

UNECE – Workshop on Safety Guidelines & Good Industry Practices - Introduction

Frank Candreva - DNV Belgium Oil & Gas
23 - 25 September 2013

UNECE Convention on the
Transboundary Effects of
Industrial Accidents

**Assistance
Programme**



MANAGING RISK



DNV = DET NORSKE VERITAS

Worldwide presence

The extensive global network of offices is one of DNV's key strengths. In 2010 we brought more decision-making power closer to the customers by creating four geographical divisions with their head offices in Oslo, London, Houston and Singapore.

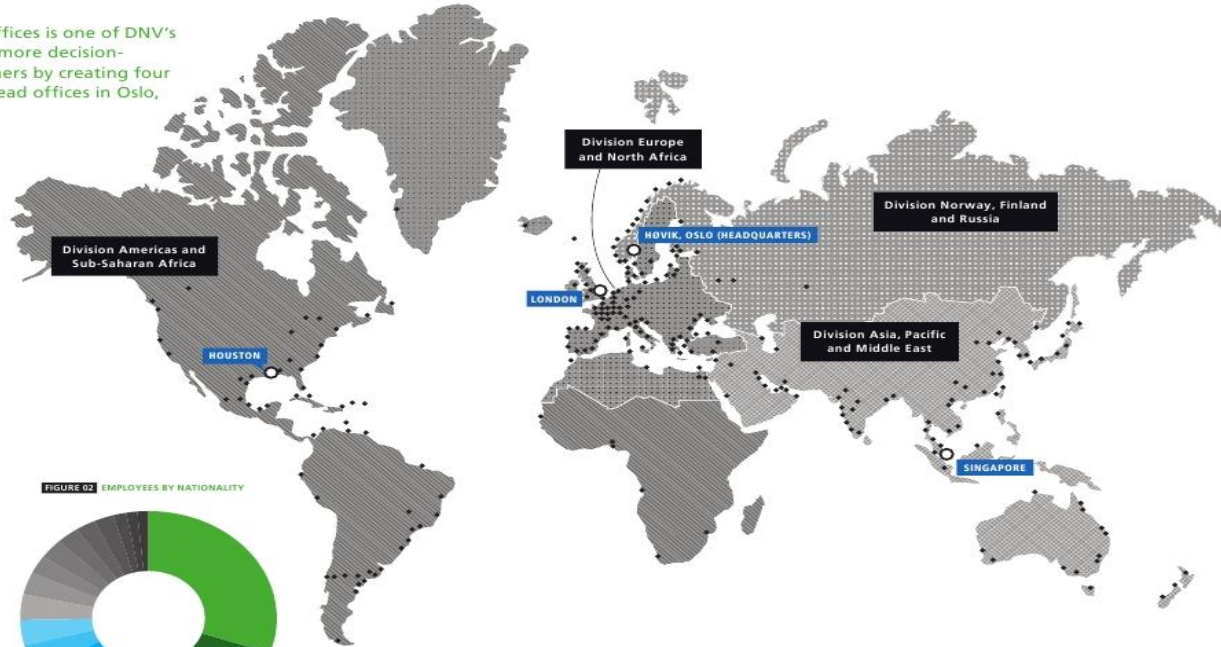
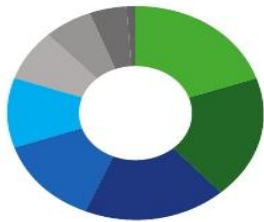
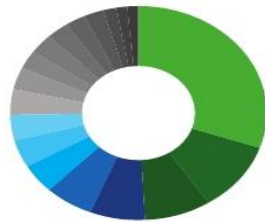


FIGURE 01 EMPLOYEES BY DIVISION



● Asia, Pacific & Middle East	1,671	19.8%
● Norway, Finland and Russia	1,579	18.8%
● DNV Business Assurance Group	1,525	18.0%
● Europe & North Africa	1,122	13.3%
● Americas & Sub-Saharan Africa	889	10.5%
● Independent Business Units	652	7.7%
● Governance & Global Development	519	6.1%
● Sustainability & Innovation	398	4.7%
● Corporate Units	94	1.1%
DNV Total	8,440	100.0%

FIGURE 02 EMPLOYEES BY NATIONALITY



● Norwegian	2,119	● Polish	223
● Chinese	721	● Swedish	204
● American	590	● Singaporean	195
● Indian	490	● French	194
● British	420	● German	190
● Korean	305	● Danish	174
● Brazilian	285	● Malaysian	105
● Italian	282	● Spanish	95
● Dutch	271	● Japanese	91

OFFICES WORLDWIDE

300

With 300 offices in 100 countries, DNV has extensive global reach.



