

Dammexplosion på fabrik för produktion av farmaceutika.

880322 MARS 1988_11

Olyckan inträffade vid fyllning av vått pulver i en torkare. Pulvret var fuktat med toluen. En elektrostatisk urladdning antände toluenångorna. Det automatiska sprinklersystemet aktiverades men dess ingripande var inte nödvändigt.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
toluen	108-88-3	10 kg

Skador:

Människor: Operatören som laddade pulvret i torkaren fick ytliga brännskador på händer och i ansikte.

Materiella: Inga.

Miljö/ekologi: Inga effekter rapporterade.

Infrastruktur: Inga.

Erfarenheter redovisade (Ja/Nej): Ja

Mycket kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1988_011_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1988-03-22 start:

finish: finish:

Establishment:

name:

address:

industry: 2004 pesticides, pharmaceuticals, other fine chemicals

Pharmaceutical (Process 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: 1988_011_01

Accident Types:

release: No 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: No explosive: Yes

ecotoxic: No other: No

flammable: Yes

description:

- Toluene (C.A.S. CODE:108-88-3, E.E.C. CODE: 601-021-00-3): amount involved = 10 kg... see Appendix Short Report / description of substances involved

Immediate Sources of Accident:

storage: No transfer: No

process: Yes other: No

description:

The accident occurred during the loading of a wet powder into a dryer in a pharmaceutical industry.

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: No

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: No **restoration:** No

sheltering: No **other:** No

evacuation: No

description:

INTERNAL TO THE ESTABLISHMENT:

The sprinkler system was automatically activated but its intervention was not necessary.

Immediate Lessons Learned:

prevention: Yes **other:** No

mitigation: No

description:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:

It was recommended to carry out the nitrogen purging before to charge the dryer.

A Occurrence Full Report

country: FA **ident key:** 1988_011_01

1 Type of Accident

remarks: Whilst an operator was charging a wet powder to the hot dryer an explosion occurred at the charge chute (the powder was damped with toluene).

Apparently, an electrostatic discharge ignited the toluene vapours and a dust explosion occurred (... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: The total establishment and the potential directly involved inventories of toluene refer to the amount involved in the accident. From the Original Report is not fully clear if toluene was a starting material or a finished product. No data a... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred during the loading of a wet powder (damped with toluene) into a dryer (code 4007) in a pharmaceutical industry (code 2004). The powder loading into the dryer was an intermittent operation (code 3304).

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

5109 operation: electrostatic accumulation

- not applicable -

- not applicable -

- not applicable -

human / organizational 5302 organization: management attitude problem

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

unclear)

- not applicable -

- not applicable -

- not applicable -

remarks: The ignition of toluene vapours was apparently by an electrostatic discharge (code 5109)

because the operator was using a metal scoop that was not earthed (code 5102). The

underlying causes were a lack of safety culture (code 5302) together... see Appendix Full

Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1988_011_01

event:

major occurrence 1305 explosion: dust explosion

initiating event 1305 explosion: dust explosion

associated event - not applicable -

Source of Accident - Situation country: FA ident key: 1988_011_01

situation

industry

initiating event 2004 pesticides, pharmaceuticals, other fine chemicals

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 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: 1988_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 1

immediate fatalities

subsequent fatalities

hospitalizing injuries

other serious injuries 1

health monitoring

remarks The operator that was charging the powder into thr dryer received superficial bu... 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 In the Original report there is no evidence of damages due to the dust explosion... 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 i... see Appendix

7 Discussion of Consequences

C Response Full Report

country: FA ident key: 1988_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

It was recommended to carry ou... 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 / 1988_011_01 report

Appendix Short Report / description of accident types:

ACCIDENT CASE HISTORY DESCRIPTION:

Whilst an operator was charging a wet powder to the hot dryer an explosion occurred at the charge chute (the powder was damped with toluene). Apparently, an electrostatic discharge ignited the toluene vapours. The operator received superficial burns to the hands and to the face. The sprinkler system was automatically activated but its intervention was not necessary.

Appendix Short Report / description of substances involved:

- Toluene (C.A.S. CODE:108-88-3, E.E.C. CODE: 601-021-00-3): amount involved = 10 kg.

- Wet Powder: composition and amount involved = not known.

Appendix Short Report / description of suspected causes:

CAUSES:

The ignition of toluene vapours was apparently caused by an electrostatic discharge (the operator was using a metal scoop that was not earthed and this would have caused electrostatic discharge). No nitrogen inerting was used during the charging operation due to both a lack of safety culture and to insufficient operational procedures.

Appendix Short Report / description of immediate effects:

EFFECTS ON PEOPLE:

1 person was injured by the explosion (he received superficial burns to the hands and to the face).

In the Original Report there is no evidence of damages due to the dust explosion.

Appendix Full Report A / type of accident:

Whilst an operator was charging a wet powder to the hot dryer an explosion occurred at the charge chute (the powder was damped with toluene). Apparently, an electrostatic discharge ignited the toluene vapours and a dust explosion occurred (code 1305).

Appendix Full Report A / dangerous substances:

The total establishment and the potential directly involved inventories of toluene refer to the amount involved in the accident. From the Original Report is not fully clear if toluene was a starting material or a finished product. No data are available about the kind and the amount of the wet powder involved in the accident.

Appendix Full Report A / causes of major occurrence:

The ignition of toluene vapours was apparently by an electrostatic discharge (code 5109) because the operator was using a metal scoop that was not earthed (code 5102). The underlying causes were a lack of safety culture (code 5302) together with insufficient operational procedures (code 5303).

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 operator that was charging the powder into the dryer received superficial burns to the hands and to the face.

Appendix Full Report B / ecological harm:

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

Appendix Full Report B / material loss:

In the Original report there is no evidence of damages due to the dust explosion.

Appendix Full Report B / disruption of community life:

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

Appendix Full Report C / lesson learned - prevent:

It was recommended to carry out the nitrogen purging before to charge the dryer.