

Utsläpp och brand på en destillationsanläggning på en kemikaliefabrik.

920608 MARS 1992_13

Olyckan inträffade på en anläggning för azeotropdestillation. En packning i en pump som matade destillationsanläggningen brast av okänd anledning. Isobutylacetat läckte ut och antändes. Kylning med vatten påbörjades omedelbart efter att branden uppstått. Emellertid spreds branden också av spolvattnet då brinnande isobutylacetat fördes bort med vattnet. Det dröjde ungefär 30 minuter innan tillflödet till pumpen kunde stoppas. Branden gjorde det omöjligt att nå de aktuella ventilerna för manuell stängning. Det tog ytterligare 30 minuter innan branden var släckt. Släckningsvattnet samlades upp för behandling.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
isobutylacetat	110-19-0	870 kg
isoftalsyra	121-91-5	

Skador:

Människor:	Inga.
Materiella:	Skador på anläggningen.
Miljö/ekologi:	Inga effekter rapporterade.
Infrastruktur:	Inga.

Erfarenheter redovisade (Ja/Nej): Nej

Report Profile

Identification of Report:

country: FA ident key: 1992_013_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1992-06-08 start: 06:20:00

finish: finish:

Establishment:

name:

address:

industry: 2001 general chemicals manufacture

Organic Chemical (Isobutyl Acetate [Isophthalic Acid] Azeotropic Distillation 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:** 1992_013_01**Accident Types:****release:** Yes **explosion:** No**water contamination:** No **other:** No**fire:** Yes**description:**

Manual closure of the suction and delivery valves of P-27 pump after a delay of about 30 minutes because of the impossibility (due to the presence of flames) to reach the pump.... see Appendix Short Report / description of accident types

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

- Isobutylacetate (C.A.S. CODE: 110-19-0); amount involved = 870 Kg (about 1 m3).

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

The accident occurred in the azeotropic distillation section of the IPA (IsoPhthalic Acid) plant of an organic chemical industry. The component involved was the pump P-27 that was feeding the azeotropic distillation section of the IPA plant... see Appendix Short Report / description of immediate sources

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

CAUSES:... see Appendix Short Report / description of suspected causes

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 LOSS:... see Appendix Short Report / description of immediate effects

Emergency Measures taken:

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

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: Yes **other:** No

mitigation: No

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:** 1992_013_01

1 Type of Accident

remarks: The release (code 1102), due to the bellow seal rupture of the pump P-27

that was feeding the azeotropic distillation section of the IPA (IsoPhthalic

Acid) plant by pumping isobutylacetate from tank V-27, and the following

ignition caused a... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: The total establishment and the potential directly involved inventories of

isobutylacetate refer to the amount involved in the accident (about 1 m3).

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred in the azeotropic distillation section of the IPA

(IsoPhthalic Acid) plant of an organic chemical industry (code 2001). The

component involved was the pump P-27 (code 4007) that was feeding the

azeotropic distillation ... 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 release of isobutylacetate was caused by the bellow seal rupture (code 5102) of the

pump P-27 that was feeding the azeotropic distillation section of the IPA (IsoPhthalic

Acid) plant by pumping isobutylacetate from tank V-27. When the O... see Appendix Full

Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1992_013_01

event:

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

initiating event 1102 release: fluid release to ground

associated event - not applicable -

Dangerous substances

country: FA ident key: 1992_013_01

a) total establishment inventory

CAS number: 110-19-0 **identity:** Isobutylacetate

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): 0,87

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 0,87 **potential quantity:** 0,87

c) substance belongs to relevant inventory indirectly involved: No

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

Source of Accident - Situation **country:** FA **ident key:** 1992_013_01

situation

industry

initiating event 2001 general chemicals manufacture

associated event - not applicable -

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 - not applicable -

component

major occurrence 4007 machinery/equipment (pump, filter, column separator, mixer, etc.)

initiating event 4007 machinery/equipment (pump, filter, column separator, mixer, etc.)

associated event - not applicable -

B Consequences Full Report

country: FA **ident key:** 1992_013_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

subsequent fatalities

hospitalizing injuries

other serious injuries

health monitoring

remarks No people were injured by the fire.

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 No data are available about the cost of the material damages to the azeotropic d... 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: 1992_013_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 Mayor of the Community of ... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

- not applicable -

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1992_013_01 report

Appendix Short Report / description of accident types:

Manual closure of the suction and delivery valves of P-27 pump after a delay of about 30 minutes because of the impossibility (due to the presence of flames) to reach the pump.

