commander works as a staff member at a level lower than his or her own. A part of the general responsibility of a higher command is to judge whether the actions of a subordinate are reasonable. Also, conditions can change quickly in a dynamic situation, and working this way could easily result in indistinction and confusion. A higher commander always has some form of responsibility based on his or her familiarity with some aspect and can therefore always intervene. A higher commander can, however, choose to act in a supportive manner, even if doing so would not be considered as working as staff.

The command process in a system perspective

The command process is in many cases a complex interplay in which the different parts of the organisation need to work together in order for the total command operation to be as effective as possible. This, among other things, involves ensuring efficient information flow as well as uniformity between various decisions. Depending on the situation, it must be possible to apply different forms of control in the organisation. Terminating an ongoing destructive sequence and having action preparedness for alternative developments are other central aspects of what a command process should achieve. Commanding when time is of vital importance and the situation is constantly changing places high demands on the ability of the commander (SRSA 1998).

Uniform decision making

Depending on the conditions during an emergency response, decisions need to be made simultaneously by different individuals, at many different levels and at different locations within the organisation. It is often difficult to achieve good coordination. Uniformity in decision making in the command organisation requires, above all, a common understanding of the purpose and goal of the emergency response, of the situation and its development and of the capacity of one's direct resources (SRSA 1998).

When purposes and goals are clearly established, it is possible to improvise and act independently towards a goal that generally benefits the total command operation. This is a prerequisite for the goal oriented control form that is sometimes

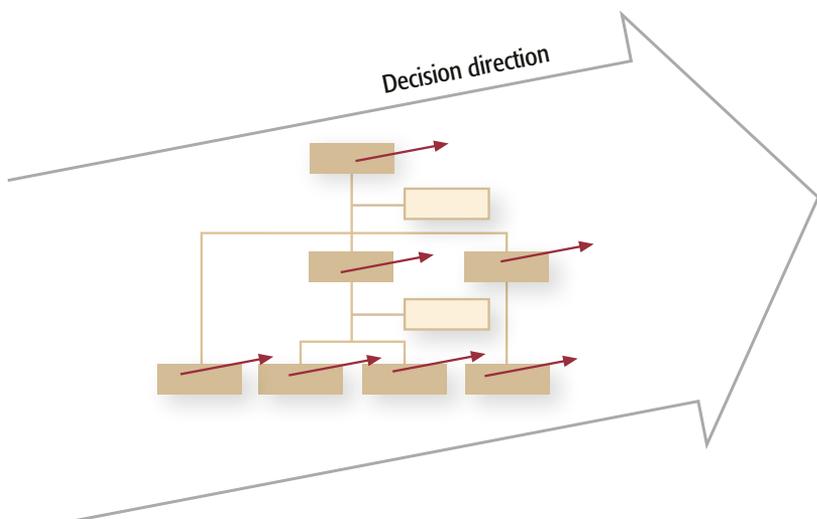


Figure 11. Decisions made in different parts of the command organisation should have the same aim and direction. This requires a common understanding of intention, objective, the situation and its progress, and of the capacity of resources.

called mission type tactics (Zetterling 1995). In some situations mission type tactics is called mission type command. A commander cannot have control over every occurrence, and local initiative taking should be encouraged, so as to accommodate any good ideas and initiatives originating anywhere in the organisation.

Uniformity in decision making demands that all commanders have the same understanding of the situation and its development. This does not mean that each individual has exactly the same picture of the situation, rather that their pictures complement each other. In the case of split decision-making it is as much an asset as a condition that an individual's understanding constitutes different subsets and degrees of resolvment of the situation and its development, within the framework of a common and concordant whole. A common opinion is required above all with regard to the course of developments.

When the whole picture is not available, it is important to understand which parts are most significant for the command process. The current situation is of little significance at the top of the command organisation; purpose, intention and development are the important factors (SRSA 1998). The current situation gains in significance, however, the lower down the chain of command one comes. As every report of the situation is a description of how it was at that time, they must be thought of as history. For reports to be current they must be complemented with a description of the likely development.

It should be pointed out that specific historical detail can be required during some phases of command work. When an emergency response operation is to be finalized, this should not be done on the basis of indications but on solid grounds. Consequently, reports from different parts of the organisation can need to include descriptions of previous events. To assess whether the problem has really been resolved, it can, for example, be beneficial to know how a fire had developed prior to being extinguished.

Uniformity in decision making also requires that everybody in the command organisation has similar and correct knowledge of the capacity of his or her own resources. The scope of an assignment can be disproportional if the commander has an incorrect understanding of the capacity of the available resources. The capacity of the resources can vary from one situation to another. Consequently it is important that the decision maker and the commander executing the task communicate with each other over the present capacity (Johansson 2000).

Information flow for decision making

An extremely large amount of information passes through the command organisation during an emergency response. Because of technical developments, both availability and transfer of information are not and will not in the future be limiting factors. Consequently, controlling parameters need to be defined.

To avoid reporting routines becoming an encumbrance for the system, they should be set according to the amount of information that is required as the basis for decision making (SRSA 1998). A superior level should actively search for the specific information it needs for continued decision making, so that the organisation does not develop a reactive character. The reporting level, naturally, does not

always know what type of information the superior level requires. Because of this it is important that the superior level is aware of how it requests information. Some enquiries can, contrary to intention, be an encumbrance. To ask too often, "How's it going?" is a typical example. It is better to request concrete reports. Questions such as, "How many sections are there in the warehouse?" specifies the relevant information and often helps the person being asked to improve his or her picture of the situation.

Higher levels should, as mentioned above, work on a longer time scale. Decisions made at these levels must therefore be based on a vision of how the situation will develop, rather than how it is at present. For an applied measure to give the desired result, the decision must be based on how the situation will be at the time the measure starts to take effect (Johansson 2000). The point in time on which this should be based, when making the decision, depends upon, among other things, the measure and its effect, based in turn on the following aspects:

- How much time is required to prepare the measure?
- How much time will pass before the measure begins to take effect?

Therefore, when a decision is being made, the commander needs to envisage the future situation. The actual point in time should be the same as the sum of the above two aspects. The ability to envisage a model of the future situation is a very valuable asset for those who can do this successfully. If one understands the factors that influence the development one is able to imagine the future situation. If the decision is based only on the present, concrete situation, the measure will probably be applied too late.

Reporting should be done on a regular basis and according to specific criteria. The levels of command that reports are being sent between should reach agreement on their frequency. This could be fixed on a long term basis or adapted to suit each situation. The frequency should not be too long or too short. This is partly because something should have been investigated between reports, and partly so that the superior can gain an insight into how the work is going. When the decision on a measure has been forwarded, it is important to receive a report back as to when the measure was applied and when it began to take effect. The reason for this is that the system should have the attitude of learning from the event. Decision makers at the relevant levels need an insight into the progress, time wise, with regard to both when a measure is applied and when it takes effect. In this way commanders become aware of the effectiveness of measures. (Johansson 2000)

A higher level should not require the reporting level to process information to suit the higher level's needs. The reporting level should only process information to suit its own needs. Otherwise the reporter is forced to carry out staff work for a level other than his or her own, which can result in information that is not required at one's own level not being reported. A consequence of this could be, in a worst case scenario, that certain information that could be significant with regard to the total effect of the emergency response is missed.

Form of control

Emergency responses are often characterized by high tempo in an, initially, unclear situation, which means that action has to be based on diffuse grounds. The activities must then be adapted successively as the picture clears, which demands flexibility. A goal oriented form of control is usually the most suitable under typical emergency response conditions. The reason for this is that the command process in the system needs to be sufficiently fast in relation to the dynamics of the event. If contemplation of detail is necessary at higher levels, the process tends to become too extended and the situation changes. Under some circumstances, however, other forms of control can be more suitable. This could be the case, for example, if a commander has specific competence in a particular, relevant area, and chooses to detail regulate. This availability should not, however, replace the continual training of personnel. Another example is when a more dangerous emergency response is going to be executed. In such cases the various tasks in the response operation must be coordinated in detail so that safety aspects are not neglected. Goal oriented control should, more so, be considered as an attitude and a mental approach (Zetterling 1995, 2000). The more the culture of the organisation is goal oriented; the greater are the number of subordinate units that can work effectively within it.

Decisive action in the command process

The most important aspect of the command process is the management of bringing the incident to a conclusion. In order for the command process to be anticipative, it is necessary also to review both the conditions and the possible development of the incident, so that alternative action can be prepared for.

The term *decisive action* implies obtaining and maintaining control of the destructive sequence so that its different elements are caused to abate or are terminated and to reverse the negative sequence of events to the benefit of the victims and society generally. To identify and assess the likelihood of and the consequences of possible courses of events and to plan for the termination of normally one but sometimes several incidents are all aspects of decisive action. In the case of response operations system command, the decisive action concerns creating conditions for obtaining and maintaining control of all ongoing destructive sequences, at the same time as establishing a balanced and phased emergency preparedness measure against prevailing risks and threats. In relation to emergency response operations, decisive action concerns establishing concrete goals in relation to the assistance need, e.g. to obtain and maintain control over the spread of a chemical substance.

Whether or not termination is possible is assessed through *constructive appraisal*. Constructive appraisal also includes identification of the capacity of the organisation in relation to one or more developments. The capacity of other involved bodies also needs to be assessed, as this may affect the conditions for one's own work. Possibilities and threats that can be disregarded are also identified here, as are new, alternative, in some cases, extremely unlikely, but at the same time possible developments. The likelihood and possible consequences of such alternative developments are also assessed. Constructive appraisal entails assessing whether the ongoing decisive action will be successful and thinking in other terms. The purpose of this is to compensate for wishful thinking

– the feeling that all will go well, which can occur if those involved think too much in the same way and by doing so fail to take warning signals seriously. Constructive appraisal creates the conditions necessary for action preparedness. Even the command work as such can be appraised to see whether or not it is goal oriented with respect to the demands of the situation. Decisive action and constructive appraisal should not be carried out by one and the same person. This is because it can be difficult for people to critically appraise and reject their own ideas.

It is important to have alternative measures prepared in case those planned for and those being executed fail to achieve the desired goal or in case developments take an unexpected turn. In order to have *action preparedness*, different preparations for alternative measures which would have a better effect can be required. It can also be the case that an incident develops in an unexpected way, which would be identified through constructive appraisal. Action preparedness is based on concrete planning for terminating the incident if alternative situations should arise. Action preparedness therefore concerns making the unexpected expected (Nylén 1996),

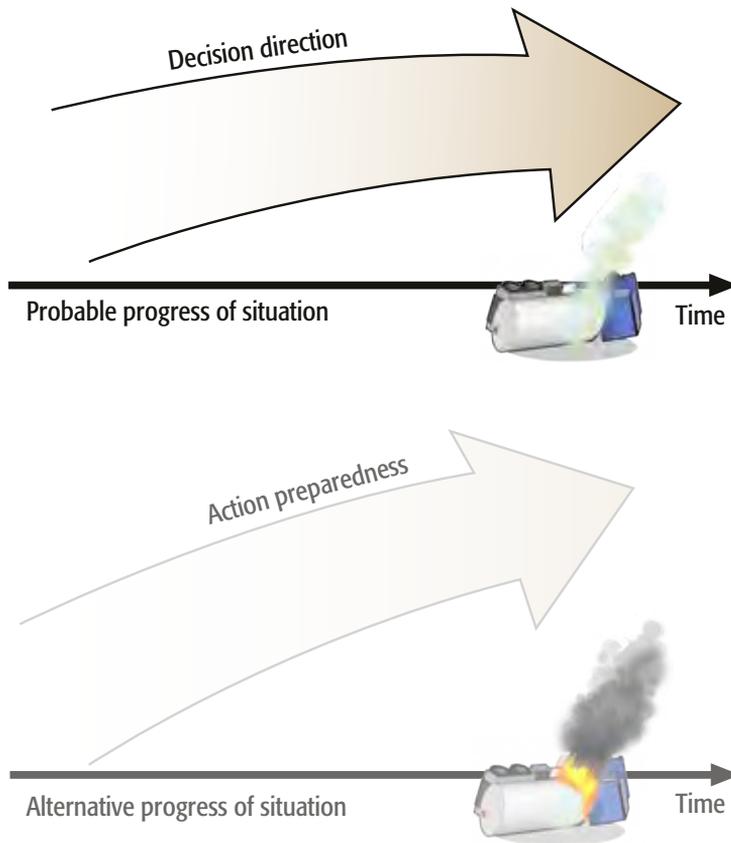


Figure 12. In order for action preparedness to be achieved the progress of the situation and the decisive action taken must be examined onstructively during the ongoing emergency response.

and in good time, based on the assessment, compiling different plans and measures for alternative approaches. This kind of planning needs to be applied throughout the command organisation, and include logistics, information and other relevant tasks. It is necessary within each decision domain to carry out constructive appraisal and compile an action preparedness plan.

Adapted command

As concluded above fire service command work should be based on the demands of the situation. Some basic routines are required, but different incidents must be managed in different ways. It is not good to let internal routines guide and for them to take the focus away from the actual assistance need. At the same time it is not feasible to start from scratch, without any ideas or routines for carrying out an adaptation. Ability is required to vary working methods and the design of the organisation to accommodate different situations and phases. Our suggestion is to start from the expected assistance need, and from there

- group the resources into flexible units which in different ways can be divided or combined to execute tasks
- form a basic organisation and allocate decision making authorisation to different individuals
- create the conditions for adaptation and for effective command work in relation to the situation

Variation in risk and threat situations

Command needs to be able to manage the total field of risk and threat possibilities that can occur in a municipality. There is, for example, a natural seasonal variation in the weather at the same time as the movement pattern of people varies throughout the day, week and year. An increase in risk or more concrete threats could arise through, for example, technical disturbances in the process industries, criminal activity, sports events and concerts etc. Through successively improving emergency response statistics and continually working to gain and process information, i.e. a form of intelligence gathering, knowledge can be improved regarding where and when different types of emergencies occur. Increased knowledge of how risk situations vary with time makes it possible to improve emergency preparedness for them in terms of, for example, having resources in the right place, at the right time, and prepared in the right way.

If there are indications of an increase in a risk or threat situation, system command needs to adapt in order to accommodate this increase. This could concern actively changing the state of emergency preparedness by transferring resources or by changing the resource capacity to match the actual situation. One could, for example, change the composition of units in relation to the prevailing risk or threat situation. Based on specific threat situations and the consequential expected command requirements, one can prepare both possible emergency responses and command work design. Preparedness in many cases needs to be organised in cooperation with other bodies in society.

Different demands on command work for different types of emergency

The demands placed on command vary depending on the type of emergency. Some aspects that affect command work are:

- design of assistance needs (people, environment, plant, type of damage etc.)
- complexity of the destructive sequence
- general dynamics of the situation
- geographical scope
- resources required
- bodies involved

Some situations entail extensive logistics management. On other occasions it can be a complex physical destructive sequence that demands a lot of attention. Some affected areas are extensive and difficult to survey, others are more limited. There can sometimes be requirements with regard to the social aspect at the site of an emergency. The following examples illustrate some situations with different command requirements that the fire brigade might need to deal with:

- A chemical emission with a complex damage situation. Different chemicals are mixed and it is difficult to assess the consequences of this. The geographical extent is limited. In this case the demands placed on command concern technical assessment more so than extensive resource logistics.
- An extensive town fire demanding considerable resources calling for large sectors and several sub sectors to create manageable spans of control at different levels.
- A situation involving many small incidents (can e.g. occur in the event of torrential rain) that calls for limited command at each incident site but which, at the same time, requires prioritization of assistance needs should be handled through applying dynamic resource management within the response organisation as a whole.
- An extensive flood affecting several areas within a municipality calls for localised assistance while the resulting problems for the municipality need to be approached in cooperation with other bodies.
- A low intensity threat situation present for several days or weeks placing demands on the design of the organisation and on sustaining operations over a long period.
- Extensive destruction which spans municipal and county borders.

Command during different phases of an incident

Emergencies occur suddenly at the same time as they are often dynamic and develop while response operations are still being implemented. Most emergencies are relatively limited, but some expand. In the event of a major emergency, the initial phase is often both diffused and fast moving. The destructive sequence initially develops faster than the measures to fight it can reach the incident site, which can need to be compensated for by allocating further resources. It is not effective to activate a command organisation purely on the grounds of confirmed information. A response operation organized on this way often lags behind the development of

the situation. To compensate for this the command organisation has to act offensively and anticipatively. This entails that the organisation will be activated more often than is necessary, which is preferable to the alternative of always trying to catch up with the developing situation (SRSA 1998).

It is important that the expansion of the command organisation does not, in itself, become an encumbrance. It must be made possible to expand the command organisation in such a way as to improve the command situation. Every complement to the command organisation must be able to take over so that continuity of operations is maintained. Certainly some responsibility aspects, for example, can be moved during an expansion of the command organisation but commanders shall as far as possible consider their tasks as similar in character to those they had prior to the expansion, even if the emergency response operation expands. In addition, as pointed out earlier, the tasks of an individual decision maker or commander shall be reasonable (role logic).

Expansion must go quickly to enable the command organisation to handle a dynamic situation in an anticipative manner. The command capacity must in many cases be increased in every decision domain in order for the whole system to function. It must be possible to handle short as well as long time scales in every decision domain. To decide upon the tactics for on-going situations, the command organisation needs to know how quickly the resource expansion occurs in the different parts of the affected geographical area.

The majority of emergency responses in Sweden are so limited that the goal is usually achieved using the resources applied through the initial response operation. This is to say that control is usually obtained before relief has to be called in. Certain situations in command work do not arise before response operations have become more extensive or lengthy. When the initial measures fail to achieve the desired result in fighting the destructive sequence, it can be difficult to adapt and take on a new approach. To obtain and maintain control over the destructive sequence in the long term, the resources must be applied in such a way as to provide continual production of measures. Sometimes the development of events can deviate from the expectations of the command organisation. Command work therefore needs to be designed bearing in mind that these deviations do not always occur at the initial stages of an event. Command needs to be able to try alternative approaches in relation to the destructive sequence and the assistance need, and, as necessary, adapt an ongoing operation.

Emergency response operations or threat situations that continue for hours, days, weeks or even longer, place specific demands on command. It is then necessary to take into account, among other things, that problems often arise during personnel changeover when information is being passed on regarding the situation, measures completed and ongoing or the need for different follow-up measures. The ability to be able to handle this problem is fundamental to the continuing and stable progress of the operation. It is necessary to consider how best to achieve a sustainable operation in terms of relieving personnel. The normal design is seldom suitable in these situations, but rather for more normal short term operations. The working hours for duty personnel often vary from a normal working day, to part-time work

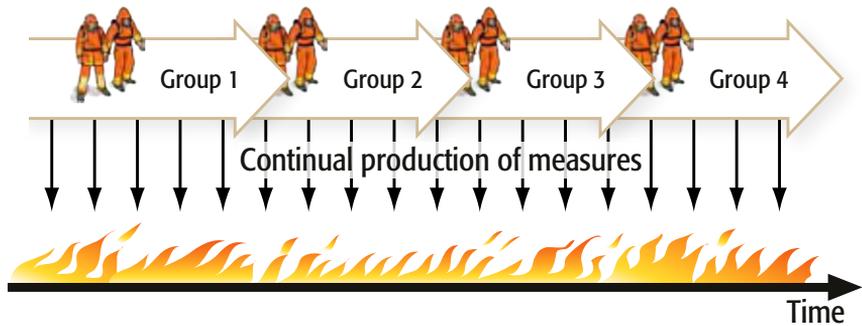


Figure 13. To obtain and maintain control over the destructive sequence during prolonged operations, resources must be applied in such a way as to provide continual measures production.

to being on stand-by for a week. These are factors that during a long and demanding situation can affect the capacity of an organisation.

When an emergency response operation is finalised it is necessary to reflect over whether the physical phase has really been completed or not, or whether some form of follow up check should be carried out, and if so for how long and by whom. In some cases a completed emergency response operation in which the owner has the capacity to handle the problem themselves, needs after a time to be followed up by the fire service. The situation can involve aspects that would cause the owner to request assistance at a later stage, meaning that the situation should continue to be regarded as a heightened risk situation. It is also necessary to follow up other assistance needs that are consequences of the emergency, e.g. allowing space for the individual to act by informing those affected and providing information and support to direct and indirect victims.

Adaptation of the system and the organisation

The fire service command organisation needs to be very adaptable to manage different assistance needs. The adaptation of command work needs to take place in the context of several dimensions. This concerns designing the organisational structure and defining the different areas of responsibility to match the demands of the actual situation.

Tasks need to be allocated in relation to the need for assistance, at the same time as resources need to be grouped to make them organisationally manageable. Factors that influence the allocation of tasks are, among others, the conditions with regard to the object, damage and resources. The aspect we have chosen to call *task command* can in principle exist at any number of levels and be contained within one another. It is factors such as role logic, span-of-control, and geographical and resource conditions that set the limits. Examples of the consequences of these factors can be the setting up of large sectors, sub sectors etc., in which each division entails the creation of a new decision domain *task command* in accordance with the model. An organisation should be built up from a small emergency response operation to a larger one, from the ground upwards. This entails, for example, that a

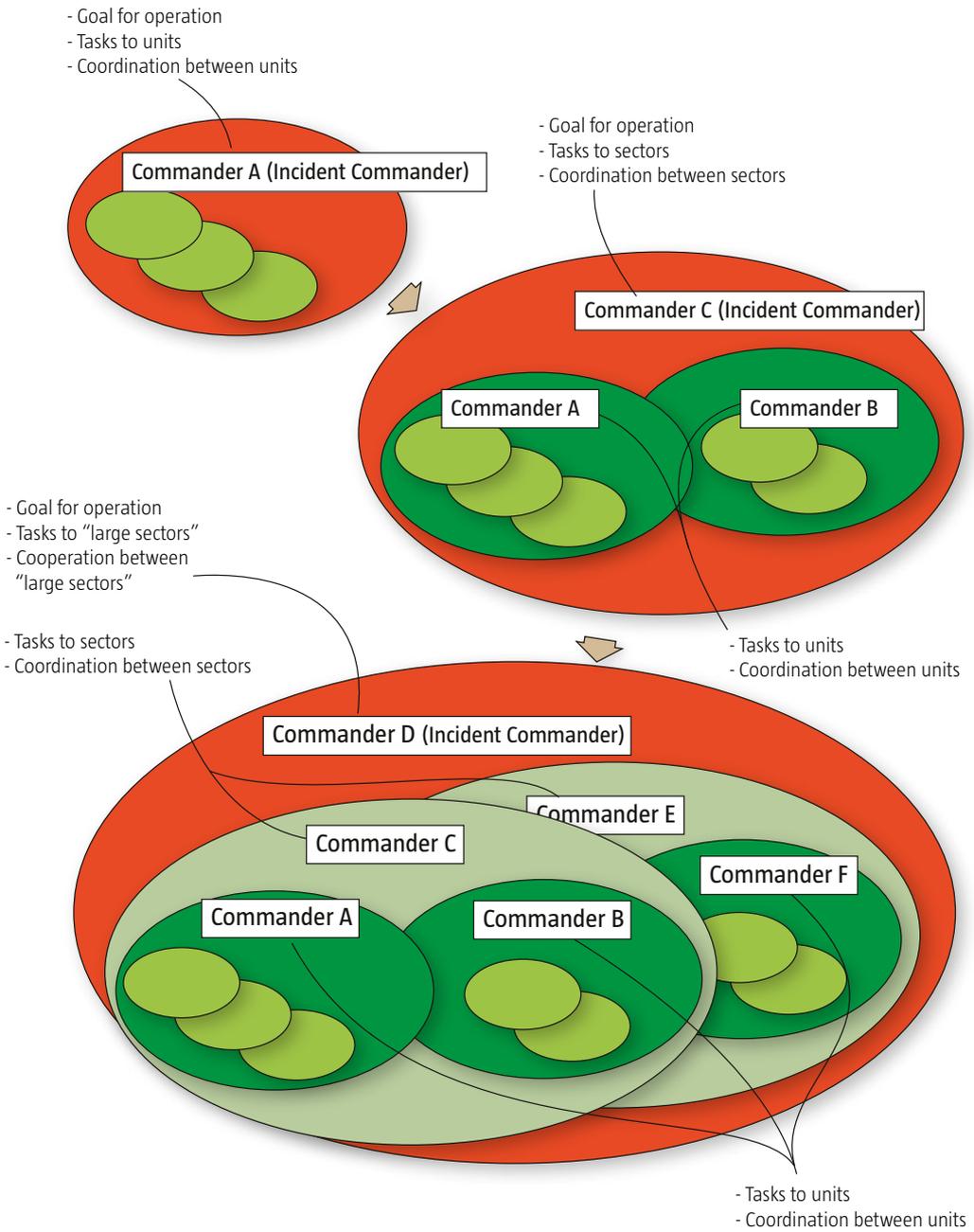


Figure 14. Emergency response operations are expanded, the goal for the operation is moved up and several decision domains for task command are created. Role logic and span-of-control must also be taken into account.

large sector is created at the same time as the commanders of the sectors within it continue to function in their roles as sector commanders.