EMPLOYEES WORLDWIDE

8,440

The number of employees was 8,440 at the end of 2010.



Topics

- Scope
- Objectives of the UNECE Safety Guidelines
- Status today
- Principles & General Recommendations
- Technical & Organisational Aspects

Scope

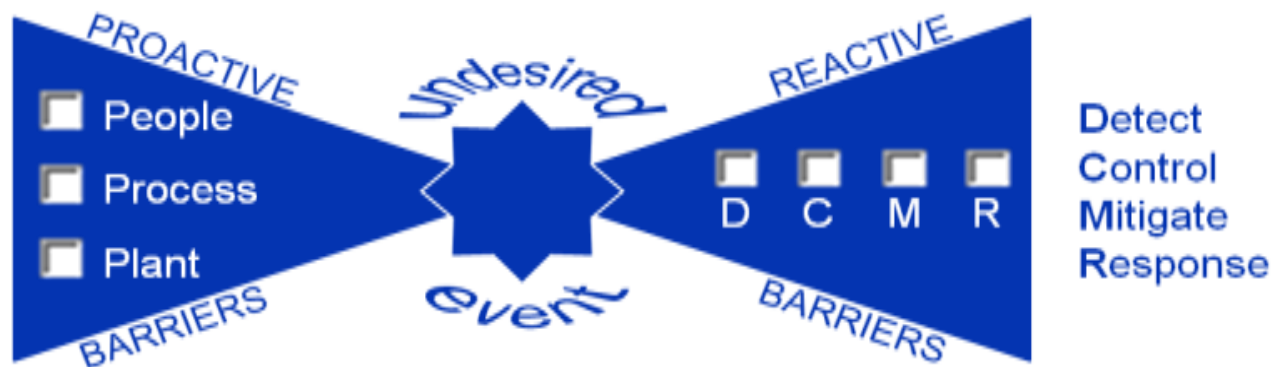
- Safety Guidelines (SG) cover more than “safety aspects” only; “safety” stands for : Health & Personal Safety, Environment and Process Safety (linked to major accidents)
- SG applicable to all Oil Terminals in the UN ECE countries
- Oil Terminals intended here are facilities for storing oil and their derivatives (not limited to: naphta, flammable liquids etc.), including loading, unloading and transfer activities.
- The SG and GIP (Good Industry Practices) address the entire lifecycle of intended Oil Terminals:



Objectives of the UNECE Safety Guidelines

- Develop a **Practical Guide** for OT Operators and Competent Authorities, aiming at providing a strategy and concrete measures for **prevention** of and **response** to industrial accidents.