The fire was originated by the bellow seal rupture of the pump P-27 that was feeding the azeotropic distillation section of the IPA (IsoPhthalic Acid) plant by pumping isobutylacetate from tank V-27. The fire lasted about one hour, because it took a lot of time to the foreman worker to manually isolate the pump by closing the suction and delivery valves (automatic activation was not provided). In effects, the manual closure of the suction and delivery valves of P-27 pump required about 30 minutes because of the impossibility (due to the presence of flames) to reach the pump. At the same time, the water poured over the plant and, although allowing to obtain the desired cooling, caused the isobutylacetate (and hence the fire) to spread along the waterway for about 50 m. When the fire was extinguished, the isobutylacetate remained in tank V-27 was pumped into a tank truck and then stored in another tank.

Appendix Short Report / description of immediate sources:

The accident occurred in the azeotropic distillation section of the IPA (IsoPhthalic Acid) plant of an organic chemical industry. The component involved was the pump P-27 that was feeding the azeotropic distillation section of the IPA plant by pumping isobutylacetate from tank V-27.

Appendix Short Report / description of suspected causes:

CAUSES:

The release of isobutylacetate was caused by the bellow seal rupture of the pump P-27 that was feeding the azeotropic distillation section of the IPA (IsoPhthalic Acid) plant by pumping isobutylacetate from tank V-27. When the Original Report was prepared, the causes of the bellow seal rupture and of the ignition of the released isobutylacetate were not fully identified.

Appendix Short Report / description of immediate effects:

MATERIAL LOSS:

No data are available about the cost of the material damages to the azeotropic distillation section of the IPA plant (to pipings, pumps, duty and electric installations) caused by the fire.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

The fire lasted about one hour, because it took a lot of time to the foreman worker to manually isolate the pump by closing the suction and delivery valves (automatic activation was not provided). In effects, the manual closure of the suction and delivery valves of P-27 pump required about 30 minutes because of the impossibility (due to the presence of flames) to reach the pump. At the same time, the water poured over the plant and, although allowing to obtain the desired cooling, caused the isobutylacetate (and hence the fire) to spread along the waterway for about 50 m. When the fire was extinguished, the isobutylacetate remained in tank V-27 was pumped into a tank truck and then stored in another tank.

Appendix Short Report / description of immediate lessons learned:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:

The Mayor of the Community of Limito di Pioltello issued an order (dated 12/06/92) to the SISAS company not to restart the IPA plant before demonstrating to the competent Authorities the ability to operate under safety conditions.

Appendix Full Report A / type of accident:

The release (code 1102), due to the bellow seal rupture of the pump P-27 that was feeding the azeotropic distillation section of the IPA (IsoPhthalic Acid) plant by pumping isobutylacetate from tank V-27, and the following ignition caused a pool fire (code 1202) that was extinguished after about 1 hour.

Appendix Full Report A / source of accident - remarks:

The accident occurred in the azeotropic distillation section of the IPA (IsoPhthalic Acid) plant of an organic chemical industry (code 2001). The component involved was the pump P-27 (code 4007) that was feeding the azeotropic distillation section of the IPA plant by pumping isobutylacetate from tank V-27 (code 3201).

Appendix Full Report A / causes of major occurrence:

The release of isobutylacetate was caused by the bellow seal rupture (code 5102) of the pump P-27 that was feeding the azeotropic distillation section of the IPA (IsoPhthalic Acid) plant by pumping isobutylacetate from tank V-27. When the Original Report was prepared, the causes of the bellow seal rupture and of the ignition of the released isobutylacetate were not fully identified (code 5501).

Appendix Full Report B / area concerned - remarks:

In the Original Report there is no evidence of significant effects outside the establishment even if the water poured over the plant causing the isobutylacetate (and hence the fire) to spread along the waterway for about 50 m.

Appendix Full Report B / ecological harm:

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

Appendix Full Report B / material loss:

No data are available about the cost of the material damages to the azeotropic distillation section of the IPA plant (to pipings, pumps, duty and electric installations) caused by the fire.

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:

The Mayor of the Community of Limito di Pioltello issued an order (dated 12/06/92) to the SISAS company not to restart the IPA plant before demonstrating to the competent Authorities the ability to operate under safety conditions.