In addition to the variation in task distribution, the implication of the term emergency response operation needs to be clarified so that different areas of responsibility can be defined for each individual response operation. It is the responsibility of *system command* to define the responsibilities of *operational command*. Emergency responses can be seen in broader terms because one just as much as several different organisations can execute operations that contribute to measures being taken to address the need for assistance. The term rescue service is only used to refer to the operations that society carries out in accordance with chapter 1 section 2 of the Civil Protection Act (2003:778). It should be pointed out that the fire service can carry out tasks in different contexts that are not legally its responsibility, e.g. to provide water supply or take part in psychosocial care as a part of societal crises management.

An emergency response operation needs to be defined in terms of *scope*, i.e. based on the need for assistance that is being provided, what is to be achieved, the geographical area concerned and the resources involved. Normally the fire service carries out measures (production of measures) with various resources within different affected areas in a municipality, which often makes the term emergency response operation easy to define in terms of geography and resources. It is sometimes, however, not so clear what should be taken as one and the same response operation. If, for example, several different buildings standing next to each other are on fire, it can be necessary to clarify the extent to which these situations should be handled within the framework of one or more response operations. Cases can arise where one and the same physical course of events can be regarded as several emergency responses.

It is not possible to define every conceivable situation in advance. The command organisation therefore needs to be able to define what shall be regarded as an emergency response operation in connection with the case at hand. The effectiveness of command work can sometimes be improved by redefining emergency response operations, for example, by adapting two previous operations and combining them to form one. Some of the grounds for defining an emergency response operation are:

- the extent of the physical destructive sequence and other aspects of the assistance needs
- requirements in terms of resources and measures management
- command, cooperation and organisational aspects

The question of whether a situation should be handled by one or more emergency responses is decided through weighing up what would provide the most effect in terms of the need for assistance for that particular incident. Depending on how the emergency response is defined, different demands are placed on *system command* and *operational command*. If the buildings that are on fire on the same street are considered as a single emergency response operation, the resource allocation between the different affected areas is handled independently by *operational command*, which helps to relieve *system command*. A prerequisite for this solution is that it is reasonable to expect that *operational command* can manage the total incident. If, on the other hand, the affected areas are considered as separate emergency response operations,

system command has to coordinate operations. In reality, in such a case, the different *operational commands* may well organise this coordination themselves, but *system command* has to ensure that this is happening. In the above situation a good opportunity is created for each *operational command* (one at each building) to have control over events at each respective building. It concerns then assessing the conditions and available command resources to establish a framework for the emergency response. Regardless of how limits are set, every solution has advantages but also disadvantages that must be compensated for in some way.

Even in the case of a single affected area and where it appears obvious that a single response operation applies, one should reflect over the area of responsibility within the framework of emergency response. The most important question is: *Do the measures applied by the emergency response answer the assistance needs of the situation?* For example, is the whole area being affected by an on-going gas emission covered? It should be pointed out that threats and damage that are purely physical can affect an area in several dimensions. For example infrastructure may exist in an area where there is the risk of landslide, and high tension cables may cross an area affected by a forest fire. In the event of a major emergency requiring considerable assistance, e.g. with many injuries and with large response operation resources to manage, it can initially be impossible to identify the whole assistance need. Consequently *system command* needs to consider whether the whole need for assistance is being

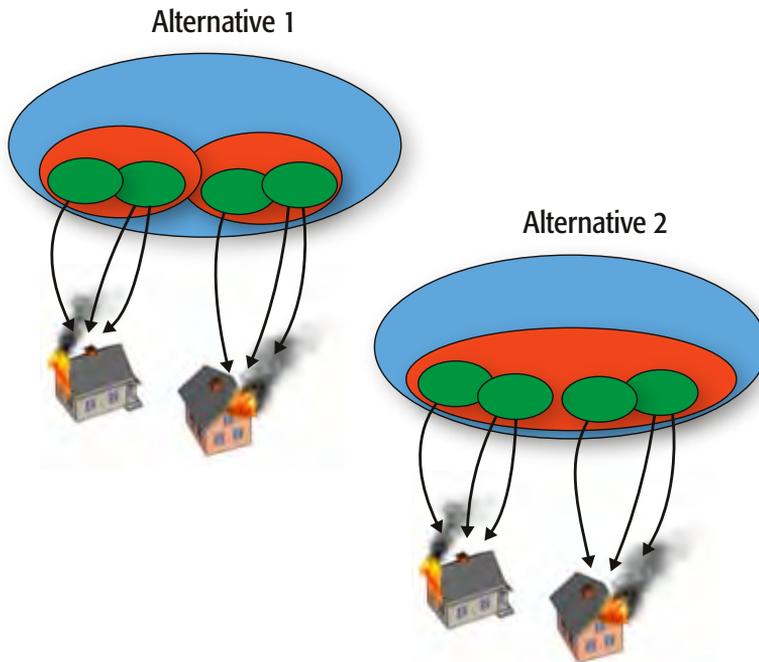


Figure 15. The area of responsibility of operational command must be defined. Command work circumstances dictate whether or not two buildings on fire on the same street should be handled within the framework of one or of two emergency response operations.

met and whether it needs to adjust the emergency response framework. It is important to establish the areas of responsibility of *operational command* and of *system command*. It is also important to establish whether a need for assistance exists outside the physically affected area. Major incidents can often influence society over a larger area than that directly affected in such a way as to create a further need for assistance that need to be managed, for example, disruptions to infrastructure and the lives of relatives of victims (cf. discussion above on affected context). In such cases the areas of responsibility for the fire service as opposed to other societal bodies must be established.

In the event of very extensive emergencies, both geographically and with regard to resources, it can be necessary to expand the command organisation in several dimensions. For example, in the event of widespread flooding, there can be several affected areas within one municipality (SRSA 1996). In this kind of situation command tasks can be designated as below:

- a municipal fire brigade is commanded by the chief fire officer (“Chief fire officer on call”) (*system command*)
- emergency response operations are commanded by the incident commander (*operational command*)

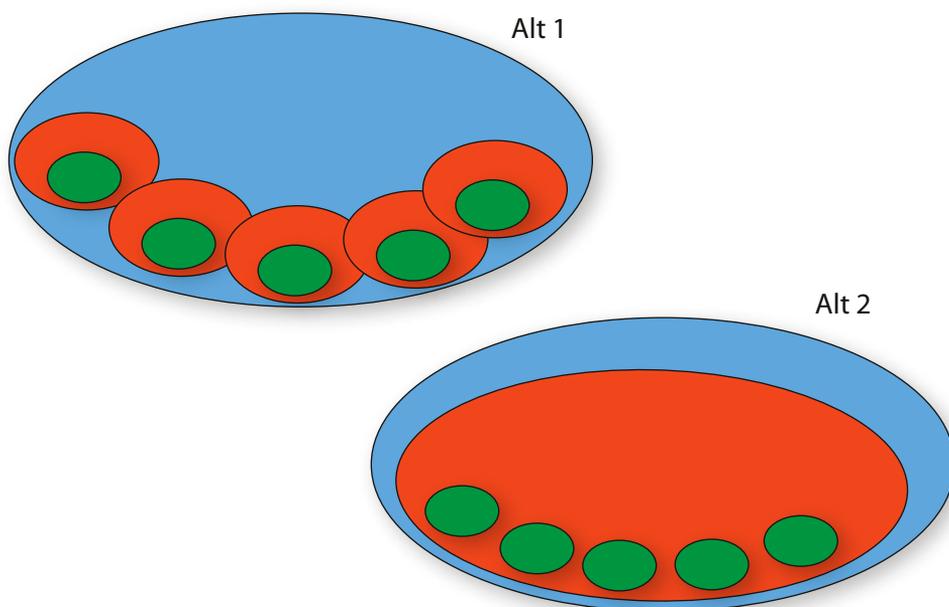


Figure 16. Several minor incidents of similar character can occasionally occur simultaneously in a municipality. The command requirement is limited at each location, but at the same time priorities and the management of high resource dynamics for the total organisation are required. Advantages and disadvantages have to be weighed up against each other when the scope for operations command is being defined.

It can also be the case that system command and operational command for a larger incident are exercised by the same command function while operations in different affected areas are commanded via task command.

- An emergency response operation is divided into several affected areas, each commanded by a different officer (*task command*).
- respective affected areas are divided into several incident sites (*task command*)
- respective incident sites are divided into several sectors (*task command*)
- within the sectors tasks are allocated to one or a combination of several units (*task command*)
- within the units tasks are allocated to individuals (*task command*)

In the event of flooding it is important that the total societal resources are applied effectively. It can be necessary to design fire service command work in combination with societal emergency management to form a whole, in order for the total effect of the disturbance to be addressed and handled effectively. The various *task commands* are found again in different degrees of resolution and are integrated into each other. In the above example, the role expectations placed on *task command* correspond to the expectations placed on the officer leading an emergency response operation of corresponding size (resources, geographically etc.) in another situation. The role logistics for commanders at all levels in the organisation is an important factor to take into account when an extensive command organisation is to be designed.

A municipal fire brigade sometimes needs to cooperate with a neighbouring municipality to fight a destructive sequence if it spreads across a municipal boundary. It can then be necessary to clarify certain system related aspects. If, for example, a forest fire spreads across a municipal boundary, the incident commanders for the respective municipalities are legally bound to reach agreement on who

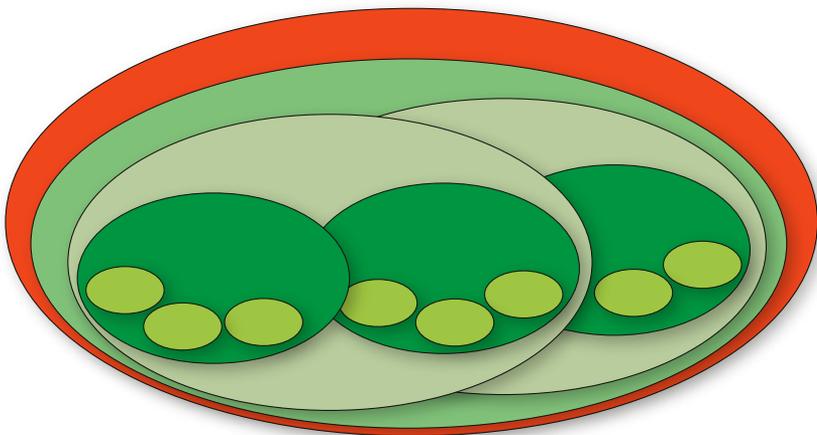


Figure 17. In the event of major incidents the command organisation can require expansion in several dimensions. There is in principle no limit to the number of levels task command can operate at. Role logic, span-of-control, and geographical and resource circumstances are influential factors.

shall command the emergency response. What is interesting in the case of a forest fire is that it is not only a question of who should lead the emergency response but also through which system the emergency response shall be managed. As an emergency response can demand extensive resources from the different systems, it needs to be clear which system the emergency response belongs to in terms of management. This system must then build up a long term resource provision and cooperate with other organisations etc. Reactive command can result if the areas of responsibility of the different systems are not clear cut. It is important then that the various fire service *system commands* reach agreement on which system shall create the conditions for the emergency response and who shall command it. Such agreements should be reached by officers having the mandate of Chief Fire Officer and are responsible for the respective *system commands*.

The above descriptions depict a point in time and do not illustrate the dynamics that are inherent in an emergency. The organisation needs to adapt to meet the increase or decrease in assistance need. Resources that have completed a task can be transferred to another task or be allocated a new one. Incident sites and affected areas have to be re-defined. Resources can need to be replaced or complemented with others with different capabilities. *Task command's* decision domains are created and dissolved as new tasks at different levels are defined in connection with an emergency response operation. *Operational command* is exercised for the duration of an emergency response operation in accordance with the Civil Protection Act. The decision domain *system command* is operational regardless of whether an emergency response is operational or not as it is always necessary to produce emergency prepa-

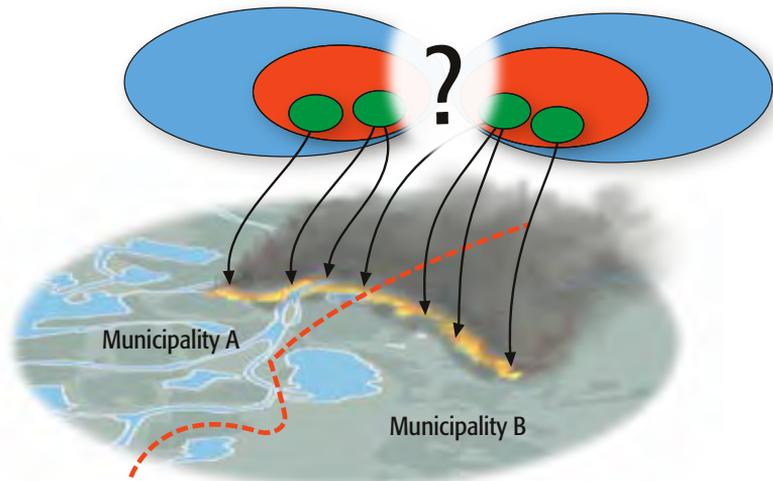


Figure 18. An affected area which stretches over two or more municipalities needs to be handled in an integrated manner. It must be made clear which system shall manage the emergency response so that the situation can be handled anticipatively, e.g. with regard to provision of resources.

redness in relation to a threat situation. In the event of emergencies resulting in serious consequences for society, command work needs to be adapted to combine with societal emergency management as a whole.

Cooperation between public sector bodies

The measures that society takes within the framework of the Civil Protection Act are included in an emergency response operation. Measures taken by medical services in accordance with the Health and Medical Services Act (SFS 1982:763) are the medical care equivalent of, and run parallel to, the emergency response operation to address combined assistance needs in terms of, for example, fire and consequential injury. It should also be noted here that a municipal fire brigade response operation in the event of different forms of threat which are, for example, the responsibility of the police can, at the same time, be regarded as an on-going response operation if legal aspects regarding this are met by the Civil Protection Act (2003:778) and the Police Act (1984:387) and its preliminary work. From a judicial point of view then the various societal bodies are to be taken as separate systems with separate tasks. Different organisations have different areas of expertise to apply in order to address the various aspects and forms of society's assistance needs. These bodies need to cooperate in order to integrate their activities and their respective command processes. Cooperation implies that the different areas of operations are coordinated without any one body and its representative having authority over any other body. (See the chapter by Per Johansson in this book.)

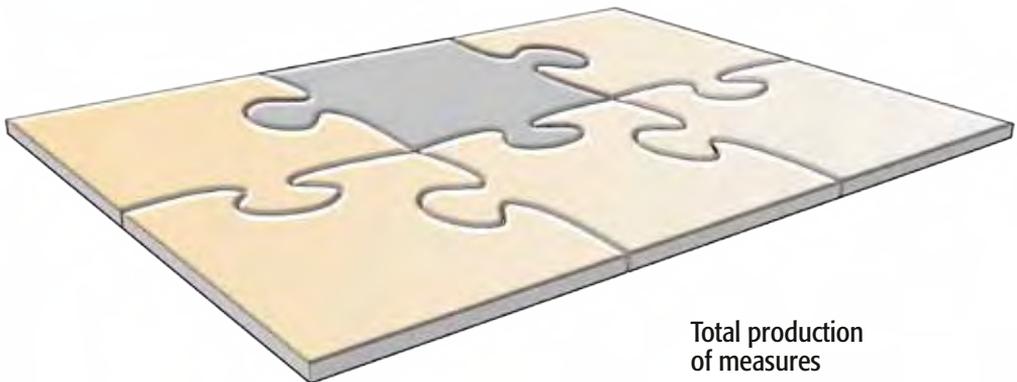


Figure 19. *The organisation's measures production must be configured so that the total assistance need is met.*

Integrated action

As pointed out above it can be necessary for several bodies in society to produce measures in time and space in relation to the dynamics of different events. This very often simultaneous production of measures needs to occur in cooperation spanning organisational dividing lines. It is important that every person representing a body thinks in terms of a broad societal perspective and bases decisions on the identifiable needs in the affected context. One aim should be to achieve measures that to a reasonable extent cover the total combined assistance need, so that nothing is left to chance.

As no public body 'owns' an event, most situations almost always include the involvement of several organisations. In order for cooperation to function well, the representatives of the respective bodies need to identify the needs of the production of combined measures in the affected context. Then based on this identification different measures need to be formed as a whole in relation to the situation's needs. When representatives for the fire brigade address the public, they should also think in terms of the municipality as a whole even if they do not make decisions in a formal sense for other bodies.

Each public sector body has its own, sectorial responsibility. An affected context is consequently addressed through the collective production of measures being designed through the cooperation of the different bodies.

An emergency can be "minor" in terms of the resources required by the fire brigade but can have far reaching effects on society and its bodies in other ways. As the fire service plays a part in societal emergency management in extraordinary situations, cooperation between all the bodies involved needs to function well. Every body has personnel that are trained so as to ensure that the respective organisation can successfully carry out its assignments. It is often the case that people with dif-

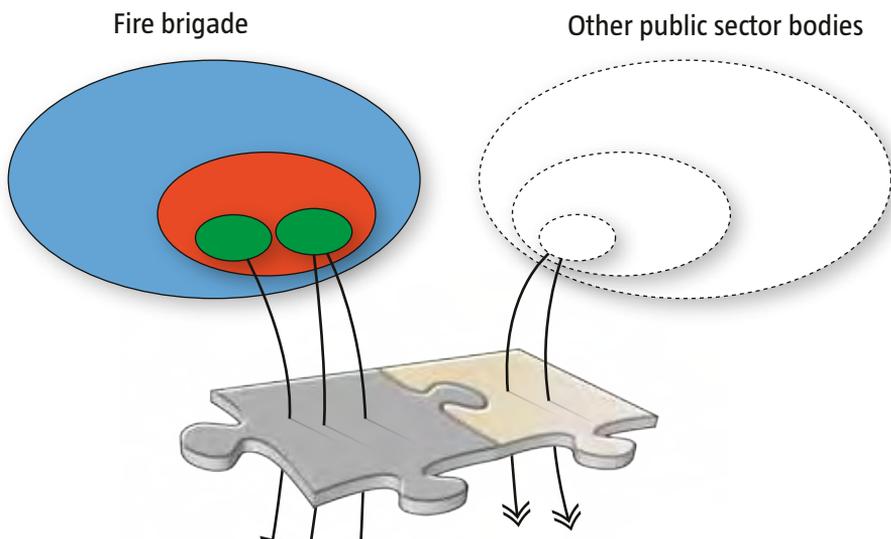


Figure 20. Each public sector body has its own system and decides independently upon its own measures production.

ferent areas of competence need to assess a situation to ensure that all the assistance needs are identified. Therefore to guarantee that a situation is well managed, it is extremely important that all the relevant organisations become involved. Early contact enables the different bodies to themselves assess the measures that need to be taken. This creates the conditions necessary for an anticipative handling of the total assistance needs in the affected context.

Command processes in cooperation

In order for a collective production of measures to be well structured, there must be cooperation between the systems of the different bodies when decisions are being made. Cooperation should however not be confused with joint decisions. Each body makes its own decisions. But during the decision making process it is necessary to be aware of the conditions and needs of other bodies. It is important that the various managers can bridge organisational dividing lines to the purpose of addressing the assistance need.

Each body should design its managerial or command work with consideration to other bodies. During cooperation it should be borne in mind that each body may have divided its decision making authority in different ways within its organisation. This can mean, for example, that managers and decision makers for the different bodies need to have contact with one another but do not need to work in the same geographic location. It can also mean that representatives for the bodies that work together at a joint command centre can have different degrees of independence in their respective areas of responsibility. The content and character of decision making authority can also vary. There is a need for cross-sectorial concordance in each decision domain or the equivalent of. This means that the manager responsible for a certain decision domain in his or her own organisation needs to cooperate with his or her equivalent in the other body that is responsible for handling the corresponding issues.

The above discussion on simultaneous activity concerns organisational principle. Depending on the location of an emergency, it can take the various organisations more or less time to structure resources. It can be the case that resources from, for example, a municipal fire brigade arrive at the incident site before resources from other societal bodies. For operations to give the most beneficial result, it is necessary to assess which measures need to be applied first so that the most important aspects of the need for assistance are attended to with minimum delay. These may not always be the responsibility of the fire service.

The emergency service can, for example, close roads and apply certain life saving measures.

Another example is that a police patrol during the initial stages following an air disaster in difficult terrain can control the flow of emergency vehicles accessing the only road to the affected area before beginning registration work. Carrying victims on stretchers could be a priority measure at a certain stage. To be needs oriented during the initial stages when resources are short requires knowledge of the responsibilities of other bodies. The fire service, for example, needs to know what applies with regard to investigation of the scene of a crime. Assistance needs should be the basis for the activities of all public sector bodies.

