



**MINISTÈRE  
DE LA TRANSITION  
ÉCOLOGIQUE**

*Liberté  
Égalité  
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**National strategy on  
ageing and maintenance  
at hazardous sites**

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**Feedback from France**



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- 1. Origins and need for a national strategy**
  - 2. National strategy and modernisation plan**
  - 3. Feedback from inspection campaigns**
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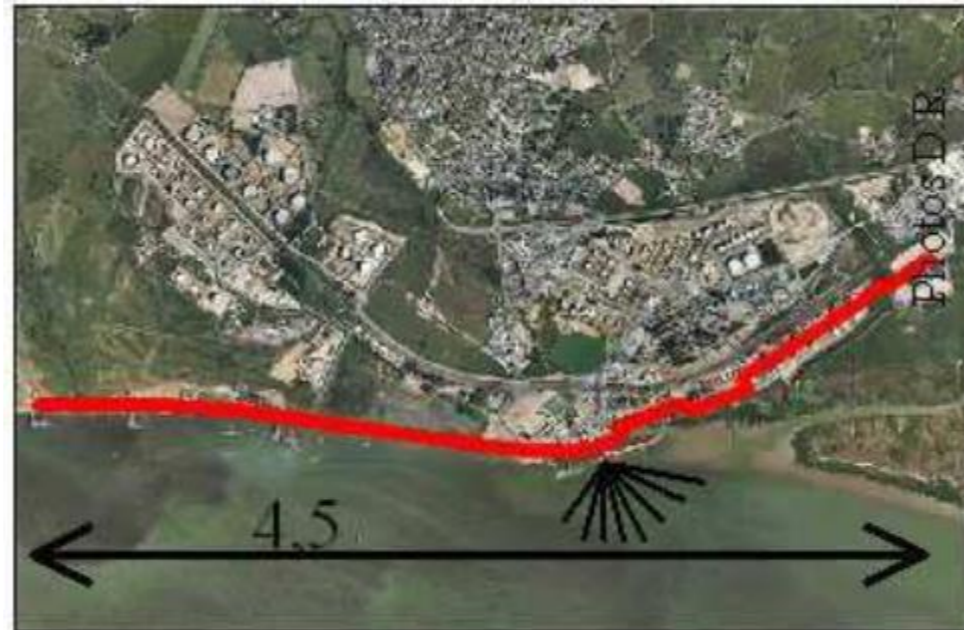
# Origins of the national plan (1/3)

- **12 January 2007 : Oil storage tank breaks**
  - 12 000 m<sup>3</sup> spilled out in a few seconds
  - 2 000 m<sup>3</sup> of petrol flow over the lateral bunds directly into the Garonne river
  - Contamination of the river over 40 km
  - De-pollution: 40 persons, for 6 months, more than € 50 million loss for the operator



## Origins of the national plan (2/3)

- **16 March 2008 : Pipe leak in a refinery near the Loire river**
  - Corroded pipe breaks : 478 tonnes of petrol are spilled over 5 hours (late detection)
  - Contamination of the river and the Atlantic coast over 60 km
  - De-pollution: 750 persons, for 3,5 months, € 50 million





## Origins of the national plan (3/3)

- **7 August 2009 : Oil pipeline breaks**
  - 5 000 m<sup>3</sup> spilled over 50 000 m<sup>2</sup> in a natural reserve
  - 73 000 tonnes of contaminated soil dug out and replaced by clean soil
  - 1 year after: 200 L of oil are skimmed from underground water reserves
  - Cost of € 10 million



