# BP Texas City Accident
## March 23, 2005
# Scenario in Short

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# Some data about the refinery

- At the time of the accident
  - Texas City is BP's Largest Refinery (3$^{rd}$ in the world)

  - 1,800 Employees and 800 Contractors

  - Purchase of the Refinery by BP in 1999 (previous owner: AMOCO)

  - 24 Fatalities in 30 years

# The accident and its consequences

- March 23, 2005, explosions and fires at BP's Texas City Refinery (isomerization unit)
- 15 fatalities and 180 persons wounded
- Damage inside and outside the refinery site
- US $ 1.5 billion loss
- US $ 21million fines imposed by OSHA

# Consequences (1/2)
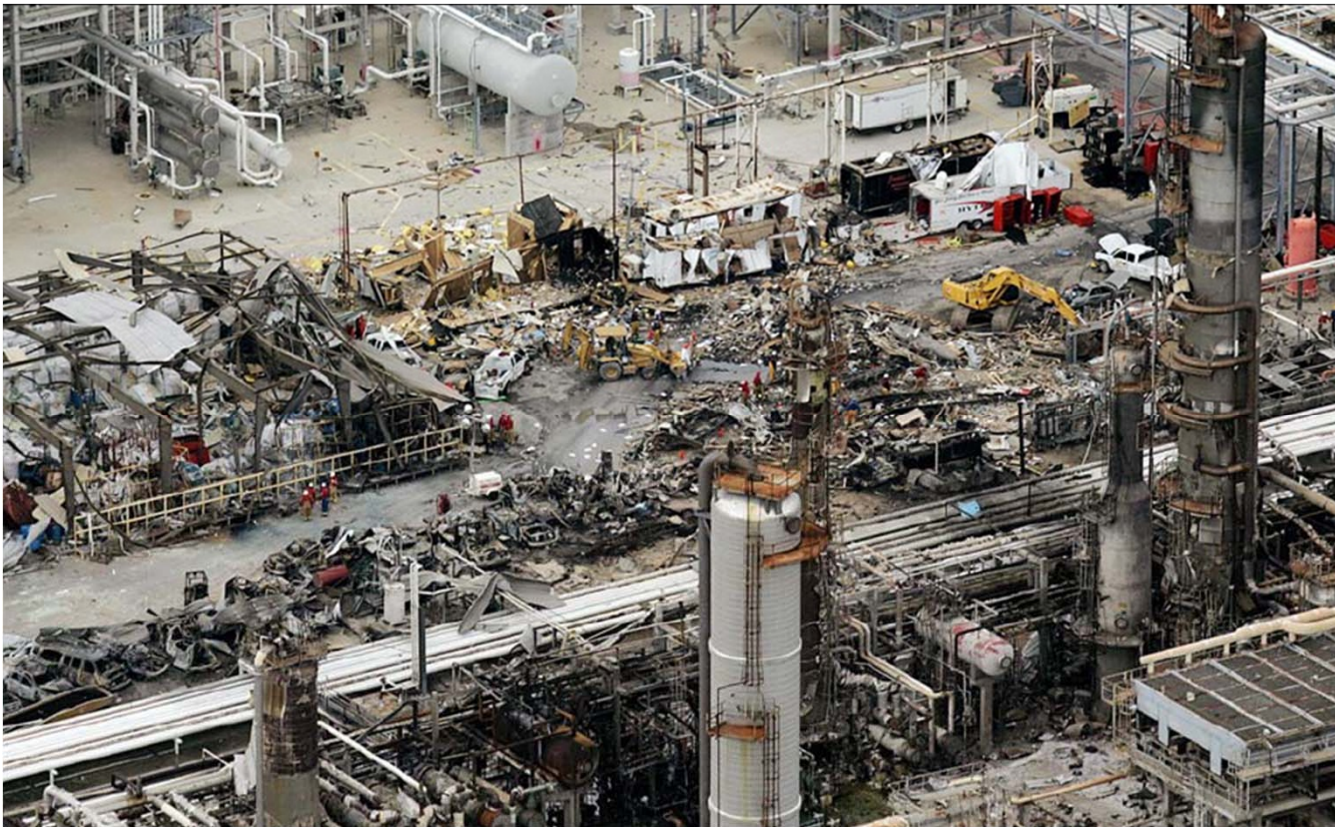
# Consequences (2/2)
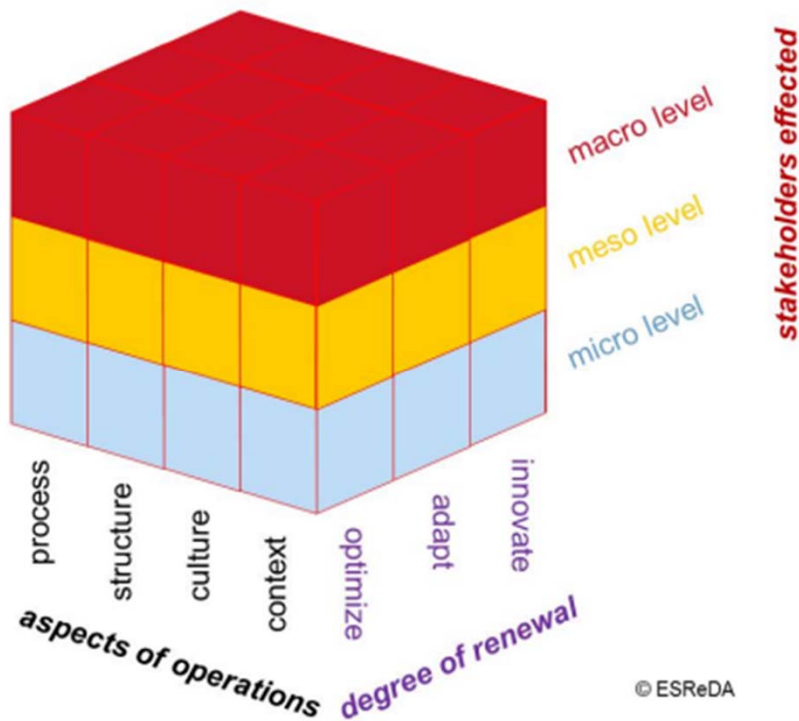
# Simplified scenario