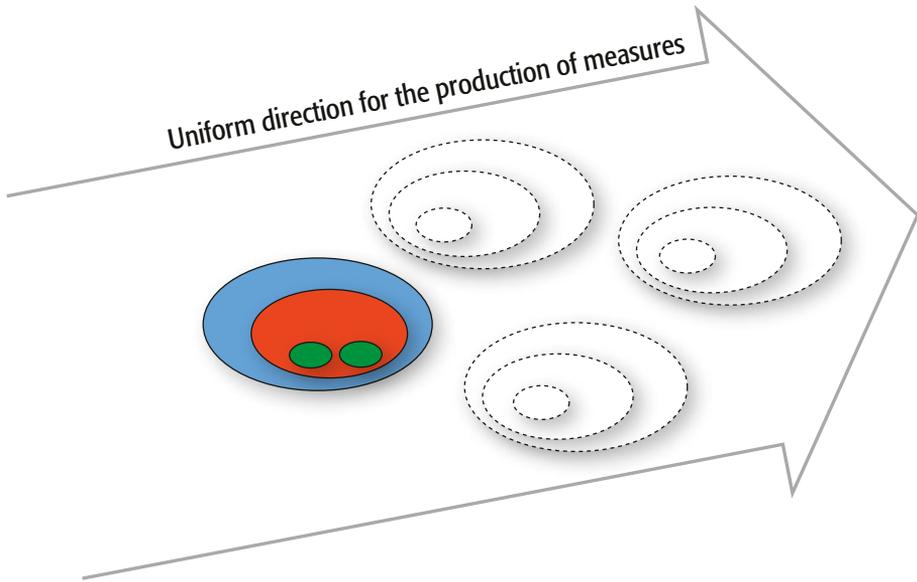


Figure 21. Decisions must be made in co-operation with all the involved entities in order to ensure that measures production occurs in a uniform direction.

As the various bodies become involved in a situation, cooperation needs to be established. To create the conditions for compatible decision making by the various bodies, it is necessary to establish a common direction for the parallel operations. One of the bodies (police, municipal/national rescue service or medical care) normally has the most responsibility judicially, or competence to assess the most significant aspects in the development of a situation (SRSA 1998). It is reasonable that that body takes the initiative to facilitate cooperation. This could entail creating a common command centre and taking on the role of “chairperson” when a common plan has been established, which needs to be done in cooperation. Subsequent to this common plan being formed, each organisation makes its own formal decisions (see Per Johansson’s chapter in this book). This structure is based on the attitudes to approach and cooperation described above.

It can be the case that various societal bodies take overall command in different places, which can entail that *coordinators* need to be detailed. A coordinator is appointed when the involved managers from the various societal bodies cannot operate from the same location or when continual coordination is called for between the staff or personnel from different bodies. One member of staff is then assigned the task of coordinating with another body by working from the command centre or equivalent of that body. The coordinator represents his or her organisation in relation to the body it is working with. The principal task of a coordinator is to create the conditions to accommodate continual cooperation in practical terms. A coordinator does not have the mandate to make decisions. Even though a coordinator is in place, the respective commanders/managers still need to meet to establish the principles of their cooperation. A manager may need to take part in some meetings even if a coordinator has been appointed.

Moreover, it is probably not sufficient to appoint a coordinator to establish good working cooperation in cases involving different types of complex social disturbance. There is a need for creating *forums* (Fredholm 2000) where commanders, managers and staff from the various societal bodies can meet. In some cases predetermined groups and meeting places can be established. The affected context can, however, on different occasions have a different geographical extent regardless of administrative boundaries, be different characteristically and dynamically or bear different consequences for society at large. Consequently a degree of flexibility is called for so that a forum compatible with the situation can be established. It should at this point be noted the various bodies may have allocated their decision making authority in different ways within the respective organisation.

A common approach can be developed between the various societal bodies to effectively address different assistance needs in the affected context. Such an approach can also establish the limitations for the cooperation. Even if authorities cooperated there will always be tasks for which the necessary competence is not available and which should therefore not be carried out. An example is the fact that the police are the only authority which may use force in Sweden in peacetime.

In conclusion

Goal oriented command is a prerequisite for effective fire service work. In this complex work the activities of various individuals shall be integrated to form a whole which benefits the combined effect of fire brigade measures during emergency responses. This concerns planning for different situations and developing the capability of command organisations during the emergency preparedness phase. Even during an emergency response operation or heightened risk and threat situation, the organisation needs to be able to adapt to suit the immediate demands. The capacity of the fire service is important as a part of society's disturbance and emergency management organisation. The collective activities of various societal bodies are a basis for the total production of measures that is to address the need for assistance in the affected context.

Our 'statement of intent' is summarised by the following points:

- In the event of threats and emergencies, measures and resources should be managed in an anticipative manner to obtain and maintain control as quickly as possible over the physical destructive sequence and create the conditions that will enable the victims to manage the situation themselves.
- The command organisation as much as the working methods must be flexible in order to be able to adapt to changing demands and dynamics in different situations and phases of events.
- The command organisation should be designed on the basis of organisational aspects and the need to allocate decision making authority to individuals on different levels and based on different time scales.
- The command organisation should be manned in such a way that the expectations placed on an individual are reasonable in different situations.

- The command organisation needs to be able to work on a short term as well as a long term perspective.
- The command process should be designed so that the organisation's various sections can act jointly to the benefit of the total production of measures.
- The activities at every level are aimed at forming and achieving the tactical intentions.
- Action preparedness is needed for possible alternative developments and to redirect operations.
- Since the command processes are carried out in cooperation with the systems of various societal bodies, the collective measures production can be compiled to form a whole.

The command of the fire service is dependent on an organisation culture that is anticipative and has the capacity to build systems, i.e. design and adapt the organisation and working methods. This adaptation needs to occur in relation to other societal bodies and the demands placed by the immediate assistance needs and the threat situation.

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Samuel Koelega

9. Command support

Samuel Koelega works at the Swedish Civil Contingencies Agency (MSB) on issues related to the management of emergencies and disasters. Samuel is a fire protection engineer and previously worked with emergency preparedness issues at both the SRSA and the MSB. At the SRSA he also worked with development issues for the fire service, and for a period with the direction of command and technical support for incident command. Samuel also served as a fire protection engineer and chief fire officer with the Bergslagen Fire Brigade.

Command support can be said to be the infrastructure and the services that support the command organisation and facilitate command tasks. In structuring command support, appropriate knowledge and well-developed command systems are therefore required. There would otherwise be the risk that command support might be developed based on technical capabilities rather than on the command organisation's needs for support. It is thus important to view command support in its entirety with the command system, and to design command support in relation to command content – meaning the distribution of powers – and for the command process that command support is to facilitate.

First in this chapter is a description of how command support is related to the command system on the whole. My intention is to clarify how command support can be considered as an important part of a command system. Addressed thereafter are future requirements in designing command support with the starting point in the changes in the field of command discussed by Cedergårdh and Winnberg in the previous chapter. Additionally, certain functional conditions under which command support is to function are described and discussed. I have also presented a network model that can be used to examine, describe, analyse and understand the infrastructure for command support during emergency response operations. Thereafter, an example is provided of user interaction in designing IT support for command. Lastly, important practical issues are discussed concerning the use and design of command support. It is my hope that this chapter can serve as a starting point in analysing existing command support and in designing new command support.

Command support as a subset of the command system

Command support – in the form of personal and technical systems that support the command organisation's work – is being refined and becoming more extensive as technology evolves. New technical functions enable command tasks to be optimised and to make them more effective during emergency response operations. However, it is often the technical capabilities that determine the technology chosen, not the actual requirements and challenges that the command organisation encounters. The technology is implemented and used without any deeper analysis being made of how it works with other parts of the command system.

By putting command support in a larger context, we can better understand its place in the whole. In the Swedish government bill 2002/02:10 for continued renewal of overall defence, the term *command system* is used as an umbrella term for the various components needed for command to be exercised: *instructions, organisation, doctrine, personnel* and *technology*. The *technology* and *personnel* supporting the command processes in the command system constitute command support. The content of command support can be categorised into *infrastructure* and *services*. The *infrastructure* is the framework that enables communication within one's own organisation and with collaborating organisations. This is composed of both technical and human systems, such as command posts,

Figure 1. Command systems with the various components needed for the exercise of command.

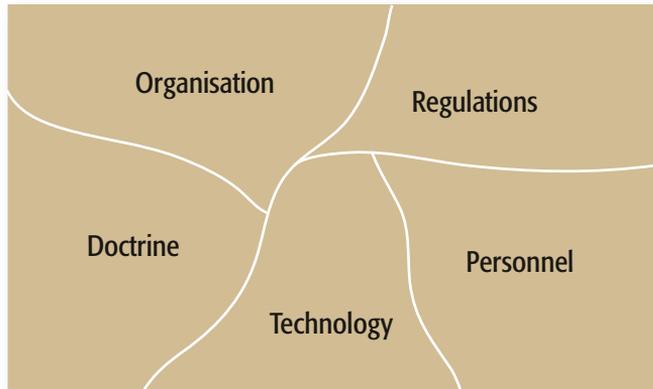


Figure 2. Command support is composed of technology and personnel that support the command processes in the command system.



liaison networks, computer networks, whiteboards, human networks and various types of orderlies¹. The infrastructure in itself contains no information on the activities it supports, but only such purely technical information that it needs to function (address structures, security conditions, logs, etc.).

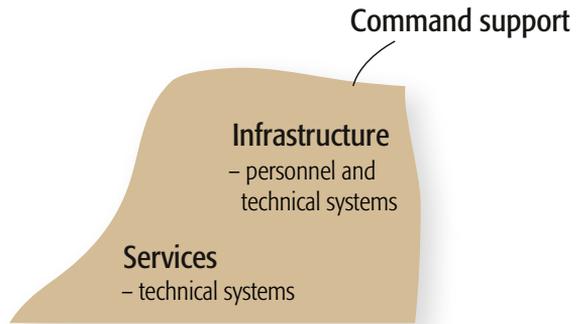
The *services* in the form of functions, tools and facts constitute support to decision makers² in the command system. Examples of services are positioning functions, information databases, switchboard functions, personnel who read and interpret measurement data, and IT tools for analysis, follow-up and simulation.

The command support's *infrastructure* and *services* consist not only of technical systems. They are also dependent on people. This entails that there are *personnel* who conduct tasks partly as a component of the command support's *infrastructure* and partly in the form of, for example, staff duties that are not a component of the command support.

1. A person who is at the disposal of military officers primarily for delivering messages.

2. Decision makers in this chapter refers both to commanders and other personnel, who in conducting their duties make various types of choice and decision, and who need to be able to communicate.

Figure 3. The content of command support can be categorised into infrastructure and services.



Future demands during the designing of command support

Knowledge of command and command systems evolves with time, and as new knowledge becomes available and is applied in operations, new needs arise for command support. This may concern, for example, new knowledge on decision making, changes in society, altered expectations from the general public and politicians, new roles for municipal fire brigades within the framework of the municipal emergency management organisation, etc. that lead to these needs.

Decision making thus far has received little focus and support in the technical systems for command support. Time-critical operations, dynamic courses of events and the lack of shared situational awareness place stringent demands on decision makers. There is a need to free mental capacities, the ability to think differently, and to an increasingly greater degree, apply and enable more reflective decision making (Landgren & Koelega, 2003). This means that command support, just as is the case for task organisational design, should relieve decision makers of tasks of a routine nature and advanced tasks (such as complex calculations and extensive compilations) so that capacity is freed for tasks best performed by humans. Command support should also be design for flexibility. Moreover, it should both encourage and enable reflective decision making since available information can seldom be sufficient for rational and analytical decision making.

Emergencies and their consequences are physical, social and societal. The focus is currently on dealing with the physical consequences of an incident. This is reflected in the present design of command support. To promote development towards dealing more with the social and societal consequences of an incident, command support should be developed to better support this work.

Needs for various types of command support are discussed below, based on the development orientations and command problems that Cedergårdh & Winnberg pointed out in the previous chapter of this book:

- Adapted emergency preparedness for response operation production
- Assistance needs in focus
- Organisation that permits rapid increase in resources
- Far-sighted management of various assistance needs
- Increased capability to assess, plan for and take actions based on conceivable alternative courses of events
- Cooperation with other societal bodies so as to deal with all assistance needs

Adapted emergency preparedness for response operation production sets high demands for there being current information in the command organisation on the resource situation in regards to position, staffing, competence, equipment, ready time, etc. To optimally allocate resources in relation to risk and threat assessments, some form of command support is needed. Such command support should compile and present a current risk and threat assessment for each point in time based on long-term follow-ups and continual information gathering, both manually and automatically via various information channels. Command support can also present suggestions for resource allocation in relation to current or forecast risk and threat assessments. We can envisage a chart with presentations of risks, threats and resources, traffic flows and fire risk prognoses, public functions, rescue teams, etc. Based on the collected risk and threat assessments, the optimal allocation of resources is calculated as supporting information for decisions on movement of rescue teams. The risk and threat assessments can also constitute the basis for prioritisation of preventive measures.

Through an *increased focus on the assistance needs of those affected*, command support needs to be developed to even better support the measures taken to deal with the social and societal consequences of an incident. There must be the opportunity to quickly obtain relevant information from the knowledge and information sources of one's own and other organisations, to communicate assistance needs to other relief bodies and to otherwise support those affected in taking appropriate actions. Examples of command support here can include services that provide access to information on insurance coverage, property, etc. of those affected, and support for administration of various types of emergency support, which can entail access to information and decision making information for dealing with and encountering population groups with differing ethnic and religious origins.

The use of tools and aids to conduct work during emergency response operations sometimes involves the risk of drawing attention away from the assistance needs and that which is achieved for those affected. To provide optimal support, command support cannot burden users with unnecessary functions. There must therefore be flexibility and capability for self-adaptation in command support. This can entail, for example, that command support – depending on the type of incident, the range of assistance needs, etc. – presents a set of useful functions based on previous use during similar response operations. These default basic functions can then be complemented and adjusted as needed to better support command tasks during the pertinent incident.

The municipal fire brigades must be organised in such a manner as to enable the rapid mustering of resources in the event of major incidents and relatively rapid increases in resources in the event an incident should become more widespread. This expansion of resources demands that command support be designed so that sub-functions and sub-systems can be combined into larger systems that optimally support command tasks and that satisfy the needs for command support throughout the course of events. This might involve, for example, combining information from one's own and reinforcing organisations' positioning and resource management systems for teams so that a comprehensive assessment can be presented of the resource situation.

By structuring support into small functional modules, the prerequisites are provided for command support in its entirety being flexible and scalable³. The modules should be designed with well-known and standardised interfaces⁴ so that they can be assembled into larger functional systems, and grow and be modified as required by changes to the situation's needs. Scalability entails not just the capability for handling larger information flows and adding new functions or sub-systems. Command support must also be flexible with respect to the total number of users, when staffing of command functions is increased or when new command functions are added. A simple example of this is that the number of terminals for an IT support system should be easy to increase and be adapted to the needs of the current situation.

Far-sighted management of various assistance needs places demands on there being command support that supports decision makers in the task of anticipating and reflecting over assistance needs and planning measures to satisfy them. Information from previous incidents and checklists with control questions are examples of such support.

Increased capacity to assess conceivable alternative courses of events, planning for these and taking actions also places demands on command support. Directly from available information in command support, it should be possible to analyse, assess and plan for various alternative courses of events using different functions and tools. This material should be documented and easily communicated and presented to concerned decision makers both in one's own organisation and in collaborating organisations.

The capability to handle all assistance needs in collaboration with other societal bodies places demands on command support flexibility and the capability to handle communications with other societal bodies. Command support for municipal fire brigades must fit into the whole that constitutes the information systems for emergency information that are developed as aids in planning for and dealing with the consequences of accidents and serious emergencies in society. The risk would otherwise arise of fire brigades having different types of support systems and databases that could partially process the same information, but that could not communicate with one another or with the systems of other societal bodies.

3. Capacity to enlarge and reduce. Software is horizontally scalable if the number of users can be increased. Software is vertically scalable if the number of functions can be increased. Source: Glossarium för IT- och dataord (translation). <http://www.geocities.com/CapeCana-veral/Galaxy/5005/>, January 2005.

4. In technical contexts, a well-defined and formally described contact surface between two systems or units.

Functional requirements for command support

For command support to function as a part of the whole in a command system, it must function on different levels, between different organisations, geographically spread over large areas and also in communication with those affected.

As a consequence of the distribution of powers, various decision makers in a command organisation have duties on different levels. This can, for example, entail that decision makers handle information on various degrees of resolution depending on the level for which the information is primarily intended. Henceforth in this chapter, the term level is used as an umbrella term to describe the command organisation's components with their various 'contents' in the form of allocation of powers, structures and degrees of resolution concerning information.

Depending on basic staffing, the current risk assessment, any ongoing response operations, etc., the number of personnel who exercise command varies. This means that in an organisation, there are many different people who establish and terminate communication as necessary. *Collaborating organisations' command systems* can be described in the same manner, even if, for example, corresponding powers can differ between the various organisations. But even if the communication structure and needs of collaborating organisations do not resemble those of one's own organisation, communication over organisational boundaries are needed during emergency response operations and it can be difficult to establish communication between the 'right' people at the various organisations.

Information is also sent between people and technical systems in an organisation. In collaboration between several organisations, people and technical systems communicate in the various organisations. There is thus significant complexity in the communication structure both within one's own organisation and between collaborating organisations.

Within one's own organisation, information is sent both between people on the same level and between people on various levels. Information of a general character, originating somewhere in the organisation, can be intended for several (and perhaps all) people in the organisation. This can, for example, be information on the identity of the incident commander or on the goal of operations. We can also mention here communication with a *one-to-many relationship*. Information that originates with several (and perhaps all) people in the organisation can be intended for and be communicated to a single person, such as information on needs for relieving personnel. We then have communications with a *many-to-one relationship*.

There can also be other information providers, such as sensors that transmit information on a single firefighter's BA equipment, position and health status. Information can also be provided on a vehicle's alarm status, position and values for technical parameters, such as water access, fuel access, water flow, pressure, etc. Several IT applications and databases are both senders and receivers of information.

Decision makers on higher levels need to be able to communicate with decision makers on corresponding levels in other organisations, for example, management staff for other departments in municipalities, municipal and departmental management staffs in other municipalities, decision makers and civil servants at county administrative boards, business management staffs, etc. Decision makers that lead

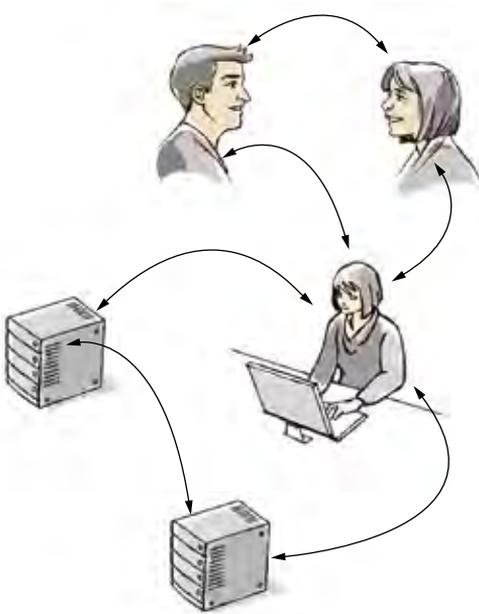


Figure 4. *Different forms of communications*

emergency response operations need to be able to communicate with personnel and decision makers on corresponding levels in collaborating organisations.

A municipality's responsibility for fire brigades during an emergency entails that several municipal and non-municipal bodies will be collaborating in conducting tasks during emergency response operations. Personnel will need to communicate with collaborating personnel when, for example, dealing with injured at larger incident sites: *transport of injured to collection points, providing care to injured at field hospital tents, registration, transport, etc.* It sometimes happens that another organisation's duties are conducted by fire service personnel (such as EMS⁵, when a fire brigade provides care with a defibrillator). There is a need here for

communications with the organisation possessing the primary responsibility for these duties.

The majority of communication associated with tasks at an incident site is conducted at or near the incident site. After that would probably be communication with the next higher level in the command system. If, for example, a firefighter is unable to establish contact with the police officer who is responsible for a collection point, he or she can turn to the incident commander who in turn has contact with the police incident officer for police operations.

That various levels can serve as backups for each other creates redundancy in command support.

On all levels of the command system, communication is conducted with pre-identified and known organisations. On higher levels, the probability of communication increases with organisations that are not pre-identified. This can be, for example, communication with management at a business where a fire has started. It can also concern communication with organisations or businesses with certain expert knowledge. Communication with these organisations must be established while work is underway.

Development towards flexibly assembled crews in emergency response operations, a widened view of the use of collected municipal resources and active resource allocation in relation to current risk and threat assessments entail that response operation resources will have a large *geographic dispersion*. Depending on variations to

5. Medical treatment carried out by, for example, firefighters while waiting for an ambulance to arrive and take over.

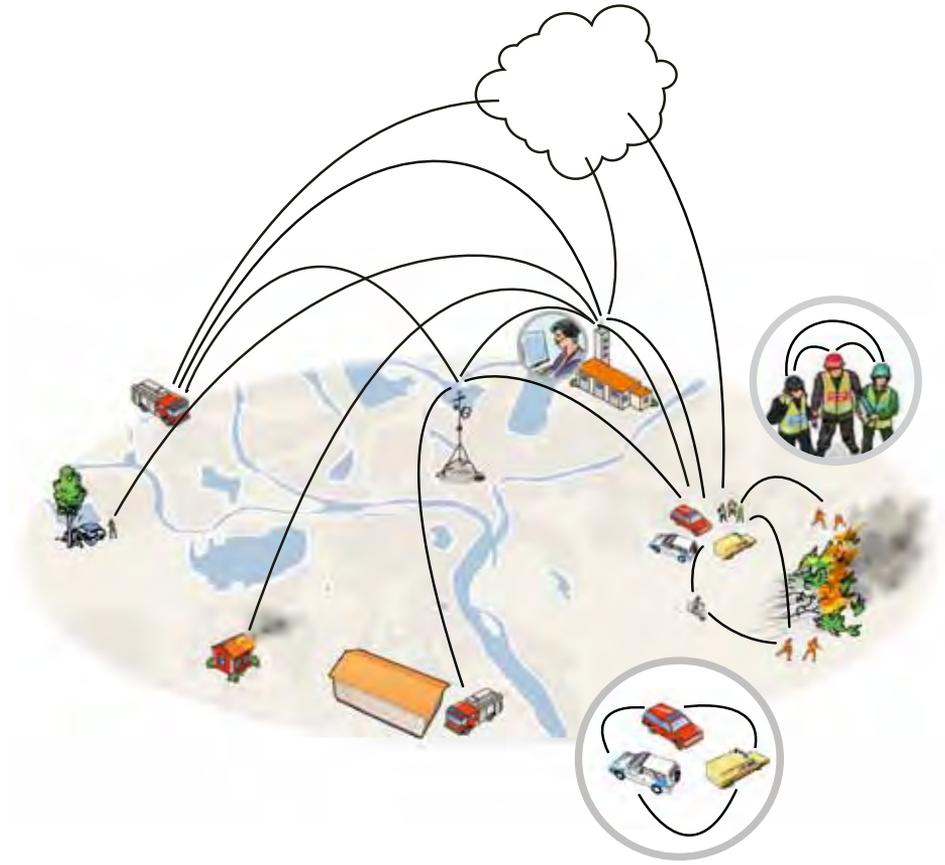


Figure 5. Communications between those affected, the alarm/command centre and the emergency response organisation's various resources during emergency response operations.

the risk and threat assessment, the geographic dispersion of resources will continually change, both in time and geographically. This entails communication at and between many different locations. A large part of this communication is established more or less permanently, while other parts are established based on the needs of each pertinent situation.

