

En brand och en explosion på ett oljeraffinaderi.

960527 MARS 1996_04

Två löst relaterade olyckor inträffade med ett litet mellanrum på ett oljeraffinaderi. Den första olyckan uppstod till följd av ett mänskligt misstag. Ett atmosfäriskt kärl med kolväten lösta i natriumhydroxid överfylldes vid rutinmässig påfyllning. Detta ledde till ett flöde av lättantändliga ämnen intill en plats där svetsning pågick. Den brand som uppstod orsakade skador på tanken och på några elektriska kablar. Myndigheterna varnades om att en mindre olycka inträffat. Branden var släckt efter 40 minuter och myndigheterna fick veta att faran var över. De elektriska kablar som skadats orsakade emellertid ett avbrott i tillflödet av gasolja till en ugn. Ett övertryck i de ledningar och slangar där gasoljan skulle ha cirkulerat gjorde att då blandningen av gasolja och vätgas nådde förvärmaren till ugnen exploderade blandningen och en andra brand uppstod. Denna andra olycka inträffade 20 minuter efter att faran förklarats över. En bidragande orsak till den andra olyckan var att någon stängt av larmsystemet i samband med första olyckan. Myndigheterna informerades igen och räddningstjänsten ryckte ut. Innan den anlände hade branden redan släckts.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
lätta kolväten		
natriumhydroxid	1310-73-2	
vätgas	1333-74-0	

Skador:

Människor:	En svetsare fick brännskador i ansiktet i den första branden.
Materiella:	Anläggningen skadades.
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Inga.

Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges erfarenheter.

Report Profile

Identification of Report:

country: FA ident key: 1996_004_01

reported under Seveso I directive as major accident reports: SHORT+FULL

Date of Major Occurrence: Time of Major Occurrence

start: 1996-05-27 start: 08:45:00

finish: 1996-05-27 finish: 10:05:00

Establishment:

name:

address:

industry: - not applicable -

Refinery (2002)

Seveso II status: not applicable: Yes art. 6 (notification): No

art. 7 (MAPP): No

art. 9 (safety report): No

Date of Report:

short: full:

Authority Reporting:

name:

address:

Authority Contact:

rep_cont_name:

rep_cont_phone:

rep_cont_fax:

Additional Comments:

a) - not applicable -

b) - not applicable -

c) - not applicable -

d) - not applicable -

e) - not applicable -

Short Report

country: FA ident key: 1996_004_01

Accident Types:

release: Yes explosion: Yes

water contamination: No other: No

fire: Yes

description:

The accident occurred in two different phases, in successive times and in two different units. In the first phase a local fire occurred near the atmospherical vessel called TK103, containing a solution of NaOH in water of the RT1 plant (rev... see Appendix Short Report / description of accident types

Substance(s) Directly Involved:

toxic: No explosive: Yes

ecotoxic: No other: Yes

flammable: Yes

description:

Probably, in the first incident, light hydrocarbons or a mixture together with sodium hydroxide returning from other processes or, with less probability back from the desalter. As far as it concerns the second event, the substance which tri... see Appendix Short Report / description of substances involved

Immediate Sources of Accident:

storage: No transfer: No

process: Yes other: No

description:

First phase: ignition of light hydrocarbons coming out of the vessel TK103 probably due to the welding works carried on near the vessel (the nearby systems were not in service due to modification works).... see Appendix Short Report / description of immediate sources

Suspected Causes:

plant or equipment: Yes **environmental:** No

human: Yes **other:** No

description:

The escape of the hydrocarbons contained in the tank TK103 occurred probably due to ... see Appendix Short

Report / description of suspected causes

Immediate Effects:

material loss: Yes

human deaths: No

human injuries: Yes **community disruption:** No

other: No

ecological harm: No

national heritage loss: No

description:

A welder worker received burns in face in the first fire and light trauma to the rear. ... see Appendix Short

Report / description of immediate effects

Emergency Measures taken:

on-site systems: Yes **decontamination:** No

external services: Yes **restoration:** No

sheltering: No **other:** No

evacuation: No

description:

The internal procedures provided the pre-alarm to the external authorities and their ... see Appendix Short

Report / description of emergency measures taken

Immediate Lessons Learned:

prevention: Yes **other:** Yes

mitigation: No

description:

In both incidents the human error was of great importance. A first consideration is to ... see Appendix Short

Report / description of immediate lessons learned

A Occurrence Full Report

country: FA **ident key:** 1996_004_01

1 Type of Accident

remarks: First incident; ignition of hydrocarbons overflowed from the recipient of

the sodium hydroxide solution due to the welding operations or to possible

electrical sparks or to the action of the vapour circulating in the same

pipes and wells i... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: In the second incident the hydrogen circulating in the serpentine of the preheating oven in the desulphuration plant (unit 300) trespassed the temperature limit of 1000oC (maximum temperature foreseen for the serpentine less than 500oC) wh... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: - not applicable -

4 Meteorological Conditions

precipitation none: fog: rain: hail: snow:

Yes No No No No

wind speed (m/s): 2

direction (from): W-NW

stability (Pasquill):

ambient temperature (∞C): 20

remarks: The photos taken during the events show the absence of wind resulting in a presumably almost vertical plume of smoke.