- Restart the Isomerization Unit After a Maintenance Shutdown
- The distillation column and the purge tank are too full
- Release in atmosphere of liquid hydrocarbon
- A cloud of steam is forming and catching fire
- Leading to Explosions and fires

# Isomerisation Unit
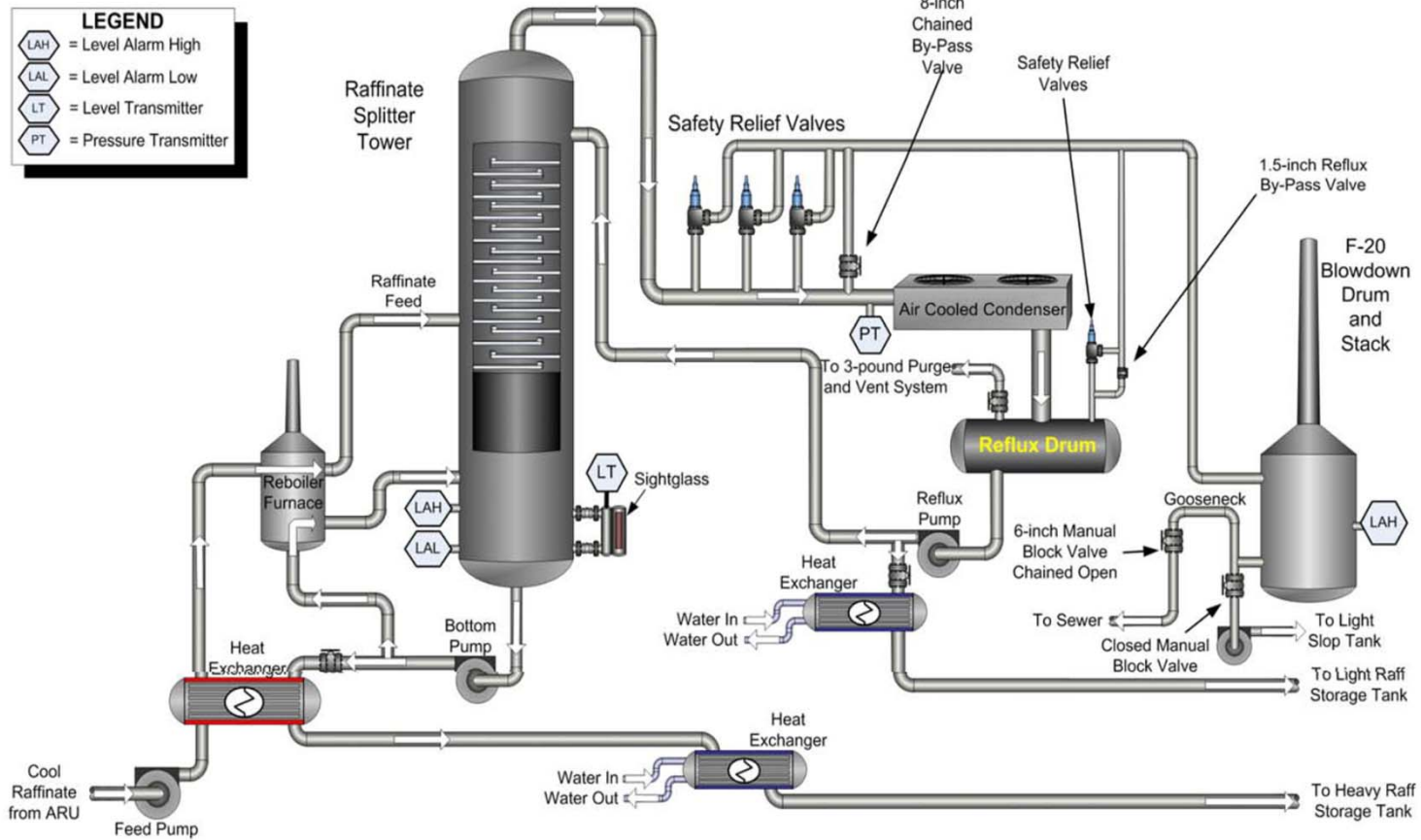
# ESReDA Cube



The Cube is a tool to systematically identify and analyse the parts of the whole and the learning process.

1st dimension: is related to WHAT needs to be learnt and how work is organized (process, structure, culture).

2nd dimension: is portrayed within the micro-meso-macro-axis representing the levels of action required and WHO are the actors that would implement them.

3rd dimension: is related to the HOW we learn (rules (optimization, single-loop learning), insights (adaptation, double-loop learning) and principles (innovation, triple-loop learning) and the related depth of change that could be implemented in the aftermath of an accident.

Source: https://esreda.org/wp-content/uploads/2016/03/ESReDA-dynamic-learning-case-studies-180315-1.pdf

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|---|---|
| **STRENGTHS** | **WEAKNESSES** |
| **Emphasises learning**. Allows stakeholders and analyst to learn in a systematic way.<br><br>**A communication tool**. Facilitates discussions amongst stakeholders on identified topics. Integrated and systematic way of looking at an event (near miss, incident, accident), taking stock of the organisational context, level of stakeholder responsibility and depth of learning required. | Should not be used as a stand-alone method, but as a supporting method.<br><br>Does not include timeline of events or causality.<br><br>Results depend on the scope, goal and viewpoint of the analyst(s). |
| **OPPORTUNITIES** | **THREATS** |
| Model may be used:<br><br>• before the investigation as a planning tool;<br><br>• during the investigation to identify what has been missed in the investigation so far;<br><br>• at the end of the investigation to pinpoint recommendations to specific stakeholders;<br><br>• after the event to analyze the event or to analyze the investigation process itself. | Risk of not seeing the big picture not the interconnections.<br><br>If the scope, goal and viewpoint of the analyst(s) is(are) not defined clearly, there is a risk that results of the analysis could be skewed or biased. |