

Explosion och brand på en bränsledepå.

860224 MARS 1986_07

Branden uppstod i en bränsletank av okänd anledning och spreds via dräneringskanaler till tio andra tankar på området. Tankarna innehöll nafta, råolja, bränsleolja och diesel. Åtta av tankarna förstördes helt, medan två kunde räddas. I samband med branden inträffade även en våldsamt förångning av vatten. Vid brandbekämpningen användes inledningsvis pulversläckare. Då branden spridit sig till fyra av tankarna började man använda vatten för kylning och skum för släckning. Företagets interna brandkår assisterades av räddningstjänst och externa specialister på brandbekämpning.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
vatten	7732-18-5	70 ton
råolja		12 870 ton
bränsleolja		29 100 ton
diesel		350 ton
nafta	8030-30-6	13,5 ton
giftiga förbränningsprodukter till följd av ofullständig förbränning av kolväten		okänt

Skador:

Människor:	12 människor skadades av branden och 13 människor av de giftiga rökgaserna.
Materiella:	10 av 12 lagertankar antändes och 8 av dem förstördes.
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Inga.

Erfarenheter redovisade (Ja/Nej): Nej

Report Profile

Identification of Report:

country: FA ident key: 1986_007_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1986-02-24 start: 13:00:00

finish: finish:

Establishment:

name:

address:

industry: 2002 petrochemical, refining, processing

Storage Activities (Liquid Petroleum Fuels [Fuel Oil, Crude Oil, Diesel Oil and Naphtha] Storage)

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: 1986_007_01

Accident Types:

release: Yes explosion: Yes

water contamination: No other: No

fire: Yes

description:

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

Substance(s) Directly Involved:

toxic: Yes explosive: Yes

ecotoxic: No other: No

flammable: Yes

description:

- Water (C.A.S. CODE: 7732-18-5): amount involved in the B.L.E.V.E. = 70,000 kg (about 70 m3)... see Appendix

Short Report / description of substances involved

Immediate Sources of Accident:

storage: Yes transfer: No

process: No other: No

description:

The accident occurred in a storage installation for liquid petroleum fuels. The storage installation

included:... see Appendix Short Report / description of immediate sources

Suspected Causes:

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

human: No **other:** No

description:

INITIATING EVENT AND CONSEQUENCES:... 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: Yes

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: No **other:** No

mitigation: No

description:

- not applicable -

A Occurrence Full Report

country: FA **ident key:** 1986_007_01

1 Type of Accident

remarks: The fire started in a fuel-oil tank (code 1202) and was transmitted through

the drainage channels to other tanks. Explosions occurred in tanks

containing fuel oil and crude oil (code 1307) and, besides, a B.L.E.V.E. of

about 70 m³ of water ... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: The total establishment inventories of the substances refer to the amounts

stored when the accident occurred. The potential inventories directly

involved of the substances had been evaluated under the hypotheses that

storage tanks D5, D10, ... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred in a storage installation for liquid petroleum fuels

(codes 2002 and 3202). The storage installation included (code 4003): tanks

D1, D2, D5, D6 and D7 containing fuel oil; tank D4 containing diesel oil;

tanks D8 and D1... 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 5102 operation: component/machinery failure/malfunction

5501 other: not identified

- not applicable -

- not applicable -

- not applicable -

human / organizational - not applicable -

- not applicable -

- not applicable -

- not applicable -

- not applicable -

remarks: The fire developed in the tank D1 area due to the failure of a pipe (code 5102) and it

was transmitted to the other tank areas through the drainage channels. When the Original

Report was prepared, the causes of the pipe failure were still ... see Appendix Full

Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1986_007_01

event:

major occurrence - not applicable -

initiating event - not applicable -

associated event - not applicable -

event:

major occurrence 1202 fire: pool fire (burning pool of liquid, contained or uncontained)

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

associated event - not applicable -

Dangerous substances

country: FA ident key: 1986_007_01

a) total establishment inventory

CAS number: 7732-18-5 identity: Water

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): 70

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 70 potential quantity: 70

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: 8030-306 identity: Naphtha

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): 27

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 13,5 potential quantity: 27

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Fuel Oil

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): 29100

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 29100 potential quantity: 29100

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Diesel Oil

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): 350

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 350 potential quantity: 350

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Crude Oil

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): 12870

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 12870 potential quantity: 12870

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

a) total establishment inventory

CAS number: identity: Combustion Products

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: 1986_007_01

situation

industry

initiating event 2002 petrochemical, refining, processing

associated event - not applicable -

activity/unit

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

initiating event 3202 storage: distribution-associated (not on-site of manufacture)

associated event - not applicable -

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 - not applicable -

B Consequences Full Report

country: FA ident key: 1986_007_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: Yes

off-site; local: not applicable

off-site; regional: not applicable

off-site; transboundary: not applicable

illustration of effects - not applicable -

remarks In the Original Report no information are available about possible effects outsi... 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 25

other serious injuries

health monitoring

remarks According to the information given by the Fire Service, 12 people were injured b... see Appendix

Full Report B / people

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 In the Original Report no information are available about possible environmental... 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 Greek Drachmaes ECU Greek Drachmaes

material losses 3000000

response, clean up, restoration

remarks 10 out of the 12 storage tanks were set on fire and 8 of them were destroyed. 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** No No No

- **media interest** No No No

- **political interest** No No No

remarks In the Original Report no information are available about possible effects outsi... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA **ident key:** 1986_007_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

Competent: YPEHODE.

measures to mitigate consequences:

- not applicable -

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1986_007_01 report

Appendix Short Report / description of accident types:

ACCIDENT CASE HISTORY DESCRIPTION:

When the Original Report was prepared, the accident was under administrative and juridical investigation and a more detailed description was not available. A first information based on the investigation of the Fire Service showed that the fire started in a fuel oil tank and was transmitted through the drainage channels to other tanks. Tanks D1, D2, D6 and D7 (containing fuel oil), tank D4 (containing diesel oil), tank D8 (containing crude oil), tank D9 (containing naphtha), the empty tank D3, the loading station and the offices of the installation were destroyed while tanks D5 (with fuel oil) and D10 (with crude oil) which caught fire were saved. Tanks D11 and D12 containing naphtha were not set on fire. Explosions occurred in tanks containing fuel oil and crude oil. Besides, a B.L.E.V.E. of about 70 m³ of water occurred. Toxic substances were released in the ambient due to the incomplete combustion of the petroleum products involved in the fire.