Command support must also deal with communication with those affected during an emergency response operation. Communication must be able to be conducted continually, throughout the course of events: *occurred incident – 112 call – guidance – ongoing operations – continued support – follow-up*. These communications can be especially difficult to administer when they are conducted with people subjected to serious emergencies and difficult experiences or with very many people who simultaneously and in various ways are affected by that which has occurred. Communication also needs to be able to be adapted so that we can support people with origins and traditions that are foreign to us.

Information management

With increased use of command support, there are increases both to overall information volumes and the information that individuals must deal with.

Command work on higher levels requires an ability to use abstractions as tools, for example, creating working hypotheses on possible consequences, analysing, synthesising, etc. (see Gerry Larsson's chapter *Theoretical Reflections on Leadership* in this book). In relation to lower levels, higher levels often need more summarised, and in certain cases, processed information to be able to gain an overview of a situation and create a comprehensive picture.

In certain cases, personnel with specialist skills are needed to interpret and explain raw data, for example, measurement values from measuring instruments. Processed information is also needed at lower levels (see Cedergårdh and Winnberg's discussion on allocation of role logic in the previous chapter).

Reduced degree of detail for information entails a risk that certain information elements can be so coarse that they automatically contain irrelevant information. For example, the term fire engine indirectly conveys information on pump capacity, water access, staffing, etc. based on experience rather than facts concerning the vehicle, which can lead to misunderstandings regarding resource capacities and capabilities.

Because different levels work at different resolution degrees, command support should be designed to present information in a manner that is adapted to how much information and which information the individual decision makers handle. In a flexible and adaptable system, information profiles can be created for various tasks or groups of tasks in the organisation, which control the information content and resolution appropriate for a given role. It can concern, for example, the level of detail of symbols on a map. The individual decision maker can later make adjustments to attain more information and higher resolution, or less information and lower resolution, depending on needs during a specific response operation.

Certain types of information can be handled by command support's technical systems and be presented at a resolution that is appropriate for the decision maker.

Other information must be processed and interpreted by someone with the right expertise and insight into the situation to be able to serve as material for making decisions.

Network model for command support infrastructure

The intention of the following network model presentation is to illustrate an approach for how an infrastructure for command support during emergency response operations can be regarded, described and analysed in the whole that constitutes a command system. By applying the model, weak links in the infrastructure can be identified and new command support more easily put into a functional and technical context. As pointed out previously, it is important that new development of command support be conducted with consideration to the whole so that functional and technical solutions are not created that do not work with other parts of the command system.

All types of communication that occur during emergency response operations can be hypothetically described and analysed using the network model even if the complex infrastructure for communication during emergency response operations is difficult to identify and establish in advance. In an organisation with many external contacts, information sources and information recipients, a flexible infrastructure is required that can be adapted to the support needs that the organisation requires to handle a specific situation.

Infrastructure for command support

The network model shows a network with a flexible infrastructure in which resources in response operations can communicate with one another directly or via other nodes⁶. The network basically consists of a permanent part and a temporary part. The permanent part of the infrastructure is composed of, for example, fixed telephone, radio and data networks. The temporary part is constituted by additional resources from collaborating organisations that connect to the network to use the information and knowledge databases that are made available via the network (a so-called ad hoc network⁷).

By letting individuals and technical systems (personnel, vehicles, databases, etc.) in response operations be represented by nodes that are connected together with links, a network is created that constitutes the infrastructure for the communications for the operation.. A node is a connection point for the exchange of information, and all resources that in any way exchange information (communicate) with other resources are represented by a node. Emergency vehicles, personnel, base stations in radio networks, databases, positioning gear, affected people, etc. are examples of nodes in this network.

6. Connection point in a network. Source: Glossarium för IT- och dataord (translation). <http://www.geocities.com/CapeCanaveral/Galaxy/5005/>, January 2005.

7. Network for specific temporary or individual purposes.

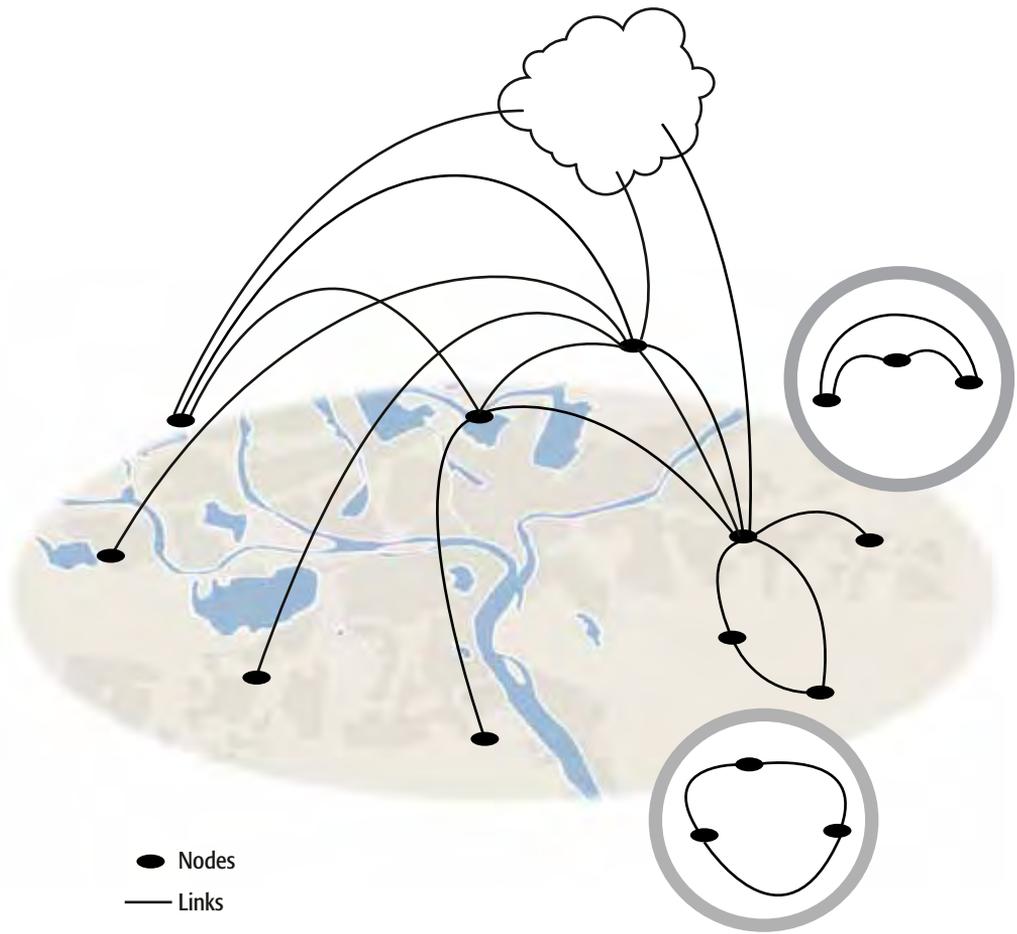


Figure 6. Nodes and links form a network that constitutes the infrastructure in the organisation's communications

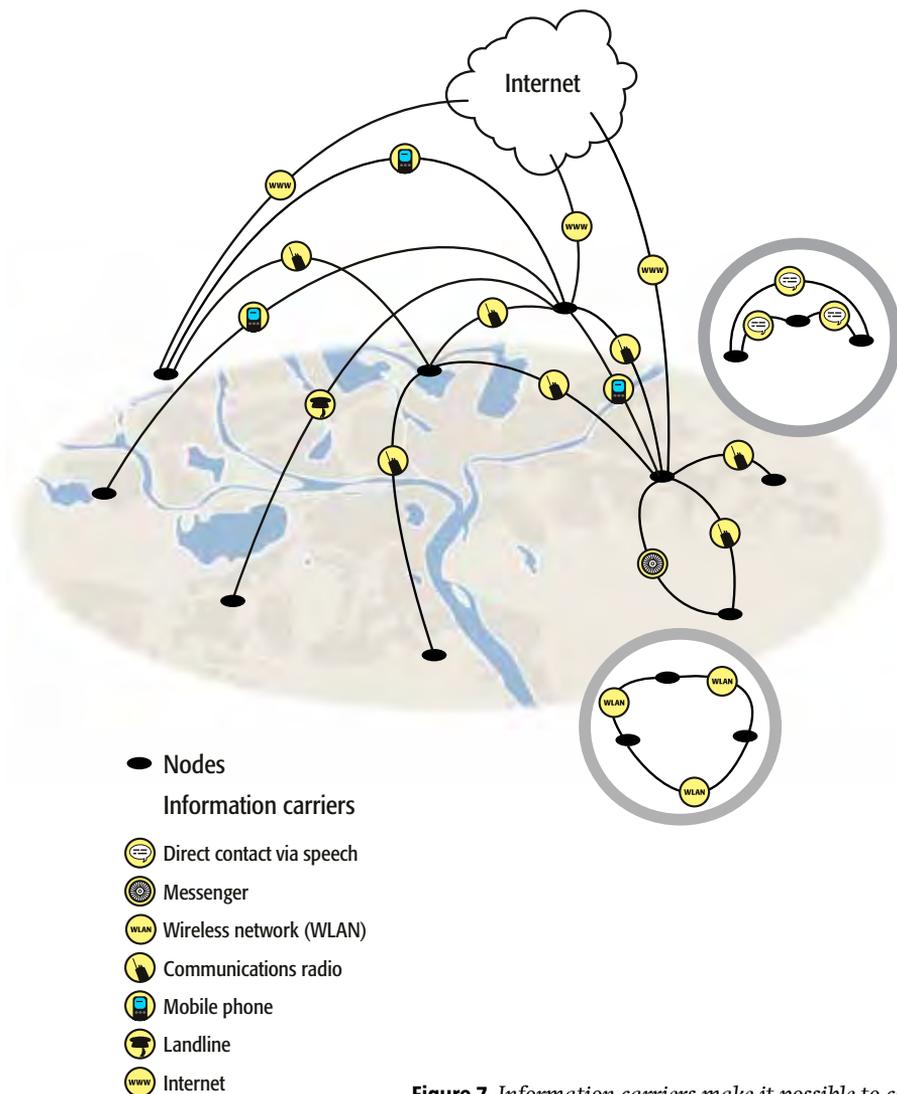


Figure 7. Information carriers make it possible to communicate.

Information carriers and interfaces

The various capabilities to communicate (the links) are constituted by information carriers. Information carriers can be, for example, radio connections via the RAKEL system⁸, e-mail messages via the Internet or calls between two people in the organisation.

8. A joint digital radio communications system for security and safety that the Swedish Emergency Management Agency began constructing in Sweden in 2004 with an expected completion date of 2009. For more information on RAKEL, see: <http://www.msb.se/en/Civil-contingencies/Support-systems-/Rakel/>

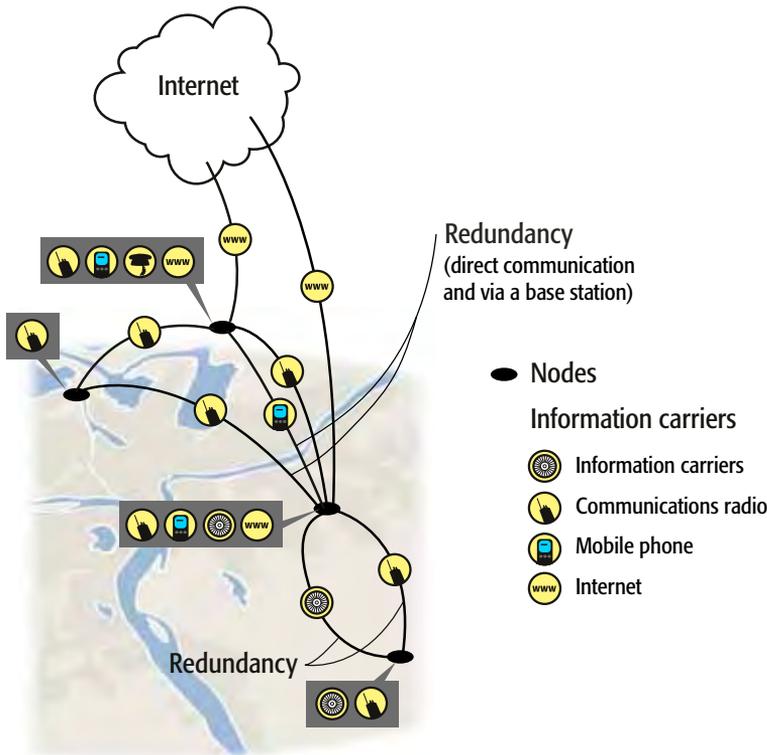


Figure 8. Nodes that have several interfaces are compatible with more information carriers. This results in flexibility and redundancy in the infrastructure.

Interfaces determine a node's capability to interact with specific information carriers. Each node has one or more standardised interfaces. With the appropriate interface, a node can connect to a computer network, establish a radio connection, communicate via fixed or mobile telephony, etc. Because each node communicates with one or more other nodes – depending on node ranges and interfaces – the resulting networks are flexible and redundant.

The information carriers and interfaces enable communications both within one's own organisation and with collaborating organisations. Agreements or standards are necessary for designing descriptions of general and recognised interfaces that can be used by all participating bodies during emergency response operations.

Depending on the technical preconditions, different information carriers are suitable for transfer of different types of information. In designing command support, one must therefore consider and be able to answer questions such as: Which information will be distributed? What are the roles of the senders and recipients? Which environments are they operating in?

Examples are provided below of various technical and manual solutions that can serve as starting points in designing interfaces and choosing information carriers.

A service interface is a computer program that in a standardised manner makes

available a database, a positioning service, a simulation tool, etc. in a computer network by serving as a type of interpreter. Using the service interfaces, the services can be searched, and based on the situation's needs for command support, can be connected together into larger functional systems, so-called situation-adapted systems.

This entails that collaborating organisations at an incident site can make their respective information databases, command support systems, communication systems, etc. available to one another using service interfaces on a common network for the incident site. Each organisation with access to the network can consequently gain access to information from and communicate with other organisations at the incident site. In a corresponding manner, upper levels of authorities and organisations can publish services via service interfaces that collaborating organisations can use.

RAKEL is a common digital radio communication system for security and safety that the Swedish Emergency Management Agency began constructing in Sweden in 2004 with completion slated for 2009. RAKEL is a network in itself; an infrastructure for radio communications via speech, and to a certain degree, via data. Viewed externally, however, the network model represents RAKEL as one of many information carriers that the nodes can use to communicate speech and data via their interfaces.

People can serve as interfaces and information carriers if the information that is to be distributed is so complex that the technical systems cannot distribute them in a correct manner. This entails that someone in the organisation has the responsibility for interpreting information between, for example, decision makers and command support in the use of IT support for gas dispersion simulation or between technical systems that do not have the same interface sets and thus can not exchange information. This interpretation can be conducted with manual routines (such as reading-translating-writing in) or with the aid of technical support that simplifies manual processing, for example, IT support that makes a rough translation that people can revise so that the message and essence reach the recipient.

We have ever-increasing amounts of information to handle. We may be moving towards a future in which complex emergency response operations must have specific information brokers that can collect, compile and distribute information to the proper recipients in one's own organisation or to the proper recipients in other organisations. Even here, IT support can simplify manual processing and support the information broker's tasks.

Examples of other common *information carriers* are fixed and mobile telecom networks, satellite telephones, etc. We have become so accustomed to these information carriers that we no longer give any appreciable thought as to their function and place in the whole. However, it can be appropriate to emphasise their place in the network model, where they have both technical and functional roles in the whole.

End-user involvement in the designing of IT support for command⁹

Successful use of IT support is not just about technological dimensions. Implementation of IT support in a given work practice entails work changes. Changes can be experienced as somewhat problematic. In this context, they must therefore be handled so that social dimensions such as traditions, attitudes and identities do not conflict with planned IT usage.

Studies of work practices and user interaction in designing IT support have proven to be successful. Studies of work practices are intended to create an understanding of how tasks function within a limited segment of operations. One thus assumes that there is a difference between the formal descriptions of operations and practice. By studying people and their work, instead of making assumptions based on idealised descriptions of how operations are conducted, knowledge is attained on the actual circumstances that people need to deal with.

User interaction in system development is not a new phenomenon, but belongs to the so-called Scandinavian school of information system research. The underlying argument for user interaction is that system developers and users working together are better able to design successful IT applications. System developers have extensive knowledge of technological capabilities, but are often lacking in knowledge of local work practices. Users sometimes have limited knowledge of technological capabilities, but instead have excellent knowledge of the work practices that they are a part of. User interaction entails that both system developers and users increase their knowledge of the problem areas that an IT solution is intended to support. Ideally, system developers and users participate on equal terms. No one should have an interpretive mandate; responsibility for system design should be shared.

An example of one of the many organisations that apply this approach in IT research is the Viktoria Institute in Gothenburg. The Viktoria Institute conducted a project on IT in operational use by the fire service in the spring of 2004. The Greater Göteborg Fire and Rescue Service and a research group jointly designed IT support for the purpose of facilitating the work of fire brigade crews at incident sites. A fire brigade crew worked with system developers as a part of their normal work shifts. No extra time or other organisational resources were allocated. Between shifts, the system developers worked to produce the prototype.

This user interaction was of significant importance for the project's results. The interface design¹⁰ was based on the wishes of the fire brigade crew and partially modified during the project as new dimensions of IT usage during emergency response operations were clarified. Demands from users continually grew as developers and users gained familiarity with one another's perspectives. One of the most important results of the project was the realisation that a fire brigade crew, with initially limited knowledge of IT, and system developers can work together and

9. This section on user interaction in designing IT support for command is based on personal communication with Jonas Landgren, doctoral postgraduate student at the Department of Informatics, Göteborg University, Viktoria Institute.

10. This refers here to the interface between the prototype and the user, such as screen views, menus and buttons.

achieve results that cannot be specified or ordered in advance. The fire brigade crew that was involved became very competent during the course of the project in reflecting upon IT usage, and developed good skills in expressing design requirements.

The prototype was evaluated through a field test with a training alarm targeting an operational object. The field test was documented with video. The results of the field test confirmed the relevance of the prototype's design, but perhaps even more importantly were the new needs for functionality that were identified. These were needs that had been previously overlooked, and in some cases, impossible to identify before the prototype was tested under field conditions.

Through studies of work practices and user interaction with system developers and users working together in IT development, not only improved design is achieved, but also greater knowledge of the work practices that are to be supported.

Command support in use

Some practical issues are discussed below, which are important to note and reflect upon during the application and design of command support.

Usability

When many different services are needed to support command tasks to varying degrees, command support should be designed so that it is perceived as a single system 'that grows with the task' without the user needing to switch between several systems or work in several parallel systems simultaneously. Usability is crucial and must be carefully analysed in consultation with presumptive users for command support to actually facilitate work.

Command support for daily use

Command support should be designed so that it naturally supports work both during everyday emergency response operations, and during large and complex operations. Command support that is not regularly used can lower the likelihood of it being used and serving as support during major emergency response operations during which workloads are more demanding. Decision makers should familiarise themselves with the technical systems as much as possible. Command support should therefore be designed so that it complies with the command system in other respects (Cedergårdh & Wennström, 1998). This entails, for example, that functions for clarifying organisational structures, resource allocation, etc. accurately reflect reality. Limitations in the design of command support may not result, for example, in the inability to describe and present an incident site organisation as it actually is.

Degree of complexity and specialisation

Education, training and experience influence the capabilities of users to use command support in various situations. Command support in command functions that are not activated and often used require a simpler design than command support in command functions that are activated and used daily. A less complex design entails, for example, that command support is designed so that the user recognises ele-

ments from administrative support systems used in daily work. Command support in command functions that are activated and used on a daily basis can be more specialised because they have the preconditions (correctly designed) to serve as support during most of the organisation's response operations.

Various technical solutions

Collaborating organisations may have different technical solutions for their command support than what is used in one's own organisation. Needs sometimes arise for communication with organisations that one has not collaborated with previously. In these situations, communication using ordinary command support is impossible. Communication must then be conducted with generally available information carriers, such as e-mail, SMS, phones and people (orderlies).

For high level communication between government authorities and command organisations in collaborating organisations, command support may be entirely lacking or only support certain functions. This can, for example, mean that command support is not available when preparing data and decisions on joint overall goals for a response operation. However, the police, for example, may have access to information on the resource situation of a fire brigades via the fire service's command support for resource and emergency preparedness management.

If common command support is lacking, specific planning and preparations are necessary for conducting communication with these organisations. Planning and preparations are also needed to establish and conduct communication with organisations that one has not collaborated with previously.

Redundancy and vulnerability analyses

The network model describes how an infrastructure can be designed to be redundant. Access to services can be quantitatively over-dimensioned to create redundancy. The expense and risk for disturbances must be weighed against the demand for high redundancy. If all or parts of command support are rendered inoperable despite built-in redundancy, manual routines are needed. Planning and mental preparations, for example, are necessary for handling a situation where communication between two levels in the command organisation are either temporarily interrupted or interrupted for an extended period: 'We are continuing our efforts in fulfilling the goal of the emergency response operation. With the help of orderlies we are carrying out only the most crucial communication' To minimise the risk for command support disturbances, vulnerability analyses should be conducted so that deficiencies can be identified and remedied.

Task execution

Present task tactics are moving towards tasks being modified dynamically as results are communicated and tasks' orientation being adjusted. With task tactics, command methods can be modified by the capability to directly and interactively influence task execution. A position must be taken here as to how much technological capabilities will be allowed to control work practices and methods. To avoid communication that make a certain work practice more difficult and make it harder for

decision makers to focus on their tasks, one should not use all available technology in all situations. Access to video directly from an incident site, for example, can negatively influence personnel who assess and plan for alternative courses of events. There is a risk that they can become overly reactive in their thinking and work in timescales that are too short.

