

# The EU Major Accident Reporting System - eMARS

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*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 six 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](mailto:emars@jrc.ec.europa.eu).

eMARS - Major Accident Reporting System Website ©2008-2011

<http://emars.jrc.ec.europa.eu>





## eMARS - Major Accident Reporting System

Database of "major accidents" reported under Seveso, OECD and UN-ECE  
Managed by the Major Accident Hazards Bureau (MAHB)

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**Search national authority accidents on:** (Select one or more items.)

**Accident start date**

**Year**

between  and

**Legislation**

**Event type**

**Industry type**

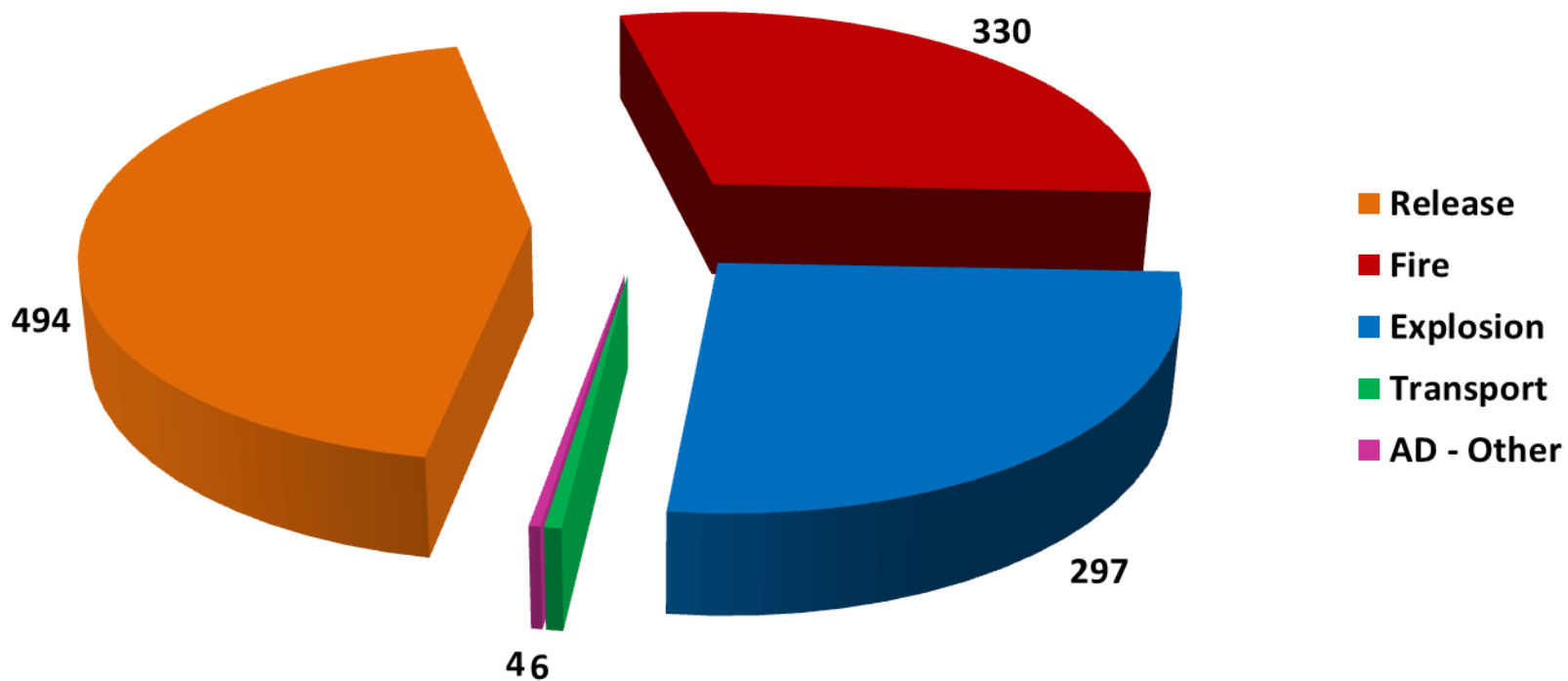
