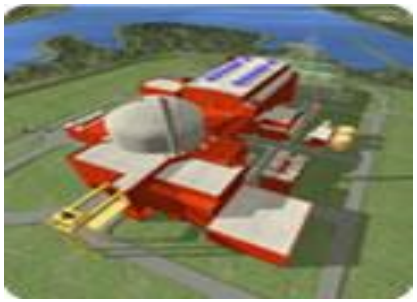
Radiological Protection Aspects of the Generic Design Assessment of Potential New Nuclear Reactors in the UK



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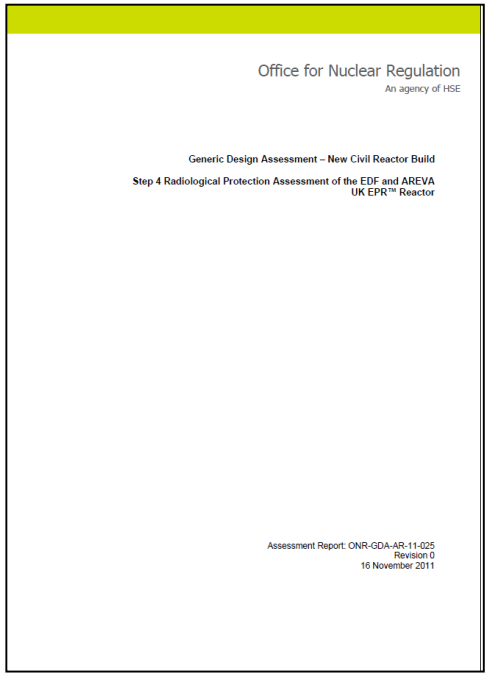
Environment Agency

Office for Nuclear Regulation

An agency of HSE

Approach (1)

- Four Step process
- Assessment criteria:
  - Relevant UK legislation (e.g. IRR99)
  - National and international standards
  - HSE Safety Assessment Principles (SAPs)
- Publication of reports
  http://www.hse.gov.uk/newreactors/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Generic Design Assessment – New Civil Reactor Build

Step 4 Radiological Protection Assessment of the EDF and AREVA UK EPR™ Reactor

Assessment Report: ONR-GDA-AR-11-025
Revision 0
16 November 2011

Approach (2)

- Challenges:
  - Significant amount of documentation
  - Wide scope of topics to be assessed
  - Designs from countries with differing regulatory frameworks
  - Operating procedures not finalised
  - Differences in language/metrology
- Sampling approach
- Consistent approach
- Technical Support Contractors (TSCs)

General Outcomes

- We were **broadly satisfied** with the claims, arguments and evidence within the Requesting Parties' safety cases and supporting documentation for radiological protection.
  - Worker doses (routine and accident) had been reduced so far as is reasonably practicable
  - Predicted doses to members of the public are very low
- We considered that from a radiological protection view point, **the designs are suitable for construction in the UK**
  - Subject to the satisfactory progression and resolution of one **GDA Issue** for each design
  - There are a number of **Assessment Findings** that will require further analysis by future licensees during the site specific phase

GDA Issues and Assessment Findings

Two mechanisms for capturing ongoing matters of concern:

- **GDA Issues**
  - Matters of particular significance that will require resolution before ONR would agree to the commencement of nuclear island safety related construction of the reactor design in the UK
- **Assessment Findings**
  - Matters where the lack of detailed information limited the extent of ONR's assessment
  - Require further analysis by future licensees during the site specific phase

Topics Covered in Step 4

Assessment areas relevant to normal operation
• Radiation sources. • Designated areas (radiological classification of areas / radiological zoning). • Shielding. • Contaminated Areas. • Ventilation. • Radiological instrumentation. • Decontamination. • Optimisation for work activities (including fuel route). • Waste handling and decommissioning. • Public exposure from direct shine (direct radiation originating from within the site boundary).
Assessment areas relevant to accident conditions
• Criticality control in the spent fuel pool. • Persons on-site. • Intervention personnel.

Points of Interest by Topic (1)

- Radiation sources
  - **Adequate**
  - Assessment Findings
- Radiological zoning and shielding
  - AP1000 – **Adequate**. Assessment Findings
  - EPR – **GDA Issue** – zoning and bulk shielding
- Contaminated areas
  - **Adequate**
  - Assessment findings

Points of Interest by Topic (2)

- Optimisation for work activities
  - **Adequate.** Doses ALARP
  - Assessment Findings
- Public exposure
  - **Adequate.** Public doses very low (<30 micro sieverts per year)
- Waste handling and Decommissioning
  - **Adequate** approach
  - Assessment findings

Points of Interest by Topic (3)

- Accident conditions
  - EPR
    - **Adequate**
    - Assessment Findings
  - AP1000
    - **GDA Issue** – Criticality control of the Spent Fuel Pool

Summary

- From a radiological protection view point, the designs are suitable for construction in the UK
  - subject to satisfactory resolution of GDA Issues
- One GDA Issue identified for each reactor
- Assessment Findings:
  - 20 for EPR, 15 for AP1000
- **Questions?**