Future command support

The future technological development of command support will likely alter the command tasks conducted during emergency response operations. New communication solutions can, for example, permit certain command tasks to be conducted remotely to a greater degree than at present. Systems for the positioning of emergency response operational teams are another example of technical support that in the future will make it possible to always have a real-time view of the geographical positions of resources as a basis for decisions on preparedness, alerts, etc. Development places stringent demands on retaining an overall view with regards to command support and command systems. Optimal use of command support requires both the will to change and the ability to see opportunities and to develop new solutions.

There are many important areas of interest in the field of command support that can be further addressed and developed, for example, specific applications such as command support in command centres and command vehicles. Issues concerning quality, currentness, copyrights and security in handling information and data are other complex areas in which development is necessary to meet future requirements in the use of command support.

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Per-Anders Berthlin

10. International emergency response operations

Per-Anders Berthlin, previously employed by the SRSA and for the last three years working as a consultant, is a fire protection engineer with 20 years experience in fire service command. He has led several international emergency response and relief operations and since 1997 has worked with international cooperation and development in the fire service field. He previously served as an instructor in command and tactics.

This chapter is intended to present and clarify the specific problems that must be dealt with when leading international response operations or when resources from other countries are used in emergency response operations in Sweden. The primary focus is on the factors that differentiate international work from command tasks in the home organisation. International response operations entail working with people from other cultures, and not the least, together with other organisational cultures, which places substantial demands on coordination and cooperation. It is not just about achieving concrete operational results in another country. It also concerns working together with others, and under unfamiliar circumstances, representing one's country and contributing to the assistance that the country requested. Concepts such as understanding, overviews, equality, ethics and morals are important in this context, as are their practical implementations. The chapter is intended to create awareness and prepare one for an approach that differs from what works at home. Initially, the international operational environment is described on a general level. Thereafter, examples are provided of measures that can improve the situation and make work more efficient while in other countries.

The available research in the field deals with military response operations and thus concerns the work of hierarchical organisations abroad. While command of civilian international operations is conducted internally in a hierarchical system, between the various organisations and participating countries, there are no strict hierarchical systems. Research in the field of commanding civilian international response operations is lacking. There are reports, for example, from personnel despatched by the MSB that provide accounts of various international emergency operations from the perspective of the individual team. There are also reports that focus on the execution and results of various international response operations on the whole. In several reports, it is deduced that command and coordination have been imperfect, but no explanations are given as to why this has been the case. As we will see below, one of the reasons can be that several different mandates are involved. Another reason is naturally the lack of common, global-spanning rules of play that have been adopted by the majority of participants in international response operations.

When commanding a known organisation in a known environment, command can be exercised by using previously accumulated knowledge and experience without having to constantly weigh in the views of 'others'. When unknown factors are a consideration, however, even those who have good leadership abilities need the help of other team members in gathering, assessing and analysing information to a greater extent than what is usually the case. It is advantageous to listen to their assessments of the situation. The more unknown and defuse the factors that affect operations, the greater the risk of making incorrect assessments and drawing incorrect conclusions. It is therefore more important to obtain help in these tasks than when working at home. This involves being mentally closer to one another, being more sensitive and even encouraging individuals to question and analyse based on their own experience and knowledge. Creating such a climate places specific demands on the commander.

Uncertainties make it important to listen

One of the most difficult decisions for local authorities in conjunction with an earthquake involves the termination of rescue operations and moving on to the clean-up phase when there may still be survivors beneath the rubble. It is a difficult but necessary decision.

Terminating search operations in the ruins of a building in which not all missing persons have been accounted for, and thereafter beginning the removal of debris, at the same time as search operations continue on the other side of the street in another ruin, would send very inappropriate signals to those who have not yet located their relatives.

Several of the international teams that were in Turkey wanted the local authorities to take this into consideration as early as the third day, but it was not until late in the evening of the sixth day that a meeting was conducted in the town hall at which a somewhat vague decision was made to terminate search operations, effective the day after. I returned from the meeting and gathered the team members who were still awake to tell them about what was said and to explain that search and rescue work would cease. There was a lively discussion. One man from the support section maintained that they could still find people and that it did not seem probable that the decision would be executed. The support supervisor was upset that his subordinate did not fall into line.

I listened to the argument and changed my decision, which turned out to be the right thing to do. The decision had not reached out from the town hall. The other response teams, as well as my own, continued searching. We did not save many lives, but our team did not differ from the others, which would have been the case if we had not taken part in search and rescue operations that day. The next day, a clearer decision came from the local authorities. I am naturally happy that I changed my decision and that I realised how dependent one is on everyone's input to be able to deal with a situation with many unknown factors, where experienced-based decision making cannot be used and where rational decision making may not work either.

Overall command

The ultimate responsibility for a response operation rests with *the affected country*. This applies both to command and coordination, and the prioritisations made. The affected country has requested assistance and it is this country's assessments and prioritisations that apply. As a representative for an international organisation, it is therefore important to be cooperative, but also be able to see, clarify and inform of one's own capabilities to influence the overall response operation. It is important to be able to clarify what you and your group have the capacity to, and are, able to accomplish in relation to other bodies. It is thus not the UN or any other international organisation, but always the affected country that has the ultimate responsibility and consequently leads operations. During an international response operation, you must abandon the incident commander role you are accustomed to working in at home as stipulated by the Civil Protection Act. At the same time, it has been shown that it is important to retain as much as possible of the work practices that the various participants are familiar with from home, which can be perceived as contradictory.

Command of own unit versus involvement in command of the whole team

In the international operations that the MSB conduct, the majority of personnel are from municipal fire brigades. A prerequisite for successful command of operations is that the participants recognise basic practices when they are abroad. As much as possible, the internal command structure, work practices and work forms that we are accustomed to should be retained. This provides frameworks for operations and a sense of familiarity that can give a sense of security in different and demanding environments. However, there are two substantial factors that can demand more direct command than at home, within one's own team. The first is that the team is made up of personnel who do not normally work together on a daily basis within the same organisation; the second is that the team is operating in a new, often unknown environment. This entails that there is a greater need of being clear and distinct as to what is to be done. But at the same time, this also means that both commanders and other participants may need to operate in different ways, both within and outside their group. This can mean, for example, that the commander must exercise an internal form of command that differs significantly from the form of command that must be conducted externally. This affects everyone in the organisation. The individual team member must also be able to adapt to the situation at hand, behaving in one way inwards and in another way outwards, and to adapt to the surroundings in regards to external contacts.

It is important to explain, discuss and clarify this in the group. Commanders must carefully explain their behaviour so that team members can understand and be aware of the fact that the commander's behavioural shifts are intentional and logical, that it concerns situation-adapted leadership and is a form of 'social command skills'. No one should be surprised if the commander behaves in an unexpected and unusual manner in contact outwards. The more that everyone is aware of one's own culture and differences in relation to other traditions and ways of living, the lesser the risk of unintentional misunderstandings.

During an extended response operation, supervision of time off must also be exercised, and based on our code of conduct, activities organised that are in harmony with local and cultural conditions. A response operation team is not a charter tourist group and must not behave as such, with the negative associations this sometimes implies.

It is important that the team commander is aware of the respective cultures' prevalent attitudes and ways of living in various contexts and is able to inform about and clarify the code of conduct that applies to the team.

External coordination and command

Coordination of an international response operation is conducted through cooperation, not through direct authority over other teams. It is my opinion that the greatest opportunity for making response tasks more efficient is attained through individual teams developing the ability to cooperate, instead of putting the focus on refining methods, techniques, etc. When resources are coordinated, duplication of tasks is avoided. Further developing the ability to cooperate and coordinate would

provide substantial gains in operational efficiency on the whole, and at the same time, strengthen credibility among the local population and other participants. Each team has its specific competence and various material resources that can only be optimally allocated if a sense of the whole is maintained. If operational planning can embrace the entire situation and ensure that materials and skills go to where they can do the most good, the greatest possible usefulness is derived from each individual team.

It is important that a commander is able to establish the prerequisites for contributing to and having a positive influence on the response operation on the whole. No organisation normally has the capability to succeed on its own. Each participating team has a responsibility for contributing and having a positive influence in cooperation with other bodies.

Look ahead

It is my experience that it is a myth that bribes are a necessity in certain countries in order to conduct operations without delays. For example, when a convoy we were travelling in stopped outside the airport because the drivers wanted money for diesel fuel. The group became impatient and wanted to move on, but the commander knew that any payments would have made travel more difficult for the groups that came later. The commander had to weigh his loyalties between his own group's desire to continue and future benefits.

When in Rome...

This can concern, for example, appropriate and inappropriate dress in a Muslim country, such as when a group got the chance to take a break at a football field somewhere in Algeria. The weather was hot, very hot, and a few of the Swedes took the opportunity to sunbathe without shirts. This is what we do when it is hot at home, but not in Algeria where Swedish values are not applicable. In such situations, it is important that the team commander clarifies that the values that apply at home do not apply everywhere.

Categories of operation

Emergency response operations in international environments entail much more than Sweden merely sending a team to a distant country to assist with rescue work during a disaster. It can involve operations in which Sweden contributes with resources in another country and it can even involve operations in Sweden, using resources from other countries. Sometimes an incident affects several countries. All such operations are to be considered as emergency response operations in international environments. Consequently, everyone needs knowledge in this field.

Let us first and foremost define what can be considered as an international response operation. As far back as the 1970s, attention was given to the need for cooperation over international borders with our neighbouring countries, which led to a *Nordic agreement on rescue services cooperation*. This agreement enabled municipalities and government authorities to establish and implement routines for joint response operations, primarily in border regions. The implemented routines apply both to response operations in Sweden with foreign resources and to response operations abroad with Swedish resources. Such cooperation occurs daily along our borders with Finland and Norway. Since the opening of the Öresund Bridge, this type of cross-border cooperation has also become more frequent with Denmark.

How these response operations are to be led are regulated by local agreements/routines. Such agreements exist, for example, between the fire brigades in Haparanda and Torneå, where essentially, a joint operational organisation has been created. Because the teams one cooperates with are not unknown, in practice command is not much different than with units/teams from more than one organisation.

Certain other incidents are regulated in advance, such as cooperation regarding the alarm procedure and information in conjunction with radioactive emissions from nuclear power plants. Cooperation makes it possible to handle most of the specific questions beforehand that arise in conjunction with this type of international response operation. Many problems, however, must be dealt with during the actual response operation situation, which often works smoothly between neighbouring countries but can be significantly more difficult during response operations far from home, in more or less unknown environments.

During recent years, Sweden has also entered cooperative agreements with additional countries in our region that do not directly adjoin Sweden (Estonia, Latvia and Lithuania). Even in these cases, there is consensus as to how command is to be exercised in the countries that are parties to the agreements. In the cases described above, there is more or less detailed regulation of how cooperation is to be conducted, but it is obviously always important with training and instruction in order to gain familiarity with the capacities and limitations of other organisations.

During recent years, a comprehensive project with the goal of strengthening cooperative capabilities of fire services within the European Union has been increasingly active. This work is still at an early stage, but the preconditions have already been improved now that we have 'free passage' within the European Union and several of our laws and ordinances have been harmonised, thus providing significant opportunities for more effective operational cooperation.

Category	Regulation	Example
Operation in Sweden, in a neighbouring municipality, per agreement	Nordic agreement	Operations in neighbouring areas in Tornedalen in accordance with the NORDRED agreement
Operation in another country, per agreement	Nordic agreement Baltic agreement	
Operation in another country without agreements following a request for specific resources	International practice Request Decision on aid Affected country's legal grounds	Aid in the form of environmental experts during flooding in Chile, 1997
Operation in Sweden, without agreements, following a request for specific resources	International practice Request Decision on aid Affected country's legal grounds	Request for generators after the storm in southern Sweden, January 2005
Operation in Sweden, without agreements, following a general request for international assistance	International practice Request Decision on aid Affected country's legal grounds	Has not yet occurred
Operation in another country, without agreements, following a general request for international assistance	International practice Request Decision on aid Affected country's legal grounds	Earthquake in Turkey, 1999
Operation in another country, to assist those ordinarily resident in Sweden	Decision on aid Agreements with the affected country Affected country's legal grounds	Tsunami in Thailand, 2005
Emergencies that affect several countries	International agreements and conventions	Reactor failure in Chernobyl, 1986

Table 1. Overview of categories of operations

Encountering an unknown operational environment

One of the major differences between an emergency response operation at home and operations abroad is that in the latter case, we are usually unfamiliar with the operational environment. Often, we are not even familiar with the normal state of affairs in the affected area. In addition to this is lack of knowledge of legal frameworks, assistance needs, organisations, cultures, command approaches and threat assessments. All this can create uncertainty and make work more difficult for all involved.

Legal frameworks

Legal frameworks concern more than written laws and ordinances. We can begin with a look at the typical situation when conducting domestic municipal emergency response operations. The legal frameworks are primarily based on laws, ordinances, and most often stipulated in legislation such as the Civil Protection Act, municipal ordinances, the Work Environment Act, etc. Moreover, we have customs and practices in Swedish municipal fire brigades that have evolved over the past 100 years and that we are accustomed to. We are familiar with the system and through centralised training, for example, have a fairly uniform approach to practices, such as conducting BA equipped firefighting activities in pairs, etc.

If we take a cooperative agreement between neighbouring municipalities in Sweden and Norway as an example, we are dealing with two functioning countries with similar traditions, similar organisational structures, similar languages and similar ways of thinking. We can work out the legal issues in advance by making arrangements and agreements that regulate positions concerning the respective countries' legislation, etc. and in which we clarify what will apply when the countries receive assistance from one another. Bilateral arrangements regulate and constitute the grounds for agreements concerning cooperation between neighbouring countries, as well as for agreements between countries that do not adjoin one another.

In most countries, there are laws that regulate the fire service field. But in contrast to cooperation between neighbouring countries, in all likelihood, both legislation and practices in countries further abroad have an entirely different design and structure than what we are accustomed to. This lessens our capabilities to understand *the actual legal* frameworks in the region. There are legal frameworks wherever we operate, but our capabilities to learn, understand and apply them are limited by lack of knowledge and cultural differences. Moreover, the situation is obviously worsened by it being more the exception than the rule that there are regulations for how operations are to be conducted when a disaster has deteriorated infrastructures or of the extent that a country has been forced to request international assistance. Most countries have legislation that covers normal circumstances, but extraordinary events are seldom regulated in detail.

Practices have evolved for international response operations since the mid-1980s, when multilateral aid response operations became increasingly common. The UN and other regional organisations such as the European Union and other non-governmental organisations have even created certain guidelines for international emergency response operations.

The Swedish government participates in international response operations after receiving requests for assistance from affected countries. In the Baltic States, when there was no functioning government, the UN had a role as a governing and territorial controlling authority and took the initiative in requesting international assistance, but normally, it is always the affected country that asks for help. This request is a basis for the mandate that lays the ground for an international response operation, and there is a direct relationship to response operation decisions made by the Swedish government. Decisions are sometimes made by another authority or organisation on behalf of the Swedish government to hasten initiation of a response operation. The MSB, for example, can make decisions on certain response operations after consultation with Sida (Swedish International Development Cooperation Agency) and the Ministry of Foreign Affairs. Decisions on response operations are based on requests for assistance made by the affected country.

Solidarity and humanity issues are obvious grounds for the Swedish government's willingness to participate during assistance operations in other countries, but it is important to be aware that other political goals can also be influential in decisions on whether a response operation is to be conducted or not. Beyond this, the mandate is always limited by financial restraints. A common occurrence is that the government decides in favour of response operations under the condition that funding is provided by Sida or another organisation.

There are always certain legal frameworks, but these are more or less clear to us. We have the affected country's laws and local traditions and there are always conventions and other international laws, such as the UN regulations that address, among other things, the sovereignty of individual countries. Local traditions are ethnically, religiously and culturally stipulated. They can be said to be included in the legal frameworks. There may be unwritten laws that are as important to observe as written laws. One must also be able to adapt one's behaviour to the fact that local traditions are sometimes diametrically opposed to international rules and conventions.

There are also certain Swedish rules that dictate our legal frameworks for conducting response operations (concerning work environment, practices, ethics and morals). New basic values, unknown to one's own personnel or other bodies, cannot be suddenly adopted. The application of Swedish law abroad is a large and complicated field that is impossible to describe within the constraints of this chapter. But in brief, one can say that our goal should be to observe/comply with Swedish law to the greatest possible extent during response operations abroad, even if the affected country has no regulations within the pertinent area or sets lower requirements than what we are accustomed to. The prerequisite for acting as a team is that within the team, one has shared principles and a set of values, and we naturally bear with us our own societal traditions/culture, ethics, morals, etc. as common basic values. It is important that the operation's team has such internally applied, common basic values. All are familiar with the basic values of the fire service, which constitute a framework for internal work. However little control we may have over the externally established frameworks (rules, laws, etc. in the affected country, non-specific requests, etc.), these factors will nonetheless constitute the basis of the legal framework that will control how we operate. However, it is very likely that we will encounter conflicts with

Conflict of values

We were in Goma, Zaire in 1994. Civil unrest in Rwanda was followed by large flows of refugees to neighbouring countries. Sweden had decided to send a force of 55 people to assist the UN in the construction and organisation of refugee camps. There are normally 100,000 inhabitants in Goma, There were now one and a half million refugees there. During the first week, 7,000 people died each day in the refugee camps. The temperature was over 30 degrees. We conducted reconnaissance north of Goma in an area where refugees were present. Along the road, refugees were moving in both directions. After passing the first refugee camp with between 400,000 and 500,000 refugees, we stopped at a location where there were relatively few people. An apparently dead person was lying at the side of the road not far from where we stopped. He began moving and one of the team members immediately went to the vehicle to get water for him, despite this being in conflict with our mission. We only had water for our own needs. There was a conflict. I was forced to make a choice and take action. I remember finally shouting, "Do what the bloody hell you want, but don't give away the water!"

our own basic values in conjunction with disaster response operations. This can concern medical staff who want to help as soon as they see a victim, but who have been assigned to provide medical care for the team's own personnel, with limited equipment. (See Gerry Larsson's chapter in this book). Everyone must maintain focus on operations and the specific task. Commanders must be distinct when communicating with personnel and be aware of what should be done by all concerned.

Conflicts between value norms and reality are not uncommon. Those who work in the emergency services naturally want to provide the best possible assistance to everyone who needs it, but the response operation's mandate in relation to the team's capacity can force personnel to reassess, reconsider and act in ways completely opposite to what they are normally accustomed.

Assistance needs

Two different situations usually constitute the basis for a request for international assistance. It can be that the affected country has a good view of the situation and requires a specific resource that it does not have access to. When the need for assistance is well-defined, assistance can probably be integrated into the existing local rescue/relief organisation without any greater difficulty. The affected country has a plan for what is to be done and for what the assisting team is to contribute to efforts, and hopefully, even a plan for how assistance will be integrated into the emergency response organisation. If such communication is possible then the operations team can plan its work, bring the right equipment, etc.

But in the event of major incidents or disasters, when resources are insufficient, actions cannot be taken based on structures planned in advance. If a country's own resources are not fully operable, knowledge of the situation is often lacking as well as of which assistance needs exist. People may be without housing, water may be

lacking and the infrastructure destroyed. No information reaches recipients. Both government authorities and people in positions of responsibility can be directly affected; fire stations may be in ruins and without equipment, etc. Nothing works as usual and the prioritisations that should be made are unknown. It is not unusual that response operations during extraordinary events are not planned in advance. It is unclear as to who has responsibility for initiating and coordinating assistance operations. It is fully understandable that it may be unclear as to which assistance needs exist.

One can question as to whether it can be justifiable to conduct disaster response operations that are extremely expensive in comparison to long-term aid. For a very modest amount, for example, water can be provided for a person's survival for an entire year. In Turkey, two people were rescued from the ruins by a Swedish operational team at a cost of four million Swedish krona. This leads us to attempt to discern the purpose of a response operation in a disaster area. The primary goal is to help the affected country in assisting its population during an emergency. An aspect of satisfying the needs of those requiring assistance is naturally to be able to evacuate, rescue and help those affected. But in a disaster situation, it is also important for the individual to see stability and structure in society and that society is able to help. In situations where society's resources are insufficient, a vacuum occurs that to a certain extent can be filled by international resources. Those affected see that someone, not the least their own government, cares about them. The individual is given new courage in a very difficult situation, dares to look to the future and can handle his or her own situation even if things look bad. The psychological effect is important. The response operation provides an indication of structure, control, organisation and actions for regaining control of the situation. This in turn is also necessary for more long-term help to be initiated. Involvement is needed for establishing the capability to survive. A person who is unable to believe in his or her country and its willingness to satisfy immediate assistance needs has difficulty in believing that there is anyone else who will see to the needs of those requiring assistance on the long-term.

It is extremely important to demonstrate that someone cares, to be at the disaster site, to be visible and to display sensitivity to the needs of those requiring assistance. But a crucial issue is how the operations team conducts itself. Inappropriate behaviour at an incident site, in conflict with local traditions, can ruin the entire impression of the response operation.

The needs of the individual and the needs of society

Normally, the affected society requests assistance to help the affected population. As is always the case during an emergency, the needs of individuals can greatly differ from the needs of society. After an earthquake, there are always people searching for missing relatives in ruins. The needs of individuals are clear in such cases. They want help in finding and extracting their relatives, living or dead. Society's needs at this phase of response operations, however, are to search the affected areas as quickly as possible to find out if there are any survivors still in the ruins that can be saved with available resources.



Working in a disaster area alongside other organisations that are unknown to us, places specific demands on command capabilities.

Unfamiliar cultures

Swedes are among the world's most travelled peoples, but I am not convinced that we always travel with our eyes open to other cultures. Moreover, we are not always aware that our own behaviour is culturally conditioned. We know that there are differing views on gender issues in various parts of the world. Religion and tradition are controlling factors. Men and women have different preconditions and live different lives in different parts of the world. We are also aware of different eating habits. Religion, tradition and culture determine if someone does not eat pork, and whether others refrain from beef or fish. Naturally, we also know that people speak different languages.

But different cultures have so many more differentiating factors. In every culture, behaviour is learned from the cradle. Gestures, expressions, dress, silence, pauses, placements, etc. send different signals to different people in different parts of the world. To learn all these culturally, communicatively conditioned factors as a foreigner is impossible, not the least because the knowledge is often on a subliminal plane. Much behaviour is so ingrained that people are unaware of it until someone breaks with it. But a general awareness that it exists can be established, and it is important to be open and observe the surroundings, as well as ourselves, to be able to work together with others.

