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Consenting Process of AERB for Regulation of NPPs



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Presentation Outline

- ❑ 700 MWe PHWRs - Fleet mode implementation
- ❑ Standardisation of design
- ❑ Proposed approach for Regulatory Consenting Process for fleet mode
- ❑ General feedback on the regulatory review process



Regulatory Consenting : Present Practice

□ Stages of Consenting Process

- Siting
- Construction
 - ✓ Excavation
 - ✓ First Pour of Concrete
 - ✓ Major Equipment Erection
- Commissioning
 - ✓ Phase A Commissioning
 - ✓ Phase B Commissioning
 - ✓ Phase C Commissioning
- Operation
- Decommissioning

Presently, Site/Project specific review is undertaken for all the above stages



700 MWe PHWRs

Fleet mode implementation

- Government of India has sanctioned the implementation of a fleet of 10 Indian PHWR units at the following sites
 - Chutka, Madhya Pradesh 2 x 700 MWe
 - Kaiga, Karnataka 2 x 700 MWe
 - Gorakhpur, Haryana 2 x 700 MWe
 - Mahi Banswada, Rajasthan 4 x 700 MWe

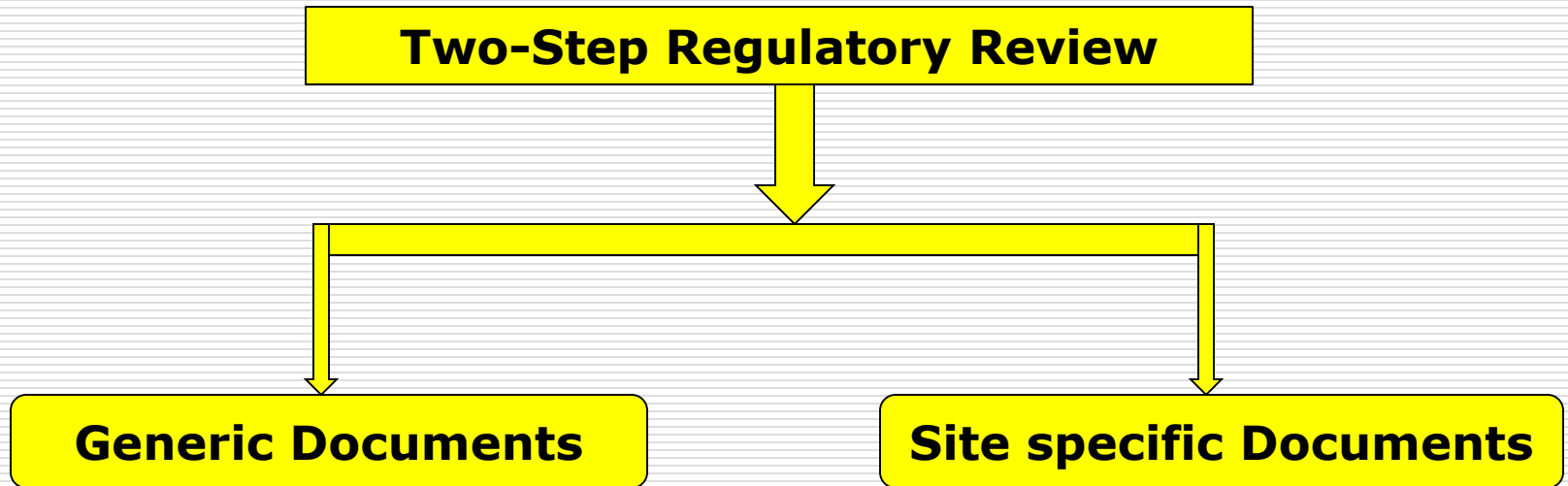


Standardisation of Design

- ❑ One seismic spectrum for soil site (GHAVP 1-4)
- ❑ An enveloping seismic spectrum for all the rock sites
- ❑ The GHAVP-1&2 design of 700 MWe PHWR will be qualified for the enveloping seismic spectrum for the rock sites
- ❑ Site specific engineering



