



NPP Site Selection, Land Acquisition & Project De-risking

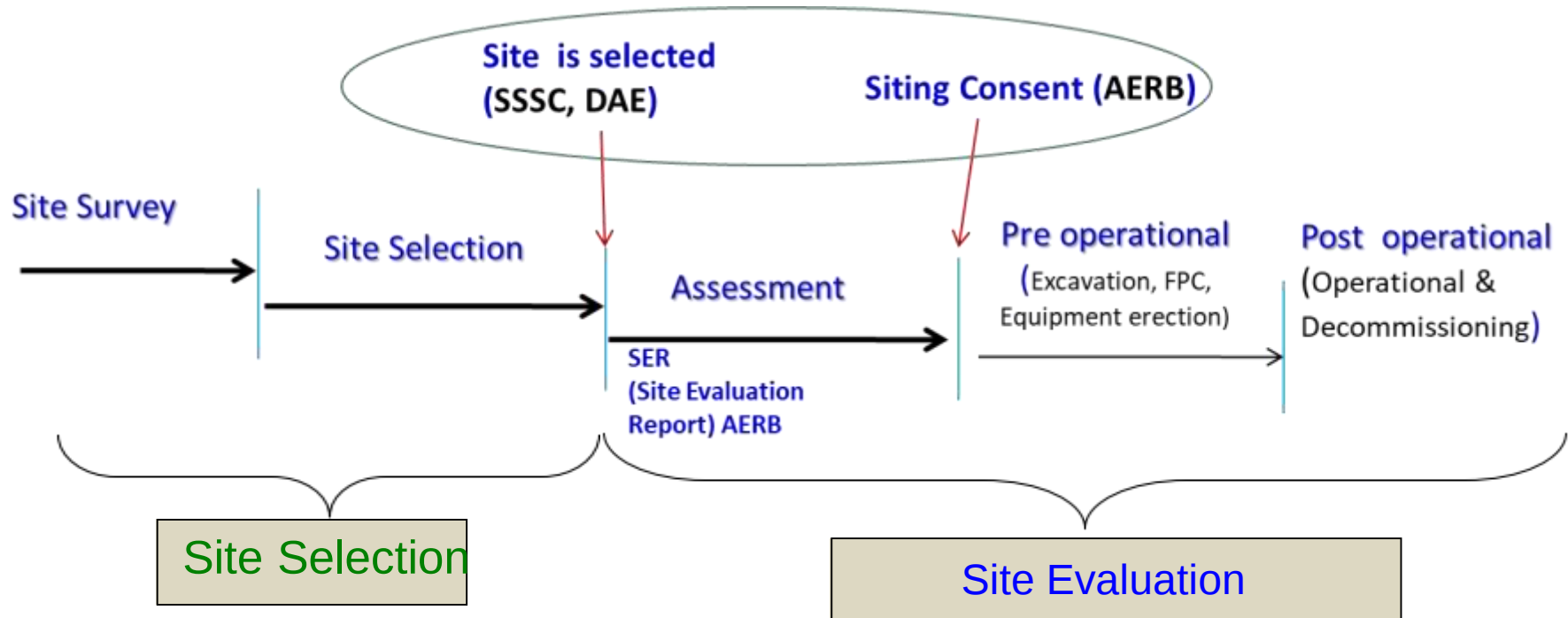
*Workshop on the SHANTI Act, 2025: Enabling India's 100 GW Nuclear Power Roadmap through Public-Private Partnership
New Delhi, April 17, 2026*

