WNA - New Build Licensing Conference
Multinational cooperation in the licensing of nuclear power plants

Session 3: Design development

Entering the new build
along with the potential to market new designs

How complete a design should be when going into licensing?

How to manage changes?
As an introduction
Some elements in the regulations

IAEA Safety Fundamentals (IAEA SF-1):

"The fundamental safety objective is to protect people and the environment from harmful effects of ionizing radiation.

This fundamental safety objective of protecting people and the environment ... has to be achieved without unduly limiting the operation of facilities... "

Safety has to be assessed for all facilities and activities, consistent with a graded approach.

A facility may only be constructed and commissioned ... once it has been demonstrated to the satisfaction of the regulatory body that the proposed safety measures are adequate.

=> Necessity to fully demonstrate nuclear safety and to anticipate in the licensing process
Safety assessment (Req.10)
Safety assessments shall be carried out throughout the design process for a NPP to ensure that all safety requirements on the design are met ... and to confirm that the design, as delivered, meets requirements for manufacture and for construction....

The safety assessments shall be commenced at an early point in the design process, with iterations between design activities and confirmatory analytical activities, and shall increase in scope and level of detail as the design programme progresses.

=> Flexibility is needed ....

Provision for construction (Req.11)
Items important to safety for a NPP shall be designed so that they can be manufactured, constructed, assembled and installed in accordance with established processes that ensure the achievement of the design specifications and the required level of safety.

=> Design in time to enable predictability and manufacturing ...
Refer to presentation yesterday by Dr Kefah Naom

**How prelicensing processes are helping deliver New Nuclear Build**

“**Pre-licensing** is generally seen by the nuclear industry as an effective means of enhancing predictability” (WNA)

Examples in US, UK, Canada, France, Czech Republic...

In France:
Examination of the safety options by the Safety Authority, before submitting the Preliminary Safety Analysis Report, which must demonstrate most of the safety analysis, by the operator (licensee).

=> Examination of design options to anticipate at an early stage of the process
US Regulation - Issuance of construction permits (10 CFR 50.35).

When an applicant has not supplied initially all of the technical information required ... the Commission may issue a construction permit if the Commission finds that:

.....

There is reasonable assurance that
(i) such safety questions will be satisfactorily resolved at the latest date stated in the application for completion of construction,...,

(ii) ... the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.

=> Flexibility to accompany the progress in the design
=> Major points:

- Importance to anticipate the progress in design for a smooth and predictable licensing process

- To demonstrate to the Regulator that the proposed safety measures are adequate (licensing process);

- To be able to take investment decision for construction in a predictable way

- To launch the construction process with the suppliers in compliance with the required level of safety

=> Questions:

- Which iterative process and with which level of detail?

- What are the best ways to lend stability and industrial consistency to the nuclear operational and planning processes?
EDF experience

**Licensing process**
- anticipate in submitting the safety options to the ASN and having its early feedback;
- importance of the Preliminary Safety Analysis Report, as a commitment by the operator to comply with the associated requirements, in order to give predictability to the project;
- necessity to reach a great confidence level in the design options when submitting the PSAR in order to minimize further modifications,
- it implies to have detailed accident analysis studies and PSAs at this preliminary stage, with validated methodologies;

**Decision process**
- beyond that, necessity to have sufficiently detailed studies at an early stage of the project to enable to take the Final Investment Decision or to validate the offer;

**Manufacturing oversight**
- necessity to anticipate the detailed studies for the procurement and quality control of big forgings, civil works and buildings for the first concrete, I&C... and even more if the planning is relatively short, while enabling the feedback of the manufacturers;

**Progress in design**
- the instruction can lead to some design modifications (additional requirements, adaptation, treatment of non-conformities...) which must be fully integrated in the process.