Cultural and linguistic issues

As mentioned above, it is important to understand the significance of cultural differences and behaviour. One must strive for positive encounters rather than crea-

ting cultural conflicts. It is important to be aware that yes does not necessarily mean yes everywhere, just as no does not mean no in all situations and cultures. It is also important to be aware that gestures, headshaking, fingers and hands in the air mean entirely different things in different parts of the world.

The only way of learning how to properly behave in foreign cultures is through practice, meaning conducting practical exercises in encounters with different cultures. We can read about cultural differences, but without actual practice and encounters with other cultures, we can never be able to behave in accordance with a particular foreign culture. One must practice so that the mind is 'correctly' set so that one knows intuitively how one should act.

It is thus important to be sensitive to that which is foreign and preferably to ask those familiar with foreign cultures to share their knowledge of what can be appropriate or inappropriate in various situations. One should be aware that it is seldom considered unmannerly to ask about cultural matters, for example, how questions are normally framed concerning local customs, etc. The capability to see, listen, feel and be aware that there may be cultural issues to deal with is a necessity. If one has come this far, it can probably be beneficial to make use of written knowledge. If body and soul have been conditioned to stop and reflect when especially sensitive cultural factors arise for consideration, one can also learn about local customs and other issues. Own interpreters and experts who can interpret and translate between cultures are first useful at this stage.

Human language embraces more than words and sentences. Language is a part of our culture and as soon as we no longer have the opportunity to communicate in our mother tongue, a portion of communication is lost, even if we feel that we are skilled in speaking a foreign language. Every language is filled with subtle nuances and variations that are used in different ways, in different situations. Awareness of this is necessary during all communication. In practice, this entails that one usually has to check that both senders and recipients have perceived the same thing. A skilled interpreter can communicate your message content so that the recipient understands it. Professional interpreters have taught themselves to communicate content, which is not the same as word-for-word translation.

Functioning communication is especially important in a conflict situation. It is thus important that your communicated message/intent reflects your views and not an interpreter's perception of the situation. There are inherent risks with using locally recruited interpreters and it is important to be observant of who the interpreter represents, loyalty and attitude. Your interpreter should represent you and no one else. In certain situations it can even be better to communicate without an interpreter despite you and the other party not sharing a common language. What an interpreter desires least is conflict with his or her own people. Conflict situations always arise when for one reason or the other, we cannot provide what the opposite party expects. This can be because our prioritisations, or grounds for prioritisations, varying so widely that we cannot agree to the local leader's prioritisations. He may want to help people of the 'right' religion, something that does not agree with basic human rights. In such a situation, it can be inappropriate to communicate through an interpreter because the interpreter may want to avoid conflict with his or her

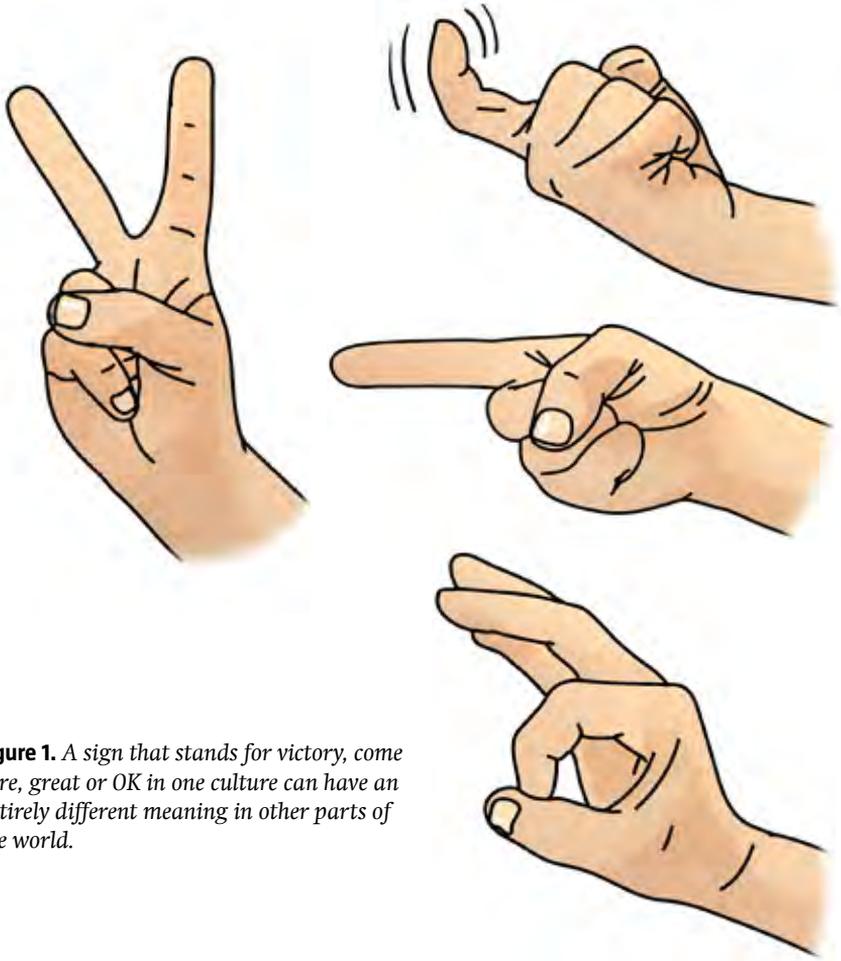


Figure 1. A sign that stands for victory, come here, great or OK in one culture can have an entirely different meaning in other parts of the world.

countryman and leader. The interpreter can be easily put in an awkward situation if he or she is to represent an ideology that he or she cannot share, and it is therefore best not to subject an interpreter to this situation.

Threat status uncertainty

We who find ourselves in an unknown environment can feel uncertain. This can lead to magnification of threats that are actually insignificant, and at the same time, depreciation of threats that seem minor but that can result in serious consequences. If we are in, for example, an African rural area, we easily overestimate threats based on what we have learned about predatory animals, while we have a tendency to depreciate the threats from that which we cannot see, for example, the different bacterial flora, malaria-carrying mosquitoes and tropical diseases. We assess the threats incorrectly. It is the same in respect to threats of robbery, assault, etc. The actual threats that exist in the areas in which we operate are usually not entirely clear to us. We have no previous applicable knowledge and we lack the native

population's ability to see nuances in environments that are foreign to us. In addition to the previously mentioned threats, in conflict areas we can sometimes be perceived as partial in a conflict because of improper behaviour. If we permit discussions to take the wrong course, we can find ourselves in taboo areas and risk creating new conflicts. It may be that we inadvertently enter areas that should be avoided, not only culturally but also geographically, for example, mined areas, roads that are controlled by extra-parliamentary elements, roads that cannot bear our vehicles, etc.

Uncertainty about the normal status in the affected area

Expectations in conjunction with emergencies at home are easier to anticipate than with emergencies that occur beyond our cultural boundaries. They are based on our everyday lives, on our degree of societal development and our own culture. In a foreign country it can be difficult, for example, for us to assess how the situation was before the emergency arose. In Algeria, we operated in an area entirely without water and electricity. But what was it like before the earthquake? Was there water and an operable electrical distribution system then? Such questions should be taken up. They influence the expectations of those needing help and it is important to know the level of expectations on the part of those affected. We should therefore try to find out what the societal situation was before the emergency occurred. There can be problems that are much more important to those affected than those that we focus on.

The same applies to how the national response system is structured, i.e. how the affected country's own organisation for dealing with emergencies and similar incidents functions. How is the response system normally organised, which authorities are responsible, etc.? And in the event of major disasters, which parts of these structures are still operable?

It is normally rather easy to obtain a clear picture of how the system works on central/national levels during an emergency. But it is often much more complicated to find out about the structures on local levels. Structures can also vary between different areas. In one area, a mayor may have taken charge, a military organisation in another, civil defence in a third and so on.

Undefined assistance needs

There is normally a considerable lack of information during the initial stages of a response operation and it is difficult to make decisions on the orientation of overall operations. This is one of the explanations as to why a request for international assistance is often unspecific. The reasons can be many, including destroyed infrastructures, insufficient organisation, missing key persons, etc. An additional problem for a team that arrives as international relief is that one often has an unclear picture of the normal state in the area, both in regards to living conditions and standards, and when it comes to the society's structure, available local operational resources and their internal structures, etc. Another problem, which naturally is primarily the domain of the affected country, is establishment of a level of ambition that applies to the assistance operation. Which level of assistance and support can individuals expect? It is difficult to make decisions on this based on insufficient

information. The organisation is always lacking in resources and it is important to have a concordant perception of the level of ambition between the various organisations to enable an appropriate allocation of the available resources in the area and make prioritisations between various areas.

The influence of the media on the assessment of assistance needs

From a command perspective, one should always critically examine the factors that may have contributed to the assessed assistance needs. Major disasters receive considerable news coverage. The CNN syndrome is spreading and several organisations want to be at the scene so that they can be visible in the media when the opportunity arises. The media affects interest for assistance. By the third day after the earthquakes in Algeria, for example, there was a consensus among both domestic and international rescue organisations that there was no longer any need for search and rescue resources. But when this need was stated nonetheless in the media, several countries sent additional resources.

If you make contributions to the media, you can help provide a more nuanced picture of the situation. It is also necessary as a commander that you attempt to contribute to further analysis of previously made assessments of assistance needs through critical examination and questioning. What are the actual sources that form the basis for our prioritisations? Is the media one of our information sources? Before we leave home, we can conduct a professional and factual assessment, and if possible, attempt to take positions on such questions. When onsite and there are assessments on resource allocation, one should always ascertain which information has constituted the basis for decisions. Because that which is taking place is not an everyday event for local authorities, it is important that those who are operating internationally can participate and take up issues concerning the media's influence on assistance needs in a factual and correct manner.

The connection to long-term recovery

The connection to long-term recovery is important throughout a response operation. A commander should always have this in mind and seek opportunities to attain goals that contribute to the long-term situation, even if the response operation is primarily oriented to the emergency course of events. For example, when response operations in conjunction with an earthquake are winding down, one can consider the possibility of leaving some equipment behind that can be of use in a later phase. In Turkey, several fire stations had been destroyed by the earthquakes and no equipment remained for maintaining everyday fire service preparedness. Prior to departure, one could have located the responsible authority and inquired as to whether the Swedish team's equipment could be assessed as functional and useable, and perhaps some of the hoses, pumps, hydraulic tools, medical equipment, etc. could have been left behind.

Another alternative is to transfer knowledge by cooperating with local organisations, alongside conducting operations. The ideal situation is to never work alone, but always together with the local body to which we are providing our specialist skills, simultaneously as this body is learning to use our equipment.

Cooperation with operational teams from other countries

What is decisive for operational results is the sum of all assistance that reaches those seeking assistance, and not the individual team's success. The greatest problem to resolve is in effectively using the available resources and avoiding failure to satisfy needs because of duplication. It is especially important that the efforts of the individual team optimally contribute to coordination. On the following pages, I will therefore focus on cooperation and coordination with other resources in the area.

Organisation for cooperation

As mentioned above, one cannot always expect information from the requesting country's intended/planned organisation. It is highly probable that the planned organisation is inoperable after a disaster. It can be assumed that the organisation is directly affected by the event or that the necessary infrastructure has been destroyed. Almost always, the organisation will be indistinct and we must be prepared for this.

We must take consideration to the affected country's organisation on all levels. Overall assistance operations are dependent on the affected country's ability to take in the whole situation and control tasks. We are also dependent on the other international bodies that participate and their ability and will to collaborate. Because there are 190 countries, learning about each country's organisations is not a viable option. Even if we have certain knowledge of the affected country's conditions in advance, we can never be sure that the planned organisation or the intended structures will be operable during the pertinent incident. Moreover, the international bodies that will participate in an international response operation are not determined beforehand.

There are several different principals. Cooperation can be conducted on a number of various levels and it is not certain that the cooperative levels will be logically related to one another. Sometimes one communicates with one, sometimes another. An international response operation differs from a Swedish rescue service response operation, where in practice, the various teams from fire brigades, police and medical care work together. Abroad, the picture is not as clear. Furthermore, we cannot identify the various participants, and this naturally places specific demands on us when we cooperate.

Mandate

Our operations are regulated by legal frameworks. An important part of this is the mandate that we have for our operations. Mandate refers to the authority to conduct certain actions on behalf of someone else. The affected country requests assistance, perhaps via OCHA (United Nations Office for the Coordination of Humanitarian Affairs), which in turn makes contact with the member states. It is the Swedish government that makes the decision to send a response team under the condition that Sida, another organisation or the affected country is able to finance operations. Lastly, the MSB receives the assignment and the response operation is conducted.

There are several ways of dealing with needs for assistance. Between neighbouring countries, it is common that immediate assistance is sent bilaterally. The Nord-

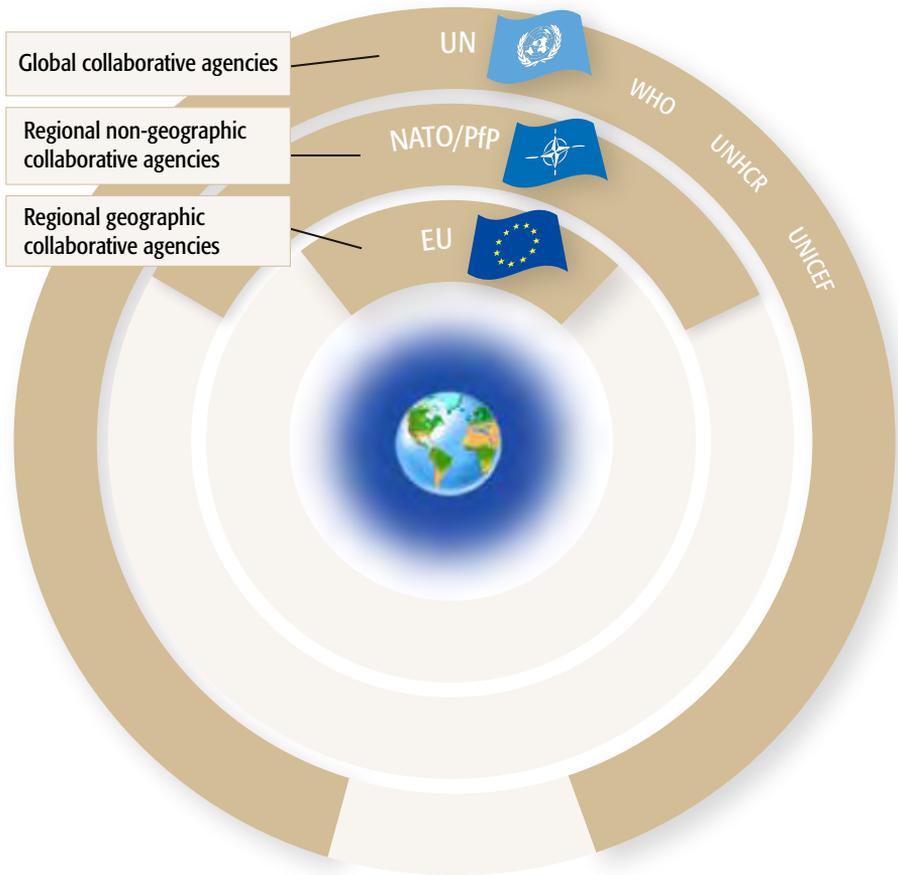


Figure 2. Regional systems for international cooperation must be adapted to the global system in standard use by the UN for joint work to be effective.

ic general agreement for rescue services is invoked about once a week. However, a request usually goes to the UN and OCHA. OCHA can be said to function as an emergency call centre. In theory, OCHA distributes received requests to all of its member states. But OCHA knows which resources are available and which countries are possible contributors in major response operations. Some countries only assist economically, while others have listed various resources, materials or personnel that can be used upon specific requests for rescue assistance. OCHA sends requests to the respective countries' official recipients. In Sweden, requests go to the Ministry for Foreign Affairs, in other countries to the permanent staff in Geneva where OCHA has its headquarters. In certain cases, requests for assistance can go via another international body, such as the European Union, Nato, etc., which subsequently forward requests to their member states.

The problem with preparing a request is that it takes time. Major incidents affect the infrastructure and interacting systems, which leads to reduced communication

capabilities. It is difficult to obtain overviews of situations. We all have natural resistance to asking for help on insubstantial grounds. In this respect, states are like people and they want to know what is happening before they ask for help. The need must exist and it must be large. Moreover, planning for assistance requests (who makes the decision and on what grounds) is imperfect in most countries. In Sweden, there is a provision in the Civil Protection Act that states that the government or the authority designated by the government has the right to request assistance beyond the Nordic countries when necessary. This is all; there are no further provisions. The contrast is considerable in comparison to the provisions for less serious accidents, where the act is very clear and lengthy.

We cannot expect any wealth of detail either in a request for international assistance from a country that has been subjected to a disaster. Naturally, information that can be provided is vague. One seldom knows exactly what assistance is desired. This entails that a request for international assistance is very open and imprecise. Despite this, it is one of the foundations for the deployed operational team's mandate.

The Swedish government makes decisions as to whether the MSB will conduct an international response operation. The government decides who will be provided with assistance (the country or other organisation), when this will be done, the approximate time frame and the number of people who will be deployed. The government does not normally have funds allocated for this and the decision only applies if there is funding. Sida normally provides funding. For a decision on funding, a project plan is required that describes the extent of the response operation and its goals. Such a plan may be verbal in the initial stage. Sida, which is in contact with the various countries, can assess suitability and difficulties, etc. and make decisions as to whether funding will be provided. The funding decision is thus the second basis for the operational team's mandate.

The third basis for our mandate when we participate in an international response operation concerns internal rules, agreements and guidelines, employment contracts with personnel, and practices and routines for how we conduct response operations as developed from existing practices and experience.

Mandate diversity

In Denmark the process is about the same as in Sweden. The request procedure is the same, and the Danish authorities have nearly the same routines, funding methods and employment contracts as in Sweden. Nonetheless, the Danish mandate is naturally different than ours. The same applies to England, France and other countries. Despite the same request procedure and similar organisational forms, the mandate is different for different organisations. Traditions and response operational systems differ. What about Turkey, where the NGO AKUT (Turkish voluntary SAR organisation, active both nationally and internationally) has the responsibility? The request procedure is the same, but here we do not have a state that bears responsibility, but rather a voluntary assistance organisation (comparable to Doctors without Borders). There is no decision from the government; a response is dependent on the specific organisation's statutes. AKUT's management makes its decisions

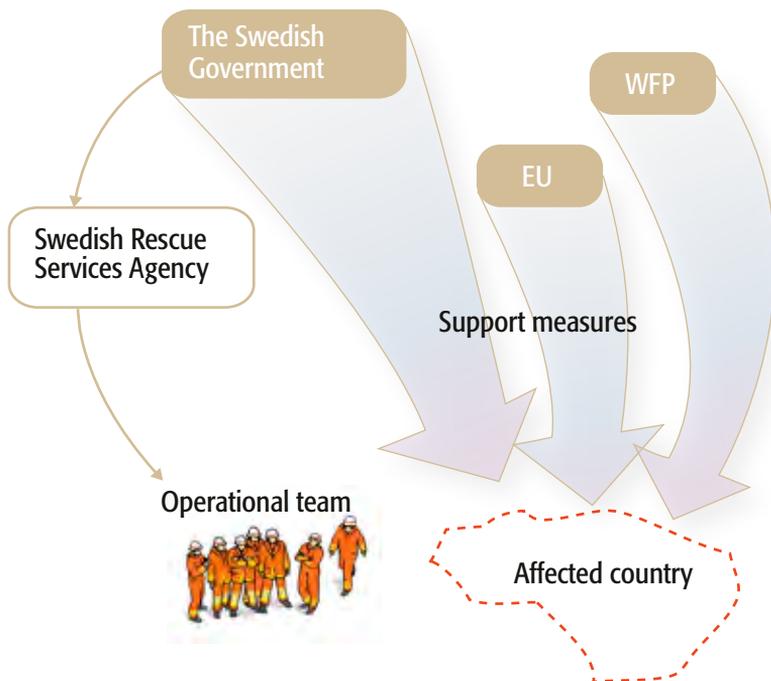


Figure 3. Working under several authorities can be a limiting factor for our operational teams, but also provides the opportunity to influence the operation as a whole.

based on the funding forms they have for conducting a response operation. There are thus many different rules, regulations and statutes that constitute the basis for operations and which result in a wide variety of mandates that differ in regards to execution of response operations, reasons for taking action, etc.

Because of this, chains of command also differ. Each organisation has its own chain of command. Subsequently, the chains of command also vary with each country. The Swedish operational commander answers to the MSBs director general, who in turn answers to the Swedish government. According to the agency's commission from the government, we are to help countries and support organisations. There is thus a certain amount of regulation and limitation as to what to we can do. The country that has asked for assistance cannot take command of our personnel, but may facilitate, forbid or restrict our actions. This is how it is for each organisation. It can thus be deduced that a multi-lateral, multi-organisational response operation does not have a hierarchal command structure, but is instead a variety of organisations with separate command structures that jointly or in parallel, take actions to lessen the consequences of an emergency. If coordination is to be conducted by these teams, the organisations onsite must cooperate.

Shared authority

As a result of the complex mandate (from the perspective of the operational team), there is shared authority for response operations. This entails that as a team, we must always conduct the requisite reporting to the various authorities, the affected country, the MSB, the Swedish government and OCHA.

Network structures

As has been mentioned above, it is normal that several different bodies are involved in an international response operation. Moreover, the international bodies often have different mandates, which entails that it is not a case of *one* chain of command. The respective teams have their own rules for following the instructions of other bodies. Depending on how our team's mandate is stipulated, it can entail supporting the affected country in operations to alleviate the situation for the needy or to support another body, for example, an organisation belonging to an organ of the UN. If the mandate stipulates that we are to assist another country's rescue service, this is what we must do. This is regardless of our direct duty to obey instructions from the Swedish government.

Involvement is based on the various groups striving to share information as much as possible, which is not always a matter of course for all bodies.

The responsibility for coordination of operations is a shared responsibility, primarily between the affected country's responsible authorities, we as a participating resource and other participating bodies. Moreover, the UN has the mandate/duty to support coordination if the affected country so desires.

When regional or other multilateral organisations (e.g. European Union, Nato) design common mechanisms for international coordination, these mechanisms must be adapted to the global system to enable overall coordination.

For coordination to be possible, an overview of the situation that is as concordant possible is required and a common understanding of prioritisations, threats, courses of events and incident dynamics. It is therefore necessary to create a functioning exchange of information between the bodies and especially with local command (which does not always exist). Coordination requires that joint responsibility be taken and that active efforts are made for there being a decision-making process – an all-embracing decision-making function that can be accepted by all, or at least by most. The strength of the local authorities is of no importance, nor the will to cooperate, unless serious efforts are made to attain this. The majority of the bodies must be satisfied with the decisions for coordination to be productive. Many international bodies have experience from similar operations, in contrast to the local bodies who are usually taking part in an international operation for the first time. The decision-making process must be transparent and based on need-related grounds. Knowledge of the significance of coordination is important.

