

Gasutsläpp och brand vid en lossningsstation på en kemikaliefabrik.

870926 MARS 1987_11

Vid lossning av koldisulfid från en tankbil slarvades med en slangkoppling och koldisulfid släpptes ut. Operatören reagerade snabbt och slog larm så fort han såg de första flammorna. Chauffören i tankbilen undkom med nöd och näppe innan bilen sveptes in av lågorna. Företagets interna brandkår fick kontroll på elden med bärbara eldsläckare innan räddningstjänsten anlönt. Chauffören fick lindriga brännskador. Operatören fick vårdas för chock på sjukhus.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
koldisulfid	75-15-0	920 kg varav 200 kg fattade eld.

Skador:

Människor:	En operatör chockades och fick föras till sjukhus. En chaufför brännskadades lindrigt.
Materiella:	Lossningsstationen och tankbilen skadades.
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Inga.

Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1987_011_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1987-09-26 start: 01:00:00

finish: finish:

Establishment:

name:

address:

industry: 2001 general chemicals manufacture

Organic Chemical (Single-bay Off-loading Station for Carbon Disulphide tankers)

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:** 1987_011_01**Accident Types:****release:** No **explosion:** No**water contamination:** No **other:** No**fire:** Yes**description:**

A dedicated CS2 road tanker arrived at the specially designed off-loading bay at 00:28 on September 26, 1987.

The shift operator arrived at the bay at 00:45 and, with the help of the tanker driver, started to make the necessary routine off-... see Appendix Short Report / description of accident types

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

- Carbon Disulphide (CS2) (C.A.S. CODE:75-15-0, E.E.C. CODE: 006-003-00-3): amount released = 920 kg of which 200 Kg caught fire.

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

The accident involved a flexible hose connecting a carbon disulphide road tanker to an off-loading bay manifold. The road tanker was carried out under nitrogen blanket pressure.

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

CAUSES:... 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:

EFFECTS ON PEOPLE:... 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:

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

Immediate Lessons Learned:

prevention: Yes **other:** No

mitigation: Yes

description:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:... see Appendix Short Report / description of immediate lessons learned

A Occurrence Full Report

country: FA **ident key:** 1987_011_01

1 Type of Accident

remarks: During the discharge of a carbon disulphide road tanker under nitrogen

blanket pressure, the failure of an EMCO-Wheaton quick-release hose

connection caused the release of carbon disulphide (code 1102). A part of

the released carbon disulph... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: The total establishment inventory of carbon disulphide refers to the

potential inventory directly involved during the accident. The amount of

carbon disulphide that was released was about 920 kg but only 200 kg caught

fire.

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred in a off-loading bay during the unloading (code 3304),

carried out under nitrogen blanket pressure, of a road tanker containing

carbon disulphide in an organic chemical industry manufacturing viscose

rayon (code 2001).... 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: The accident occurred during an overcast and still night.

5 Causes of Major Occurrence

main causes

technical / physical 5102 operation: component/machinery failure/malfunction

- not applicable -

- not applicable -

- not applicable -

- not applicable -

human / organizational 5308 organization: design of plant/equipment/system (inadequate, inappropriate)

5314 organization: testing/inspecting/recording (none, inadequate,

inappropriate)

5401 person: operator error

- not applicable -

- not applicable -

remarks: The accident occurred due to the malfunction of a quick-release hose connection. Due to

incorrect engagement (code 5401) or to an accidental displacement of the levers (code

5102) the connection failed during the CS2 unloading (no safety me... see Appendix Full

Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1987_011_01

event:

major occurrence 1204 fire: flash fire (burning vapour cloud, subsonic flame front)

initiating event 1102 release: fluid release to ground

associated event - not applicable -

Dangerous substances

country: FA ident key: 1987_011_01

a) total establishment inventory

CAS number: 75-15-0 **identity:** Carbon Disulphide

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): 0,92

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 0,2 **potential quantity:** 0,92

c) substance belongs to relevant inventory indirectly involved: No

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

Source of Accident - Situation country: FA ident key: 1987_011_01

situation

industry

initiating event 2001 general chemicals manufacture

associated event - not applicable -

activity/unit

major occurrence 3304 transfer: loading/unloading activities (transfer interfaces)

initiating event 3304 transfer: loading/unloading activities (transfer interfaces)

associated event - not applicable -

component

major occurrence 4011 general pipework/flanges

initiating event 4011 general pipework/flanges

associated event - not applicable -

B Consequences Full Report

country: FA ident key: 1987_011_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: No

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 i... see Appendix

Full Report B / area concerned - remarks

2 People

establishment popul. emergency personnel off-site population

total at risk 2

immediate fatalities

subsequent fatalities

hospitalizing injuries 1

other serious injuries 1

health monitoring

remarks The tank driver suffered only minor injuries. The shift operator was detained in... 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 British Pounds ECU British Pounds

material losses 4000

response, clean up, restoration

remarks Fire damaged the off-loading bay and road tanker's tyres and breaking system. Th... 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: 1987_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

After the accident, the follow... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

After the accident only minor ... see Appendix Full Report C / lesson learned - mitigate

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1987_011_01 report

Appendix Short Report / description of accident types:

