Industry Initiatives on New Reactor Designs

EDF perspective

Xavier POUGET-ABADIE
Senior Safety Advisor
EDF Nuclear and Engineering Division

MDEP conference Sept 15-16, 2011
EDF’s nuclear facilities in France

- A standardized fleet
  - 58 reactors in operation
  - Distributed over 19 sites
  - Unique technology: PWR ("Pressurized Water Reactor")
  - 3 power capacity levels:
    - 900 MW: 34 units, 31 GW
    - 1300 MW: 20 units, 26 GW
    - 1450 MW (N4): 4 units, 6 GW
  - EDF owns both nuclear power plants and sites
  - Average age: 24 years

1 MDEP conference Sept 15-16, 2011
EDF involved in several EPR projects in the world

**United States**
- First EPR planned at Calvert Cliffs

**France**
- 1 EPR unit under construction (Flamanville)
- 1 EPR project (Penly)

**Great Britain**
- Target: 4 EPR units
  - First EPR planned at Hinkley Point

**China**
- 2 EPR units under construction in Taishan with CGNPC

*2 MDEP conference Sept 15-16, 2011*
Standardization and series effect for plant design

Standardization and series effect do not mean strict duplication but should rely for a reactor design on the following:

- Adaptability of safety demonstrations and of plant design to specific country and site conditions
- Same core of main design features (main SSCs of the Nuclear Island)
- Benefit of the experience feedback and potential synergies between projects

Evolutions are necessary to avoid for a n\textsuperscript{th} new project using the same technology to be a FOAK

- Harmonized regulatory framework or mutual recognition mechanisms between regulators

EDF together with other utilities develops actions to promote harmonization and standardization through specific organizations

- The European Utility Requirements (EUR)
- European Nuclear Installations Safety Standards (ENISS)
- The EPR family
The European Utility Requirements

- EUR: a mature cooperative organization of European utilities
- EUR: a hub to harmonize European utilities views and requirements and to interact with major external stakeholders
  - Regulators: safety (WENRA), HV grid…
  - Vendors
  - International organizations: IAEA, EU, WNA
  - EUR counterparts outside Europe: EPRI, Asian utilities

The EUR document
- A generic GEN3 LWR specification
- A list of preselected designs
ENISS: European Nuclear Installations Safety Standards Initiative

- FORATOM/ ENISS representing nuclear licensees of the EU

- Interaction with WENRA in a constructive dialogue through the RHWG and the WGWG
  - Reference Levels for operating reactors
  - “Stress tests” specifications in the light of the Fukushima event
  - Safety objectives for new reactors

- Interaction with IAEA through assistance in IAEA drafting groups

- Interaction with the European Commission
  - EU safety directive
  - Long Term operation
  - “Stress tests”
The EPR Family: synergies and series effect between EPR projects

- Within the EDF group and in interaction with AREVA and TVO
  - Sharing safety and licensing issues and lessons learned
  - Sharing construction experience and best practices
  - Sharing procurement and information technology
  - Preparing for commissioning and operation
  - Coordinating our public acceptance initiatives

- In interaction with MDEP through the EPRWG
  - Making available information and data to explain and understand differences existing between different EPR projects
  - Promote harmonized principles, methods and solutions resulting in the same level of safety for all EPR family plants