The EU Major Accident Reporting System - eMARS

www.jrc.ec.europa.eu

Serving society
Stimulating innovation
Supporting legislation
Major-Accident Reporting System - MARS

Open register and information system

Administered by the EC Major-Accident Hazards Bureau (MAHB) part of JRC, Ispra, Italy

Contains

- accident information supplied by Member States
- analyses of causes
- lessons learned
- information about preventive measures

Active since first Seveso Directive (effective 1984)

Some 750 accidents reported (soon 800)
Who reports to the eMARS database?

EU/EEA* Member States (Seveso implementing countries) **must** report all “major accidents” in fixed facilities as defined by criteria listed in Annex VI of the Seveso Directive 96/82/EC

Non-EU/EEA countries of OECD and **UNECE can** report accidents in fixed facilities or transport

eMARS database includes ~30 accidents from non EU/EEA countries - several more will be added in 2013

*European Economic Area countries – Norway, Iceland, Liechtenstein*
Annex VI Criteria for notification of accidents

1. Substances involved - a quantity of at least 5 % of the upper-tier threshold (tonnages of substances present, above which the most strict requirements Directive apply to the establishment)

2. Injury to persons or damage to real estate
   1 death and/or 6 persons injured on-site/ hospitalized 24 hrs and/or 1 person off-site hospitalized for at least 24 hours and/or disruption of public life, e.g., evacuation or confinement of persons (500 hours), utility disruptions (1000 hours)

3. Damage to the environment - various criteria

4. Damage to property (onsite – 2 mil Euro, offsite – 0.5 mil Euro)

5. Cross-border damage
The Seveso reporting database

Major Accident Reporting System (eMARS)

Welcome to the Major Accident Reporting System

eMARS

The scope of the European Commission official online reporting system eMARS is facilitating the exchange of information on accidents and near misses occurred in Seveso establishments and promoting lessons learned among the EU Member States and other OECD countries as well as the general public.

The system contains events on chemical accidents and near misses reported to the Major Accident and Hazards Bureau (MAHB) by the competent National Authorities under the current and prior Seveso Directives since 1982.

The information of the reported event is entered into eMARS by the EU Member States and OECD Countries themselves. Reporting an event into eMARS is compulsory for EU Member States when a Seveso establishment is involved and the event satisfies one or more of the criteria set out in the Seveso Directive. The reporting is done on a voluntary basis by those OECD Countries which are non EU members.

The authorised users from the National Reporting Authorities can report events and update accident reports by clicking on the upper left login button.

The public can freely access eMARS to search for accident reports and extract specific lessons learned by clicking on the eMARS logo above.

Please note that whilst MAHB takes care in reviewing the information inserted by the competent National Authorities, neither MAHB nor the European Commission can accept any liability for the use made of the data stored in eMARS. For further information please read the Disclaimer note.

Please feel free to provide MAHB with any feedback by sending an email to emars@jrc.ec.europa.eu.

http://emars.jrc.ec.europa.eu
General analysis of accident data
October 2011
ACCIDENT TYPE

- Release: 494
- Fire: 330
- Explosion: 297
- Transport: 46
- AD - Other: 46
Most Involved Sectors (1979 – Sept 2011)

Production and manufacturing of pulp and paper
Power supply and distribution
Waste treatment, disposal
Manufacture of food products and beverages
Plastic and rubber manufacture
Other activity (not included above)
Production and storage of pesticides, biocides, fungicides
Processing of metals
Wholesale and retail storage and distribution (excluding LPG)
Petrochemical / Oil Refineries
General chemicals manufacture (not included above)

With total events ≥ 10

Other Event
Near Miss
Major Accident
Substance Types Involved in ≥ 10 Events

With total events ≥10

- Oxidising: 10
- Extremely flammable - note 3(c) + Toxic + Named substance: 11
- Highly flammable - note 3(b)(1): 13
- Explosive - note 2(a): 18
- Dangerous for the environment - R50 + Flammable - note 3(a) + Toxic: 20
- Flammable - note 3(a) + Toxic: 20
- Very toxic: 25
- Toxic + Named substance: 27
- Highly flammable - note 3(b)(2): 29
- Named substance: 30
- Flammable - note 3(a): 37
- Extremely flammable - note 3(c) + Named substance: 49
- Toxic: 60
- Extremely flammable - note 3(c): 68
- Not provided: 111
Lessons Learned from accidents
Bulletin - Studies - workshops
Lessons Learned Bulletin

Lessons Learned Bulletin to be published every semester

- Issue #1 – June 2012 – Lessons learned from accidents involving hydrogen
- Issue #2 – December 2012 – Lessons learned from accidents involving contractors
- Issue #3 – June 2013 – Lessons learned from accidents with environmental consequences?

