

# Gasutsläpp från en anläggning i petrokemisk industri.

910308 MARS 1991\_01

Olyckan inträffade på en petrokemisk anläggning. En blandning av brandfarliga gaser innehållande väte och vätesulfid släpptes ut genom en rörkrök som rostat sönder. Vätesulfiden spred dålig lukt kring anläggningen. Flödet till sprickan ströps och innehållet i den reaktor det kom ifrån skickades till facklan. Allmänheten varnades.

## Inblandade ämnen och mängder

	CAS Nr.	Mängd
brandfarliga gaser		145 kg
vätesulfid	7783-06-4	55 kg
väte	1333-74-0	100 kg

## Skador:

Människor: Inga.  
Materiella: Inga.  
Miljö/ekologi: Inga effekter rapporterade.  
Infrastruktur: Inga.

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

## Report Profile

### Identification of Report:

country: FA ident key: 1991\_001\_01

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

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

start: 1991-03-08 start:

finish: finish:

### Establishment:

name:

address:

industry: 2002 petrochemical, refining, processing

Petrochemical (Hydrogenation Plant)

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:** 1991\_001\_01

**Accident Types:**

**release:** Yes **explosion:** No

**water contamination:** No **other:** No

**fire:** No

**description:**

SYSTEM ORIGINATING AND OPERATING CONDITIONS:... see Appendix Short Report / description of accident types

**Substance(s) Directly Involved:**

**toxic:** Yes **explosive:** Yes

**ecotoxic:** No **other:** No

**flammable:** Yes

**description:**

- Flammable Gases: amount involved = 145 Kg... see Appendix Short Report / description of substances involved

**Immediate Sources of Accident:**

**storage:** No **transfer:** No

**process:** Yes **other:** No

**description:**

The accident occurred during normal operation in the gasoil hydrogenation plant (operating under vacuum conditions) of a petrochemical industry. The system involved was the reaction products cooler (the cooling medium was water).

**Suspected Causes:**

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

**human:** No **other:** No

**description:**

CAUSES:

The heat-exchanger of the cooling system was corroded by the action of the hydrogen sulphide contained in the reaction products.

**Immediate Effects:**

**material loss:** Yes

**human deaths:** No

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

**other:** No

**ecological harm:** No

**national heritage loss:** No

**description:**

MATERIAL LOSSES:

The release caused minor damages to the installation.

### **Emergency Measures taken:**

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

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

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

**evacuation:** No

**description:**

INTERNAL TO THE ESTABLISHMENT:... see Appendix Short Report / description of emergency measures taken

### **Immediate Lessons Learned:**

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

**mitigation:** No

**description:**

- not applicable -

## **A Occurrence Full Report**

**country:** FA **ident key:** 1991\_001\_01

### **1 Type of Accident**

**remarks:** As a bend in the water cooler had corroded, toxic/flammable/explosive substances (flammable gases, hydrogen sulphide and hydrogen) could escape to the open air (code 1101). The hydrogen sulphide emission caused bad odour in the surroundings... see Appendix Full Report A / type of accident

### **2 Dangerous Substances**

**remarks:** The total establishment and the potential directly inventories of flammable gases, hydrogen and hydrogen sulphide refer to the amounts released into the environment during the accident.

### **3 Source of Accident**

**illustration:** - not applicable -

**remarks:** The accident occurred during normal operation in the gasoil hydrogenation plant [code 3102] (operating under vacuum conditions) of a petrochemical industry (code 2002). The system involved was the reaction products cooler (the cooling mediu... see Appendix Full Report A / source of accident -

remarks

#### 4 Meteorological Conditions

**precipitation none: fog: rain: hail: snow:**

No No No No No

**wind speed (m/s):**

**direction (from):**

**stability (Pasquill):**

**ambient temperature (°C):**

**remarks:** - not applicable -

#### 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:** The heat-exchanger of the cooling system was corroded (code 5104) by the action of the hydrogen sulphide contained in the reaction products.

