

Explosion och utsläpp på en anläggning för produktion av gödningsämnen.

851010 MARS 1985_11

Vätgas som bildats i en tank där korrosion uppstått antändes vid underhållsarbete med en skärbrännare. De två arbetare som utförde arbetet avled omedelbart. Explosionen kastade tanken över en lagerbyggnad. Två andra tankar som innehöll svavelsyra förstördes i nedslaget. Den största delen av svavelsyran kunde samlas upp i en bassäng. Ett stort giftmoln bildades dock ovanför bassängen då svavelsyran dunstade. Molnet skingrades dock inom kort. Bassängen tömdes helt och rengjordes med natriumkarbonat.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
svavelsyra	7664-93-9	okänt
väte	1333-74-0	okänt

Skador:

Människor: Två personer omkom vid explosionen.
Materiella: Tre tankar totalförstördes.
Miljö/ekologi: Inga effekter rapporterade.
Infrastruktur: Inga

Erfarenheter redovisade (Ja/Nej): Nej

Kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1985_011_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1985-10-10 start: 11:00:00

finish: finish:

Establishment:

name:

address:

industry: 2004 pesticides, pharmaceuticals, other fine chemicals

Fertilizers Production

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:** 1985_011_01**Accident Types:****release:** Yes **explosion:** Yes**water contamination:** No **other:** No**fire:** No**description:**

ACCIDENT CASE HISTORY DESCRIPTION:... see Appendix Short Report / description of accident types

Substance(s) Directly Involved:**toxic:** Yes **explosive:** Yes**ecotoxic:** No **other:** Yes**flammable:** Yes**description:**

- Sulphuric Acid (C.A.S. CODE: 7664-93-9); amount involved = not known (No data are available about the whole amount of sulphuric acid that was released in the basin from the three damaged storage tanks. Also, no data are available about th... see Appendix Short Report / description of substances involved

Immediate Sources of Accident:**storage:** Yes **transfer:** No**process:** Yes **other:** No**description:**

The accident occurred during the maintenance of a sulphuric acid storage tank in an industry for the fertilizers production. The maintenance works consisted in cutting operations (to remove some plates fastened with bolts) by using oxyaceti... see Appendix Short Report / description of immediate sources

Suspected Causes:**plant or equipment:** Yes **environmental:** No**human:** Yes **other:** No**description:**

INITIATING EVENT AND CONSEQUENCES:... see Appendix Short Report / description of suspected causes

Immediate Effects:

material loss: Yes

human deaths: Yes

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

other: No

ecological harm: No

national heritage loss: No

description:

EFFECTS ON PEOPLE:... see Appendix Short Report / description of immediate effects

Emergency Measures taken:

on-site systems: Yes **decontamination:** Yes

external services: No **restoration:** No

sheltering: No **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:

A Occurrence Full Report

country: FA **ident key:** 1985_011_01

1 Type of Accident

remarks: An explosion (code 1307) hurled a sulphuric acid storage tank over a hangar, demolishing two other tanks (also containing sulphuric acid) and causing the escape of the product which invaded the basin of containment. The released sulphuric a... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: No data are available about the whole amount of sulphuric acid that was released in the basin from the three damaged storage tanks and about the amount which evaporated from the basin originating a toxic cloud. Also, no data are available a... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred during the maintenance of a sulphuric acid storage tank (codes 3201 and 4003) in an industry for the fertilizers production (code 2004). The maintenance works consisted in cutting operations (to remove some plates fast... 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 5303 organization: organized procedures (none, inadequate, inappropriate, unclear)

- not applicable -

- not applicable -

- not applicable -

- not applicable -

remarks: The accident occurred because, on the internal surface of a tank containing sulphuric acid, a corrosion phenomenon (code 5104) associated with the accumulation of hydrogen occurred due to poor maintenance (caused by inadequate procedures [c... see Appendix Full Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1985_011_01

event:

major occurrence 1307 explosion: VCE (vapour cloud explosion; supersonic wave front)

initiating event 1307 explosion: VCE (vapour cloud explosion; supersonic wave front)

associated event 1101 release: gas/vapour/mist/etc release to air

Dangerous substances

country: FA ident key: 1985_011_01

a) total establishment inventory

CAS number: 7664-93-9 **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): -1

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

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: 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): -1

use of substance as: ABNORMAL PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: -1 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: 1985_011_01

situation

industry

initiating event 2004 pesticides, pharmaceuticals, other fine chemicals

associated event 2004 pesticides, pharmaceuticals, other fine chemicals

activity/unit

major occurrence 3201 storage: process-associated (stockholding, etc. on-site of manufacture)

initiating event 3201 storage: process-associated (stockholding, etc. on-site of manufacture)

associated event 3201 storage: process-associated (stockholding, etc. on-site of manufacture)

component

major occurrence 4003 container; non-pressurised (hopper, tank, drum, bag, etc.)

initiating event 4003 container; non-pressurised (hopper, tank, drum, bag, etc.)

associated event 4003 container; non-pressurised (hopper, tank, drum, bag, etc.)