5 Causes of Major Occurrence

main causes

technical / physical 5101 operation: vessel/container/containment-equipment failure

5205 environment: utilities failure (electricity, gas, water, steam air, etc.)

5304 organization: training/instruction (none, inadequate, inappropriate)

5401 person: operator error

- not applicable -

human / organizational 5304 organization: training/instruction (none, inadequate, inappropriate)

5401 person: operator error

- not applicable -

- not applicable -

- not applicable -

remarks: First incident: probable underevaluation, by the assigned to the operation, considered as of routine and then not at risk. ... see Appendix Full Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1996_004_01

event:

major occurrence 1301 explosion: pressure burst (rupture of pressure system)

initiating event - not applicable -

associated event - not applicable -

event:

major occurrence 1203 fire: jet flame (burning jet of fluid from orifice)

initiating event 1999 other: other

associated event 1301 explosion: pressure burst (rupture of pressure system)

event:

major occurrence 1202 fire: pool fire (burning pool of liquid, contained or uncontained)

initiating event 1202 fire: pool fire (burning pool of liquid, contained or uncontained)

associated event 1203 fire: jet flame (burning jet of fluid from orifice)

Dangerous substances

country: FA **ident key:** 1996_004_01

a) total establishment inventory

CAS number: **identity:** Tetraethyle/methyl Lead

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 132

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 **potential quantity:** -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 **indir_pot_quant:** -1

a) total establishment inventory

CAS number: 7783-06-4 **identity:** Sulphuric Acid

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 19

use of substance as: ON-SITE INTERMEDIATE

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 **potential quantity:** -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 **indir_pot_quant:** -1

a) total establishment inventory

CAS number: 7446-09-5 **identity:** Sulphurous Anhydride

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 0,3

use of substance as: ON-SITE INTERMEDIATE

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Nickel Oxide

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 2,5

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Hydrogen

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 0,9

use of substance as: ON-SITE INTERMEDIATE

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: -1 potential quantity: 0,9

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Highly Flammable Liquids

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 1905400

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 0,5 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: 7664-39-3 identity: Fluoric Acid

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 130

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Flammable Liquids

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 7700

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Flammable Gas

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 32000

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: 74-96-4 identity: Ethylene Bromine

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 74

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Cobalt Oxide

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 22,5

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: 7664-41-7 identity: Ammonia

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 4

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: No

actual quantity: -1 potential quantity: -1

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

B Consequences Full Report

country: FA ident key: 1996_004_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: Yes

off-site; local: No

off-site; regional: No

off-site; transboundary: No

illustration of effects - not applicable -

remarks - not applicable -

2 People

establishment popul. emergency personnel off-site population

total at risk

immediate fatalities 0 0 0

subsequent fatalities 0 0 0

hospitalizing injuries 0 0 0

other serious injuries 4 1 0

health monitoring 0 0 0

remarks The total number of persons at risk in the first event, considering its characte... see Appendix

Full Report B / people

3 Ecological Harm

pollution/contamination/damage of:

- residential area (covered by toxic cloud) not applicable
- common wild flora/fauna (death or elimination) not applicable
- rare or protected flora/fauna (death or elimination) not applicable
- water catchment areas and supplies for consumption or recreation not applicable
- land (with known potential for long term ecological harm or not applicable

preventing human access or activities)

- marine or fresh water habitat not applicable
- areas of high conservation value or given special protection not applicable

remarks Meteorological data registrations give for the time of the accidents wind veloci... see Appendix

Full Report B / ecological harm

4 National Heritage Loss

effects on:

- historical sites not applicable - historic monuments not applicable
- historic buildings not applicable - art treasures not applicable

remarks No damage

5 Material Loss

establishment losses off site losses

costs (direct costs to operator) (social costs)

in ECU ECU

material losses

response, clean up, restoration

remarks At the moment of the on-the-spot investigation the costs were not quantifiable, ... see Appendix

Full Report B / material loss

6 Disruption of Community Life

establishment/plant evacuated disabled/unoccupiable destroyed

- nearby residences/hotels No No No
- nearby factories/offices/small shops No No No
- schools, hospitals, institutions No No No
- other places of public assembly No No No

interruption of utilities etc. no / yes duration

- gas No
- electricity No
- water No
- sewage treatment works No
- telecommunications No