A good example of this can be seen when comparing the two response operations after the earthquakes in Turkey in August and in November 1999. The actions of local and national bodies in working with the international resources that were deployed to provide assistance during the respective emergencies were decisive for the effective use of resources. Many lessons were learned after the extensive opera-

tions after the earthquake on August 17. When a second major earthquake occurred less than three months later, neither the Turkish authorities, domestic organisations nor the international response teams had time to implement these lessons. Despite this, the newly gained knowledge among the majority of the participants proved to contribute to more effective coordination and use of international resources. Several factors contributed but decisive was the Turkish authorities' understanding of the importance of establishing an all-embracing operational command staff and of immediately establishing direct cooperation with the UN's UNDAC team. Another important change was that most international teams assigned personnel to handle cooperation both with Turkish authorities and other international teams.

Terminology

Even the most skilled interpreters can encounter problems with the terminology for specific areas, operational terms and nomenclature. Many cultures lack words for, what are for us, natural concepts. Moreover, there can be several entirely different definitions for the same term. In Swedish international operations, the term *team leader* is commonly understood to mean 'the highest commander for an operational team', but in England, a *team leader* only commands a small group, with a team being the smallest functional part of a *task force*.

Communication is difficult and it is important to check that the message one wants to convey is received by the recipient. It can be very advantageous and important, together with other teams and bodies with which one would like to cooperate with, to invest time and energy in deciding on what things will be called in order to facilitate further communication. This primarily applies to occupational and operational terms for job titles, equipment, unit designations, geographical points, etc. For example, *forward control points* and *regrouping points* in this context are not just everyday phrases, but rather important terms when used in conjunction with a response operation. If agreement is reached on a common forward control point, it is important to know that a discussion partner is aware of which forward control point we are referring to.

All too often, however, there is a blind faith in the creation of a unified nomenclature. There are many who are eager supporters of common, generally accepted definitions. It is my opinion that in individual cases, it is worthwhile to make the effort to ensure that one understands, but one should not expect that a general nomenclature list will do wonders. Such a solution does not coincide with the current situation in what for me is a foreign country. I believe that it is better to be aware that different languages, cultures and traditions co-exist and that it is important to take this into consideration and understand that there are differences in the nomenclature of different countries. Temporary agreements can be made and specific definitions assigned to terms that function in specific situations, or in other words, reaching agreement on the definitions of words/concepts here and now.

Command cultures

Just as with cultures in general, there are wide variations in command cultures in different countries and in the various organisations of different countries. The dif-

ferences become apparent in questions such as: Who is allowed to speak? How may one speak? How does one communicate? And how does one receive information? Who possesses information? Regardless of the degree of consensus as to what should be done, because of inabilities to communicate between different cultures/command cultures, it can sometimes be nearly impossible to conduct joint operations.

It has been previously mentioned that within the group, on foreign soil, that the command structure and the form of command that is normally used at home should be retained as much as possible, but in respect to cooperation or integration outwards, adaptations must always be made. This means that within the group, we do as we usually do at home, but outwards that we act as demanded by the situation. This applies just as much to commanders as to other group members. In external communication and collaboration, we must, for example, be aware of and adapt to the expectations of other groups and their commanders.

It is usually maintained that a basic requirement for success in cooperation is to never lie. My experience, however, is that in certain situations, it can be necessary to stretch the truth a bit. If, for example, we are in a country where no other medical proficiency is recognised other than the title of doctor, I believe that it can be permissible to let our accompanying nurse, for example, say that she is a doctor when obtaining information from a local hospital. And it can sometimes be appropriate to let the person who consults with other teams to represent oneself as the commander of our team until the operation is completed. But the use of this type of 'white lie' must naturally always be exercised with the greatest possible care.

Technology – Command support

Just as with all response operations, it is desirable to use *command support* for all staff tasks that do not necessarily need to be performed onsite. A prerequisite for this is that there is a well-functioning communication platform and that consideration is taken to certain issues in regards to technical support that are of specific importance during international response operations:

- The choice of language is not just a matter of which language one chooses to communicate with, but also influences the design and choice of technical support. As concrete examples, the following can be mentioned: language choice for computer operating systems and keyboard layouts, markings on and user instructions for technical equipment and designations of commanders.
- Long-distance communications that provide both voice and data communication even if the normal systems (fixed and mobile telephony) are not operable.
- The ability to establish secure communications within the operational area when the permanent basic network is down.
- Design of equipment for withstanding different operational environments, where the climate and other physical factors can differ considerably from conditions in the Nordic countries.
- Preparations to facilitate requests for permission to use a certain frequency and the ability to adapt programming of equipment in the field.

Trust-building leadership

At home, most rescue service situations are regulated by law. We know who is responsible and which resources can be used to deal with different incidents. Through legal regulation, the various representatives from the authorities know when they are required to participate with expertise and resources. We nearly always have knowledge of and previous relations with the various bodies and know for the most part what each can contribute with. It does not work this way abroad. There we have to butt our way forward to come in contact with the person organising operations. Normally, we are a completely unknown body in his eyes. It is important here to be able to perceive the required assistance needs, realise what one's own group would be able to contribute relative to other teams and to 'sell' this in a manner fitting for the situation.

When a response operation is not regulated so that the bodies are identified, new bodies are constantly encountered in new situations. A problem is that we are an unknown resource for the collaborative party and for the person leading operations on the whole. One must therefore market one's resources to gain acceptance so that they are used in an appropriate manner. One way of accomplishing this is what I like to refer to as *trust-building leadership*. The purpose of this is to permit the collaborative party or a person having overall command to be able to do the most good for those requiring assistance. It is important to be both authoritarian and forceful to be noticed, so that what the group has to offer can be used. At the same time, one must be respectful to be accepted by other organisations and other organisations' command staffs. Unfounded marketing drivel or grand titles do not lead to increased confidence in an operational situation. What is important is to maintain the proper balance by demonstrating a go-ahead spirit, the will to help and respect at meetings with stressed organisations and unknown fellow participants who are overloaded with information and do not have time to waste on matters that seem irrelevant at present. Establishing confidence usually takes a long time. When taking part in response operations, the confidence of others must be won without having time to prove that it is deserved.

It is important to obtain knowledge on what is specific to the present situation, and quickly place this in relation to what we can provide. This involves seeing the problem, reflecting, analysing and clarifying for others that we can conduct a specific task here and now. In this way, the group can be used in a positive sense and in the most adequate manner in satisfying assistance needs. After all, this is our mission, not that we arrive on the scene and do what we think we are best at. It is important to ensure that our own resources can be used in relation to all resources and skills at the incident site.

Negotiation as a command tool

Conducting emergency response operations at home is often based on clarifying rights and duties. During a normal response operation, the relationships *between* the various bodies are often clarified in advance. We are therefore unaccustomed to negotiating in municipal fire brigades. During an international response operation, however, where obscurities outnumber the clearly regulated areas, negotiation is a

natural element of operations from the first day to the last. Everything is negotiated, from transport resources, border passage and locations of base camps to operational areas, etc. This entails that we must be prepared for attitudes that we are not accustomed to from home. We must be skilled negotiators, who do not become upset, disappointed, angry or sad, and know and accept that negotiation is a part of everyday life in the new situation. It is thus important that strategies are available for this, for example, that negotiation duties are not assigned to the person with the highest rank, but instead handled by a 'chief negotiator' who can be replaced if negotiations run aground or take too much time. In this way, an extra chance can be obtained in resolving an undesirable situation.

Needs controlled, proactive and initiative command

Being able to take the initiative in conducting actions beyond the assigned task, based on the needs of those seeking assistance, is an important ability in this context. Here as well, it is about an approach that permits us to see obvious needs for taking actions based on the perspective of those seeking help and also taking these actions. This approach can be referred to as proactive command or demand-controlled, initiative command. It involves initiating the desired actions regardless of whether this is part of the task that has been assigned, whether the resources are available or not. It always entails keeping the needs of those seeking assistance in focus, regardless of the resources available or the limitations of the assigned task. It is important to maintain an approach that permits you and the team you command to be prepared to take the necessary initiatives for satisfying the needs of those seeking assistance as much as possible.

It is my opinion that this is the core of international response operations, as well as in types of extraordinary events that are not fully regulated in Sweden. (See Staffan Harbom's case studies in the chapter *Management of various types of emergency*.) During such circumstances, one needs to prepare appropriate basic information for the affected inhabitants on which specific arrangements they can make on their own. Because this type of action is not encompassed by any legislation, it is important that commanders are able to take the initiative and are willing to assume responsibility.

Analysis of prospective collaborative partners

It is always important to conduct an overall analysis of the organisations that one intends to work with and to consider the advantages and disadvantages of possible collaboration. Prospective partners may be organisations that are already established in and knowledgeable of the area, such as a local NGO. It is common that there are organisations onsite working with schooling, healthcare or some other activity with long-term goals. They often have good relations with the local population, and they are familiar with its resources, traditions etc., but they are seldom prepared for a sudden emergency. For them, collaboration with a rescue service organisation entails that they also become players in the disaster situation. This is noticed and appreciated by the local population, while at the same time, such an organisation can facilitate execution of our tasks.

Two organisations, previously unfamiliar with one another, that arrive in an area can sometimes operate much more efficiently by cooperating. It is naturally important in such cases that decisions be made on what is to be jointly achieved, but also to find out if the other party has any hidden agendas.

Prior to cooperation, one should therefore consider questions such as:

1. What do operations gain by cooperation? Would cooperation benefit those seeking assistance? How is efficiency of operations affected by cooperating/not cooperating?
2. What possible risks or threats are involved in cooperation between our organisation and the other party? An organisation that we are not familiar may be a party in a conflict or have specific interests that are not in concordance with our mandate or our efforts. Cooperation with such an organisation might entail a serious risk to our personnel or jeopardise our capabilities to conduct our work.
3. To be able to offer and establish cooperation, we must also know what the collaborative partner would gain by cooperating with our organisation.

If the advantages outweigh the risks and threats, we should attempt to establish cooperation and try to sell our ideas.

Employment of personnel onsite and negotiations in the field

During most response operations, we need to employ or contract local labour, such as guides, interpreters, drivers, guards, etc. This cannot usually be done without applying international practices or Swedish rules. Many questions must be considered in each situation, for example: What are the stipulations for employing personnel? How do I employ personnel? Do Swedish rules conflict with local rules? What about work environment responsibility? The same applies in negotiations with subcontractors or suppliers of goods. Besides our own training and preparations, good backup is required from support functions in our home organisation.

Conflicts of needs

In conjunction with a major incident, and definitely in the event of disasters of the degree that international assistance is deployed, it is obvious that need conflicts will arise between the needs of individuals and those of the affected society. This usually involves prioritisations. When the overall needs for assistance vastly exceed the current availability of resources in the area, an affected individual may not get the help that is perceived as necessary. We are continuously confronted with the problem of informing on behalf of the local authorities of such matters that are not good for the individual, for example, that no one can receive satisfactory assistance. As the mouthpiece for local authorities, we often serve as messengers to people who do not speak our language or who even know who we are. The individual may want us to repeatedly search ruins where his or her relatives are believed to be entrapped, while taking a wider perspective, it is more important to search in areas where search operations have not yet been conducted. One must establish a level of ambition for sub-activities based on the perspective of the community and

Overall perspective is most important

In Goma, while 7,000 people were dying each day in refugee camps, we were given the task of building an organised refugee camp together with an American engineering unit. The refugees were in three spontaneously created refugee camps with no facilities for hygiene, water, food or medical care. It was not an easy task to maintain motivation for staking out roads, and helping with construction of the infrastructure, distribution channels, areas for hospitals and food distribution, and building latrines in the lava landscape, while people were dying of thirst and hunger right beside us. Everyone naturally wants to work where it feels most urgent. Only after five weeks, when the first tens of thousands of people could move into the new functioning area did things feel better.

response operations, and work from there. It is also fundamental to ensure that we are accompanied by a representative of the local authorities who can take a position and play an active role in this information work.

Command of own units

This chapter has so far focused on involvement in command of the whole. In the following section, the focus is on command of one's own team as well as the specific factors that must be attended to and dealt with in conjunction with an international response operation. The starting point is still the routines and methods of operation that we can bring with us from home.

Clarify purpose

In large-scale operations, where many countries are involved, it is of the utmost importance to clarify the mission of the team and the team's part in overall operations for all team members. *It is important that one understands the role of one's own team, especially in generating motivation for the task at hand.* The commander must be aware of how important this is and have thorough knowledge of why the group is to conduct the task they have been assigned, and be able to motivate the group in performance of the task.

The problem touched on above is the difficulty in understanding a sub-task when one is unaware of one's part in the whole. If we are at home and respond with a team to assist a neighbouring municipality and perhaps become involved in a BA equipped firefighting task to hold a separating wall in a section of a larger building, we know that we are a part of a greater whole. Even if the team has received only minimal orientation of overall operations, based on previous experience, they understand the situation. In Goma, there was no previous experience from similar tasks. In everyday work, we already have insight into how overall operations are normally conducted and the individual can understand his or her task without further motivation and without further mention of the whole. During large, less frequent operations, and particularly abroad, this is especially important.

Safety

During domestic operations, safety is a matter of course. We do not have to think about landmines, assaults, illnesses, dangerous animals, traffic, etc. However, such hazards must be considered during international operations. Because safety is taken for granted at home, commanders of teams deployed abroad must pay special attention to this in conjunction with planning and briefing. This is especially important during demobilisation, when the team is fatigued or relaxing; the external threats can be just as substantial as before.

Endurance

Dealing with one's own endurance is not something we normally have to consider at home. Operations are normally structured so that teams relieve one another/are rotated to maintain endurance. During international operations, it can be assumed that there will always be a shortage of resources. Supply, conservation and replenishment of the limited resources must therefore always be considered. This applies both to materials and people, which entails increased command responsibility in comparison to an operation at home. The commander cannot take time off from the team and the team cannot take time off from the commander. In other words, the team must be led even when it is not active. Subsequently, there is the problem that the commander is never relieved. Just as during a long-term operation at home, it is extremely important that the commander rests, which places substantial demands on self-discipline. It is important to remember that you are never to command alone and that you will constitute a safety risk to your personnel if you continue to work when exhausted.

Abroad, team members must be supervised even when they are not actively participating in rescue work. Responsibility and planning, safety and social concerns, also apply during non-active periods. In other words, it is important to constantly be available to all in stressful, around-the-clock duty. This places demands both on the organisational structure and on the commander in maintaining his own endurance, and making sure that he is able to receive the necessary rest and recovery time. In the figure on page 294, an example illustrates the organisation of a search and rescue team, where organisationally, it is specified that the command functions that can be expected to be on duty around the clock maintain endurance by these positions having relief personnel, while team components that have opportunities for rest and recovery lack relief personnel.

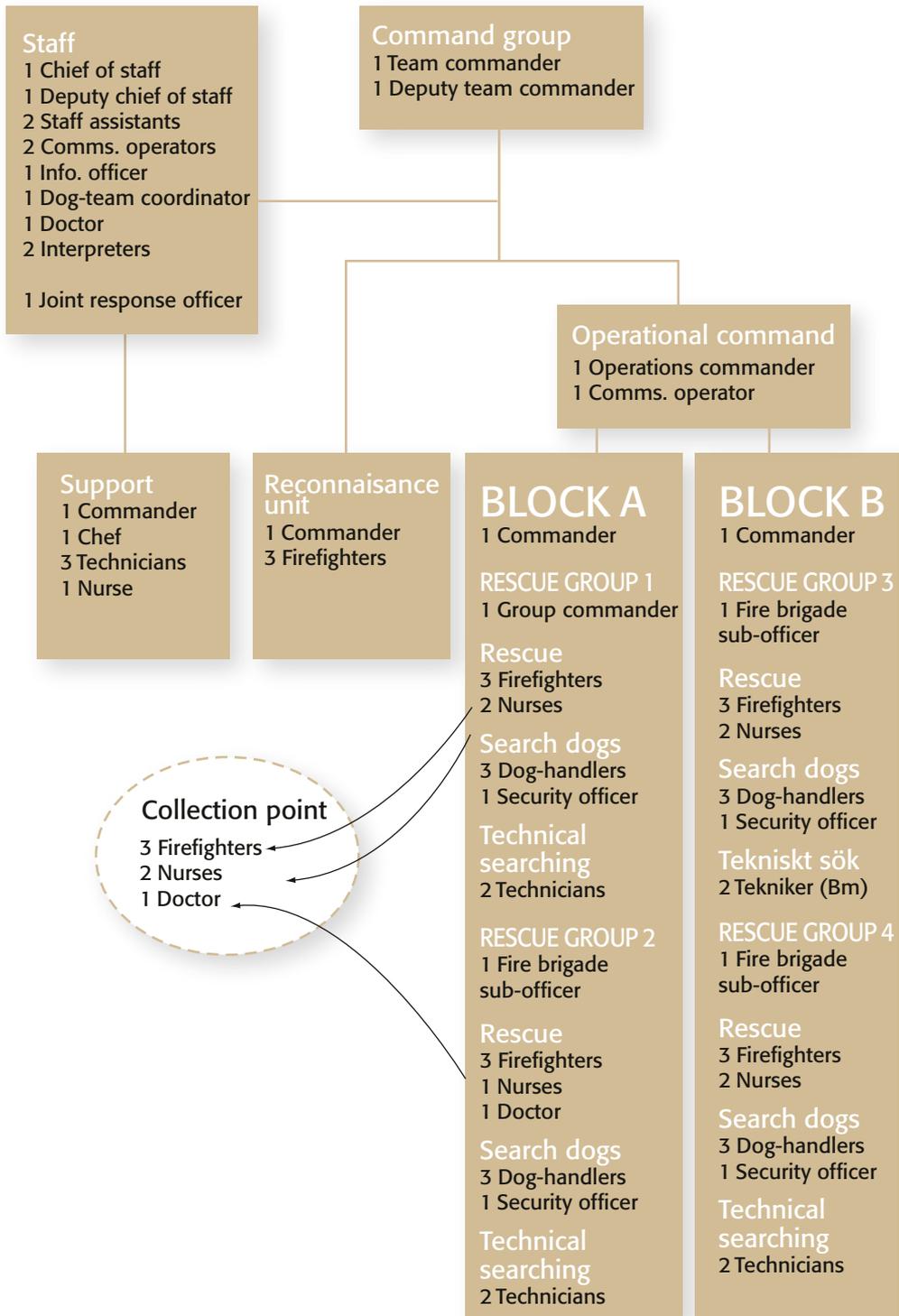


Figure 4. Search and rescue team. Organisation 2005–1.

The planning process

For an international operation, planning is of the utmost importance in that knowledge of the operational environment, the degree of damage, assistance needs and of other players is vague. Moreover, personnel's experience from similar operations is very limited. Planning is necessary for creating the prerequisites for a common ground to be established for conducting operations, will also contribute to a readiness for action for unexpected developments during a course of events and improvisation.

'Plans are useless, but planning is indispensable'

From a quote by Dwight D. Eisenhower: In preparing for battle I have always found that plans are useless, but planning is indispensable.

When the unknown factors are many, a structured planning process can be a useful tool for supporting command tasks. The collected experience within INSARAG provides examples of a well-proven structure. An operation is divided into six phases: *preparedness, mobilisation, in-transit, operation, stand-down, demobilisation and post-mission*. Planning and execution of plans are then linked to the respective phase.

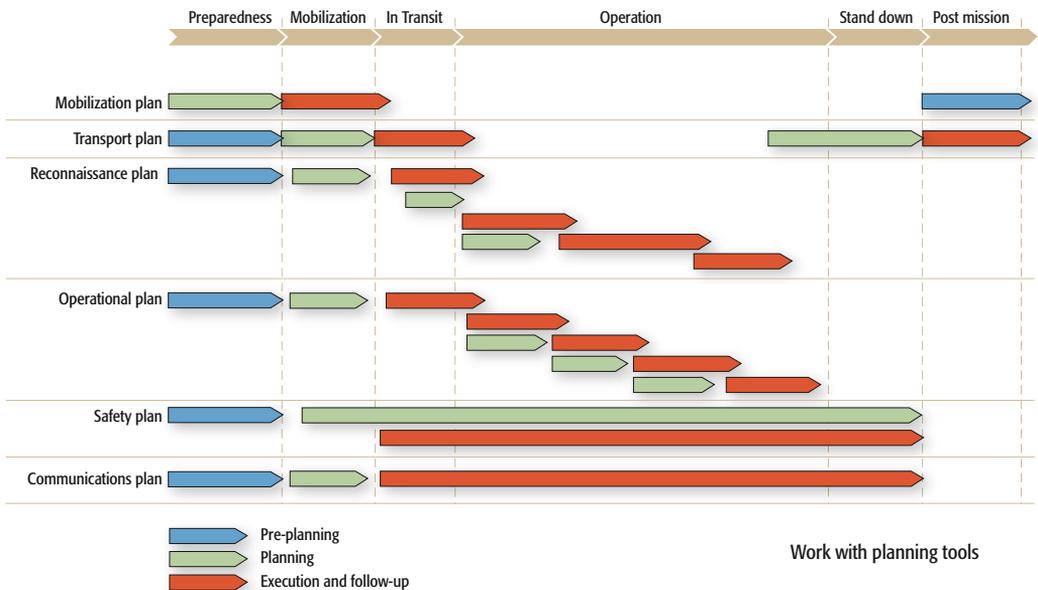


Figure 5. Continual planning throughout a response operation is decisive for efficiency and safety.

Communication within the team

Communicating a decision, a plan or some other issue in a way that results in several people having a similar perception is always difficult in a response situation. It is very important to remember that information that is not directly related to the immediately impending task often does not register with the recipient since this person's concentration is focused on the task at hand. To ensure that the message is communicated, it is necessary during briefings and reviews, and preferably on several occasions, to give special emphasis to 'non-prioritised information' for the recipient. Moreover, vital information (such as evacuation plans, MEDEVAC [medical evacuation of own personnel] plans, safety plans, etc.) must also be communicated in written form.

MEDEVAC and evacuation

During domestic operations, it can always be assumed that there is an organisation that handles both medical care and any evacuation of injured team members. During an international operation, however, it is very important to find out if there is an actual, executable plan for how medical care and evacuation of team members will be conducted. As an example, such planning saved a number of lives after the bombing of the UN's office in Bagdad in 2003.

In most cases, it is also necessary to establish a plan for evacuation because of other reasons, such as risk situations, the release of hazardous substances, etc.

Transport

The specific planning of transport very seldom occurs in conjunction with operations at home in that this is often regulated through predetermined response routes, vehicle convoys and other routines. Moreover, this knowledge is to a large extent constituted by 'hidden knowledge', which is often gained through experience and training. This must be considered, however, during an international operation because transport entails an element of danger. Additionally, good planning is necessary so as to avoid wasting time in conjunction with moves. Before moves are made, it is especially important to consider how communications, safety, medical care and any border crossings will be handled.

