French action plan in industrial facilities : to control risks from ageing

***3 February 2010**, BRUSSELS*

Dr Marie-Astrid KORDEK-SOENEN, INERIS (France)
marie-astrid.kordek@ineris.fr

INERIS
maîtriser le risque pour un développement durable

National Institute for Industrial Environment & Risks

Created in 1990

- Revamp and merging of National Institute for Mining, Coal and Steel and Applied Chemical Research Institute

Public-private entity

- Supervision by Environment Ministry
- Client basis: 50/50

Center of expertise

- 600 staff
- Demanding recruitment
  - Engineers; PhDs
  - Hard & Soft Sciences

INERIS
maîtriser le risque pour un développement durable

INERIS Activities at a Glance

Technical Expertise for Industry

- Risk analysis, assessment & management
- Process safety; technical & organisational features
- Risk-based support to innovation & project development

Regulatory Expertise for public & private clients

- Support to industry to meet regulatory demands
- Third party review of safety studies (for State services)
- Pre-normative contribution for State & European services

Research: covering most fields of industrial safety

- Process; safety systems; methodology; social science etc.
- Public (State, EC etc.) and private research

Training to industry & civil servants

- On the shelf and on-demand

INERIS
maîtriser le risque
pour un développement durable

Introduction

Why a national plan in 2009 ?

Aims and scope of the 2009 action plan

Role of INERIS in this action plan

Main topics of the benchmark

National Action Plan for 2010 :
plan de modernisation des installations industrielles

INERIS
maîtriser le risque
pour un développement durable

Why a national plan ? Succession of accidents in France

- these last 10 years : about 120 accidents linked to ageing of the facilities – mainly corrosion *(source : database ARIA from the BARPI)*
  - Refineries : 14 accidents ;
  - Flammable liquids storage (terminals) : 14 accidents ;
  - Chemical industries (52 accidents) ;
  - Production of gas (Natural or LPG) :4 accidents ;
  - Others (including pipelines) : 32 accidents.
- Recent examples :
  - Pipeline of la Crau – summer 2009 : leak => pollution of a preserved area
  - Refinery in Donges – 2008 : leak on a fuel pipe due to external corrosion => pollution of the Loire
  - Refinery in Notre-Dame de Gravenchon – 2008 => leak on a propane pipe due to external corrosion
  - Petrol storage unit at Ambès – 2007 : catastrophic rupture of an atmospheric storage tank of petrol ; *corrosion of the ground of the tank*
  - Refinery of Martigues – 2008 : leak on a floating roof of an atmospheric tank

Why a national plan ?
Succession of accidents in France

- Most of the accidents (half of them) : pipes (difficult access, important lenght…);
- Pressure storage tanks : few accidents
- More frequently: atmospheric storage tanks

- Three subjects of worry:
  - For some of the equipment : inspections have been performed recently and have concluded that the equipment was « fit for service » => what confidence in the control ?
  - For others : no inspections were performed (out of the scope of the inspection plans)
  - Facilities more and more « old » => worry for the future

=> Launch of a national "ageing" plan by the French Ministry of Ecology at the end of 2008 to define a national action plan at the end of 2009.

INERIS
maîtriser le risque pour un développement durable

The 2009 national « ageing » Plan : aims and scope

To improve the control of ageing in the high-risks industrial facilities in France

- Implementation of national working groups (WG) dealing with different topics :
  - Capacities and piping (pressure equipment or non subjected to pressure regulation)
  - Atmospheric storage tanks
  - Electricity and safety instrumented systems
  - Civil works
  - Pipelines

- Leader of the WG : representatives of the Ministry;
- Participants : competent authorities, experts (INERIS…), representatives from the industries (especially onshore oil and gas, chemistry sectors…), control and certification companies

- Facilities in the scope of the national plan : refineries, terminal petroleum storage, LPG sites, chemical facilities, companies from pipelines

Role of INERIS in the action plan

- Benchmark of the French practices
  - To make an analysis of the practices
  - To underline the difficulties
  - To suggest improvement

  - Analysis of the regulation and professional guides
  - Visits on 14 sites
  - Participation to the national WG

- International benchmark
  - To make a comparison in terms of regulations and practices in four countries (United-Kingdom, USA, Netherlands and Germany)
  - Comparison with the French practices

  - Bibliographic analysis of the regulations and professional guides
  - Survey with EU-VRI
  - Direct contacts and conferences

=> For a limited scope

- no boilers, no pipelines, no process equipments, no buried equipment…
- In-service inspection only and not control after fabrication or at the commissioning

INERIS
maîtriser le risque pour un développement durable

Main topics of the benchmark : for each type of equipment (pressure, hazardous substances, civil works, SIS…)

1/ Are **the inspections mandatory**? What are the main principles and what are the main reference texts (regulation and/or professional guides)?