#### 6 Discussion about the Occurrence

- not applicable -

**Type of Accident** country: FA ident key: 1991\_001\_01

**event:**

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

**initiating event** 1101 release: gas/vapour/mist/etc release to air

**associated event** - not applicable -

#### Dangerous substances

country: FA ident key: 1991\_001\_01

##### a) total establishment inventory

**CAS number:** 7783-06-4 **identity:** Hydrogen Sulphide

**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): 0,055

use of substance as: NORMAL FINISHED PRODUCT

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

actual quantity: 0,055 potential quantity: 0,055

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

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

**a) total establishment inventory**

CAS number: 1333-74-0 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): 0,1

use of substance as: STARTING MATERIAL

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

actual quantity: 0,1 potential quantity: 0,1

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

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

**a) total establishment inventory**

CAS number: identity: Flammable Gases

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): 0,145

use of substance as: NORMAL FINISHED PRODUCT

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

actual quantity: 0,145 potential quantity: 0,145

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

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

**Source of Accident - Situation** country: FA ident key: 1991\_001\_01

**situation**

**industry**

**initiating event** 2002 petrochemical, refining, processing

**associated event** - not applicable -

**activity/unit**

**major occurrence** 3102 process: chemical continuous reaction

**initiating event** 3102 process: chemical continuous reaction

**associated event** - not applicable -

**component**

**major occurrence** 4009 heat exchanger (boiler, refrigerator, heating coils, etc.)

**initiating event** 4009 heat exchanger (boiler, refrigerator, heating coils, etc.)

**associated event** - not applicable -

## **B Consequences Full Report**

**country:** FA **ident key:** 1991\_001\_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** Even if the population was warned, in the Original Report there is no evidence o... see Appendix

Full Report B / area concerned - remarks

### **2 People**

**establishment popul. emergency personnel off-site population**

**total at risk**

**immediate fatalities**

**subsequent fatalities**

**hospitalizing injuries**

**other serious injuries**

**health monitoring**

**remarks** No people were injured during the accident.

### **3 Ecological Harm**

**pollution/contamination/damage of:**

- residential area (covered by toxic cloud) Suspected

- common wild flora/fauna (death or elimination) Suspected

- rare or protected flora/fauna (death or elimination) Suspected

- water catchment areas and supplies for consumption or recreation Suspected

- land (with known potential for long term ecological harm or Suspected

preventing human access or activities)

- marine or fresh water habitat Suspected

- **areas of high conservation value or given special protection** Suspected

**remarks** In the Original Report there is no evidence of significant ecological harms.... 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 data available.

#### **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** The release caused minor damages to the installation.... 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 No No

- **political interest** No No No

**remarks** The population was warned about the toxic release.

#### **7 Discussion of Consequences**

# C Response Full Report

country: FA ident key: 1991\_001\_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**

- not applicable -

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

- not applicable -

##### **useful references:**

- not applicable -

#### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1991\_001\_01 report**

### **Appendix Short Report / description of accident types:**

#### **SYSTEM ORIGINATING AND OPERATING CONDITIONS:**

Gasoil hydrogenation reactor (operating under vacuum conditions) and products cooler (the cooling medium was water).

#### **ACCIDENT CASE HISTORY DESCRIPTION:**

As a bend in the water cooler had corroded, toxic/flammable/explosive substances (flammable gases, hydrogen sulphide and hydrogen) could escape to the open air. The hydrogen sulphide emission caused bad odour in the surroundings of the plant area. The population was alerted.

### **Appendix Short Report / description of substances involved:**

- Flammable Gases: amount involved = 145 Kg.

- Hydrogen Sulphide (C.A.S. CODE: 7783-06-4, E.E.C. CODE:016-001-00-4): amount involved = 55 Kg.

- Hydrogen (C.A.S. CODE: 1333-74-0, E.E.C. CODE: 001-001-00-9): amount involved = 100 Kg.

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

#### **INTERNAL TO THE ESTABLISHMENT:**

The accesses to the installation were blocked and the reactor contents was sent to the flare system. Hydrogen sulphide concentration measurements were carried out.

#### **EXTERNAL TO THE ESTABLISHMENT:**

The population was warned.

### **Appendix Full Report A / type of accident:**

As a bend in the water cooler had corroded, toxic/flammable/explosive substances (flammable gases, hydrogen sulphide and hydrogen) could escape to the open air (code 1101). The hydrogen sulphide emission caused bad odour in the surroundings of the plant area.

### **Appendix Full Report A / source of accident - remarks:**

The accident occurred during normal operation in the gasoil hydrogenation plant [code 3102] (operating under vacuum conditions) of a petrochemical industry (code 2002). The system involved was the reaction products cooler (the cooling medium was water) [code 4009].

### **Appendix Full Report B / area concerned - remarks:**

Even if the population was warned, in the Original Report there is no evidence of significant effects outside the establishment.

### **Appendix Full Report B / ecological harm:**

In the Original Report there is no evidence of significant ecological harms.

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

The release caused minor damages to the installation.