

## Klorutsläpp på en fabrik i metallindustrin.

960121 MARS 1996\_05

Utsläppet av klor orsakades av en röranslutning till en pump som rostade sönder. Klorgasen blev uppvärmd av okänd anledning och reagerade med rörstålet. Ett gasmoln spred sig mot den närliggande byn. Anläggningen nödstoppades och interna såväl som offentliga katastrofplaner aktiverades. Vattengardiner användes för att kontrollera klormolnets spridning.

### Inblandade ämnen och mängder

	CAS Nr.	Mängd
klor	7782-50-.5	4-5 ton.

### Skador:

**Människor:** 6 anställda förgiftades av klorgasen. Utanför fabriksområdet drabbades 7 personer av klorutsläppet. Samtliga fick sjukhusvård.

**Materiella:** Rörledning och pump förstördes.

**Miljö/ekologi:** Inga effekter rapporterade.

**Infrastruktur:** Allmänheten varnades över radio och uppmanades att stanna inomhus bakom stängda dörrar och fönster.

**Erfarenheter redovisade (Ja/Nej): Nej**

## Report Profile

### Identification of Report:

country: FA ident key: 1996\_005\_01

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

### Date of Major Occurrence: Time of Major Occurrence

start: 1996-01-21 start: 02:15:00

finish: 1996-01-21 finish: 05:15:00

### Establishment:

name:

address:

industry: 2011 metal refining and processing (includes foundries, electrochemical refining, plating, etc.)

Electroquimica (Gas Processing)

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\_005\_01

**Accident Types:**

release: Yes explosion: No

water contamination: No other: No

fire: No

**description:**

21 January 1996 - ERKIMIA (Process plant)

Emission of Chlorine at the breathing line of a pump, with formation of toxic cloud.

**Substance(s) Directly Involved:**

toxic: Yes explosive: No

ecotoxic: No other: No

flammable: No

**description:**

Chlorine ( CAS 7782-50-5 ) , quantity : 5 -6 tonnes

**Immediate Sources of Accident:**

storage: No transfer: No

process: Yes other: No

**description:**

Chlorine liquid feeding from the liquation plant, through a deposit, with a pressure of 8 Kg/cm<sup>2</sup>

**Suspected Causes:**

plant or equipment: Yes environmental: No

human: No other: No

**description:**

The initiating event was corrosion of the pipe and pump union, in the suck in. There was an all deposit overflow.... see Appendix Short Report / description of suspected causes

**Immediate Effects:**

material loss: Yes

**human deaths:** No

**human injuries:** Yes **community disruption:** Yes

**other:** Yes

**ecological harm:** Yes

**national heritage loss:** No

**description:**

Material loss in the industrial plant: the pipe and the pump were destroyed;... see Appendix Short Report /  
description of immediate effects

### **Emergency Measures taken:**

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

**external services:** Yes **restoration:** No

**sheltering:** Yes **other:** No

**evacuation:** No

**description:**

Automatic and safe shutdown of the plant. The operators verified it. They cutted the deposit feeding.  
Activation of the internal emergency plan, actuation of the external emergency plan (PLASEQTA) with  
sheltering of the public by radio to ... see Appendix Short Report / description of emergency measures taken

### **Immediate Lessons Learned:**

**prevention:** Yes **other:** No

**mitigation:** No

**description:**

Automatical valve at the deposit exit (it is activated when there is an excess of volume)

## **A Occurrence Full Report**

**country:** FA **ident key:** 1996\_005\_01

### **1 Type of Accident**

**remarks:** initiating event: corrosion of the pipe and pump union, in the suck in.

There was an all deposit overflow.