**Major
Accident
Hazards
of Oil Terminal**



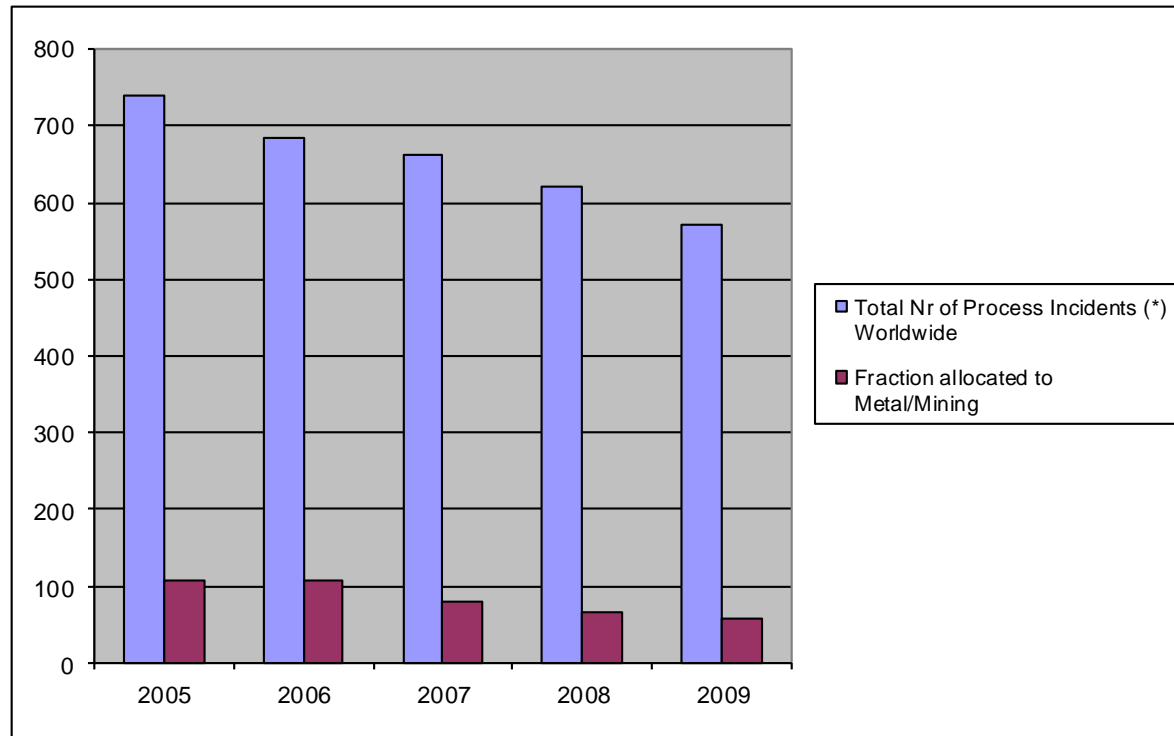
Preventive measures to reduce probability for top-event.

Measures to reduce the consequences of the top-event & to stop escalation.

Objectives of the UNECE Workshop

- Highlight roles and responsibilities of OT Operators , Competent Authorities and ECE Member States throughout the OT lifecycle
- Discuss the feasibility of the Safety Guidelines and Good Industry Practices for the 3 target groups well represented today.
- Make recommendations to the Practical Guide to finalise the document

Status today : Process Incidents Statistics – Worldwide (*) (2005 – 2009)



