

Toluenutsläpp från en fabrik för produktion av farmaceutika

860519 MARS 1986_09

Olyckan inträffade på en kemikelifabrik till följd av ett operatörsmisslag. En ventil som borde varit stängd möjliggjorde att en stor mängd toluen från en extraktionskolonn kunde nå avloppssystemet. I avfallssystemet fanns en toluendetektor som inte gav utslag. Istället för att omdirigerast till en dumptank fortsatte det kraftigt förorenade avloppsvattnet till det allmänna reningsverket. Normalt leds effluenten direkt ut i havet från reningsverket. Personalen på reningsverket hade förvarnats så att man kunde leda föroreningen till en behandlingsanläggning. Pumparna på behandlingsanläggningen var emellertid inte i gång och all toluen försvann ut i floden. I floden orsakade toluenen avsevärd skada på djurlivet över en 5 km lång sträcka. Man uppskattade återhämtningstiden till 6-12 månader.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
toluen	108-88-3	13 ton

Skador:

Människor:	Inga.
Materiella:	Inga.
Miljö/ekologi:	I floden orsakade toluenen avsevärd skada på djurlivet över en 5 km lång sträcka. Man uppskattade återhämtningstiden till 6-12 månader.
Infrastruktur:	Inga rapporterade.

Erfarenheter redovisade (Ja/Nej): Ja

Kortfattat anges förebyggande åtgärder.

Report Profile

Identification of Report:

country: FA ident key: 1986_009_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1986-05-19 start: 06:00:00

finish: finish:

Establishment:

name:

address:

industry: 2004 pesticides, pharmaceuticals, other fine chemicals

Pharmaceutical

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_009_01

Accident Types:

release: Yes **explosion:** No

water contamination: Yes **other:** No

fire: No

description:

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

Substance(s) Directly Involved:

toxic: Yes **explosive:** Yes

ecotoxic: Yes **other:** No

flammable: Yes

description:

- Toluene (C.A.S. CODE: 108-88-3, E.E.C. CODE: 601-021-00-3): amount involved = 13,000 kg.

Immediate Sources of Accident:

storage: No **transfer:** No

process: Yes **other:** No

description:

The accident occurred during normal operation of a toluene extraction column in a pharmaceutical industry. The component involved was the drain/wash valve connecting the extraction column with the effluent discharge system.

Suspected Causes:

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

human: Yes **other:** No

description:

INITIATING EVENT AND CONSEQUENCES:... see Appendix Short Report / description of suspected causes

Immediate Effects:

material loss: No

human deaths: No

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

other: Yes

ecological harm: Yes

national heritage loss: No

description:

OTHER:... 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: 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:** 1986_009_01

1 Type of Accident

remarks: A drain-wash line valve was left open, allowing toluene to flow from an

extraction column to an effluent discharge system and, then, to discharge

into a river estuary (code 1103).

2 Dangerous Substances

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

toluene refer to the amount released during the accident. From the Original

Report it is not fully clear if toluene is used as a starting material or it

is a finish... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: The accident occurred in an extraction column (code 3104) of a process plant

in a pharmaceutical industry (code 2004). The components involved in the

initiating event were the toluene's extraction column (code 4007) and the

drain/wash line ... 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 5105 operation: instrument/control/monitoring-device failure

- not applicable -

- not applicable -

- not applicable -

- not applicable -

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

5307 organization: process analysis (inadequate, incorrect)

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

5401 person: operator error

- not applicable -

remarks: The causes that led to the accident were both an operator error (code 5401), that left open the drain-wash line valve, and the failure of the detector in the effluent line (code 5105) in detecting the presence of toluene. The underlying cau... see Appendix Full Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1986_009_01

event:

major occurrence 1103 release: fluid release to water

initiating event 1103 release: fluid release to water

associated event - not applicable -

Dangerous substances

country: FA ident key: 1986_009_01

a) total establishment inventory

CAS number: 108-88-3 **identity:** Toluene

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): 13

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 13 **potential quantity:** 13

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_009_01

situation

industry

initiating event 2004 pesticides, pharmaceuticals, other fine chemicals

associated event - not applicable -

activity/unit

major occurrence 3999 other: other

initiating event 3104 process: physical operations (mixing, melting crystallizing, etc.)

associated event - not applicable -

component

major occurrence 4999 other

initiating event - not applicable -

associated event - not applicable -

B Consequences Full Report

country: FA ident key: 1986_009_01

1 Area concerned

affected

extent of effects installation: Yes

establishment: Yes

off-site; local: Yes

off-site; regional: No

off-site; transboundary: No

illustration of effects - not applicable -

remarks The release of toluene caused damages to fauna in a 5 km stretch of tidal river.... 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 during the accident.