**Full text search**

Save as Excel

	Start Date	Industry Type	Legislation	Event Type
	08/07/1997	Production and manufacturing of pulp and paper	EU Seveso I Directive	Major Acc
	26/06/1998	Manufacture of food products and beverages	EU Seveso I Directive	Near Miss
	29/06/1998	Manufacture of food products and beverages	EU Seveso I Directive	Near Miss
	26/06/2001	Wholesale and retail storage and distribution (excluding LPG)	EU Seveso II Directive	Major Acc
	13/08/2003	General chemicals manufacture (not included above)	EU Seveso II Directive	Major Acc
	09/08/2004	Not known / not applicable	EU Seveso II Directive	Major Acc

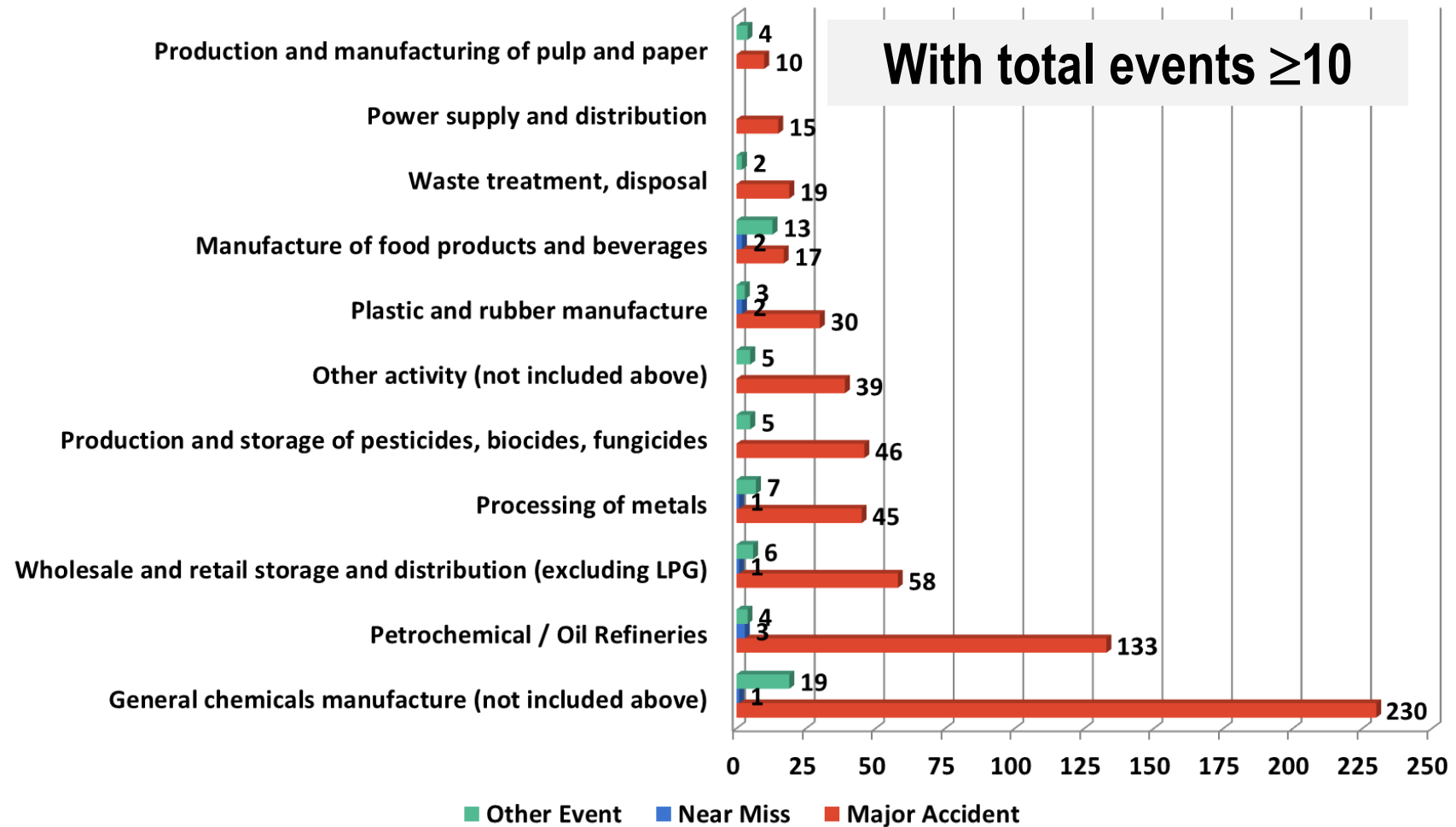
# **General analysis of accident data October 2011**

