

Naturgasutsläpp från en naturgasanläggning.

940209 MARS 1994_12

En nödventil på en rörledning fallerade och naturgas släppte ut. Gasen skingrades utan att antändas. Katastrofplanen trädde omedelbart i kraft. Det tog 15 minuter att manuellt stänga nödventilen. Orsaken till utsläppet var fortfarande under utredning.

Inblandade ämnen och mängder

	CAS Nr.	Mängd
naturgas, huvudsakligen metan	74-82-8	8,5 ton

Skador:

Människor: Inga.
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: 1994_012_01

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

Date of Major Occurrence: Time of Major Occurrence

start: 1994-02-09 start: 14:15:00

finish: 1994-02-09 finish: 14:30:00

Establishment:

name:

address:

industry: 2005 power supply and distribution (electric, gas, etc.)

Natural Gas Processing

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: 1994_012_01

Accident Types:

release: Yes explosion: No

water contamination: No other: No

fire: No

description:

During a pigging operation, a 30" pipeline, bringing natural gas on-shore, failed between the emergency shut-down (ESD) valve and the pig trap. The intervention of the ESD valve from the control room failed and it had to be closed locally. ... see Appendix Short Report / description of accident types

Substance(s) Directly Involved:

toxic: No explosive: Yes

ecotoxic: No other: No

flammable: Yes

description:

- Natural Gas [mainly Methane] (C.A.S. CODE: 74-82-8, E.E.C. CODE: 601-001-00-4): amount involved = not known.

Immediate Sources of Accident:

storage: No transfer: Yes

process: No other: No

description:

The accident involved a 30" pipeline, entering the site on the seaward side, that was bringing natural gas on-shore. The pipeline was operating at a pressure of about 130 psi.

Suspected Causes:

plant or equipment: Yes environmental: No

human: Yes other: No

description:

CAUSES:... 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: No

national heritage loss: No

description:

OTHER:

No material losses occurred except the natural gas released at 130 psi for 10 minutes.

Emergency Measures taken:

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

external services: Yes **restoration:** No

sheltering: No **other:** No

evacuation: Yes

description:

INTERANL TO THE ESTABLISHMENT:... see Appendix Short Report / description of emergency measures taken

Immediate Lessons Learned:

prevention: Yes **other:** No

mitigation: Yes

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:** 1994_012_01

1 Type of Accident

remarks: During a pigging operation, a 30" pipeline, bringing natural gas on-shore,

failed between the emergency shut-down (ESD) valve and the pig trap. The

intervention of the ESD valve from the control room failed and it had to be

closed locally. ... see Appendix Full Report A / type of accident

2 Dangerous Substances

remarks: Natural gas (mainly methane), at a pressure of 10 bar, was providing motive

power to a pig in a 30" pipeline between an offshore installation and the

onshore gas reception facilities. The pipeline failed onshore, releasing

approximately 8.5... see Appendix Full Report A / dangerous substances

3 Source of Accident

illustration: - not applicable -

remarks: A 30" pipeline (code 4011) entering the site on the seaward side, bringing

natural gas (code 3301) on-shore failed at a conical reducer at a

pre-existing hydrogen induced crack at the toe of a weld. Pipe constructed

in 1968 and not subject ... see Appendix Full Report A / source of accident

- remarks

4 Meteorological Conditions

precipitation none: fog: rain: hail: snow:

Yes No No No No

wind speed (m/s): 3

direction (from): NE

stability (Pasquill):

ambient temperature (°C): 3

remarks: Conditions not severe and generally quite reasonable for the time of the year.

Meteorological conditions did not significantly contribute to the incident.

5 Causes of Major Occurrence

main causes

technical / physical 5101 operation: vessel/container/containment-equipment failure

- not applicable -

- not applicable -

- not applicable -

- not applicable -

human / organizational 5308 organization: design of plant/equipment/system (inadequate, inappropriate)

5310 organization: manufacture/construction (inadequate, inappropriate)

5312 organization: isolation of equipment/system (none, inadequate, inappropriate)

5401 person: operator error

5403 person: wilful disobedience/failure to carry out duties

remarks: When the Original Report was prepared, the causes of pipeline failure were not fully

identified. It may be linked to pigging operation that was underway, with the pigs

possibly entering the on-shore section of pipe at high speed and then st... see Appendix

Full Report A / causes of major occurrence

6 Discussion about the Occurrence

- not applicable -

Type of Accident country: FA **ident key:** 1994_012_01

event:

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

initiating event 1101 release: gas/vapour/mist/etc release to air

associated event - not applicable -

Dangerous substances

country: FA **ident key:** 1994_012_01

a) total establishment inventory

CAS number: 74-82-8 **identity:** Methane (natural Gas)

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): 328

use of substance as: STARTING MATERIAL

b) substance belongs to relevant inventory directly involved: Yes

actual quantity: 8,5 potential quantity: 125

c) substance belongs to relevant inventory indirectly involved: No

actual quantity: -1 indir_pot_quant: -1

Source of Accident - Situation country: FA ident key: 1994_012_01

situation

industry

initiating event 2005 power supply and distribution (electric, gas, etc.)

associated event - not applicable -

activity/unit

major occurrence 3301 transfer: pipeline/pipework transfer

initiating event 3301 transfer: pipeline/pipework transfer

associated event - not applicable -

component

major occurrence 4011 general pipework/flanges

initiating event 4011 general pipework/flanges

associated event - not applicable -

B Consequences Full Report

country: FA ident key: 1994_012_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 The flammable gas cloud was limited to the area immediately around the failed pi... see Appendix