- **main roads** No

- **railways** No

- **waterways** No

- **air transport** No

significant public concern none local level national level

- **off site populations** No Yes No

- **media interest** No Yes No

- **political interest** Yes No No

remarks The news of the incident were reported at a national level by the ANSA agency an... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA **ident key:** 1996_004_01

1 Emergency Measures

taken - on site - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

- **off site** - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

still - on site - not applicable - - not applicable -

required

- not applicable - - not applicable -

- not applicable - - not applicable -

- **off site** - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

continuing contamination or danger

-**on site** not applicable

-**off site** not applicable

remarks - not applicable -

2 Seveso II Duties

pre-accident evaluation

Article item not due yet not done done/submitted evaluated

6 notification No No No No

7 policy (MAPP) No No No No

9 safety report No No No No

9, 10, 11 update No No No No

11 internal plan No No No No

11 external plan No No No No

13 informing public No No No No

9, 12 siting policy No No No No

post-accident evaluation

Seveso II duty was actual were actual compared with actual

contingency consequences consequences, the

addressed? addressed? predicted extent was?

Article item

7 policy (MAPP) not applicable not applicable not applicable

9 current safety report not applicable not applicable not applicable

11 internal plan not applicable not applicable not applicable

11 external plan not applicable not applicable not applicable

13 informing public not applicable not applicable not applicable

9, 12 siting policy not applicable not applicable not applicable

evaluation of safety organisation

organisational element element existed did element relate to actual circumstances of

yes / no no / partly / yes adequate?

- **written policy objectives** No

- **specified management** No

structure

- **specified responsibilities** No

- **specified working procedures** No

- **specified procedures for** No

assessment/auditing of

management system

- **specified procedures for** No

review and update of

management policy

- **specified general training** No

procedures

- **specified emergency** No

training procedures

evaluation of ecological impact control

organisational element element existed did element relate to actual circumstances of

yes / no no / partly / yes adequate?

- **ecological status review** No

before incident

- **potential ecological** No

consequences assessment

- **ecological impact review** No

after incident

- **ecological restoration** No

procedures

- **subsequent review of** No

restoration success

remarks - not applicable -

3 Official Action Taken

legal action

- not applicable -

other official action

- not applicable -

4 Lessons Learned

measures to prevent recurrence

See short report

measures to mitigate consequences:

- not applicable -

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1996_004_01 report

Appendix Short Report / description of accident types:

The accident occurred in two different phases, in successive times and in two different units. In the first phase a local fire occurred near the atmospherical vessel called TK103, containing a solution of NaOH in water of the RT1 plant (revamping topping) and used for neutralizing the acidity of the raw oil contained in the desalter of the TK2 plant. The fire caused damages to the tank and to the electrical cables running near the vessel. This fire has been definitively extinguished at 9.25. In the second phase at 9.45, an explosion occurred at the exit of the tube from the preheating oven (F301) of gasoil + H₂ of the desulfurisation plant. This explosion damaged, besides the oven, various equipment in a radius of about 50 m from the explosion point. The fire following this explosion was of short duration.

Appendix Short Report / description of substances involved:

Probably, in the first incident, light hydrocarbons or a mixture together with sodium hydroxide returning from other processes or, with less probability back from the desalter. As far as it concerns the second event, the substance which triggered the explosion, resulting in serious consequences, was essentially hydrogen in gaseous phase..

Appendix Short Report / description of immediate sources:

First phase: ignition of light hydrocarbons coming out of the vessel TK103 probably due to the welding works carried on near the vessel (the nearby systems were not in service due to modification works).

Second phase: Explosion, after hydrogen escape from the rupture of the connection tube in the F301 oven's exit. The explosion was followed by an anomalous temperature and pressure increase due to stop of the gasoil supply which followed the interruption of electricity coming from the cabin, as a consequence of the first event.

Appendix Short Report / description of suspected causes:

The escape of the hydrocarbons contained in the tank TK103 occurred probably due to a human error, during the manual operation of the dilution of the sodium hydroxide solution (routine operation), protracted for an excessive time, leading to the overflow and emission of hydrocarbons in the canals and their flushing shafts collecting white waters. The overflowing hydrocarbons reached the zone in which workers performed the welding. The following fire and the extinguishing operations caused the activation of the protection devices of the grounding system, which resulted in interruption of the electrical supply. Such interruption provoked the gasoil supply loss in the oven F301 in

which the second accident occurred. The increase in the temperature and pressure inside the pipes in which gasoil + H₂ should have circulated occurred due to this supply loss, with consequent overheating of the pipes resulting in rupture and explosion. Also in this case, a human error can be reasonably presumed, based on the available computerised registrations, consisting of the undue silencing of alarms due to insufficient supply and of high temperature and pressure and the subsequent omitted interventions as foreseen by the existing procedures.