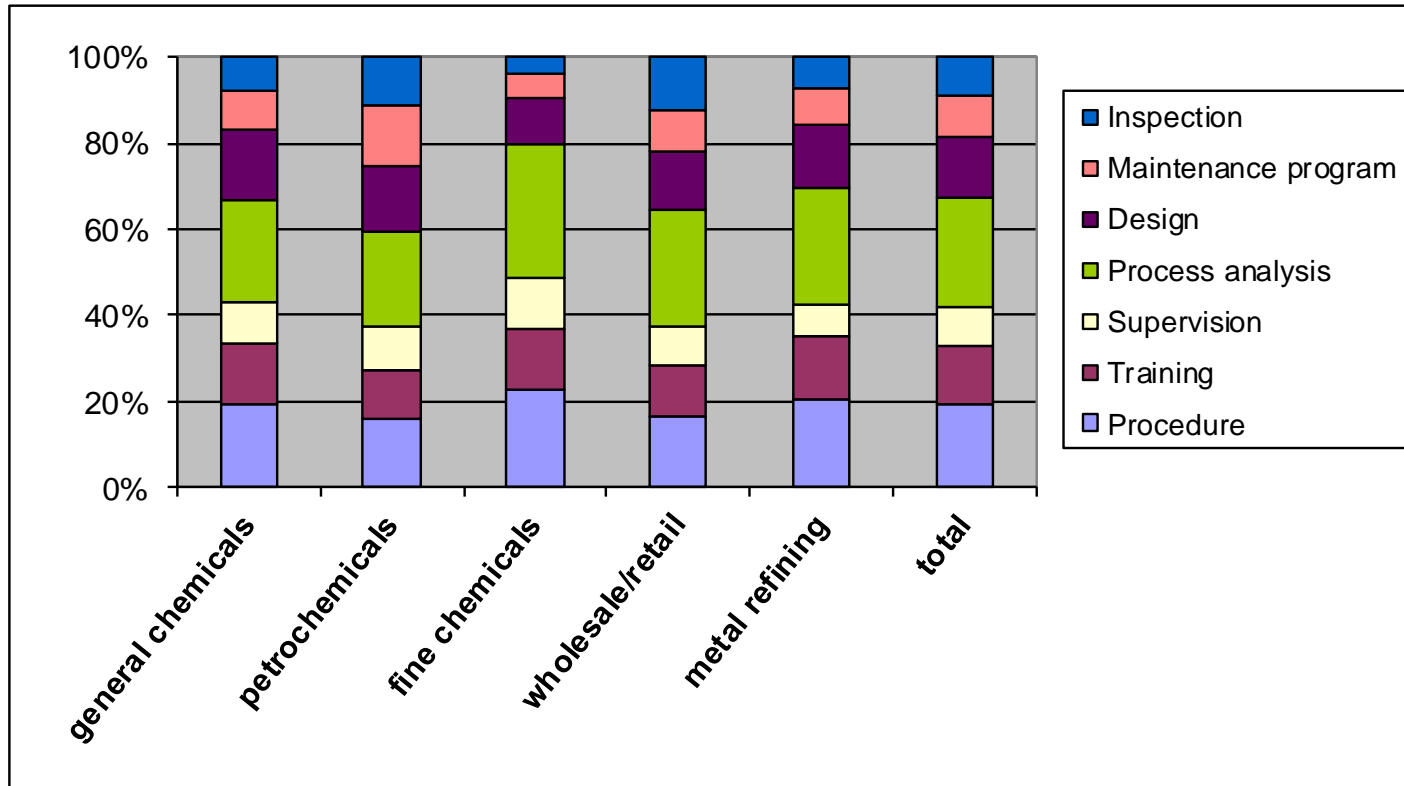
Process industry categories covered:

Chemical
Petrochemical
Metal processing
Mining industries
Onshore oil and gas installations,
Storage facilities
Pipelines

(*) **Process Incidents Database** (DNV owned) covers the following undesired events as reported in public sources: Major Accidents (Seveso definition) + other problem events such as process upsets, prosecutions, fines and other regulatory actions.

Status today:

Patterns of underlying causes of major accidents



Similar pattern of underlying causes regardless of the industry type

All industry types have weaknesses in **“process safety analysis”**, **“procedures”** and **“design”** as the most common underlying causes.

Status today :

Weaknesses in safety management systems & safety culture

Industry type	General chemicals	Petro-chemicals	Fine chemicals	Wholesale retail	Metal refining
# reports	71	34	12	12	15
% weaknesses in SMS	72	62	100	75	87
% weaknesses in safety culture	63	56	75	58	80

A **very high percentage** of the major accidents have their underlying causes related to weaknesses in the **safety management systems & the safety culture**.

Source: Jacobsson et al., Journal of Loss Prevention in the Process Industries 23 (2010), 39-45.

Principles and General Recommendations

- Ensuring a Proper Design & Construction of OT = a responsibility for all 3 target groups.
- Considerations on land-use planning in view of OT siting (prevention is less costly than mitigation afterwards)
- For new OT's the principles of design for decommissioning should be considered in the early phase of the lifecycle.
- Commitment to safety is vital for the OT Operator, as well as an adequate safety culture to ensure a high level of protection of human health and the neighbouring environment .
- Transboundary effects to be identified and managed proactively and reactively.
- In total : 56 Principles and General Recommendations for OT Operators, Competent Authorities and ECE Member states

Technical and Organisational Aspects

- Design & Construction
- Operations and Management
- Asset Integrity and Reliability
- Emergency Planning and response
- Managing Lifetime & Decommissioning

Design & Construction (Part 2 – chapter 1)