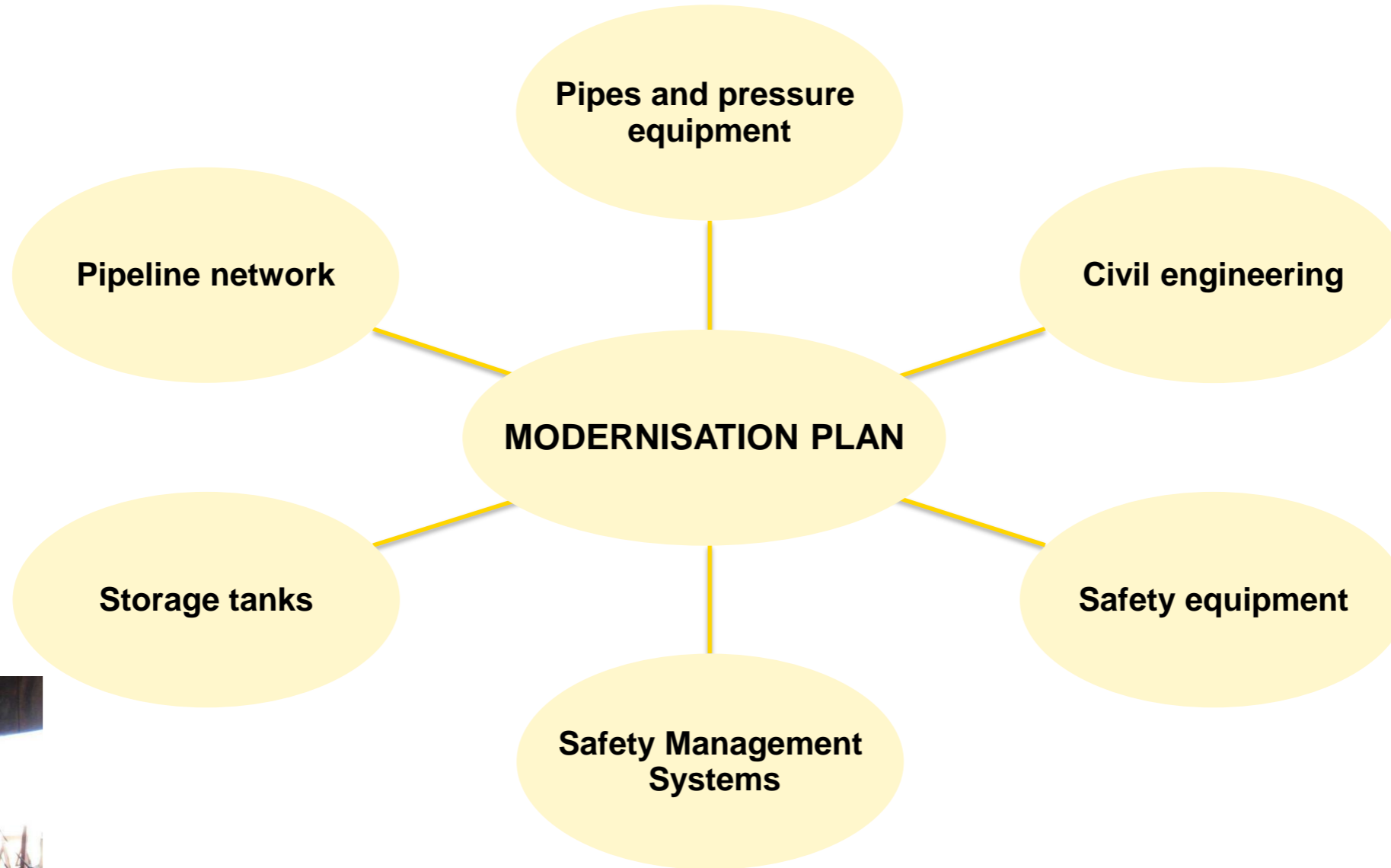


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# Plan for modernising industrial installations (PMII 2010)





# General methodology

1. To establish an **inventory** of equipment (tanks, pipes, etc.) that could lead to a **major accident** in case of failure
2. To **assess** equipment's **initial state** (good, acceptable or damaged) and compile a **technical dossier** with all relevant information (plans, characteristics, operating conditions, photos, monitoring, repair and maintenance history, etc.)
3. To **develop** and **implement** an **inspection programme** to be conducted by the plant operator:
  - **Routine** inspection: general state, structure, possible signs of deterioration
  - **Reinforced** inspection: targeted checks and controls
4. To **establish** and **maintain** a data base for keeping track of and **record inspection results**
5. To **carry out maintenance** and repair actions

# Generic and targeted regulations

- Ministerial orders:
  - **Generic requirements** for monitoring **ageing** and **carrying out maintenance**
  - **Generic requirements** for taking ageing into account in the **safety management system**
  - Specific requirements for:
    - **aboveground storage** tanks containing flammable liquids
    - **Pipelines**
    - **Pressure equipment** and pressure **vessels**

# Specific guidelines and targeted inspection campaigns

- Specific national working groups (trade associations, inspectors, experts, competent authorities)
- Specific national guidelines for each area of the modernisation plant:
  - How to identify relevant equipment
  - Possible failures and degradations
  - Targeted control points and associated control methods
  - Acceptance criteria
  - Monitoring frequency
  - Timeframe for repair and maintenance action / prioritisation
- Inspection checklist for plant operators



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# Inspection campaigns by competent authorities

- **2012:**
  - deadline for plant operators to **comply with the modernisation plan.**
  - **First informal inspections**
- **2013 – 2017:** formal inspections
- **Objectives:**
  - To **verify the appropriate implementation** of the modernisation plan by plant operators
  - To **check its follow-up** in the long run
- Average number of annual inspections: ~300





# Feedback from inspection campaign

- **More exhaustive and systematic identification** of relevant equipment
  - **Improved maintenance** : maintenance actions are better **identified** and **scheduled**
  - Better **understanding** of degradation mechanisms
  - Improved **anticipation** and organisation for **maintenance** and **repairs**
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- Technical dossiers are **not always available**, or are **incomplete**
  - First assessment of **equipment's initial state** is **not always (properly) done**
  - **Maintenance** or corrective actions are **not always implemented** (or implemented in due time)
  - **Outsourced maintenance**: possible difficulties/issues due to outsourced maintenance are not always identified

# Lessons learnt and good practices

- Thorough and careful checks play a major role in **anticipating** and **preventing** ageing and failure of equipment
- Staff **awareness** and **involvement**: essential to involve all staff from top management to maintenance workers in the design of the modernisation programme
- Controls should be **increased** before and after plant **shutdowns** and **turnarounds**
- A good knowledge of main equipment types, and a good maintenance plan help **anticipate** the need for **replacement** and the management of **spare parts**



# Thank you for your attention!

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