B Consequences Full Report

country: FA ident key: 1985_011_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 In the Original Report there is no evidence of significant effects outside the e... see Appendix

Full Report B / area concerned - remarks

2 People

establishment popul. emergency personnel off-site population

total at risk

immediate fatalities 2

subsequent fatalities

hospitalizing injuries

other serious injuries

health monitoring

remarks The two men who were performing the cutting operation died. The explosion origin... see Appendix

Full Report B / people

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 explosion hurled the tank over a hangar, demolishing two other tanks (also c... 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** Yes No No

- **media interest** No No No

- **political interest** No No No

remarks In the Original Report there is no evidence of significant effects outside the e... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA **ident key:** 1985_011_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 / 1985_011_01 report

Appendix Short Report / description of accident types:

ACCIDENT CASE HISTORY DESCRIPTION:

On the internal surface of a tank containing sulphuric acid a corrosion phenomenon associated with the accumulation of hydrogen occurred owing to poor maintenance. The hydrogen was ignited by the oxyacetylenic flame used for cutting operations on the tank (two men were removing some plates fastened with bolts using the oxyacetylenic flame). The explosion hurled the tank over a hangar, demolishing two other tanks (also containing sulphuric acid) and causing the escape of the product which invaded the basin of containment. The two men who were performing the cutting operation died. The released sulphuric acid evaporated from the basin originating a toxic cloud which dispersed without consequences for the population. The basin invaded by the sulphuric acid was emptied and neutralized with sodium carbonate in order to avoid that sulphuric acid could corrode the ammonia pipings inside the basin itself.

Appendix Short Report / description of substances involved:

- Sulphuric Acid (C.A.S. CODE: 7664-93-9): amount involved = not known (No data are available about the whole amount of sulphuric acid that was released in the basin from the three damaged storage tanks. Also, no data are available about the amount of sulphuric acid which evaporated from the basin originating a toxic cloud).

- Hydrogen (C.A.S. CODE: 1333-74-0, E.E.C. CODE: 001-001-00-9): amount involved in the explosion = not known (hydrogen gas accumulated inside the sulphuric acid storage tank due to a corrosion of the internal tank surface caused by poor maintenance).

Appendix Short Report / description of immediate sources:

The accident occurred during the maintenance of a sulphuric acid storage tank in an industry for the fertilizers production. The maintenance works consisted in cutting operations (to remove some plates fastened with bolts) by using oxyacetylenic flame on the storage tank.

Appendix Short Report / description of suspected causes:

INITIATING EVENT AND CONSEQUENCES:

On the internal surface of a tank containing sulphuric acid a corrosion phenomenon associated with the accumulation of hydrogen occurred. The hydrogen was then ignited by the oxyacetylenic flame used for cutting operations on the tank (two men were removing some plates fastened with bolts using the oxyacetylenic flame) and an explosion occurred.

CAUSES:

The accident occurred because, on the internal surface of a tank containing sulphuric acid, a corrosion phenomenon associated with the accumulation of hydrogen occurred due to poor maintenance (caused by inadequate procedures). The hydrogen was then ignited by the oxyacetylenic flame used by two workers for cutting operations.

Appendix Short Report / description of immediate effects:

EFFECTS ON PEOPLE:

The two men who were performing the cutting operation died. The explosion originated a toxic cloud which dispersed without consequences for the population.

MATERIAL LOSS:

The explosion hurled the tank over a hangar, demolishing two other tanks (also containing sulphuric acid) and causing the escape of the product which invaded the basin of containment. No data are available about the cost of the material losses.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

The explosion hurled the tank over a hangar, demolishing two other tanks (also containing sulphuric acid) and causing the escape of the product which invaded the basin of containment. The released sulphuric acid evaporated from the basin originating a toxic cloud which dispersed without consequences for the population. The basin invaded by the sulphuric acid was emptied and neutralized with sodium carbonate in order to avoid that sulphuric acid could corrode the ammonia pipings inside the basin itself.

Appendix Full Report A / type of accident:

An explosion (code 1307) hurled a sulphuric acid storage tank over a hangar, demolishing two other tanks (also containing sulphuric acid) and causing the escape of the product which invaded the basin of containment. The released sulphuric acid evaporated from the basin originating a toxic cloud which dispersed without consequences for the population (code 1101).

Appendix Full Report A / dangerous substances:

No data are available about the whole amount of sulphuric acid that was released in the basin from the three damaged storage tanks and about the amount which evaporated from the basin originating a toxic cloud. Also, no data are available about the amount of hydrogen gas accumulated inside the sulphuric acid storage tank due to a corrosion of the internal tank surface. From the Original Report it is not clear if sulphuric acid was a starting material or a finished product.

Appendix Full Report A / source of accident - remarks:

The accident occurred during the maintenance of a sulphuric acid storage tank (codes 3201 and 4003) in an industry for the fertilizers production (code 2004). The maintenance works consisted in cutting operations (to remove some plates fastened with bolts) by using oxyacetylenic flame on the storage tank.

Appendix Full Report A / causes of major occurrence:

The accident occurred because, on the internal surface of a tank containing sulphuric acid, a corrosion phenomenon (code 5104) associated with the accumulation of hydrogen occurred due to poor maintenance (caused by inadequate procedures [code 5303]). The hydrogen was then ignited by the oxyacetylenic flame used by two workers for cutting operations.

Appendix Full Report B / area concerned - remarks:

In the Original Report there is no evidence of significant effects outside the establishment (the toxic cloud dispersed without consequences for the population).

Appendix Full Report B / people:

The two men who were performing the cutting operation died. The explosion originated a toxic cloud which dispersed without consequences for the population.

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 explosion hurled the tank over a hangar, demolishing two other tanks (also containing sulphuric acid) and causing the escape of the product which invaded the basin of containment. No data are available about the cost of the material losses.

Appendix Full Report B / disruption of community life:

In the Original Report there is no evidence of significant effects outside the establishment (the toxic cloud dispersed without consequences for the population).