

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:

<http://www.oecd.org/env/ehs/chemical-accidents/publicationsintheseriesonchemicalaccidents.htm>

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

Tip!

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 country has a 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?