Appendix Short Report / description of immediate effects:

A welder worker received burns in face in the first fire and light trauma to the rear. Other 3 workers were presented in the infirmary; some of them showed effects of light state of shock or breathing difficulties. In no case was the doctors intervention required but all workers were sent home. A worker of an external company, escaping, received an injury by a nail in the palm of the left hand. In general the cures given were first aid, or administration of sedatives or oxygen in the case of respiratory problems.

Material damages caused by the first fire around the sodium hydroxide recipient (rupture of electrical cables and of the insulation of the pipes connecting to the tank. The second event provoked besides the damages to the oven and to the connecting pipes, also damages to mobile devices like a crane truck, a light lorry required for the modification works in progress and glass breakage and other damages to various objects inside a radius of 50m from the point of the explosion.

Appendix Short Report / description of emergency measures taken:

The internal procedures provided the pre-alarm to the external authorities and their intervention only in case of alarm confirmation. At 8.45 the pre-alarm concerning the first accident was given (external firemen, "Carabinieri", prefecture, mayor, port authorities). In the same time the internal emergency plan was put in action with the internal fire brigade intervention with foam and water extinguishers of various kinds. The emergency procedure required the evacuation from the nearby plants of all the persons not involved in the extinction efforts, which resulted in sustaining only material damages and no personnel injuries. After the pre-alarm, the persons assigned to the emergency, believing the incident has concluded, gave at 9:25 an "end of pre-alarm" signal to the external authorities, which in the meantime have not intervened. In the meantime, for prudence, the state of emergency was maintained inside the establishment. At 9:45, having verified the 2nd event, a 2nd pre-alarm to the external authorities was issued: in this case the fire-fighting forces of Cagliari intervened; however when they have reached the establishment the 2nd incident was also concluded.

Appendix Short Report / description of immediate lessons learned:

In both incidents the human error was of great importance. A first consideration is to make the procedures of the training more stringent, repeating them at regular intervals, as well as the updating of the responsible personnel to the operations in the plant, even for operation considered "routine", emphasising the necessity of following to the rule, the instructions received and above all the written procedures. Another consideration consists of the opportunity of making more rigid the security processes prescribed for the modification and /or improvement of the plants, in particular when external companies are used, when these operations take place in

the vicinity of functioning plants, or with operations under work (routine or not),

adopting a more stringent system for the working permits.

However, because the experience teaches that human errors can happen, although everything is always possible, it would be opportune that some key interventions at the end of the functioning of the security of the plants can not be bypassed, ignored or silenced by the responsible personnel (blockage devices, alarms of extreme intervention, etc.).

Appendix Full Report A / type of accident:

First incident; ignition of hydrocarbons overflowed from the recipient of the sodium hydroxide solution due to the welding operations or to possible electrical sparks or to the action of the vapour circulating in the same pipes and wells in which the drain of the overflowed solution was collected. Second incident: loss of gasoil supply to the oven due to the electrical supply loss caused by the first incident.

Appendix Full Report A / dangerous substances:

In the second incident the hydrogen circulating in the serpentine of the preheating oven in the desulphuration plant (unit 300) trespassed the temperature limit of 1000oC (maximum temperature foreseen for the serpentine less than 500oC) when the gasoil supply loss occurred (the preheating oven, in normal conditions, operates with a combined charge of liquid gasoil and gaseous hydrogen and is heated by burners supplied by fuel gas.)

Appendix Full Report A / causes of major occurrence:

First incident: probable underevaluation, by the assigned to the operation, considered as of routine and then not at risk.

Second incident: on the base of the available registrations, the cause may have been a series of erroneous consecutive actions by the operator who misinterpreted the instruments indications, and his disposition for the conduction of the process.

Appendix Full Report B / people:

The total number of persons at risk in the first event, considering its characteristics (fire not particularly extended) can be quantified to 6-7, the intervention personnel included. In the second event, characterised by the potential of greater consequences, also if it was of shorter duration, the persons at risk are not easily quantifiable, since in the area there could have been present also people not directly involved in the modification operations.

Appendix Full Report B / ecological harm:

Meteorological data registrations give for the time of the accidents wind velocity of 1,9-3 m/s with variable direction between W-NW and E. The registrations concerning SO₂,NO_x,NO e NO₂ of 6 fixed positions around the establishment indicate an increase of the normal mean value from 9 to 12 hrs. The maximum value of SO₂ (282 ug/m³) was registered at about 10hrs at S-SE of the establishment. Max. for NO_x (55,2 ppb) at 11hrs at S-SE.

Appendix Full Report B / material loss:

At the moment of the on-the-spot investigation the costs were not quantifiable, however they refer to the restoration of damaged parts of the plant and limited to the internal of the establishment.

Appendix Full Report B / disruption of community life:

The news of the incident were reported at a national level by the ANSA agency and by "Televideo RAI"