### **2 Dangerous Substances**

**remarks:** - not applicable -

### **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):** 315 dgr NW

**stability (Pasquill):**

**ambient temperature (∞C):**

**remarks:** 95% humidity (it was not raining)

## 5 Causes of Major Occurrence

**main causes**

**technical / physical** 5104 operation: corrosion/fatigue

- not applicable -

- not applicable -

- not applicable -

- not applicable -

**human / organizational** - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

**remarks:** corrosion of the pipe and pump union, in the suck-in. There was an all-deposit overflow.

## 6 Discussion about the Occurrence

- not applicable -

**Type of Accident** country: FA ident key: 1996\_005\_01

**event:**

**major occurrence** 1101 release: gas/vapour/mist/etc release to air

**initiating event** - not applicable -

**associated event** - not applicable -

## Dangerous substances

country: FA ident key: 1996\_005\_01

### a) total establishment inventory

**CAS number: identity:** Chlorine

**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):** 6

**use of substance as:**

**b) substance belongs to relevant inventory directly involved:** Yes

**actual quantity:** 5 **potential quantity:** -1

**c) substance belongs to relevant inventory indirectly involved:** No

**actual quantity:** -1 **indir\_pot\_quant:** -1

**Source of Accident - Situation** country: FA ident key: 1996\_005\_01

**situation**

**industry**

**initiating event** - not applicable -

**associated event** - not applicable -

**activity/unit**

**major occurrence** 3103 process: electrochemical operation

**initiating event** - not applicable -

**associated event** - not applicable -

**component**

**major occurrence** 4010 valves/controls/monitoring devices/drain cocks

**initiating event** 4011 general pipework/flanges

**associated event** - not applicable -

## **B Consequences Full Report**

**country:** FA **ident key:** 1996\_005\_01

### **1 Area concerned**

**affected**

**extent of effects installation:** Yes

**establishment:** Yes

**off-site; local:** Yes

**off-site; regional:** not applicable

**off-site; transboundary:** not applicable

**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** 6 0 7

**other serious injuries** 0 0 0

**health monitoring**

**remarks** - not applicable -

### **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 - not applicable -

#### **4 National Heritage Loss**

effects on:

- **historical sites** not applicable - **historic monuments** not applicable

- **historic buildings** not applicable - **art treasures** not applicable

remarks - not applicable -

#### **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 for the establishment, there was material lost (no figures given); outside not.... 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 No No

- **media interest** No No No

- **political interest** No No No

remarks - not applicable -

## 7 Discussion of Consequences

- not applicable -

# C Response Full Report

country: FA ident key: 1996\_005\_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**

Automatic valve at the depos... see Appendix Full Report C / lesson learned - prevent

#### **measures to mitigate consequences:**

- not applicable -

#### **useful references:**

- not applicable -

### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1996\_005\_01 report**

#### **Appendix Short Report / description of suspected causes:**

The initiating event was corrosion of the pipe and pump union, in the suck in. There was an all deposit overflow.

Cause description: The chlorine got hot for unknown reasons and reacted with the pipe steel. The pipe got sectioned and half destroyed. Only the zone between the pump suck in and the filters was affected. (It is still under investigation why the chlorine got hot).

#### **Appendix Short Report / description of immediate effects:**

Material loss in the industrial plant: the pipe and the pump were destroyed;

6 employes intoxicated (by release) were hospitalized; 7 persons external to the site intoxicated (by release) were also hospitalized.

A toxic cloud was over the village. Medical-environmental damages under investigation. Social impact.

#### **Appendix Short Report / description of emergency measures taken:**

Automatic and safe shutdown of the plant. The operators verified it. They cutted the deposit feeding. Activation of the internal emergency plan, actuation of the external emergency plan (PLASEQTA) with sheltering of the public by radio to the Flix population and control of the chlorine concentration in the zone. Water curtains in the tunnels which communicate with the village. Improvement of the population warnings. Emergency equipment for the municipal government.

#### **Appendix Full Report B / material loss:**

for the establishment, there was material lost (no figures given); outside not.

#### **Appendix Full Report C / lesson learned - prevent:**

Automatic valve at the deposit exit (it is activated when there is an excess of volume)