



The Danish Institute of Fire and Security Technology

**FIRE AND EXPLOSION
MODELING AT HYDROGEN
REFUELING STATIONS IN PORTS**

**STRATEGIC INSIGHTS FOR
CONTINGENCY AND SAFETY
MANAGEMENT**





Iskenderun, Turkiye

Photo: BM.GE



Beirut, Lebanon

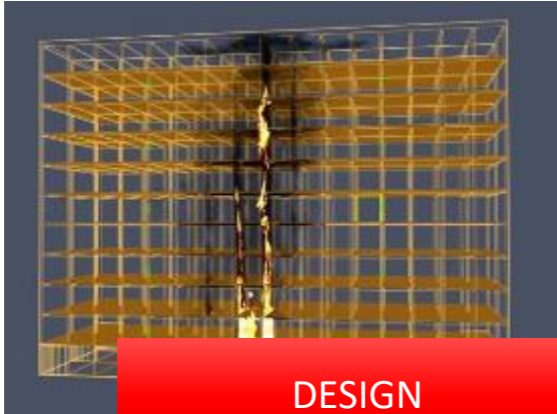
Photo: The Outlaw Ocean Project

A CENTRAL QUESTION:

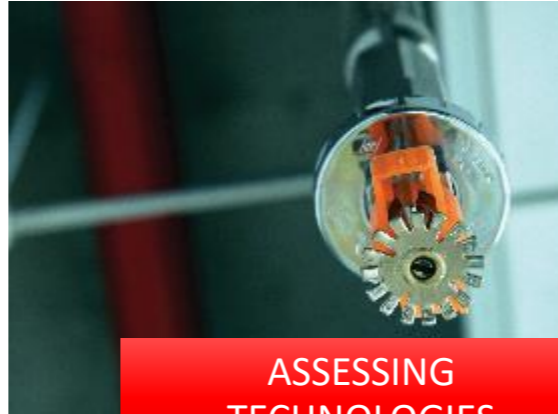
***WHAT DOES HYDROGEN
INFRASTRUCTURE MEAN
FOR SAFE PORT
OPERATIONS?***



DBI – SUPPORTING A SAFE AND FAST GREEN TRANSITION



DESIGN



ASSESSING
TECHNOLOGIES



FIRE INVESTIGATION



DISSEMINATION AND
TRAINING



FIRE TESTING

THE NORDICH2UBS PROJECT

WP 2 TASK 2.1

Scope:

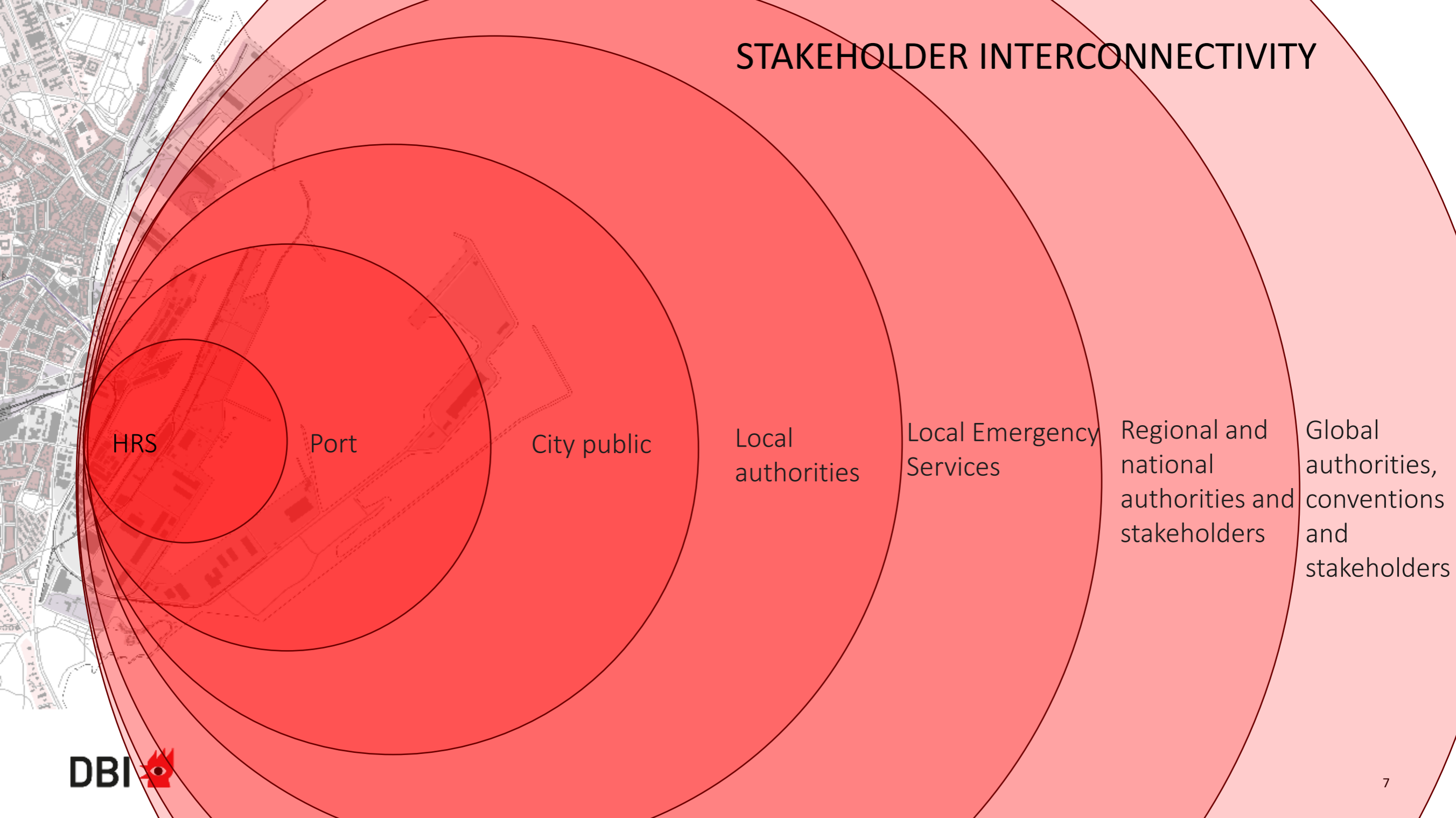
Safety analysis of HRS with large /very large gaseous and liquid hydrogen storage located especially in ports