- NPP Site Selection
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- NPP Site selection parameters
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- Land Requirement for PHWR NPPs
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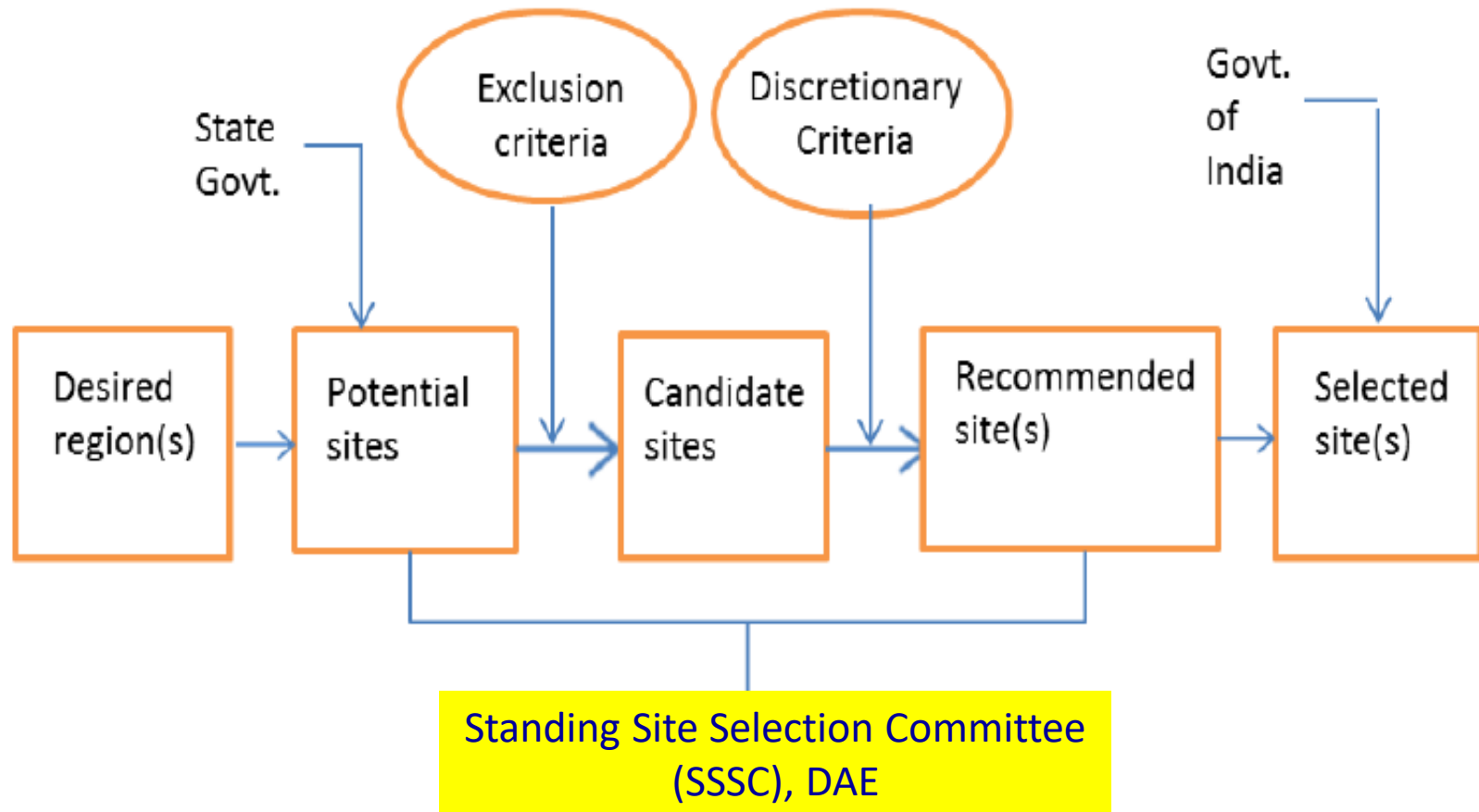
NPP Site Selection & Siting Process