Appendix Short Report / description of substances involved:

- Water (C.A.S. CODE: 7732-18-5): amount involved in the B.L.E.V.E. = 70,000 kg (about 70 m³).
- Crude oil: amount involved = 12,870,000 kg (about 14957 m³).
- Fuel oil: amount involved = 29,100,000 kg (about 30665 m³).
- Diesel oil: amount involved = 350,000 kg (about 420 m³).
- Naphtha (C.A.S. CODE: 8030-30-6): amount involved = 13,500 kg (about 20 m³).
- Toxic substances produced by the incomplete combustion of the petroleum products: composition and amount involved = not known.

Appendix Short Report / description of immediate sources:

The accident occurred in a storage installation for liquid petroleum fuels. The storage installation included:

- tanks D1, D2, D5, D6 and D7 containing fuel oil;
- tank D4 containing diesel oil;
- tanks D8 and D10 containing crude oil;

- tanks D9, D11 and D12 containing naphta;
- empty tank D3.

Appendix Short Report / description of suspected causes:

INITIATING EVENT AND CONSEQUENCES:

The fire started in a fuel oil tank and was transmitted through the drainage channels to other tanks.

CAUSES:

When the Original Report was prepared, the causes of the pipe failure were still under investigation.

Appendix Short Report / description of immediate effects:

EFFECTS ON PEOPLE:

According to the information given by the Fire Service, 12 people were injured by fire and 13 were injured by the release of toxic fumes produced by the incomplete combustion of the petroleum products during the fire.

MATERIAL LOSS:

10 out of the 12 storage tanks were set on fire and 8 of them were destroyed. The fire also threatened an adjacent storage facility for petroleum products. The cost of these material losses has been estimated in about 0.016 MECU (about 3,000,000 drachmaes).

ECOLOGICAL HARM:

In the Original Report no information are available about possible environmental harms due to the dispersion of the toxic substances produced by the incomplete combustion of petroleum products during the fire.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

After the initiation of the fire and its transmission to tanks D7 and D8, portable dust-fire extinguishers were used and when the fire spread to other tanks water and foam were also used and fences-protection walls were erected.

EXTERNAL SERVICES:

Portable foam generator (Hellenic Refineries S.A). Water and foam were used at the presence of Fire Service and foreign specialists.

Appendix Full Report A / type of accident:

The fire started in a fuel-oil tank (code 1202) and was transmitted through the drainage channels to other tanks. Explosions occurred in tanks containing fuel oil and crude oil (code 1307) and, besides, a B.L.E.V.E. of about 70 m³ of water occurred (code 1302). Toxic substances were released in the ambient due to the incomplete combustion of the petroleum products involved in the fire (code 1401).

Appendix Full Report A / dangerous substances:

The total establishment inventories of the substances refer to the amounts stored when the accident occurred. The potential inventories directly involved of the substances had been evaluated under the hypotheses that storage tanks D5, D10, D11 and D12 should not be saved. No data are available about the composition and the amount of the combustion products released in the ambient due to the incomplete combustion of the petroleum products during the fire.

Appendix Full Report A / source of accident - remarks:

The accident occurred in a storage installation for liquid petroleum fuels (codes 2002 and 3202). The storage installation included (code 4003): tanks D1, D2, D5, D6 and D7 containing fuel oil; tank D4 containing diesel oil; tanks D8 and D10 containing crude oil; tanks D9, D11 and D12 containing naphta and an empty tank D3. The storage installation was located in a rural area with the Calohori village 1000 metres far away.

Appendix Full Report A / causes of major occurrence:

The fire developed in the tank D1 area due to the failure of a pipe (code 5102) and it was transmitted to the other tank areas through the drainage channels. When the Original Report was prepared, the causes of the pipe failure were still under investigation (code 5501).

Appendix Full Report B / area concerned - remarks:

In the Original Report no information are available about possible effects outside the establishment due to the dispersion of the toxic substances produced by the incomplete combustion of petroleum products during the fire.

Appendix Full Report B / people:

According to the information given by the Fire Service, 12 people were injured by fire and 13 were injured by the release of toxic fumes produced by the incomplete combustion of the petroleum products during the fire. All of them were inside the storage installation. From the Original Report is not fully clear if people were hospitalized or not.

Appendix Full Report B / ecological harm:

In the Original Report no information are available about possible environmental harms due to the dispersion of the toxic substances produced by the incomplete combustion of petroleum products during the fire.

Appendix Full Report B / material loss:

10 out of the 12 storage tanks were set on fire and 8 of them were destroyed. The fire also threatened an adjacent storage facility for petroleum products. The cost of these

material losses has been estimated in about 0.016 MECU (about 3,000,000 drachmaes).

Appendix Full Report B / disruption of community life:

In the Original Report no information are available about possible effects outside the establishment due to the dispersion of the toxic substances produced by the incomplete combustion of petroleum products during the fire.