Purpose

- Disseminate lessons learned from major accidents
- Highlight accidents from eMARS and other sources from the angle of lessons learned
- A useful source on accident causes (for operators and competent authorities)
New!
http://ipsc.jrc.ec.europa.eu/?id=503

Chemical Accident Prevention & Preparedness

Issue on Accidents Involving HYDROGEN

Summary
Most often accidents are the result of human error associated with design or organizational errors or insufficient instructions or operating procedures.

The investigations safety fundamentally relies on the operator-contractor's experience and training, as well as the quality of the instructions and operating procedures.

Issuing the permit-to-work is a crucial part of the repair activity maintenance.

Please note:
The accident descriptions and lessons learned are reconstructed from accident reports submitted to the EU’s Major Accident Reporting System (MAH) as well as other open sources.

MAHBulletin
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Accident 1
Release of hydrogen due to broken equipment

Plastics and rubber manufacture
While downgrading a cooling circuit, a blockage occurred while an uncontrolled movement of a flexible hose connected to the system. The flexible hose split for several small open leaks. Due to the broken pipe work there was a release of hydrogen and a pressure that lasted about five minutes. Small showers were activated, no ignition occurred. One employee standing nearby was hit by the flexible hose, causing a severe cut on the upper leg. The estimated production loss was 7 days.

Causes: Human and organizational
The cause was identified by the dead weight of the high-pressure pipe. During the day, the hydrogen had been temporarily opened due to concerns that an explosive atmosphere could occur in the receiving gaswork. When the water pressure was returned to the system, it is suspected that the emergency had caused compression of a nitrogen plug. When the blockage released, the gas suddenly was ejected at high speed, causing the rupture of the connected equipment.

Lessons Learned
From the information on this accident, it seems that the procedures should be carried out strictly following the pre-established set of procedures.

Accident 2
Release of hydrogen from a reactor

General chemicals manufacturer
Hydrogen escaped when a venting valve was opened for the inspection of a reactor. A hydrogen leak at 500 bar and 300 °C occurred during the unloading of a car while 9 employees were standing nearby. The open valve was sealed, resulting in the death of 4 people, injuries to others, and damages to the plant. No off-site emergency procedures were necessary. No off-site emergency procedures were necessary. No fatalities were detected.

Cause: Other
The cause of the accident could not be precisely identified despite a general test of the equipment involved in the first accident, suspected to have caused the accident. However, it was assumed that the leak was due to the failure of a isolation valve.

Lessons Learned
Lessons learned were not provided because the judicial procedure is ongoing. However, there are some features of this accident that have often been associated with hydrogen accidents. The operator must pay attention to the fact that valves could be critical elements for plant safety and maintenance operations should be carried out strictly following the pre-established set of procedures.

Number 1
June 2012
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Lessons Learned – Studies and workshops

Studies

- Overview of eMARS accidents involving toxic releases (complete 2013)
- Lessons learned from corrosion-related accidents in refineries (complete 2013)
- Lessons learned from emergency response and mitigation (start 2013)

JRC-MAHB workshops and reports

Seveso inspectors workshop on emergency response (Oct 2012 – Ireland) and expert publication Lessons learned from chemical accidents (Sept 2013 – Sweden)
Advantages of registering accidents in eMARS

• Increases transparency and confidence from neighbouring countries – the public at large – whilst keeping information on operator and MS anonymous

• Draft national statistics based on the eMARS database/software

• Better access to mutual research on lessons learnt

• Structured system where all relevant accidents and near misses are registered – learn from it for the future
Thank you for your attention

For more information on eMARS, you may contact emars@jrc.ec.europa.eu

Any questions?