<ul style="list-style-type: none">♦ Environmental Baseline & Impact assessment	<ul style="list-style-type: none">♦ QA during Procurement – Fabrication - Installation - Commissioning
<ul style="list-style-type: none">♦ Facility Siting & Land Use planning	<ul style="list-style-type: none">♦ Hazards Management<ul style="list-style-type: none">- Hazards Management in the Design & Planning phase<ul style="list-style-type: none">➤ Safety Reports- Hazards Management in the other phases of the OT lifecycle<ul style="list-style-type: none">➤ HAZOP studies
<ul style="list-style-type: none">♦ Safe Design<ul style="list-style-type: none">- Primary Safety Level Considerations (Tank design, overfill protection etc.)<ul style="list-style-type: none">- Secondary Safety Level Considerations- Tertiary Safety Level Considerations	

Operations & Management (Part 2 – chapter 2)

♦ Process Safety Focus	♦ Management of abnormal situations
♦ Process Safety Leadership and Safety Culture	♦ Investigation of incidents and aftercare
♦ Organisation and Personnel	♦ Performance monitoring and compliance assurance
♦ Operating Manual	♦ Records management
♦ Operating Procedures & Safe Work Practices	♦ Audit and management review
♦ Management of Change	♦ Learning from experience
♦ GIP for transport and storage of hazardous materials - Principles for safe transfer management - Operational Planning - Operational controls -	

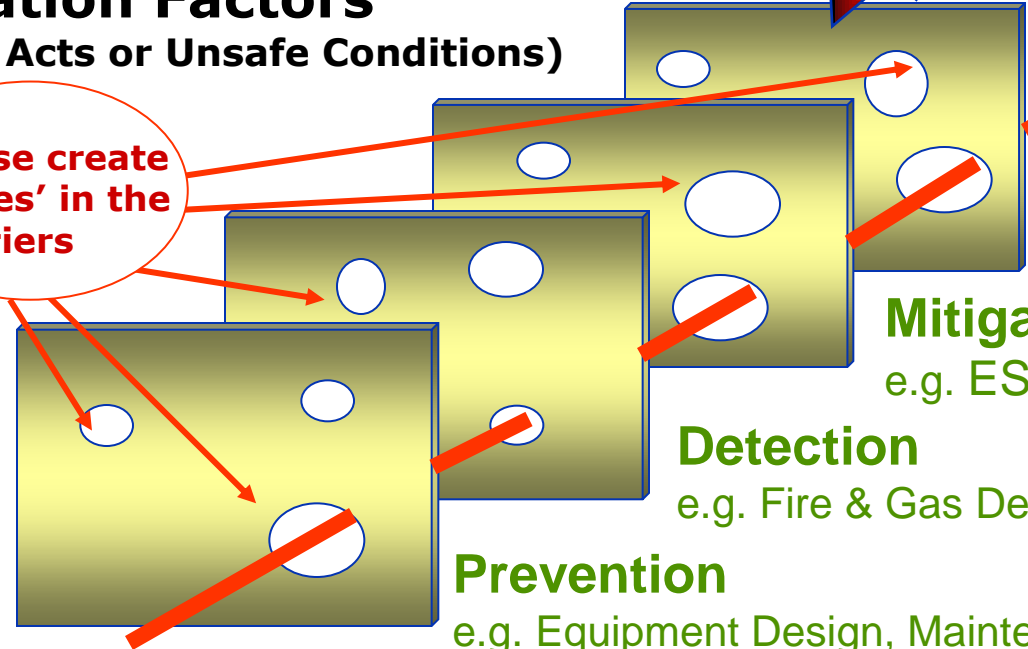
Operational Control of Barriers

Under a certain set of circumstances, all the 'holes' may line up leading to.....



