


9.1 Natech Accident Database: eNatech (European Union)

OECD GP Activity	UN SF Activity	UN SD Goals / Targets
9. Natech risk in enforcement and in follow up to Natechs9. Natech risk in enforcement and in follow up to Natechs	1. Understanding disaster risk	Non-specific targets relevant for Natech Risk Management (3.8, 6.3, 9.4, 11.5, 11.B, 12.4)

Classification according to OECD Guiding Principles, UN Sendai Framework Priorities/Activities, and UN SDGs and Targets

Figure 1: Example eNatech natural hazard, industrial site, and Natech accident records

Natech Information

 Draft

Type:	Natech
Date:	1999/08/17
Natural hazard:	Kocaeli Earthquake [Turkey, 1999/08/17]
Industrial site:	TUPRAS Izmit Refinery [Turkey]

Units Involved

1. Name:	Chemical warehouse
Type:	Storage – Warehouse
2. Name:	Crude oil unit stack
Type:	Process – Stack
Description:	Stack of the newest crude oil unit, which is 115m tall.
3. Name:	Plant 25
Type:	Process – Other

Event Sequences

1. Name:	Chemical warehouse fire	
Unit:	Chemical warehouse	
Description:	Chemicals fall from storage racks and spill in warehouse, which resulted in fire.	
Initiating Events	Critical Events	Major Events
Component (Non-structural): Dislodging / displacement Contributing Factors: Inadequate Restraint straps or chains Prevention, Safety and Mitigation Measures:	Release: Fluid release to ground Release: Gas / vapour / mist release to air	Fire: Pool fire
2. Name:	Collapse of the crude oil unit stack	
Unit:	Crude oil unit stack	
Description:	Stack of the crude oil unit collapsed due to the earthquake.	
Initiating Events	Critical Events	Major Events
Building (Structural): Partial collapse	-	Event Sequence: Plant 25 fire
3. Name:	Plant 25 fire	
Unit:	Plant 25	
Substances Involved:	Naphtha – ? tons / ? tons, ? atm, ?°C	
Initiating Events	Critical Events	Major Events
Event Sequence: Collapse of the crude oil unit stack Natural Hazard: Debris impact Component (Structural): Partial collapse Component (Non-structural): Pipe break / damage 63 pipes transporting various (hazardous) substances broke down.	-	Fire: Pool fire

Emergency Response

Response Planning:	Emergency response plan takes natech events into consideration: Yes Emergency response plan is sufficient in taking natech events into consideration: No
Response to Natural Hazard:	Natech event prevents access of personnel to natural hazard affected area: Yes Natech event prevents efficient operation of personnel in the natural hazard affected area: Yes
Response to Natech Event:	Damage to lifelines (e.g. water, power, communication, transportation): Yes On-site systems (e.g. sprinkler, water cannon) On-site fire fighting team On-site fire fighting trucks Local fire fighting team Fire fighting teams of nearby plants Regional / national fire fighting teams International fire fighting teams On-site evacuation Off-site evacuation


Consequences

Environmental:	Shore (e.g. beach, dune, marsh land) Off-shore (e.g. estuary, sea)
Economic Losses:	On-site material losses: 57800 thousand USD
Community Disruption:	Industrial areas (e.g. factories) Residential areas (e.g. housings, hotels) Commercial areas (e.g. offices, shops) Public areas (e.g. schools, hospitals) Infrastructure (e.g. roads, railways, air transport)

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Attachments

 No attachments.

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Short Facts:	Natural Hazard(s) Considered:
Governance approach: Risk Communication Source: Joint Research Centre, European Commission Entry into force: 2012 Targeted Stakeholders: Authorities, operators Scope of applicability: International	<ul style="list-style-type: none"> • All Climate change: not considered

Description

eNatech is a web-based, open and collaborative database that systematically collects information on Natech accidents around the world. It enables the search for and analysis of Natech accident reports in order to learn lessons from past problems. It was developed by the European Commission Joint Research Centre (JRC) and has been publicly available since 2012 at <http://enatech.jrc.ec.europa.eu>. Currently, eNatech is the only dedicated Natech accident database in the world and covers a wide range of natural hazards and industrial activities (e.g. industrial installations, pipeline systems, and offshore platforms).

Specifically designed to capture the characteristics of Natech events, the database allows the recording of the natural and technological components of Natech accidents and their interaction. The modern and mobile-friendly user interface of eNatech facilitates accident data entry and lets the users easily search and list available natural hazard, industrial site, and Natech accident records. Multiple natural hazard or industrial site records can be linked to multiple accident records. In this way, Natechs triggered by natural disasters affecting large areas (e.g. multiple countries) or sites where Natech accidents periodically occur can be identified and studied systematically. For each accident, the following information can be specified:

- Information on the triggering natural-hazard event,
- Information on the industrial site where the accident occurred,
- Process equipment and storage units involved in the accident,
- Hazardous substances involved,
- Sequence of events (e.g. initiating, critical, major) that led to the Natech accident,
- Contributing factors,
- Modes of physical and functional damage,
- Extent and severity of the consequences on human health, environment, economy, and community services,
- Emergency response, recovery, and remediation activities,
- Lessons learned on various aspects (e.g. equipment, organizational factors, mitigation measures)

Natech-specific aspects are explicitly considered at each section and the users are encouraged and, moreover, directed to provide the basic information that is necessary to capture the essence of the Natech event. The database also allows reconstruction of the complex accident dynamics by using multiple event sequences, which can be linked to each other. Bibliographic references and other documents related to natural hazard events, industrial sites, or Natech accidents can be uploaded. Part of the information can be made anonymous or confidential if necessary. The database also features stage-wise data entry through which the users can work on draft versions of the records before reaching a final version, which is then validated and made public by the database administrators. The high data quality and the high level of detail also allows to define natural-hazard specific lessons learned and to formulate associated recommendations for Natech risk reduction. Work on populating the database continues in order to provide to the users a

repository of information for accident analysis, lessons learning, and the development of equipment vulnerability models and scenarios for use in Natech risk assessment.

Link/Contact:

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



Comments by the UN/OECD Natech-Steering Group:

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