Siting process involves two major sub-stages,

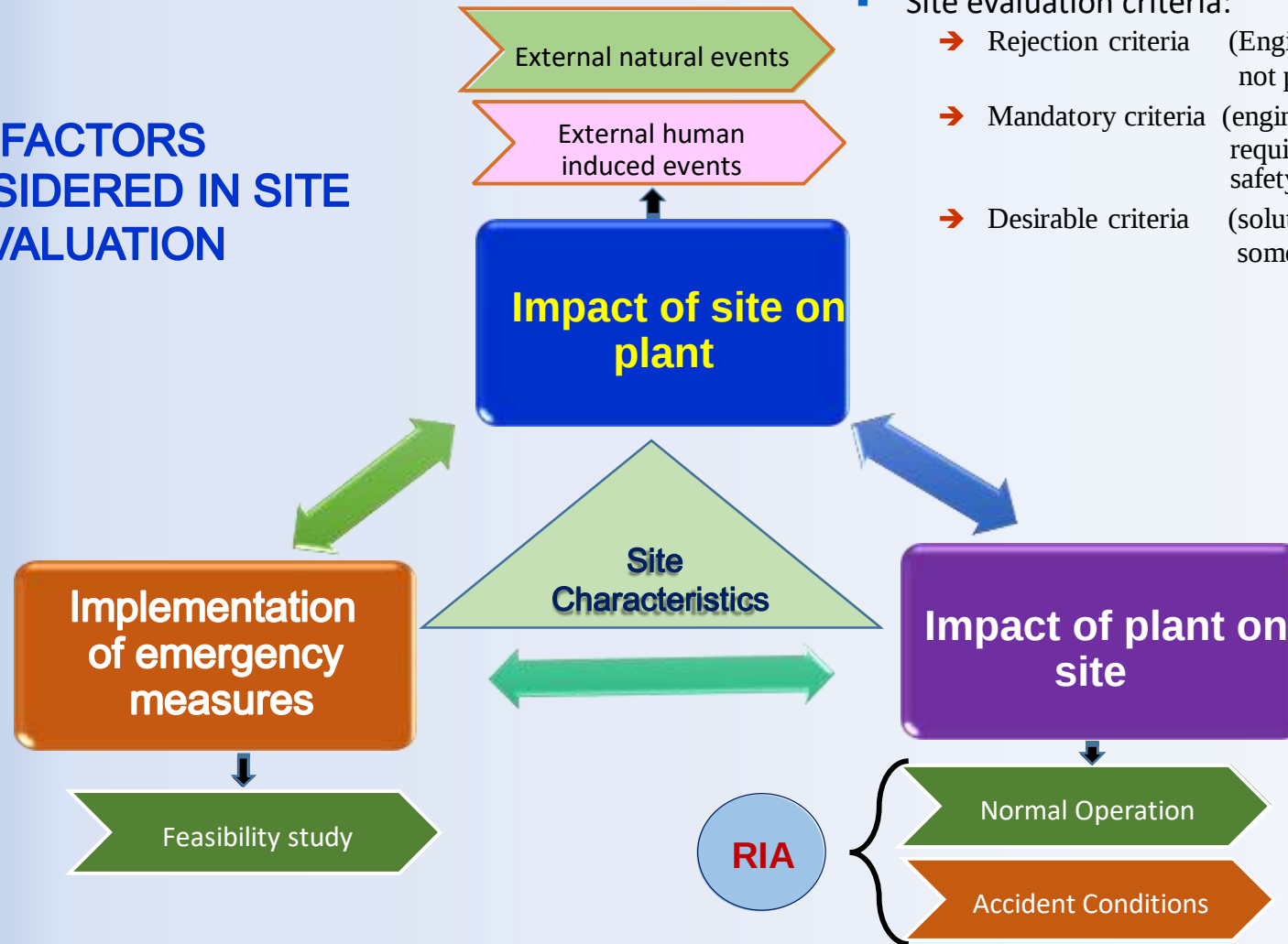
- Site Selection
- Site Evaluation



NPP Site Selection



FACTORS CONSIDERED IN SITE EVALUATION



Site evaluation criteria:

- ➔ Rejection criteria (Engineering solutions not possible)
- ➔ Mandatory criteria (engineering solutions required for radiological safety)
- ➔ Desirable criteria (solutions available with some economic penalty)

NPP Site Selection parameters

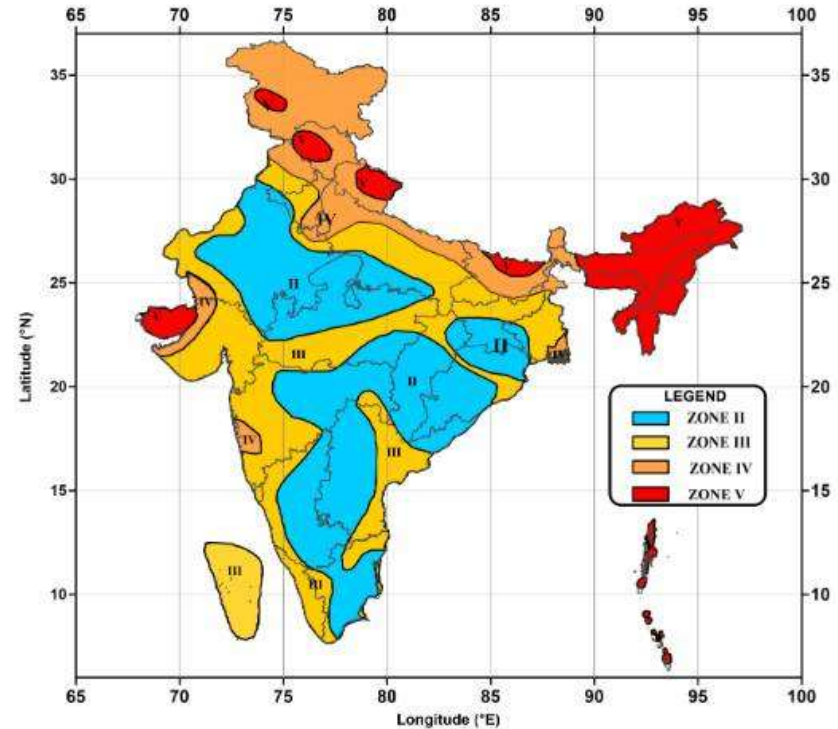
- ☐ Land Availability
- ☐ Water Availability
- ☐ Rejection Criteria – Seismic zone, Active/capable seismic faults within 5 km radius,
- ☐ Geotechnical studies to assess foundation parameters
- ☐ Seismotectonic studies to confirm rejection criteria (Ground Truthing)
- ☐ Site meteorology, hydrology, topography