Deliverable:

Modeling of fires/explosions in relation to large hydrogen storage at the HRS



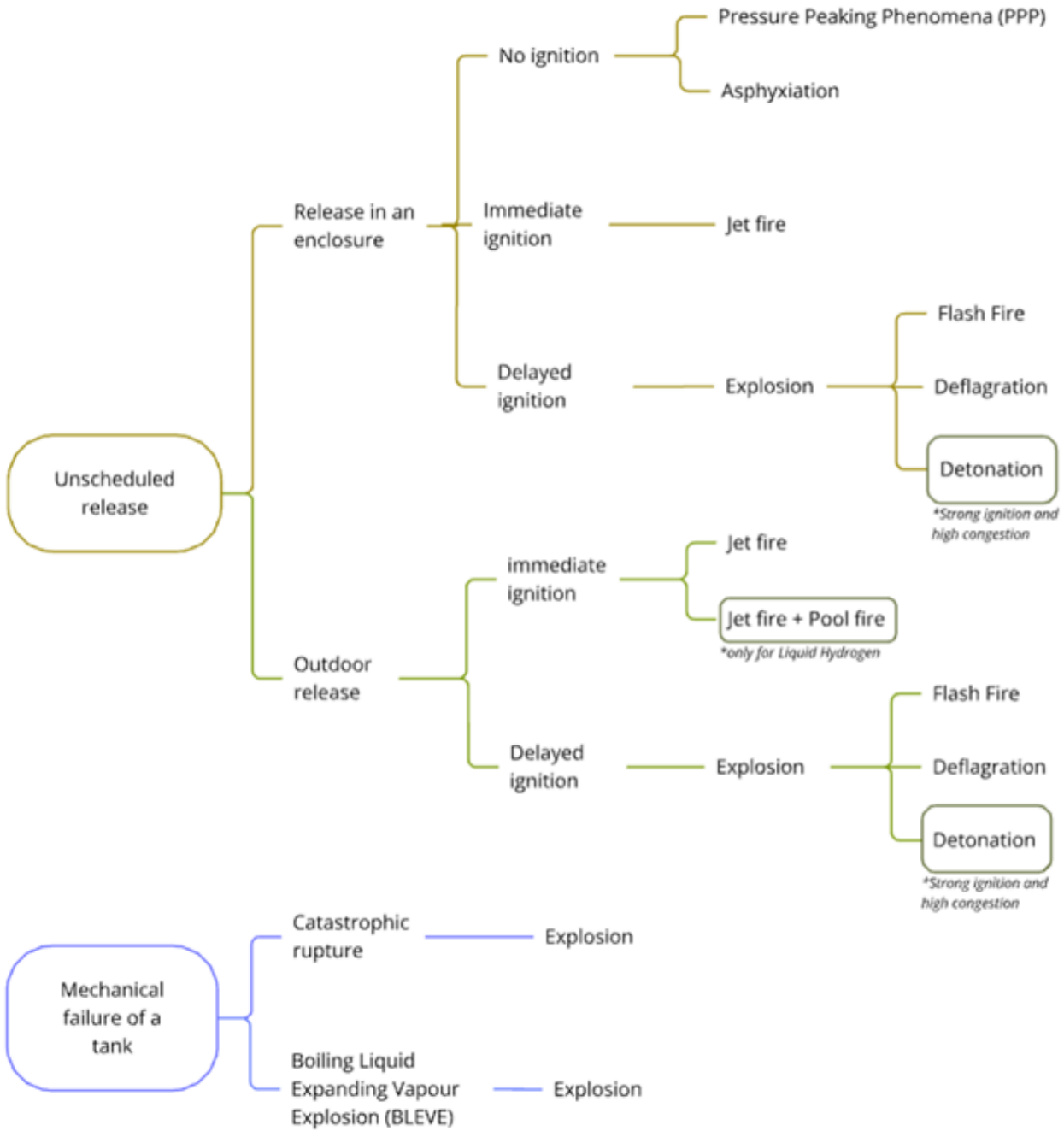
STAKEHOLDER INTERCONNECTIVITY



CONSEQUENCE ANALYSIS – MODELLING IN PHAST

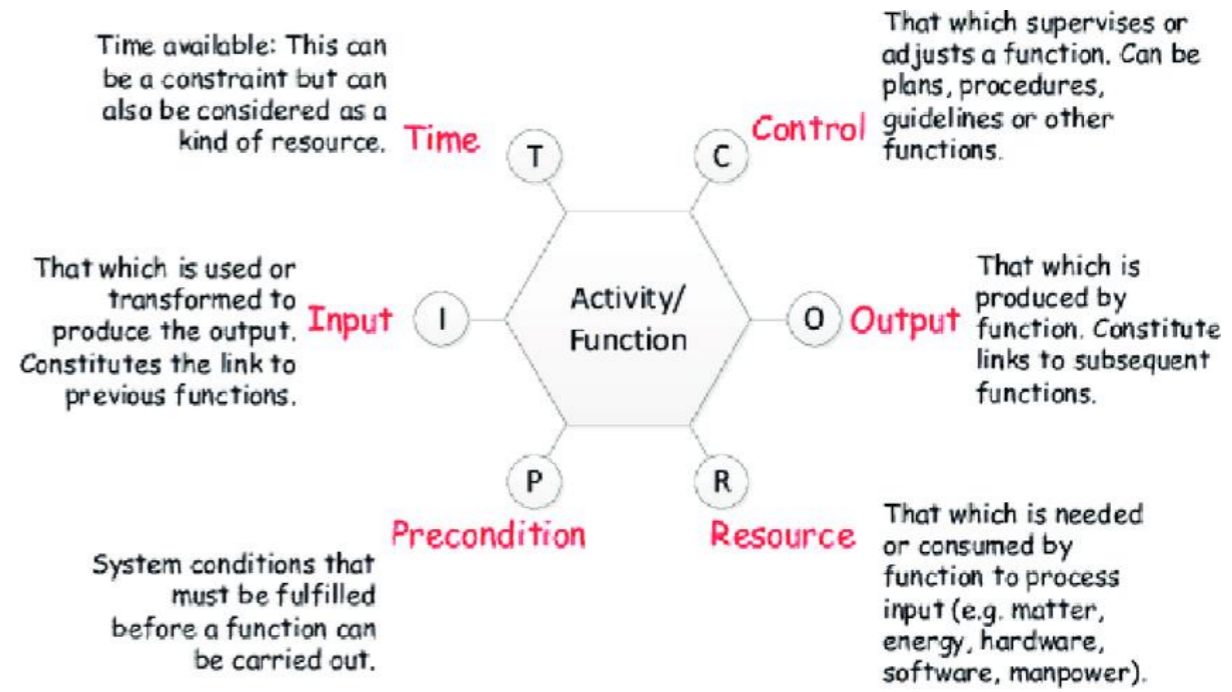
- Estimating the magnitude of consequences from fire/explosion/toxicity for a range of fuels and scenarios.
- Parameters such as storage quantity, pressure, environmental conditions, leakage conditions, material composition etc.
- Local industrial and civil infrastructure.
- Limitations include:
 - Empirical data validity dependent
 - Simplified 2D modelling approach
 - Not accounting for ventilation route and presence of suppression systems of nearby buildings
 - Not accounting terrain unevenness





INSIGHTS FROM THE MODELLING

- Consequence analysis ->
- Evaluation of contingency and emergency preparedness plans (gap analysis pt. 1) -> Are we (procedure) ready?
- Evaluating theoretical plans up against practical experience -> Modelling WAI vs. WAD using FRAM (gap analysis pt. 2)





**DBI BELIEVES IN A SAFE AND
FAST GREEN TRANSITION
– EVEN FOR PORTS**

Thanks for your attention



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