3 Ecological Harm

pollution/contamination/damage of:

- **residential area (covered by toxic cloud)** Suspected

- **common wild flora/fauna (death or elimination)** not applicable

- **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** not applicable

- **areas of high conservation value or given special protection** Suspected

remarks The release of toluene caused damages to the fauna in a 5 km stretch of tidal ri... 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 material losses occurred except the released toluene.... 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 Yes No
- media interest No No No
- political interest No No No

remarks The accident was notified to the local authority sewage department and the emerg... see Appendix

7 Discussion of Consequences

Ecological Components involved

country: FA ident key: 1986_009_01

type: 6402 offshore: estuary

threatened: not applicable affected: not applicable

type: 6204 freshwater: river

threatened: not applicable affected: not applicable

C Response Full Report

country: FA ident key: 1986_009_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 followi... 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 / 1986_009_01 report

Appendix Short Report / description of accident types:

ACCIDENT CASE HISTORY DESCRIPTION:

A drain/wash line valve was left open when it should have been closed allowing toluene from an extraction column to escape into an effluent discharge system. A toluene detector in the effluent line failed to activate a system which would have diverted the effluent stream to a dump tank. As a result the toluene entered a public sewer through which the effluent is normally discharged to the sea. This sewer was closed for maintenance work and the effluent was diverted to a treatment plant. The pumps at the treatment plant were out of action and the toluene was discharged to the river estuary.

Appendix Short Report / description of suspected causes:

INITIATING EVENT AND CONSEQUENCES:

A drain/wash line valve was left open when it should have been closed allowing toluene to escape from an extraction column into the effluent discharge system and eventually into a tidal estuary.

CAUSES:

The accident was caused by an operator error in leaving drain/wash line valve open together with the failure of toluene detector to activate system to divert the escaping toluene to a dump tank.

Appendix Short Report / description of immediate effects:

OTHER:

No material losses occurred except the released toluene.

ECOLOGICAL HARM:

The release of toluene caused damages to fauna in 5 km stretch of tidal river. Recovery expected to take 6-12 months.

Appendix Short Report / description of emergency measures taken:

INTERNAL TO THE ESTABLISHMENT:

The leak was identified and the plant shut-down.

EXTERNAL TO THE ESTABLISHMENT:

Local authority sewage department notified immediately and their emergency procedures initiated.

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- the direct connection between the extraction column and the effluent line to be removed;
- 2- an additional toluene detection system to be installed;
- 3- the frequency of maintenance and testing of the toluene detection systems to be increased;
- 4- to experiment with direct on-line measurement of toluene levels in the effluent stream;
5. the whole site to be surveyed to identify other sources of effluent contamination.

Appendix Full Report A / dangerous substances:

The total establishment and the potential directly involved inventories of toluene refer to the amount released during the accident. From the Original Report it is not fully clear if toluene is used as a starting material or it is a finished product.

Appendix Full Report A / source of accident - remarks:

The accident occurred in an extraction column (code 3104) of a process plant in a pharmaceutical industry (code 2004). The components involved in the initiating event were the toluene's extraction column (code 4007) and the drain/wash line valve (code 4010) that was left open. The toluene was released into the effluent discharge system (codes 3999 and 4999) and, then, into the river estuary.

Appendix Full Report A / causes of major occurrence:

The causes that led to the accident were both an operator error (code 5401), that left open the drain-wash line valve, and the failure of the detector in the effluent line (code 5105) in detecting the presence of toluene. The underlying causes were insufficient maintenance procedures (code 5303) and the inadequacy both in testing the toluene detection system (code 5314) and in the process analysis (code 5314).

Appendix Full Report B / area concerned - remarks:

The release of toluene caused damages to fauna in a 5 km stretch of tidal river.

Appendix Full Report B / ecological harm:

The release of toluene caused damages to the fauna in a 5 km stretch of tidal river. The recovery of the damages were expected in 6-12 months. No data are available about the damages to marine or freshwater habitat.

Appendix Full Report B / material loss:

No material losses occurred except the released toluene.

Appendix Full Report B / disruption of community life:

The accident was notified to the local authority sewage department and the emergency procedures were initiated.

Appendix Full Report C / lesson learned - prevent:

After the accident the following measures were established:

- 1- the direct connection between the extraction column and the effluent line to be removed;
- 2- an additional toluene detection system to be installed;
- 3- the frequency of maintenance and testing of the toluene detection systems to be increased;
- 4- to experiment with direct on-line measurement of toluene levels in the effluent stream;
5. the whole site to be surveyed to identify other sources of effluent contamination.