NPP Site Selection parameters

- ☐ Demand for power in the region & facility for power evacuation
- ☐ Screening Distance Values (SDVs) – Airports, major military fields, tourist centers
- ☐ Presence of eco-sensitive areas including national parks, sanctuaries etc.
- ☐ Population distribution around the site
- ☐ Availability of Infrastructure like connectivity, access roads, availability of construction materials etc.

Rejection Criteria

- ☐ NPPs shall not be sited in Seismic zone-V as per IS 1893(Part-1) : 2016
- ☐ There should not be any active/ capable fault within 5km radius from the reactor centers
- ☐ The site shall be deemed to be unacceptable if existence of an active/capable fault can cause potential surface faulting affecting the safety of NPP.



Many other aspects related to impact of site on plant, impact of plant on the site environment and engineerability of the site are also studied to establish its suitability



Land Requirements for NPPs

- ❑ For locating plant buildings and exclusion zone.
- ❑ Exclusion zone (EZ) is an area extending up to a specified distance around the plant where no public habitation is permitted and this zone is physically isolated and is under complete control of plant management
- ❑ The stipulated AERB dose limits are to be met at the EZ boundary (1 mSv/year for normal operation and 20 mSv/year for Design Basis Accident)
- ❑ As per current AERB siting code (AERB/NF/SC/S Rev 1) the prescribed EZ radius is 1 km from center of each reactor at site.
- ❑ Reduction of the EZ requirement from the currently prescribed 1 km has been reviewed from safety and security point of view by AERB and DAE respectively and has been agreed in-principle. The applicable regulatory documents are under revision.
- ❑ The proposed EZ radius for 700 MWe PHWRs is 700 m and for 220 MWe PHWRs is 500 m. However, the final EZ radius for a site will be based on site specific RIA. ■



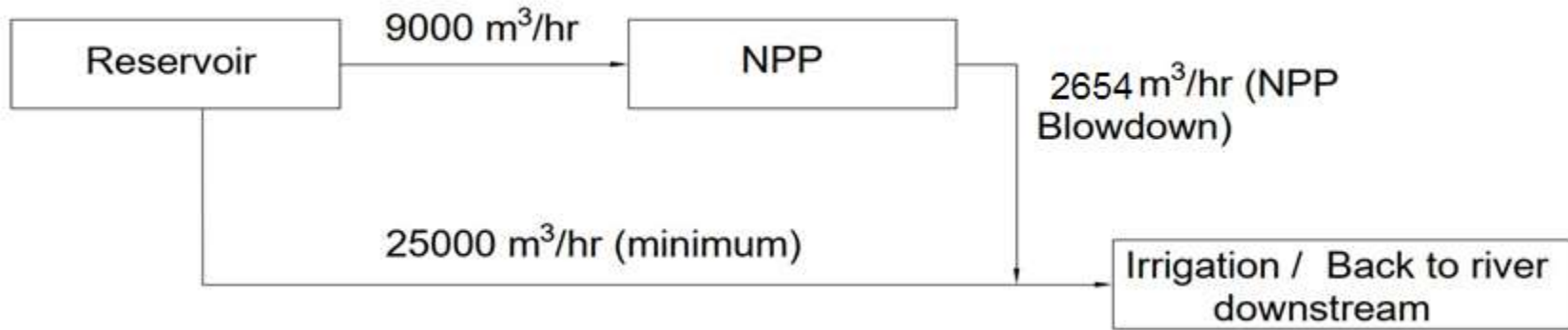
Land Requirements for 700 MWe & 220 MWe PHWR NPP