## ACCIDENT TYPE

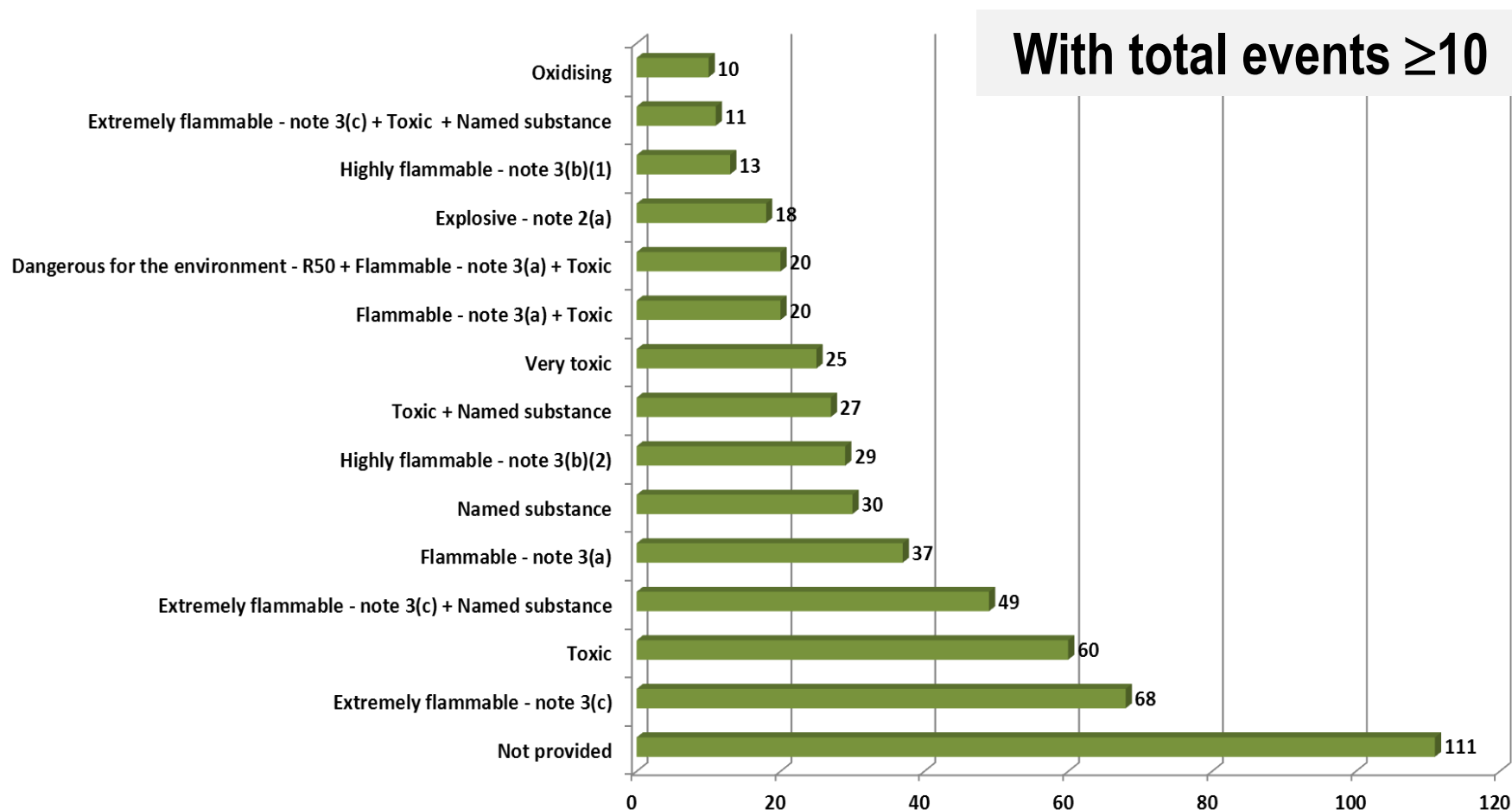




# Most Involved Sectors (1979 – Sept 2011)



## Substance Types Involved in $\geq 10$ Events



# **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>

## Lessons Learned Bulletin No. 1

### CHEMICAL ACCIDENT PREVENTION & PREPAREDNESS

#### Issue on Accidents Involving HYDROGEN

This is the inaugural issue of the JRC-MAHB Lessons Learned Bulletin for chemical accident prevention and preparedness. The aim of the bulletin is to provide insights on lessons learned from accident reported in the European Major Accident Reporting System (EMARS) and other accident sources for both industry operators and government regulators. In future the CLBP Lessons Learned Bulletin will be produced on a semi-annual basis. Each issue of the Bulletin will focus on a particular theme.

#### Summary

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

The installations' safety fundamentally relies on the operators/contractors/subcontractors' training and experience, as well as the quality of the instructions and operating methods.

Issuing the permit-to-work is an output of the repair work/maintenance.

#### Please note:

The accident descriptions and lessons learned are reconstructed from accident reports submitted to the EU's Major Accident Reporting System.

<https://emars.jrc.ec.europa.eu/>

or

<https://emars.jrc.it/>

as well as other open sources. EMARS consists of over 800 reports of chemical accidents contributed by EU Member States and OECD Countries.

#### Accident 1

##### Release of hydrogen due to broken pipework

##### Plastics and rubber manufacture

While unplugging a cooling circuit, a blockage suddenly set loose, causing an uncontrolled movement of a flexible hose connected to the system. The flexible hose hit several small pipes nearby. Due to the broken pipe work there was a release of hydrogen and butene that lasted about five minutes. Sprinkler systems were activated, no ignition occurred. One employee standing nearby was hit by the flexible hose, causing serious cut on the upper leg. The estimated production loss was 7 days.