Escalation Factors (Unsafe Acts or Unsafe Conditions)

These create 'holes' in the barriers



Emergency Response
e.g. Emergency Response Plan

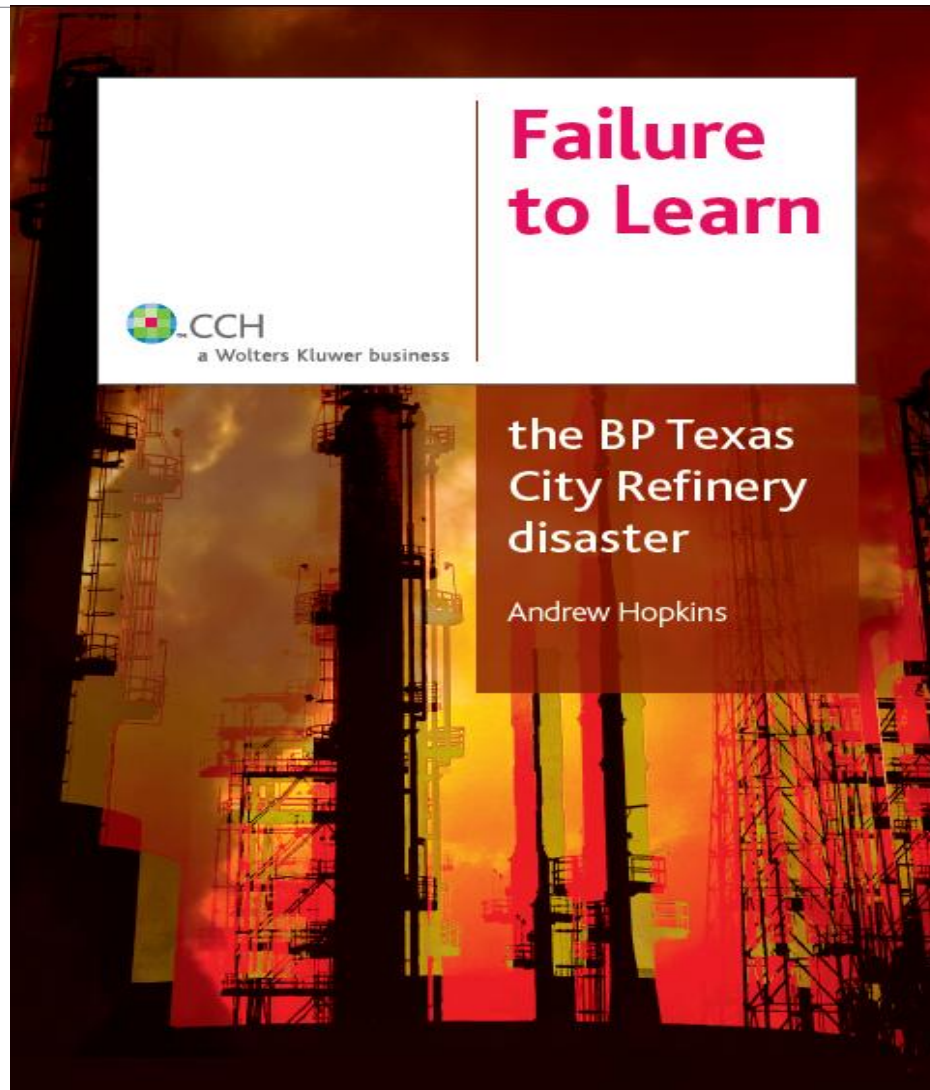
Mitigation
e.g. ESD/EDP, Fixed Fire Protection

