

Gasutsläpp från en gasanläggning.

931005 MARS 1993_23

En mängd gas släpptes ut från en gasanläggning utan att den antändes. Utsläppet bedömdes som potentiellt mycket allvarligt varför nödstopp av anläggningen aktiverades och en utredning av orsakerna, och de eventuella konsekvenserna sattes igång.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
metan	74-82-8	200 kg

Skador:

Människor: Inga.
Materiella: Inga.
Miljö/ekologi: Inga effekter rapporterade.
Infrastruktur: Inga.

Erfarenheter redovisade (Ja/Nej): Nej

Report Profile

Identification of Report:

country: FA ident key: 1993_023_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1993-10-05 start:

finish: finish:

Establishment:

name:

address:

industry: 2008 wholesale and retail storage and distribution (incl. LPG bottling & bulk

distrib., more: F1!)

Gas Liquefaction 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: 1993_023_01

Accident Types:

release: Yes explosion: No

water contamination: No other: No

fire: No

description:

- not applicable -

Substance(s) Directly Involved:

toxic: Yes explosive: Yes

ecotoxic: No other: No

flammable: Yes

description:

Methane CAS code 74828, (actual quantity 200, potential quantity 20000)

Immediate Sources of Accident:

storage: No transfer: No

process: No other: Yes

description:

- not applicable -

Suspected Causes:

plant or equipment: No environmental: No

human: Yes other: No

description:

- Insufficient procedure

- Loss of process controll

Immediate Effects:

material loss: Yes

human deaths: No

human injuries: No community disruption: No

other: No

ecological harm: No

national heritage loss: No

description:

No off-site effects. The potential was large. Shutdown of all British Gas liquefaction plants. Study of the rollover and of mitigation methods.

Emergency Measures taken:

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

external services: No **restoration:** No

sheltering: Yes **other:** No

evacuation: No

description:

- not applicable -

Immediate Lessons Learned:

prevention: No **other:** Yes

mitigation: Yes

description:

- not applicable -

A Occurrence Full Report

country: FA **ident key:** 1993_023_01

1 Type of Accident

remarks: - not applicable -

2 Dangerous Substances

remarks: Normally stored as refrigerated LNG at about ambient pressure. Process relief valves set at 135 mbar.

3 Source of Accident

illustration: - not applicable -

remarks: Well established LNG storage site, with on site liquefaction. Recent modification to cold box, to remove more heavy ends, reflecting change in source of supply had been made.

4 Meteorological Conditions

precipitation none: fog: rain: hail: snow:

Yes No No No No

wind speed (m/s): 21

direction (from): South

stability (Pasquill):

ambient temperature (°C): 5

remarks: Normal conditions for time of year. Low at pressure may have had an effect.

5 Causes of Major Occurrence

main causes

technical / physical 5103 operation: loss of process control

- not applicable -

- not applicable -

- not applicable -

- not applicable -

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

- not applicable -

- not applicable -

- not applicable -

- not applicable -

remarks: It is likely that Bgas had not fully considered the effect of process change to the front end. In effect, they created the conditions of a rollover discussed in their safety report.

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA ident key: 1993_023_01

event:

major occurrence 1101 release: gas/vapour/mist/etc release to air

initiating event - not applicable -

associated event - not applicable -

Dangerous substances

country: FA ident key: 1993_023_01

a) total establishment inventory

CAS number: identity: Methane 74828

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): 84000

use of substance as: NORMAL FINISHED PRODUCT

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 200 **potential quantity:** 20000

c) substance belongs to relevant inventory indirectly involved: No

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

Source of Accident - Situation country: FA ident key: 1993_023_01

situation

industry

initiating event - not applicable -

associated event - not applicable -

activity/unit

major occurrence 3201 storage: process-associated (stockholding, etc. on-site of manufacture)

initiating event - not applicable -

associated event - not applicable -

component

major occurrence 4005 container; non-ambient temperature (refrigerated or heated)

initiating event - not applicable -

associated event - not applicable -

B Consequences Full Report

country: FA **ident key:** 1993_023_01

1 Area concerned

affected

extent of effects installation: No

establishment: No

off-site; local: No

off-site; regional: No

off-site; transboundary: No

illustration of effects - not applicable -

remarks As there was no ignition or structural damage there were no off-site effects. Th... see Appendix

Full Report B / area concerned - remarks

2 People

establishment popul. emergency personnel off-site population

total at risk 30 0 0

immediate fatalities 0 0 0

subsequent fatalities 0 0 0

hospitalizing injuries 0 0 0

other serious injuries 0 0 0

health monitoring 0 0 0

remarks No injuries as there was no ignition. Had there been immediate ignition the tank... 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 Methane emission was a small % of that occurring naturally eg. from ruminants an... see Appendix

Full Report B / ecological harm

4 National Heritage Loss

effects on:

- historical sites Suspected - historic monuments Suspected
- historic buildings Suspected - art treasures Suspected

remarks Nothing known to have been threatened.

5 Material Loss

establishment losses off site losses

costs (direct costs to operator) (social costs)

in ECU British Pounds ECU British Pounds

material losses 5000 -1

response, clean up, restoration -1 -1

remarks Adjacent, similarly filled tank was emptied as a precaution. Estimated cost of r... 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** Yes No No

- **political interest** Yes No No

remarks Nil

7 Discussion of Consequences

C Response Full Report

country: FA ident key: 1993_023_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

British Gas to carry out resea... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

Improvement required to tank t... see Appendix Full Report C / lesson learned - mitigate

useful references:

- not applicable -

5 Discussion about Response

- not applicable -

Appendices for the FA / 1993_023_01 report

Appendix Full Report B / area concerned - remarks:

As there was no ignition or structural damage there were no off-site effects. The potential was large. the incident led to shut down of all British Gas liquefaction plant while the rollover was studied and mitigation methods determined.

Appendix Full Report B / people:

No injuries as there was no ignition. Had there been immediate ignition the tank roof would have received high radiation levels and may have failed leading to major fire. If there had been delayed ignition then there could have been Flixborough type damage, with on site and possibly off site fatalities, window damage off site and possibly worse. Work by British Gas indicated that the tank top sprays had the capacity to prevent the tank top melting in the event of ignition of the gas from the ven

Appendix Full Report B / ecological harm:

Methane emission was a small % of that occurring naturally eg. from ruminants and is unlikely to have had a significant effect.

Appendix Full Report B / material loss:

Adjacent, similarly filled tank was emptied as a precaution. Estimated cost of refilling (liquefaction) 500000 Pound.

Appendix Full Report C / lesson learned - prevent:

British Gas to carry out research to give understanding of rollover mechanism, reason for poor mixing while the tank was filled etc. No more tank filling until suitable precautions have been determined.

Appendix Full Report C / lesson learned - mitigate:

Improvement required to tank top sprays - some areas were not covered when they demonstrated the system.