Full Report B / area concerned - remarks

2 People

establishment popul. emergency personnel off-site population

total at risk 10 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 Since the release was controlled relatively quickly, only those persons in and ... 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 The natural gas released, predominantly methane, dispersed to the atmosphere and... 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 Since ignition of the gas did not occur, no historical sites were threatened.... see Appendix

Full Report B / national heritage loss

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 Actual costs not obtained. However, no offsite losses occurred. Main onsite loss... 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 Since the ignition of the release gas did not occur, the incident did not escula... see Appendix

C Response Full Report

country: FA ident key: 1994_012_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

Plant-re-HAZOPed. Improved wor... see Appendix Full Report C / lesson learned - prevent

measures to mitigate consequences:

Emergency shut down system to ... see Appendix Full Report C / lesson learned - mitigate

useful references:

Report no. 620551/1/94, "Inves... see Appendix Full Report C / lesson learned - references

5 Discussion about Response

- not applicable -

Appendices for the FA / 1994_012_01 report

Appendix Short Report / description of accident types:

During a pigging operation, a 30" pipeline, bringing natural gas on-shore, failed between the emergency shut-down (ESD) valve and the pig trap. The intervention of the ESD valve from the control room failed and it had to be closed locally. Released natural gas did not ignite, but was a serious risk to personnel.

Appendix Short Report / description of suspected causes:

CAUSES:

When the Original Report was prepared, the causes of pipeline failure were not fully identified. It may be linked to pigging operation that was underway, with the pigs possibly entering the on-shore section of pipe at high speed and then sticking, causing stresses in the pipe. The ESD valve failed to operate because, before the accident occurred, it had been isolated from the control room for maintenance work but the need to de-isolate had been overlooked.

Appendix Short Report / description of emergency measures taken:

INTERANL TO THE ESTABLISHMENT:

On-site emergency procedures were activated and all on-site personnel (approximately 70 people) were evacuated to muster points. The intervention of the ESD valve from the control room failed and it had to be closed locally. It took about 15 minutes to manually close the ESD valve.

EXTERNAL SERVICES:

Police was alerted about the accident but off-site emergency plan was not activated because it was controlled in about 15 minutes.

Appendix Short Report / description of immediate lessons learned:

MEASURES TO PREVENT ANY RECURRENCE OF SIMILAR ACCIDENTS:

When the Original Report was prepared, the pipeline and pigs were being inspected to ascertain the causes of failure.

MEASURES TO MITIGATE THE EFFECTS OF THE ACCIDENT:

After the accident, maintenance procedures had to be reviewed with respect to valve isolations.

Appendix Full Report A / type of accident:

During a pigging operation, a 30" pipeline, bringing natural gas on-shore, failed between the emergency shut-down (ESD) valve and the pig trap. The intervention of the ESD valve from the control room failed and it had to be closed locally. Natural gas was released over a period of 10 minutes (code 1101). The natural gas cloud was not ignited.

Appendix Full Report A / dangerous substances:

Natural gas (mainly methane), at a pressure of 10 bar, was providing motive power to a pig in a 30" pipeline between an offshore installation and the onshore gas reception facilities. The pipeline failed onshore, releasing approximately 8.5 tons of gas to atmosphere before the onshore emergency shut down valve was closed.

Appendix Full Report A / source of accident - remarks:

A 30" pipeline (code 4011) entering the site on the seaward side, bringing natural gas (code 3301) on-shore failed at a conical reducer at a pre-existing hydrogen induced crack at the toe of a weld. Pipe constructed in 1968 and not subject to any modifications since. Pipe failed during arrival of a significant slug of liquid during the pigging which subjected it to a high impact loading. The release of natural gas occurred at 130 psi over a period of about 10 minutes.

Appendix Full Report A / causes of major occurrence:

When the Original Report was prepared, the causes of pipeline failure were not fully identified. It may be linked to pigging operation that was underway, with the pigs possibly entering the on-shore section of pipe at high speed and then sticking, causing stresses in the pipe. Failure of pipeline at latent defect when subject to stresses well in excess of those experienced during normal operations. Design of plant not adequate to cope with this although such stresses are not foreseeable.

Appendix Full Report B / area concerned - remarks:

The flammable gas cloud was limited to the area immediately around the failed pipe. Ignition did not occur and therefore there were no significant effects.

Appendix Full Report B / people:

Since the release was controlled relatively quickly, only those persons in and around the immediate area of the pipeline failure were at risk. If ignition had occurred, it is likely that these numbers could have increased.

Appendix Full Report B / ecological harm:

The natural gas released, predominantly methane, dispersed to the atmosphere and therefore did not threaten any serious ecological harm.

Appendix Full Report B / national heritage loss:

Since ignition of the gas did not occur, no historical sites were threatened.

Appendix Full Report B / material loss:

Actual costs not obtained. However, no offsite losses occurred. Main onsite losses have been a result of loss of production rather than material lost. Figures of 15-20 million pounds lost production have been talked about.

Appendix Full Report B / disruption of community life:

Since the ignition of the release gas did not occur, the incident did not escalate to have offsite consequences. As a result, there was no offsite disruption and the incident did not become public knowledge.

Appendix Full Report C / lesson learned - prevent:

Plant-re-HAZOPed. Improved work instructions have been developed, a reassessment of "fitness for purpose" of all onsite pipework has been conducted. Competence testing in use of permit to work system to be introduced.

Appendix Full Report C / lesson learned - mitigate:

Emergency shut down system to be tied into fire and gas detection systems to allow automatic activation.

Appendix Full Report C / lesson learned - references:

Report no. 620551/1/94, "Investigation of a failure associated with a sphere T at the Phillips Petroleum Bacton Gas Terminal", The Welding Institute, Cambridge.