

Explosion och brand vid ett vägbygge

940503

Mycket kortfattad.

Rapporten innehåller ingen egentlig beskrivning av förloppet. Olyckan inträffade vid underhållsarbete på ett företag i vägbyggesbranschen. Olyckan omfattade två asfaltstankar, en full och en tom, samt en tank med väteklorid. Det synes som om någon av de kolväten som blandas i asfalten för att göra asfalten mer lätthanterlig vid väganläggningsarbete har exploderat. Resultatet blev en våldsam explosion som förstörde en tank med väteklorid och skadade ytterligare sju cylindrar.

Inblandade ämnen och mängder

| | CAS Nr. | Mängd |
|------------|-----------|--------|
| väteklorid | 7647-01-0 | okänt |
| asfalt | 8052-42-4 | 18 ton |

Skador:

| | |
|----------------|---|
| Människor: | De två arbetare som utförde underhållsarbetet slungades 30 m bort av explosionen och omkom. |
| Materiella: | Förutom byggnaden förstördes sju bilar på en intilliggande parkering. |
| Miljö/ekologi: | Avloppsvattnet förorenades en aning. |
| Infrastruktur: | Inga effekter rapporterade. |

Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1800_033_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 03/05/1994 start:

finish: 03/05/1994 finish:

Establishment:

name:

address:

industry: 2021 building and works of engineering construction

road works

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:** 1800_033_01

Accident Types:

release: Yes **explosion:** Yes

water contamination: No **other:** No

fire: No

description:

the short report has not been filled out (just full report)

Substance(s) Directly Involved:

toxic: No **explosive:** No

ecotoxic: No **other:** No

flammable: Yes

description:

the short report has not been filled out (just full report)

Immediate Sources of Accident:

storage: Yes **transfer:** No

process: No **other:** No

description:

the short report has not been filled out (just full report)

Suspected Causes:

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

human: Yes **other:** No

description:

the short report has not been filled out (just full report)

Immediate Effects:

material loss: No

human deaths: Yes

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

other: No

ecological harm: No

national heritage loss: No

description:

the short report has not been filled out (just full report)

Emergency Measures taken:

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

external services: Yes **restoration:** No

sheltering: No **other:** No

evacuation: Yes

description:

the short report has not been filled out (just full report)

Immediate Lessons Learned:

prevention: No **other:** Yes

mitigation: No

description:

the short report has not been filled out (just full report)

A Occurrence Full Report

country: FA **ident key:** 1800_033_01

1 Type of Accident

remarks: - not applicable -

2 Dangerous Substances

remarks: fluidified asphalt (bitumen) is a mixture of asphalt and volatile petrochemical solvents, for example kerosene. The flash point is comprised between 21 degrees Celsius and 55 degrees Celsius.

3 Source of Accident

illustration: A plant lay-out map illustrating schematically the onsite consequences of the accident, a picture showing the top of a tank, a picture showing the top of two tanks with railings and a gangway connecting them, a scheme of a emulsion producti... see Appendix Full Report A / source of accident - illustration

remarks: The accident occurred in the logistic base of a road work company, sited in an urbanised area (industrial and service activities). The installations concerned by the accident are fluidified asphalt tanks. These tanks are cylindrical tanks w... 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): 23

remarks: - not applicable -

5 Causes of Major Occurrence

main causes

technical / physical - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

human / organizational 5302 organization: management attitude problem

5303 organization: organized procedures (none, inadequate, inappropriate, unclear)

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

5305 organization: supervision (none, inadequate, inappropriate)

5313 organization: maintenance/repair (none, inadequate, inappropriate)

remarks: management fault: the maintenance work was being performed with a certain improvisation.

Instructions had not been issued or were not detailed enough. Inadequate management and instructions.