Proposed approach for Regulatory Consenting Process for fleet mode



Proposed approach for Regulatory Consenting Process for fleet mode

- ❑ Review for siting consent may be carried out in line with the siting code with a focus on the rejection criteria so that the consent can be issued early. The review process may be optimized and regularized through the Regulatory Guide
- ❑ The siting consent is currently a requirement for obtaining Environmental clearance from the MoEF.
- ❑ Detailed evaluation of engineerability with respect to the site specific design basis parameters may be undertaken for the next milestone, i.e Construction



Proposed approach for Regulatory Consenting Process for fleet mode

Two-Step Regulatory Review

Review of Standard Design (GHAVP-1&2 as reference plant)

- **Standard Consenting Documents**
 - Design Basis Information
 - Safety Analysis Report (Preliminary)
 - Design Description (Part-A)
 - Accident Analysis (Part-B)
 - Design/analysis documents including FRS
- **Additional Documents to qualify standard design for rock site**
 - Analysis/Design Methodology
 - Standard DBGM for Rock site
 - Design/analysis documents including FRS for rock site

Site-specific Review

- **Siting Consent (Including Excavation Consent)**
 - ✓ SER in line with siting code based on site-specific data
 - *Present practice of granting consent, focusing rejection criteria may continue*
- **Construction Consent (FPC Including MEE)**
 - ✓ Detailed seismic studies beyond 5 Km radius
 - ✓ Detailed geo-technical investigation/foundation design parameters
 - ✓ Site-specific DBGM and establishing applicability of corresponding standard DBGM/FRS
 - ✓ Applicability of all other site-specific design input parameters with respect to inputs considered for standard design.
 - ✓ Ground/Foundation improvements, if any
 - ✓ Site Safety Assessment of NSDF
 - ✓ Site-specific nuclear security/ EPP
 - ✓ Site-specific contractor's documents
 - ✓ Site specific changes, as applicable



Proposed approach for Regulatory Consenting Process for fleet mode

- Provision may be built-in in the guide to permit review of standard enveloping design in advance so that the review outcome of such generic documents could be used at a later date along with site specific documents
- For this purpose, utility in consultation with AERB may identify **generic** as well as **site specific** documents



Proposed approach for Regulatory Consenting Process for fleet mode

- Flexibility may be provided for safety review, in case such requirement arises, concurrently with construction activities
- Lead time for submission of various documents may be optimized



General feedback on the regulatory review process

- ❑ Requirement(s) based on code/ guides identified in the midst of review process results in delays
- ❑ The applicable codes/ guides may be identified in advance
- ❑ If at all other international codes are to be considered, they may be used as reference documents and the applicability needs to be rationally decided by considering Indian conditions and reactor technology used



General feedback on the regulatory review process

- Regulatory documents due for review may be identified on priority and revised based on current technology and industry experience. (Example. Safety Standard on Fire Protection System)
- Areas where clear cut guidance is not available today may be identified and safety guides may be issued. (Example: (1) Beyond Design Basis Parameters. (2) Seismic Margin Assessment)



General feedback on the regulatory review process

- ❑ The design safety review may focus on the NPP design in depth and extent of review of detailed engineering may be optimized.
- ❑ Flexibility may be available with the designer to finalize engineering solutions/ changes without affecting the design intent by proven engineering methods as per relevant codes/ practices.
- ❑ During the course of review, postulation of additional events/ conditions beyond the scope of the relevant codes/ guides may be avoided.



General feedback on the regulatory review process

- ❑ Criteria for event reporting (ECRP) during construction may be defined with more clarity. The current scheme has scope for subjectivity.
- ❑ The number of expert working groups/ Task Forces may be optimized. Since it is practically difficult to precisely define the scope of different expert committees, repeat review becomes necessary.
- ❑ The review comments on documents or observations during Regulatory Inspections may be consolidated and scrutinized by a committee within AERB prior to forwarding the same to the utility. This could avoid repeat questions/ already resolved issues.



Thank you

