



Finanziato
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Ministero
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Italiadomani
PIANO NAZIONALE
DI RIPRESA E RESILIENZA

multi-Risk sciEnce for resilienT commUnities undeR a changiNg climate

Codice progetto MUR: **PE00000005** – F83C22001660002



Deliverable title: Report, data base on industrial accident

Deliverable ID: DV 4.5.7

Due date: 30/11/2025

Submission date: 25/07/2025

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1. Technical references

Project Acronym	RETURN
Project Title	multi-Risk sciEnce for resilienT commUnities undeR a changiNg climate
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Project Duration	December 2022 – November 2025 (36 months)

Deliverable No.	DV 4.5.7
Dissemination level*	PU, CO
Work Package	WP5 (VS4) – Prevention and remediation
Task	T4.5.5 - Consequences modeling of major accidents of industrial nature in terms of environmental impact; resilience and adaptation of interdependent infrastructures increasingly exposed to NaTech hazards due to climate change
Lead beneficiary	PoliTo
Contributing beneficiary/ies	PoliTo, PoliMi

* PU = Public

PP = Restricted to other programme participants (including the Commission Services)

RE = Restricted to a group specified by the consortium (including the Commission Services)

CO = Confidential, only for members of the consortium (including the Commission Services)



1.1. Document history – Part 1

Version	Date	Lead contributor	Description
0.1	16/10/2024 – 13/11/2024	All Partners	Individual contributions to the first draft
0.2	13/11/2024	Marco Ravina, Marta Brignone (PoliTo), Fabrizio Santamato (PoliMi)	First draft
0.3	15/11/2024 – 30/11/2024	All Partners	Edits for approval
0.4	3/12/2024	Valentina Busini (PoliMi)	Revision
1.0	10/12/2024	Deborah Panepinto (task coordinator)	Final version

2. Abstract

In recent years, the rising frequency and severity of NaTech incidents — industrial accidents triggered by natural events such as earthquakes, floods, and storms — has raised growing concern among researchers and risk management authorities. These complex events require the development of specific prevention and management strategies. This study proposes an analysis of 1,300 NaTech incidents over the past 70 years, aiming to identify trends, geographical distribution, and material damages.

The analysis highlights the need for a systematic approach to data collection and organization, as fragmentation and lack of standardization across databases limit the sharing of information. The study also examines NaTech risk assessment methodologies, divided into quantitative and qualitative approaches for natural events such as earthquakes, floods, and storms. The review of these methodologies emphasizes the importance of an integrated approach to risk assessment, helping to improve preparedness and response to future NaTech incidents.

To further illustrate the risks and complexities of NaTech events, the study presents an in-depth analysis of the fire at the TUPRAS refinery during the 17 August 1999 Kocaeli earthquake. This case study highlights the sequence of events, the severe environmental and economic consequences, and the lessons learned from the incident. By examining the structural weaknesses that contributed to the disaster and the subsequent measures taken to enhance safety, the analysis provides actionable insights for improving industrial resilience to natural hazards.

The results underscore the importance of accurately identifying natural hazards, assessing their potential impact on industrial facilities, and developing effective mitigation strategies. Despite advancements in the field, greater efforts toward standardization and international collaboration are essential to improving global readiness and response to NaTech events, ultimately optimizing risk management and environmental safety.

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