Ethical issues

As a commander, I must prepare myself for handling ethical issues, conflicts that arise in regards to the team's code of conduct or other conflicts relating to ethical issues. We shall always conduct ourselves properly in relation to cultural, traditional and religious matters. Certain things are easy to teach, for example, having covering clothing, wearing long-sleeve shirts and keeping shirts on. It is the nuances that are difficult to capture. The code of conduct states that you may not conduct commercial enterprises, but where does the line go between obtaining necessities and conducting business? Ethics can also concern how you use your camera. Is it appropriate to photograph people in a ruin? Improper camera usage can lead to conflicts within the team.

It is easy to come close to the line. What happens if someone steps over it? Fai-

lure to comply with the code of conduct is also considered as failure to comply with the employment agreement. An infraction means termination of service and a journey home. This is easy to write but difficult to judge and handle in an operational situation. Everyone will have their own interpretation until the issue is discussed within the group. Sending someone home can be disastrous for team spirit.

At home the situation is different; there is often a plan of action and support for dealing with these issues. Abroad, it is not as easy to immediately go from words to action. This is something one must be prepared for.

Command when the team is under duress

It is important to be prepared for the unanticipated, such as a death or serious injury to a team member or other exceptional occurrences, as well as direct threats or serious internal conflicts that escalate so that the team comes under duress. Problems may arise because of something as simple as a mistake in planning so that support and necessities do not arrive. Many factors are involved. It may also be that a period of inactivity occurs for one reason or another, such as not being able to cross a border, which can lead to frustration in the group.

At home, everything is prepared in advance. There are personnel trained in providing support to their colleagues, dedicated debriefing personnel, planning staffs, etc. The normal initial action is to relieve the concerned unit. This is not that easy abroad, where we are usually under-strength when it comes to resources and opportunities to leave the affected area can be limited. We could cease operations to attend to our own problems, but this is obviously not why we have been deployed. To retain credibility both externally and internally, there must be plans for handling various situations without entirely ceasing operations. Even if the crew is not participating in response operations, the commander must continue to exercise command, and if operations are stopped entirely, the crew commander must still lead the team.

Future perspectives

Against the background of rapid globalisation and today's speedy flow of information, the number of international response operations will likely increase rather than decrease in the future. Disasters have always occurred, but previously, we found out about them long afterwards and thus had no opportunities to contribute with emergency assistance. Now we find out about them immediately and can travel quickly to the scene. This means that we can do more than before.

Since the 1980s, international relief and emergency operations have been conducted more or less regularly. Within many areas, however, formal regulation of these operations is lacking, which can be compared with the international peace-keeping missions that since 1945, have had better legal grounds. At this time, procedures were adopted for the establishment of mandates for military and peace-keeping operations in the constitutional grounds of the UN. Within the humanitarian area, a study is being conducted of the international laws and rules that can influence execution of future humanitarian missions. The intention of the study is to act

as a stimulus for establishment of basic regulation. As of this writing (2005), a comprehensive study is in progress, under the auspices of the International Federation of Red Cross and Red Crescent Societies, concerning the existing omissions and what needs to be improved and created to provide the capabilities for improved legal grounds for conducting humanitarian operations.

A development project for creating *one* common platform for information exchange (Global Disaster Alert System, GDAS) between the international bodies was begun in 2004. This will provide opportunities for more concordant overviews during future operations.

Another development already underway is regionalisation. In many parts of the world, regional cooperative organisations are gaining increasing importance for effective shared use of existing resources in many areas. This also applies to rescue services.

EU crisis management

The regional development that primarily affects Sweden is that which is conducted within the European Union. A common emergency management system is under development. The European Union has begun to improve its capability to coordinate information exchange in regards to more serious incidents within the region. A common resource database has been created. For the past year, training and exercises have been conducted as a part of efforts to create common routines for cooperation as a complement to existing intra-country cooperative agreements within the European Union. This will increase our future capabilities to use foreign resources in response operations.

Work is also underway to determine how the European Union can support the existing international coordination systems (UN, International Federation of Red Cross and Red Crescent Societies etc.) in operations outside the European Union. In this development work, it is of the greatest importance that a harmonisation occurs with the existing global system.

Research and development needs

Because research in command of international operations is limited, there is an immediate need for efforts in this field, primarily in regards to command and coordination in non-hierarchical systems. Such research would not only benefit international operations but also be able to contribute to development of command capabilities during emergencies in Sweden, in that command problems during these types of incident are similar in many respects.

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Legislation

Lagar och förordningar (<http://www.lagrummet.se/>)

Lag (2003:778) om skydd mot olyckor (Civil Protection Act)

Förordning (2003:789) om skydd mot olyckor (Civil Protection Ordinance)

Organisations

AKUT - <http://www.akut.org.tr/eng/historical.asp>

DEMA - <http://www.brs.dk/uk>

EADRCC - <http://www.nato.int/eadrcc/index.html>

EU - <http://www.eu.int/>

IDRL - <http://www.ifrc.org/what/disasters/idrl/>

IFRC - <http://www.ifrc.org>

INSARAG guidelines - <http://www.reliefweb.int/undac/documents/insarag/guidelines/topics.html>

Ministry for Foreign Affairs - <http://www.sweden.gov.se/sb/d/2059>

Nato - <http://www.nato.int/>

Nordred - www.nordred.org

OCHA - <http://ochaonline.un.org/>

Sida - <http://www.sida.se/English/>

UN - <http://www.un.org/>

Lars Fredholm

11. Preparing for the Future

Lars Fredholm was introduced on page 6.

Some of the central aspects of the book's chapters are discussed below. I see these aspects as examples of important areas that are applicable in shaping the future of management functions and the execution of management. The aspects presented in the 12 following hypotheses will be discussed:

1. An important basic value is the assistance needs of those affected
2. The allocation of responsibility to meet assistance needs must be clarified
3. It is important to have an understanding for and knowledge of the situation of those affected
4. Management problems during critical phases are multi-dimensional
5. It is important to develop integrated emergency management capabilities
6. Cooperation on the international level is becoming increasingly important.
7. Management processes at different management levels require different levels of competence.
8. Leadership during emergencies is dependent on everyday leadership.
9. Management during major emergency response operations will have a political aspect.
10. Adaptivity is an important capability.
11. During emergencies, a central aim is to obtain and retain control.
12. Dealing with emergencies in the future will entail an increased demand on external analysis and a collective ability to understand and master a larger societal context.

An important basic value is to begin with the assistance needs of those affected

A supporting basic value of the book's chapters is to begin with the assistance needs of those affected. We believe that this basic value should serve as the touchstone for establishment of resources, organisational forms, operational planning and command. It is our opinion that this is not yet considered to a sufficient degree. Methods and organisational forms have traditionally been based instead on internal perspectives and interests. The question has been asked as to how one can improve, but not whether the right things are being done.

Assistance needs during disasters and other emergencies can be expressed in terms of actions concerning technical, medical, social, psychological and existential aspects. Based on risk and vulnerability analyses, it should be possible to identify need for assistance profiles for various types of emergency in the composition of a population. Thereafter, positions can be taken on the degree to which these assistance needs can be satisfied and how responsibility for these can be divided between individuals and the public sector. The organisational solutions can then be shaped so that resources function smoothly.

The division of responsibility to meet assistance needs must be clarified

An important aspect is how responsibility is to be divided over time and space to satisfy the assistance needs that arise. At the core of this is the degree to which the individual is to handle the situation himself and the degree to which the public sector will provide assistance. Also important is the question of how responsibility is allocated among the public sector and private organisations that constitute important functions in society.

It is important to have an understanding and knowledge of the situation for those affected

Ann Enander's knowledge overview in her chapter *Human Needs and Behaviour in the Event of Emergencies and Social Crises* demonstrates the importance of knowledge of human reactions during disasters and other emergencies.

A disaster or other emergency occurs in a societal context, from the individual's immediate surroundings to contexts that embrace cities, regions and even countries. Command of response operations should take consideration to human behaviour. This applies to those directly affected, their relatives and to others in the society. Decision-makers often prefer that people comply with issued instructions, for example, concerning cordoning, evacuation, and use of means of communication. But during emergencies, people display wider variations in behaviour than is preferred by decision-makers and they do not obey instructions to the degree stipulated by decision-makers. Some people will act alone. Others will be passive. One can understand this by assuming that people in a given situation will usually act based on what for them is a rational starting point. In her chapter, Ann Enander addresses, among other things, the significance of people understanding the situation and whether or not they can influence it. This is a core aspect to consider in command work. Information should be oriented towards helping people to understand the situation and towards providing concrete information that helps them to deal with it. Diffuse and vague courses of events demand carefully thought-out, outgoing information. Command preparations and emergency response management tasks should take more consideration of human behaviour during emergencies than they do at present. Emergency response management preparations can include the analysis of possible types of human behaviour during various types of incident, preparations for dealing with behavioural variations and preparations for measures for encouraging proper behaviour during various types of incident.

Management problems during critical phases are multi-dimensional

The chapters in this book cover a wide spectrum. They address the problems concerning what one wants to achieve in alleviating the effects of an emergency on a society, as well as the problems concerning how assistance resources can be used and coordinated. Management is seen as a means of structuring resources over time

and space so as to satisfy assistance needs over time and space. This approach defines three primary areas that are important to consider:

1. The extent of affect
2. Assisting resources
3. Management processes

The chapters of this book address all three areas. We would like to direct the attention of readers to the extent of the management problems that one should be knowledgeable of prior to designing command functions and exercising emergency response management. One assessment is that the design of command functions and conduct of emergency response management is presently based on traditions and unsystematic knowledge. There is a need for developing management functions by putting greater emphasis on analyses of courses of events during emergencies, analyses of coordination between resource units and analyses of management processes in various scopes of complexity.

It is important to develop integrated emergency management capabilities

Staffan Harbom's chapter, *Management of various types of emergency*, Erik Cedergårdh and Thomas Winnberg's chapter *Structuring a command organisation* and Per Johansson's chapter *Legal Grounds for Emergency Response Operations* all express in various ways the concept that organisations must cooperate during emergency response operations. Thus far, management functions and methods for exercising management have to a large degree been designed from the internal perspectives of organisations. This also applies to emergency management training. Needs exist for developing management functions that can deal with several interacting organisations that have different tasks and different cultures.

Cooperation must be conducted between 'blue-light authorities', and between 'blue-light authorities' and other emergency response bodies, especially the emergency management boards of municipalities and county councils. In principle, three cases arise:

1. Each authority or organisation takes actions based on its particular task.
Contact must be maintained with other authorities and organisations that are also taking actions based on their own tasks.
2. Participating authorities or organisations conduct joint actions based on a common normative concept or plan.
3. Two or more authorities conduct joint actions based on a common normative concept or plan with other authorities and organisations that are conducting separate actions based on their particular tasks.

The most common case is probably the first. Each authority or organisation defines its task and takes actions based on this. The interface with other emergency response bodies must then be administered.

The second and third cases require that response authorities in some way subor-

dinate themselves to a general interpretation and plan of action for the entire emergency. It is not self-evident how such a general interpretation of a situation and general plan of action are to be achieved. In contrast to a military situation, no one has overall command over all emergency response bodies. An important question is whether some form of coordination doctrine is needed as a basis for how several authorities work out common, normative, general, orientation decisions. A possible coordination doctrine for emergency response management can be formulated based on the model in the chapter, *Dealing with all types of emergency from everyday accidents up to disasters*.

Management processes entail, based on the needs that arise in time and space (such as life saving, protection of property, environmental protection, life and function support and recovery), the arrangement of measures that are intended to:

- Gain control over an emergency as a physical process.
- Create favourable conditions for people and their social contexts.
- Gain control over threatened or affected societal functions.

With the starting point in such a doctrine, several response organisations can jointly draw up a general orientation resolution during major emergencies that can serve as a frame of reference for the actions of all included organisations. The intention of this approach, however, is not to gain acceptance for the doctrine proposal, but rather to produce reflection on the pertinent problems.

Staffan Harbom's chapter, *Management of various types of emergency*, takes up not only cooperation between different authorities and organisations, but also the entire set of problems that concern cooperation over administrative borders. An emergency can affect several municipalities and two or more counties. Thinking on the municipalities and the national government's emergency management capabilities is largely based on the municipalities and county administrative boards having local responsibilities. Increased attention needs to be devoted to the management problems that arise when municipalities and counties encounter situations that require their management tasks to be coordinated.

Cooperation on an international level is becoming increasingly important

In his chapter *International emergency response operations*, Per-Anders Berthlin addresses cooperation between units from different countries. Many things are happening in the world around us that justify developing our capabilities for such cooperation. In Sweden, a tradition of international response operations has been established. This applies both to military and civilian operations. The MSB has extensive experience in international response operations. Within the European Union, work is underway to develop forms of cooperation and assistance between European Union member states in the event of major disasters. During recent decades, Sweden has been subjected to incidents that have required various forms of international contact and cooperation. In 1986, a nuclear power plant failed in Chernobyl in the for-

mer Soviet Union, with radioactive fallout over some parts of Sweden. In 1990, there was a fire on the passenger ship *Scandinavian Star* in the Kattegat with 158 dead. Norway, Sweden and Denmark were involved in the rescue action. In 1994, the *M/S Estonia* sank with over 800 dead. Estonia, Finland and Sweden were primarily affected. In 2004, the tsunami disaster occurred in Asia. Many Swedish tourists were affected and the number of dead entailed national mourning and stress in Sweden. Per-Anders Berthlin's chapter illustrates the need for analysing what types of international cooperative situation can arise, and based on this, draw conclusions on how command functions should be developed to function in various international contexts.

In Sweden, we are oriented to conducting international response operations abroad. It is also important that we prepare ourselves for situations in which we need international assistance in Sweden. This entails that it is important to develop management functions that can cooperate with units from other countries on local, regional and national levels in Sweden. The need for development in this area is probably substantial.

Management processes at different management levels require different levels of competence

Gerry Larsson's chapter *Theoretical Reflections on Leadership*, Lars Fredholm and Mattias Åström's chapter *Incident Command and Decision Making* and Erik Cedergårdh and Thomas Winnberg's chapter *Structuring Command Organisations* indicate that the handling of management problems in various scopes of complexity on various management levels requires different proficiencies. Gary Larsson discusses five hypothetical proficiency profiles for five different management levels during the management of operations. Lars Fredholm and Mattias Åström discuss what decision making entails in relation to lack of time, type of incident and management level. Both of these chapters provide input for continued analysis of proficiency requirements for handling management processes on various levels. Both chapters refer to research and emphasise the capability for cognitive abstraction as an important proficiency in senior management functions. It is my conclusion that there is a need to analyse which emotional, cognitive and social requirements are characteristic for the handling of management tasks on various levels. It is not self-evident that experience from management on one management level entails good proficiency for working on another management level. Erik Cedergårdh and Thomas Winnberg use the term *role logic* in this context in discussing how an organisation can 'gear up' while consideration is given to the creating of reasonable expectations for individuals.

Leadership during emergencies is dependent on everyday leadership

Gerry Larsson, in his chapter *Theoretical Reflections on Leadership*, presents a model for leadership under severe stress. In this model, everyday leadership is viewed as an

important basis for leadership under severe stress. It is important that the design of management functions for dealing with emergencies is based on the leadership culture that exists within the organisation. Gary Larsson maintains that trust-building everyday leadership is an important prerequisite for leadership under severe stress. This is a relationship that must be considered more often in designing management functions and exercising emergency response management. A key to smoothly functioning leadership during an emergency is good everyday leadership. This is complicated by operations during major emergencies often needing to be conducted through cooperation between temporarily assembled teams from different organisations. This means that emergency response management can be problematized from two perspectives. One is that leadership during emergencies is based on everyday leadership. The other is that leadership is exercised in a temporarily assembled unit staffed by response bodies from different organisations. Commanders in senior positions during emergency response operations involving different bodies should be aware of these two factors.

Management during major emergency response operations will have a political aspect

In his chapter *Management of various types of emergency*, Staffan Harbom presents situations that entail serious pressure on public services. During such incidents, politicians can be expected to become participants in the management process. Two situations can be discerned. The first is when a municipality or a county council's emergency management committee is activated. The emergency management board will consist of politicians who perform their duties in cooperation with the respective emergency service management structure. Managers from fire brigades, the police or medical services are decision makers within their respective domains, and the emergency management board makes decisions on consequence-related measures within the municipality or county. These situations reflect a management structure that is constituted by a combination of professionals as decision makers within their domains, and a political board (the emergency management board) as decision makers. The other situation is when pressure on public services is so severe that crucial decisions must be made on a high political level. This can involve general orientation decisions for management in a region or in the entire country.

The conclusion is that management functions should be prepared for handling these two situations to a greater extent than is usual at present.

Adaptivity is an important capability

Erik Cedergårdh and Thomas Winnberg emphasise the capability for adaptivity and flexibility in their chapter *Structuring Command Organisations*. They say that the fire service management organisation needs to have a major capability to adapt – adaptivity – in order to satisfy various assistance needs. This applies both within and between the various decision domains (management of tasks, operations and systems). During an incident in which different organisations participate, an important

part of the capability to adapt is that cooperation can be conducted between the management levels of the different organisations.

In his chapter *Command Support* Samuel Koelega shows how complex a situation can be when different forms of command support are to provide assistance to decision makers and during communication between decision makers. He emphasises how important it is that the participants are accustomed to using complex aids in their everyday duties and do not encounter them first when an emergency occurs. Basing command support for emergencies on the command support that is used during everyday operations is an especially important basic value. Samuel Koelega also discusses the options for how communication can be conducted between participants within one's own organisation and between organisations. A conclusion of his reasoning is that it is important to take consideration to the command support of cooperating organisations when designing command support for one's own organisation. In line with this, it is important to try to build in as much adaptivity/adaptability as possible from the start when designing the command support system and to analyse how connections can be established between different organisations and levels in one's own organisation.

During emergencies, a central aim is to gain and retain control

Stefan Svensson maintains in his chapter *Tactical Fundamentals* that the intention of emergency response operations is to gain and retain control. He discusses the concept of control and clarifies what he refers to as various characteristic degrees of control. I believe that this concretisation of the various significant factors in various types of control is a good basis for being able to develop proficiency and practices both in tactical decision making and in long-term strategic decision making. The description and the discussion of the control concept enable decision makers to analyse their own behaviour and to reflect over various forms of improvements, such as developing and improving the use of resources.

Dealing with emergencies in the future will entail an increased demand on external analysis and the collective ability to understand and master a large societal context

In the first chapter of the book, *Dealing with all types of emergency from everyday accidents up to disasters*, a model is presented that on a general level, reveals the entire set of management problems, everything from frequent everyday accidents to incidents that affect two or more countries. Both Ann Enander, in her chapter *Human needs and behaviour in the event of emergencies and social crises*, and Per-Anders Berthlin, in his chapter *International emergency response operations*, address the complexity and dynamics in elements of a society that are affected by an emergency or crisis. The remaining chapters concern the complexity and dynamics in dealing with parts of society that constitute resources for helping those who are affected. The main thread in all of the chapters of this book is the message that proficiency in designing manage-

ment functions and exercising management must be widened and deepened, both in respect to understanding the course of events in the affected societies, and to understanding the complexity involved in managing and coordinating response resources.

During recent years, Sweden has been affected by several incidents that permit us to emphasise the importance of management bodies understanding both the courses of events in the affected societies and the complexity of managing and coordinating response resources. During the summer of 2004, large parts of central Sweden were flooded. Many municipalities in Småland were severely affected by high flows of water. In December of 2004, the tsunami occurred in Southeast Asia. Many Swedes were in the area as tourists and were affected. In January of 2005, the storm Gudrun hit large parts of central Sweden. Large portions of the forest stand were damaged and electrical distribution was inoperable for several weeks in certain areas. In February of 2005, a major release of sulphuric acid occurred in Helsingborg. Key characteristic factors in dealing with the ensuing problems can be identified for each of these incidents:

Management characteristics during the floods in Småland in the summer of 2004

- Management of slow dynamically widening damage (flooding spread over time and space)
- Protection of important societal functions (especially electrical distribution, water supply, sewage)
- Protection of private property (e.g., buildings)
- Dealing with conflicting interests (reducing lake level favours one municipality but not another)
- Information management (information to the public and other concerned groups)
- Establishment of communication lines to authorities (opportunity to receive advice and information)
- Coordination locally and regionally (between municipalities, between municipalities and regional organs, between regional organs in different counties)
- Endurance

Management characteristics in Sweden following the tsunami in Southeast Asia

- Swedes needed assistance outside of Sweden
- Another country needed assistance from Sweden
- Information management was a main problem
- Handling sorrow and concern in Sweden
- Need for psychosocial measures
- Need for medical measures
- Attending to the dead
- International, national, regional and local coordination

Management characteristics following the storm Gudrun in January 2005

- Emergency safety and care services (rescuing people entrapped by downed trees)

- Emergency clean-up tasks (clearing roads to reach the sick, etc.)
- Assurance of basic human needs (housing, heat, food, water)
- Information management
- Assistance in maintaining normal living conditions
- Handling of existential problems (many suffered major reductions in their future material incomes)
- Restoration of technical infrastructures (electrical grids, roads)
- Cooperation with private business (electrical distribution companies)
- Local and regional coordination
- Endurance

Management characteristics following the emission of sulphuric acid in Helsingborg in February 2005

- Management of dynamically widening danger (gas cloud)
- Quick information to people in the danger zone
- Preparation of information that people could understand
- Technical emergency management of the course of events
- Assistance in maintaining normal living conditions for those affected
- Expert dependency in the design of response operations
- External resource supplement
- Inter-municipal cooperation
- Endurance

The above management characteristics are not based on any stringently conducted analysis of the management problems encountered during the incidents. They are rather observations of the significant management problems that existed during the four emergencies. To deal with these problems, cooperation was required between different levels (local, regional, national and international levels). An important part of management in such situations is external analysis. It is important to be able to analyse and anticipate assistance needs in the affected society. And it is important to be able to be aware of and understand the societal structures on the local, regional, national and international levels to be able to coordinate assistance operations. The defined management problems emphasise the need for comprehensive and in-depth management proficiency in regards to understanding the:

- Courses of events in the affected societies.
- Complexity involved in managing and coordinating response resources.

It is our hope that this book will help readers in their further efforts to make management proficiency more comprehensive and in-depth. Our intention has not been to provide concrete solutions, but rather starting points for reflection and continued knowledge seeking. We do not want the reader to uncritically take everything at face value. But we hope that the contents of the book contribute to readers deepening their understanding of the subject and becoming inspired to take a greater interest in how emergency response management can be improved.

List of illustrations

Drawings:

Per Hardestam except for p. 127, 131: Dan Hyllengren Larsson.

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