	2 x 700 MWe PHWR	2 x 220 MWe PHWR
Land Requirement	336 hectares for 1 km EZ radius 179 hectares for 700 m EZ radius	331 hectares for 1 km EZ radius 94 hectares for 500 m EZ radius

Water Requirements

For 2X700 MWe PHWR at Inland Site:

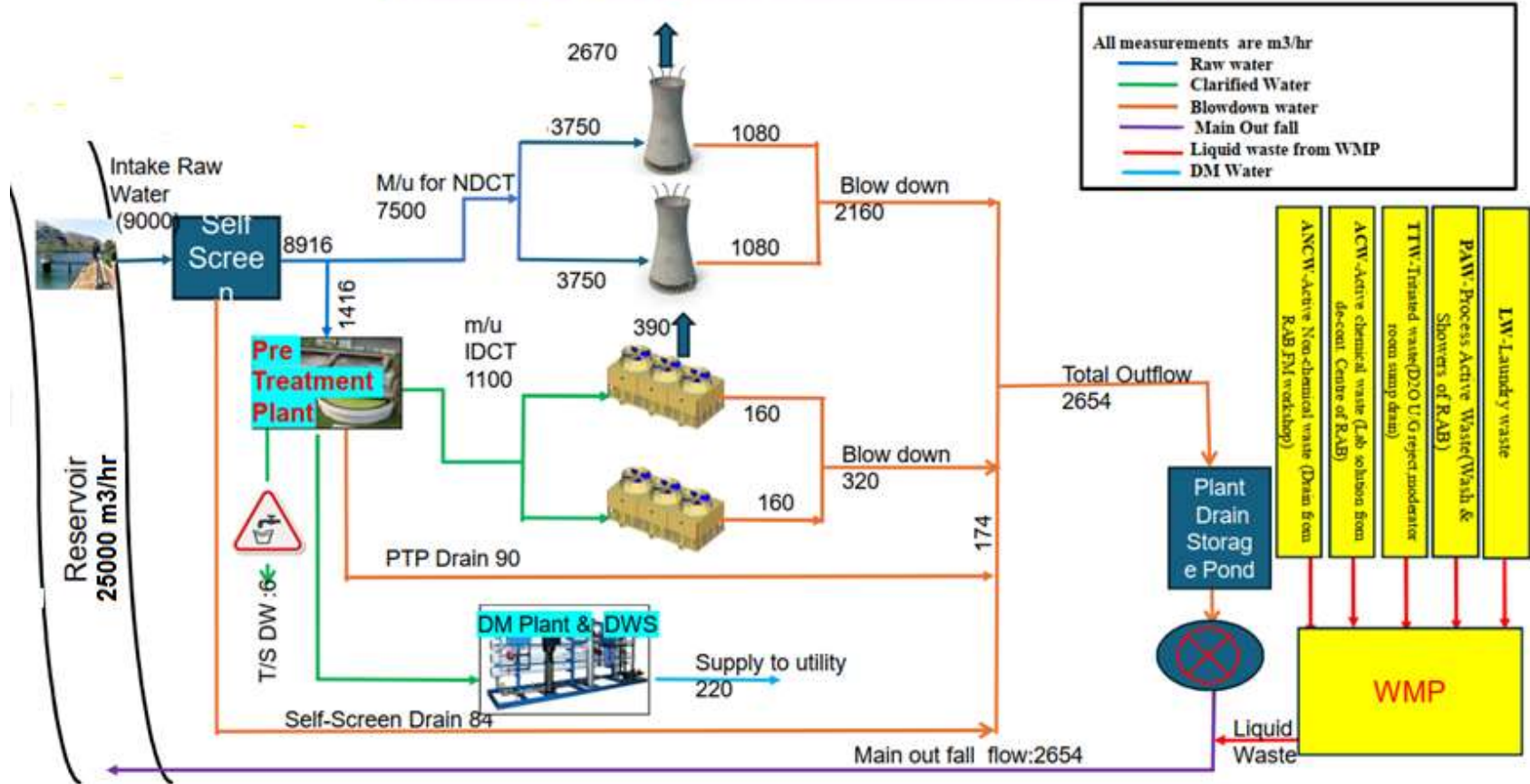
- Annual requirement - 80 Million Cubic Meters (MCM) or 9000 m³/hr
- Consumptive Use - 52 MCM
- Secondary dilution - Continuous flow of 25000 m³/hour in reservoir / river / canal