Detection
e.g. Fire & Gas Detection

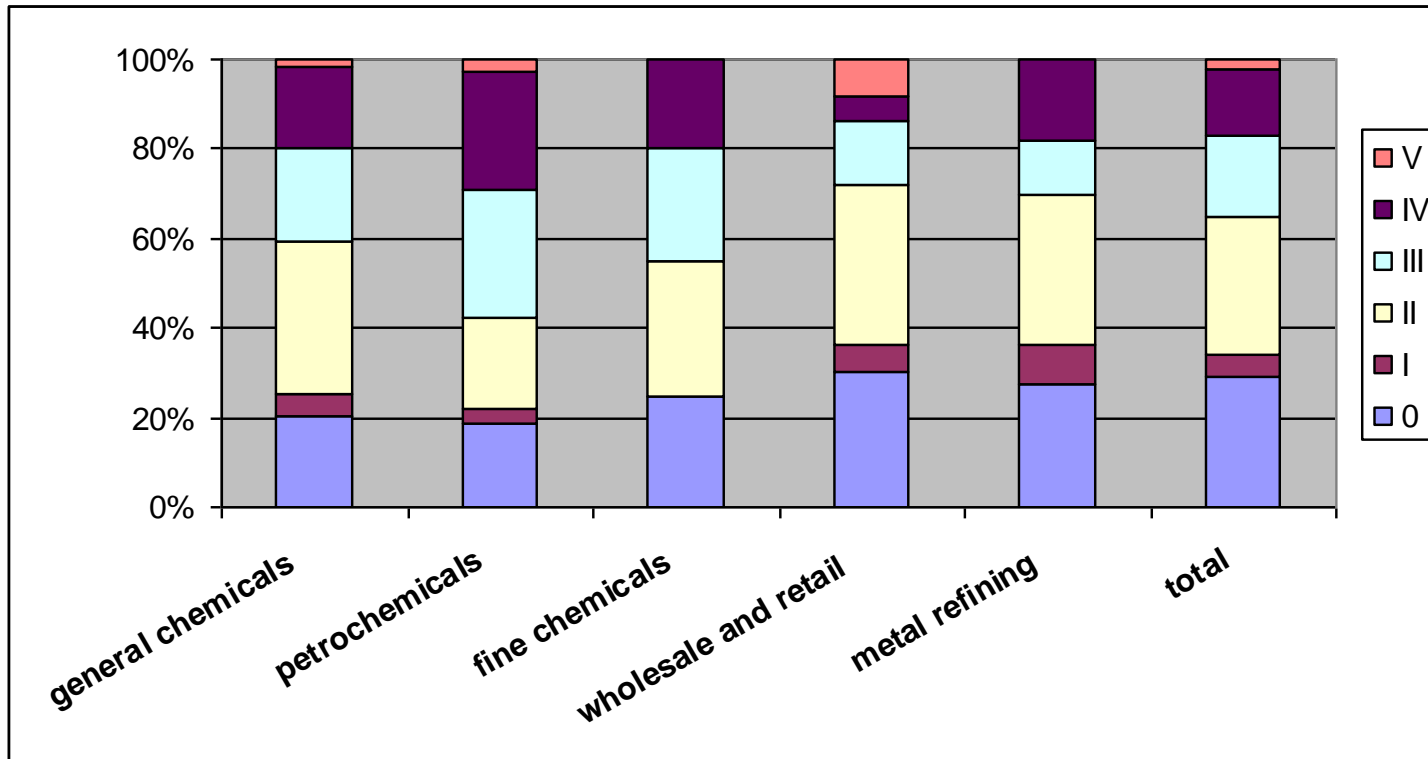
Prevention
e.g. Equipment Design, Maintenance & Inspection Policy, Procedures, Training & Competence



Prof Andrew Hopkins (Australia National University)



Level of learning from accidents



- About **33%** of all accidents lead to a **poor level of learning**
- For another **33%** the learning is only obtained at a **very local level**
- The last **33%** implies learning at **site level**
- Only **2%** of accidents leads to a degree of **learning on corporate level**

Asset Integrity & Reliability (Part 2 – chapter 3)

♦ Asset Integrity – General Considerations

♦ Inspection, Testing and Preventive Maintenance (ITPM)

- ITPM during plant commissioning
- ITPM during operations

Emergency Planning & Response (Part 2 – chapter 4)

♦ **Emergency Plans – General**

- Internal Emergency Plans
- External Emergency Plans

♦ **Emergency Response**

- Warning and Alert Systems
- Emergency Response

Equipment

- Emergency Teams

Managing Lifetime & Decommissioning (Part 2 – chapter 5)

◆ Temporary closure (“preservation”)

◆ Decommissioning

- Principles of Design for Decommissioning
- Obligations of OT Operator prior to Decom.
- Obligations of OT Operator during Decom.
- Obligations of OT Operator after Decom.

Safeguarding life, property and the environment

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