2/ Who is **responsible for the control of ageing** of the equipment (users, owners…)? Who is **responsible for supervision** (authorities, insurance companies…)? What is the periodicity of the supervisions?

3/ Are the persons in charge of writing the inspection plans and / or carrying-out the inspections required having a **specific competency** (official accreditations, training and experience…)? Are there persons from the site or external organizations?

4/ Are **inspection plans or / and inspections validated by a third party** (external company…)? On what conditions are there validations? What are competences and qualifications of the possible third party?

5/ What are the **practices for inspections** (by who are they performed, according to what guides, what type of controls, what periodicity of inspections, in what industrial sector, depending on the structure of the company?)

6/ Are **there recent changes (less than 2 years) in the legislation** for taking into account control of ageing?

7/ Is **duration of life** predefined for specific types of equipment? Is a **remaining life** of equipment assessed after each inspection? What is the competence of the companies or people performing remaining life assessment? What are the criteria for considering an equipment is "fit for service" until the next inspection (by who and according to what reference document)?

8/ **Are there differences** in the policies between **large structures** (like refineries) and **small structures** (storage units or small chemical site)?

+ Some specific questions

1/ **Atmospheric storages** : What is the policy for opening the atmospheric storages? On what conditions can this opening be avoided (specific dispensation, substitutive controls…)? Opinion on acoustic emission ?

2/ **Vessels and pipes not subjected to pressure regulation:** According to what criteria are some equipment subjected to an inspection (consequences on the environment or human beings in case of loss of containment, high probability of failure, mandatory by a specific regulation...)?

3/ **Safety instrumented system (SIS)**

- What are the criteria defining the maintenance operations (changes of materials, change in the software, maintenance operations)? Is obsolescence taken into account?
- What is the policy for spare parts?
- What is the practice to collect and analyze the failures of SIS during normal operations or discovered during the periodic tests?

4/ **Safety devices :** Are there complementary policies (in addition to regulation regarding pressure vessel and pressure piping) to inspect safety devices (relief valves, bursting disks…)?

4/ **Civil Works** : What failures in relation with ageing have you noticed for retention dikes and foundations of storage tanks? For supports / anchorages of pipe works (pipe racks between process units or off-site pipe racks)? For pipe chases? For buried pipes in process units?

Organization of INERIS and results

- Around 10 persons directly involved for the different topics

- Reports :
  - First « project » report on the French practices in June
  - « Project » Report on international benchmark end of October

  - Final general report at the end of the year ; translation in 2010 in English
  - French and English reports would be available on INERIS website in 2010

INERIS
maîtriser le risque pour un développement durable

The content of the National Action Plan

- Foundations of plan :
  - Meetings of WG during 2009 involving 130 people (experts, industrials, government representatives)
  - Proposals to improve the regulatory framework / to develop standards/ guidance for specific industrial facilities, ...

- 6 TOPICS :
  - Safety Management System : 1 action
  - Civil engineering : 4 actions
  - Storage tanks : 14 actions
  - Pipelines : 8 actions
  - Facilities tubes and piping : 7 actions
  - Safety instruments : 4 actions

The content of the National Action Plan

- Safety Management System :
  - Adding a mandatory provision to SMS (Annex III of SEVESO II Directive : 7 points) : to constitute a reference document for the monitoring of risks equipment

- Civil engineering :
  - Zero State : general inventory
  - Monitoring of the civil engineering constructive works
  - Classification of the constructions : 3 class
  - Technical guidance

The content of the National Action Plan

- Storage tanks
  - Zero state & Monitoring of installations (specific inspections according to volume storage) & Technical guidances
  - Specific provisions for cryogen storage
  - Safety measure for crude oil storage
- Pipelines
  - Database on pipelines accident/incident
  - Complement of existing technical guidance and good practice guidance
  - Research actions on different items
  - Mandatory implement of SMS
  - 3rd party assessment for monitoring and maintenance plan.

INERIS
maîtriser le risque
pour un développement durable

The content of the National Action Plan

- Facilities tubes and piping
  - Incident indicators & sharing of feedback
  - Technical guideline to control pipelines
  - Risk assessment by applying safety report methods
  - Taking into account the environmental aspects
  - Periodic re-assessment of high risk-equipment
  - 3rd party of inspection plan
- Safety instrument System
  - Zero state
  - Monitoring and maintenance of “MMRI” Instrumented measure of risks control : elaboration of technical guidance

Conclusion

38 measures grouped into 6 topics and based on :

- Technical guidances
- Specific inspections (internal or external)
- Development of research items to improve knowledge of ageing phenomena
- Implementation of these actions with a collaboration between all participants of the 2009 action plan.

Thanks for your attention:

Questions ?

INERIS
maîtriser le risque
pour un développement durable