##### Causes: Human and organizational

The cooler was destroyed by the use of water at high pressure. During the day, a nitrogen feed had been temporarily opened due to concerns that an explosive atmosphere could develop in the receiving tank truck. When the water pressure was returned to the system, it is suspected that the pressure had caused compression of a nitrogen plug. When the blockage released, the plug suddenly was ejected at high speed, causing the firing of the connected flexible hose.

##### Lessons Learned

From the information on this accident, it seems likely that deviations on working procedures should only be allowed after thorough evaluation.

(EMARS Accident # 277)

#### Accident 2

##### Release of hydrogen from a reactor

##### General chemicals manufacture

Hydrogen escaped when a venting valve was opened for the inspection of a cap. A hydrogen leak under 300 bar and 300 °C occurred during the uncoupling of a circuit while 6 employees dominated a blank flange and an open drain valve. The escaped hydrogen caught fire (jetfire), resulting in the death of 4 people, injuries to others 3 and damages to the plant. No off-site emergency measures were necessary; no off-site effects were detected.

##### Causes: Other

The cause of the accident could not be precisely identified. Identified despite a general test of the equipment involved in the fire and/or suspected to have caused the accident. However it was assumed that the leak was due to the failure of an isolation valve.

##### Lessons Learned

Lessons learned were not provided because the judicial procedure was 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.

(EMARS Accident # 288)

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European  
Commission

Research  
Centre

**Number 1**  
**June 2012**  
JRC72109

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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](mailto:emars@jrc.ec.europa.eu)**

**Any questions?**