MJV Workshop for Seveso Inspections
OECD report on ageing of hazardous installations

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What is meant by ageing of installations?

Ageing is not simply the chronological ageing of a piece of equipment!

Ageing is a multi-aspect phenomenon:

- ageing of equipment (degradation of equipment over time from its initial condition)
- ageing of plant personnel (expertise, transfer of knowledge...)
- ageing of technologies (obsolescence, new design...)
- ageing of procedures
OECD project

• Initiated in 2013 by the OECD Working Group on Chemical Accidents

• Objective = better understanding ageing plants:
  - what are the risk factors associated to an ageing plant
  - is ageing a cause of accident
  - how ageing is being approached by public authorities
  - is ageing a specific subject in policy and regulations

• A report was written that sum up the conclusions from the different activities conducted within the framework of the project:

Analysis of accidents

- 430 reports of accidents were analyzed

- Ageing phenomena involved in reported accidents:
  - Corrosion: 45%
  - Fatigue/wear/vibration: 20%
  - Obsolescence: 12%
  - Erosion: 10%

- Main consequences of accidents associated with ageing:
  - Dangerous materials released: ~50%
  - Human consequences: 16%
  - Consequences to the environment: 15%
  - Financial loss: 12%

- Types of industries affected:
  - Production of chemicals: 33%
  - Production of petrochemicals: 26%

- Types of equipment affected by ageing phenomena:
  - Pipe: 45%
  - Storage tank: 26%
  - Heat exchanger, reactor vessel, pump...
Main causes for the reported accidents

• A failure caused by an ageing phenomenon is the result in one or more elements of the Safety Management System

• Human and organisational factors:
  - Lack of oversight of ageing issues by the company
  - Inappropriate design of the equipment
  - Absence of proper hazard analysis and risk assessment
  - Lack of proper monitoring/inspection/audit system
Guidance to improve ageing management

• Improve the knowledge of the installation:
  - Informing contractors and third party personnel about the functioning and history of the facility
  - Transferring knowledge about design or operation of the plant
  - Assuring the availability of up-to-date documentation (history, replacement, repairs...)
  - Learning from past accidents (in the site itself, or in the same industrial sector)

• Improve risk assessment and inspection:
  - Focusing inspections on critical pieces of equipment that are particularly subject to ageing phenomena
  - Conducting risk assessment before changing the way in which pieces of equipment are going to be used
How do the authorities address ageing?

SEVESO III Directive specifically requires SEVESO establishments to address ageing issues in their Safety Management System.

Questionnaire sent to delegations in 2014: 19 respondents

- The role of governments in addressing the potential consequences:
  - **Role of government**:
    1. Observe and correct unsafe situations / Impose penalties or other sanctions
    2. Support (guidance, recommendations) / Information
    ⇒ Half of respondents: Combination of the 4 actions above.
  - **Tools used by authorities to address ageing**:
    1. Regulation / inspection
    2. Recommendation and guidance
How do the authorities address ageing?

- How inspection approaches across countries address the issue of ageing:
  - Inspection programme designed for the topic of ageing:
    - Ageing is not often considered as a separate subject requiring particular attention in policy and regulations.
    - Only a few countries have an inspection programme for ageing (5/18 respondents).
    - Inspection programme focus on aspects of ageing, and not all types of ageing (degradation, obsolescence, organisational...)
  - Specific questions or check lists about ageing:
    - Procedure with check lists on ageing or specific sectors
    - Sometimes used as a general guidance
  - Inspection of degradation mechanisms:
    - Mainly treated as a maintenance or safety issue
How do the authorities address ageing?

- How inspection approaches across countries address the issue of ageing:
  - **Reason of introduction of inspections:**
    - Usually because of past accidents trends
    - Because research was conducted on ageing
  - **Weaknesses in industry’s response to ageing:**
    - Outsourcing ageing management activities
    - Documentary evidence of maintenance history
    - Addressing corrosion under insulation
Examples of programme addressing ageing

- United Kingdom
- Germany
- France
Thank you for your attention

Any questions?