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Feedback on consenting process of PWR NPPs

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INTRODUCTION

Basis Of Feedback

- 2 X 1000 MWe VVERs under operation at Kudankulam (KKNPP-1&2):
  - Unit-1 operating with Regular Operation license
  - Unit-2 operating with authorization to operate at full power for 100 full power days- to be followed up with Regular Operation License after plant performance review.
- 2 X 1000 MWe VVERs under construction at Kudankulam (KKNPP-3&4).
  - Got the construction (FPC) consent.
- Extension of Siting consent for KKNPP-5&6.
- Technical Assignment (TA) documents of NPCIL with Vendor have been reviewed by AERB for
  - EPR
  - AP1000
- Discussions with Technology Developers of EPR and AP1000.

REGULATORY REVIEW OF NPPs

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- Existing consenting process as per safety guide on consenting process for nuclear projects (AERB/SG/G-1) envisages following
  - five major stages : Siting, Construction, Commissioning, Operation and Decommissioning.

- Allows stage wise consenting including three sub-stages of Construction- Site Excavation, First Pour of Concrete (FPC) & Erection of Major Equipment (MEE), if requested by applicant.

- Allows parallel construction and concurrent detail review of further stage.

SAFETY REVIEW PROCESS

Multi-tier systems is followed for review and assessment, safety monitoring, surveillance and enforcement

Construction, Commissioning & Initial Operation

APPLICATION

Internal Review by LWR Engg Directorate

NPCIL Safety Review (SRC) Committee(Project & Design)

WGs/SGs, PDSC, ACPSR, AERB Board

(as applicable)

Operation

APPLICATION

KKNPP Station Operation Review Committee (SORC)

NPCIL Safety Review (SRC) Committee (Operation)

KKSC, SARCOP

(as applicable)

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Feed back based on KKNPP experience on licensing

Experience of Licensing…..

NPCIL have the experience of more than 23 years in PWR Licensing process with AERB (First ACPSR-LWR meeting was held in Oct 1994 and so far 198 meetings have taken place).

Extensive review has been carried out in all areas by Specialist groups (SGs) and ACPSR-LWR and and as an out come there are safety enhancements of the plant and more importantly of In-house capabilities.

This Experience have been extensively helping in the technical discussions with Foreign vendors and finalization of Technical Assignments.

It has been a learning experience for both the sides, NPCIL being the major beneficiary.
Experience feedback of licensing is being shared for meeting challenges for rapid growth.

Feedback

- Comparison of codes of country of origin with code of other countries is a very challenging and risky exercise as each country develops the codes based on extensive exercise which are generally not shared.
- Detail design information in some cases may not be shared by technology developers. In some cases, informations are shared after supply of equipment. This aspect requires due consideration.
- Technology specific governing documents/Guides for consenting will speed up the process of submission by utility and review by regulator like Safety classification, PSI/ISI, Tech Spec preparation/revision, etc.

Feed back…..

- Standard Review Plan: Performing safety reviews of documents submitted by the Utility for Consenting applications and guidance for the applicant to know the expectations of regulator.
  - ✓ It enhances the quality and uniformity of safety reviews.
  - ✓ It helps the information about regulatory reviews widely available and to improve communication between the Regulator, Utility and the vendors/Suppliers.
  - ✓ It provides the guidance for the Utility & Designer to know the expectations of regulator.
- In some areas involving first of a kind system and specific safety research, submission of additional information (over the Licensing Requirement information) may be treated separately under a long term action plan and need not be linked with consenting clearance.

- For Nuclear buildings, there is a need to reconsider the requirements of door size, fire escape, staircase landing etc of Atomic Energy Factory Rules which are primarily intended for protection occupants in industrial buildings.

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- There is a need for speeding up the process of review of Commissioning stages and sub-stages.

A suggestion in this regard:

The commissioning tests should be carried out and checked against the acceptance criterion. If the approved acceptance criterion are met, then the utility may be allowed to submit the report and go ahead for the next stage.

For verification purpose, authorized representative Regulatory Body may be present in the plant.

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Feed back based On interaction with technology developers of AP 1000 and EPR

Experience

For other reactors with international cooperation NPCIL is engaged in discussions with various vendors like

- Westinghouse(WEC) for AP1000
- AREVA (presently with EDF) for EPR

Technical Assignments(TA) have been made for EPR and AP1000 and the documents were reviewed by AERB.

These review process helps NPCIL for greater understanding the technology, identifying the gray areas, improvements scope and acceptance of the technology w.r.t to regulatory requirements.

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Thank You