A dedicated CS2 road tanker arrived at the specially designed off-loading bay at 00:28 on September 26, 1987. The shift operator arrived at the bay at 00:45 and, with the help of the tanker driver, started to make the necessary routine off-loading hose and nitrogen pressurizing connections. After applying nitrogen pressure to all four tank compartments, the operator noticed that compartment N° 2 was air-locked and bubbles were visible in the flow sight glass. He left the control bay and attempted to clear the air lock by opening and closing the discharge valve. As he was returning to the bay to check again the sight glass, he saw flames creeping up the near side of the tanker. Immediately he operated the alarm switch located in the bay which simultaneously started the deluge system and initiated the on-site emergency routine. The tanker driver has incorrectly returned to his cab and had to jump clear as the flames engulfed the vehicle. The works fire team used hand-held AFFF extinguishers and the fire was controlled before of the local brigade arrival on-site. The driver suffered only minor injuries but the shift operator was detained in hospital for one day as he was suffering from severe shock and received minor bruising and abrasions in his haste to descend the loading bay access stairway.

Appendix Short Report / description of suspected causes:

CAUSES:

The initial cause of the carbon disulphide spillage was the failure of an EMCO-Wheaton quick release hose connection. The female half has two diametrically-opposed lever operated locking cams: due to incorrect engagement or accidental displacement of these levers, the coupling fell apart during carbon disulphide discharge under nitrogen blanket pressure. Subsequent examination of the mating parts revealed a degree of wear but when properly engaged the coupling was considered serviceable

Appendix Short Report / description of immediate effects:

EFFECTS ON PEOPLE:

Inside the establishment 1 person (of the 2 exposed) was injured by fire. The driver suffered only minor injuries but the shift operator was detained in hospital for one day as he was suffering from severe shock and received minor bruising and abrasions in his haste to descend the loading bay access stairway.

MATERIAL LOSS

Fire damaged the off-loading bay and road tanker's tyres and braking system. The cost of the damages has been estimated in about 4,000 UK Pounds.

MAP OF THE ACCIDENT AREA AND MAX. DENSITY OF POPULATION:

The location of the installation is shown on a map attached to the Original Report.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

Tanker was flooded with water as a precaution. Operator immediately activated the water deluge system and initiated the on-site major emergency plan. The works fire team attend the scene.

EXTERNAL TO THE ESTABLISHMENT:

The works incident controller alerted the external emergency services. The local fire brigade attended but the accident was under control before their arrival on-site.

Appendix Short Report / description of immediate lessons learned:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:

After the accident, the following measures were established:

1. provision and use of modified type of hose connection which incorporates a security ring designed to engage over the levers of the locking cams;
- 2- a more rigorous routine examination of the hose coupling involving the use of standard test male and to check the degree of wear in the locking cams and the amount of compression of the annular rubber seal;
- 3- recommended changes to code of practice to incorporate points above mentioned.

MEASURE TO MITIGATE THE EFFECTS OF THE ACCIDENT:

After the accident only minor changes to the water deluge system and to the operational arrangement for the on-site emergency plan (for example provision of radio for incident controller) were established.

Appendix Full Report A / type of accident:

During the discharge of a carbon disulphide road tanker under nitrogen blanket pressure, the failure of an EMCO-Wheaton quick-release hose connection caused the release of carbon disulphide (code 1102). A part of the released carbon disulphide immediately caught fire (code 1204).

Appendix Full Report A / source of accident - remarks:

The accident occurred in an off-loading bay during the unloading (code 3304), carried out under nitrogen blanket pressure, of a road tanker containing carbon disulphide in an organic chemical industry manufacturing viscose rayon (code 2001). The component involved was the flexible hose used to connect the road tanker to the off-loading bay (code 4011). The location of the establishment is shown on a map attached to the Original Report.

Appendix Full Report A / causes of major occurrence:

The accident occurred due to the malfunction of a quick-release hose connection. Due to incorrect engagement (code 5401) or to an accidental displacement of the levers (code 5102) the connection failed during the CS2 unloading (no safety measure to avoid the accidental displacement of the levers was provided [code 5308]). Subsequent examinations of the mating parts revealed a degree of wear (code 5314 for insufficient inspection procedures) but when properly engaged it was serviceable.

Appendix Full Report B / area concerned - remarks:

In the Original Report there is no evidence of significant effects outside the installation.

Appendix Full Report B / people:

The tank driver suffered only minor injuries. The shift operator was detained in hospital for one day as he was suffering from severe shock and received minor bruising and abrasions in his haste to descend the loading bay access stairway.

Appendix Full Report B / ecological harm:

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

Appendix Full Report B / material loss:

Fire damaged the off-loading bay and road tanker's tyres and braking system. The cost of the damages has been estimated in about 4,000 UK Pounds.

Appendix Full Report B / disruption of community life:

In the Original Report there is no evidence of significant effects outside the establishment.

Appendix Full Report C / lesson learned - prevent:

After the accident, the following measures were established:

1. provision and use of modified type of hose connection which incorporates a security ring designed to engage over the levers of the locking cams;

2- a more rigorous routine examination of the hose coupling involving the use of standard test male and to check the degree of wear in the locking cams and the amount of compression of the annular rubber seal;

3- recommended changes to code of practice to incorporate points above mentioned.

Appendix Full Report C / lesson learned - mitigate:

After the accident only minor changes to the water deluge system and to the operational arrangement for the on-site emergency plan (for example provision of radio for incident controller) were established.