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1800_033_01

event:

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

initiating event - not applicable -

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

Dangerous substances

country: FA ident key: 1800_033_01

a) total establishment inventory

CAS number: 7647-01-0 **identity:**

name from Seveso I Directive: Hydrogen chloride (liquefied gas)

name from Seveso II Directive: Hydrogen chloride (liquefied gas)

category from Seveso II: toxic

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): -1

use of substance as: starting material

b) substance belongs to relevant inventory directly involved: No

actual quantity: 0 potential quantity: 0

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: 0 indir_pot_quant: 0

a) total establishment inventory

CAS number: 8052-42-4 identity: asphalt (bitumen)

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: highly flammable liquids R11, 2nd indent

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 18

use of substance as: starting material

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 18 potential quantity: 18

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: 0 indir_pot_quant: 0

Source of Accident - Situation country: FA ident key: 1800_033_01

situation

industry

initiating event 2021 building and works of engineering construction

associated event - not applicable -

activity/unit

major occurrence 3202 storage: distribution-associated (not on-site of manufacture)

initiating event - not applicable -

associated event - not applicable -

component

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

initiating event - not applicable -

associated event - not applicable -

B Consequences Full Report

country: FA ident key: 1800_033_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: Yes

off-site; local: Suspected

off-site; regional: No

off-site; transboundary: No

illustration of effects - not applicable -

remarks Apart from the two metallic tanks and the hydrogen chloride tank, 7 other cylind... see Appendix

Full Report B / area concerned - remarks

2 People

establishment popul. emergency personnel off-site population

total at risk -1 -1 -1

immediate fatalities 2 0 0

subsequent fatalities 0 0 0

hospitalizing injuries 0 0 0

other serious injuries 0 0 0

health monitoring 0 0 0

remarks The two workers carrying out the work were thrown about 30 meters and were kille... see Appendix

Full Report B / people

3 Ecological Harm

pollution/contamination/damage of:

- residential area (covered by toxic cloud) No

- common wild flora/fauna (death or elimination) No

- rare or protected flora/fauna (death or elimination) No

- water catchment areas and supplies for consumption or recreation No

- land (with known potential for long term ecological harm or No

preventing human access or activities)

- marine or fresh water habitat No

- areas of high conservation value or given special protection No

remarks - not applicable -

4 National Heritage Loss

effects on:

- historical sites None - historic monuments None

- historic buildings None - art treasures None

remarks - not applicable -

5 Material Loss

establishment losses off site losses

costs (direct costs to operator) (social costs)

in ECU FFR ECU FFR

material losses -1 -1 0 0

response, clean up, restoration 970000 6500000 0 0

remarks - not applicable -

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 Yes No No

- political interest Yes No No

remarks - not applicable -

7 Discussion of Consequences

- not applicable -

Ecological Components involved

country: FA ident key: 1800_033_01

type: - not applicable -

threatened: not applicable affected: No

C Response Full Report

country: FA ident key: 1800_033_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

The properties of the fluidisi... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

The increase of the distance b... see Appendix Full Report C / lesson learned - mitigate

useful references:

no information is given

5 Discussion about Response

- not applicable -

Appendices for the FA / 1800_033_01 report

Appendix Full Report A / source of accident - illustration:

A plant lay-out map illustrating schematically the onsite consequences of the accident, a picture showing the top of a tank, a picture showing the top of two tanks with railings and a gangway connecting them, a scheme of a emulsion production instalation, a lay-out map of the plant, a 1/5000 map of the surroundings of the plant, a copy of a cargo intake certificate, a copy of characteristic specifications for asphalts, a safety data sheet for liquefied asphalts (cut-backs) updated to 1 January 1981, are annexed

Appendix Full Report A / source of accident - remarks:

The accident occurred in the logistic base of a road work company, sited in an urbanised area (industrial and service activities). The installations concerned by the accident are fluidified asphalt tanks. These tanks are cylindrical tanks with a vertical axis and a capacity of 50 tons. The tank on which maintenance work was performed contained 18 t of liquefied asphalt. The other tank was empty but not cleared of gas.

Appendix Full Report B / area concerned - remarks:

Apart from the two metallic tanks and the hydrogen chloride tank, 7 other cylindrical tanks were damaged. The retention pond and the roofing of a neighbouring building are damaged, 7 vehicles parked in vicinity were destroyed. The sewage system was slightly polluted

Appendix Full Report B / people:

The two workers carrying out the work were thrown about 30 meters and were killed.

Appendix Full Report C / lesson learned - prevent:

The properties of the fluidising substance mixed to the asphalt have to be attributed also to the asphalt. The mixture with kerosene confers to the liquefied asphalt the properties of the kerosene. The producer of the mixture but also their users have the responsibility to identify this risk.

Appendix Full Report C / lesson learned - mitigate:

The increase of the distance between the tanks reduces the risk of domino effects. An area of several tens of square metres around the tanks could be subject of an impact. This area should be free of any sensible installation. The storage in underground tanks reduces the risk considerably.