For Coastal sites : Sea water for Condenser cooling, fresh water from desalination

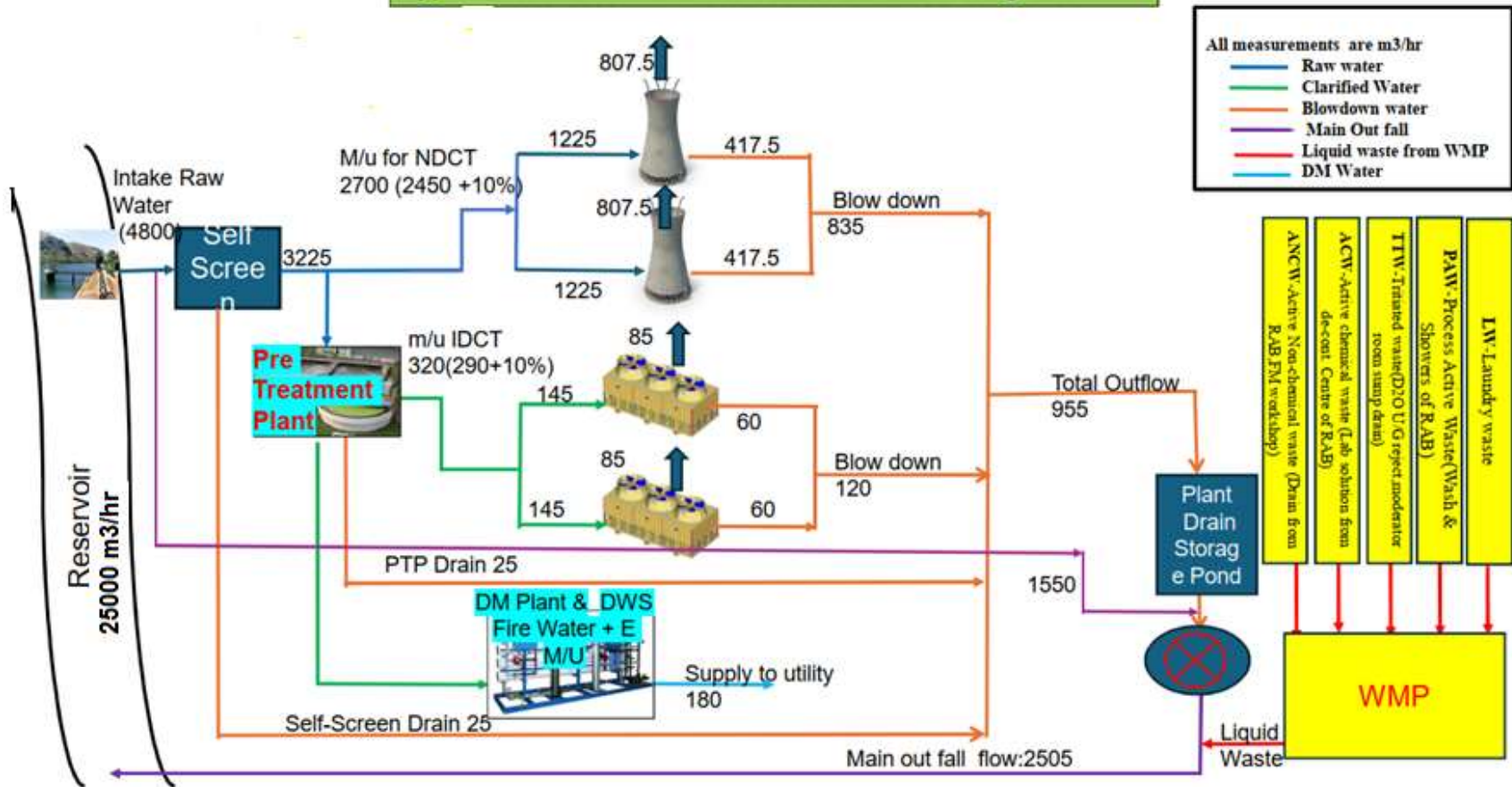
Water Requirements for 700 MWe PHWR NPP

Typical NPP 2 X 700 MWe Water Balance Diagram

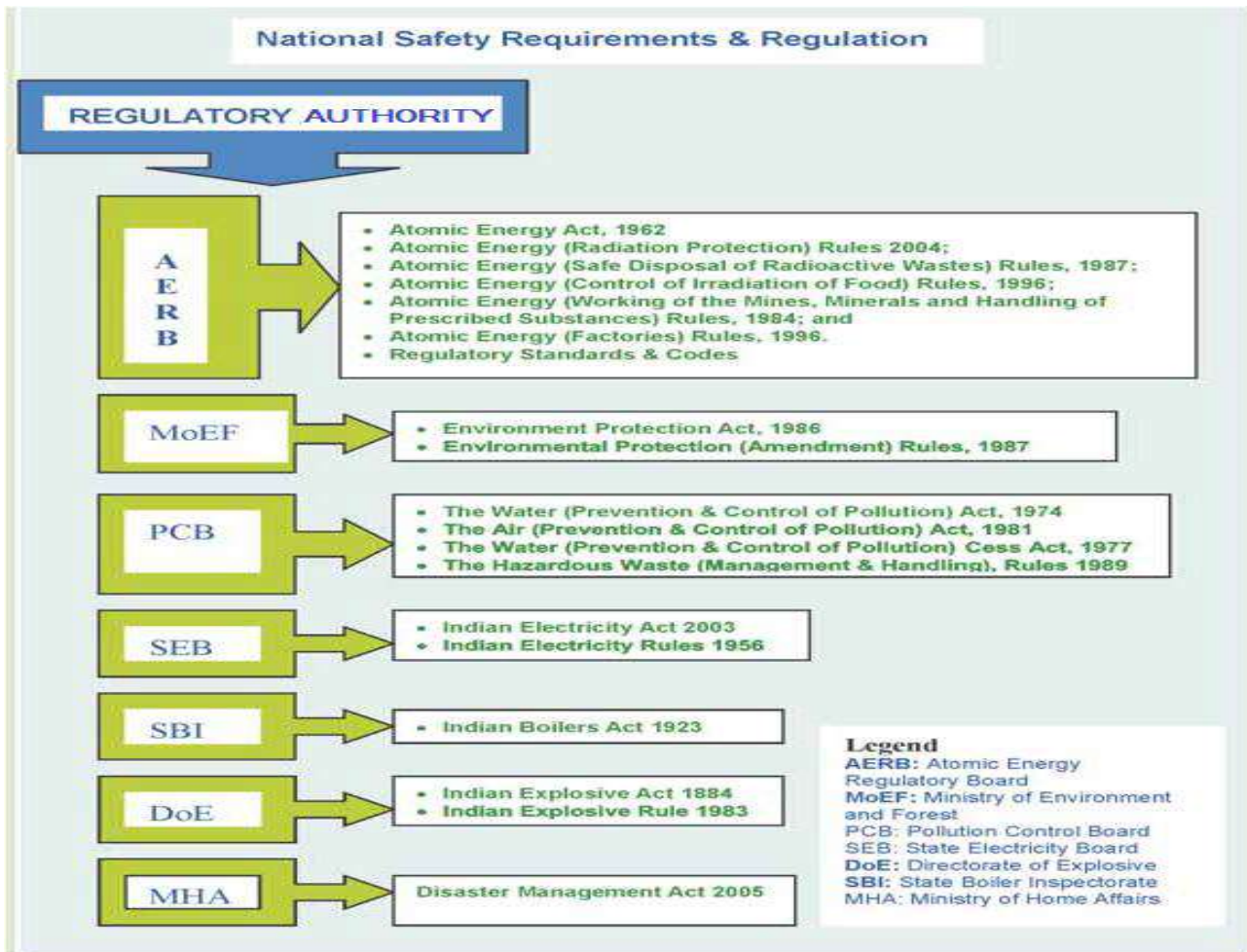


Water Requirements for 220 MWe PHWR NPP

Typical NPP 2 X 220 MWe Water Balance Diagram



Regulatory & Statutory interfaces for NPPs





Pre-project Activities for NPPs

Site-specific Studies & Investigations required for Siting consent and establishing design bases:

- ☐ Site Topography
- ☐ Geo-technical and Geophysical Investigations
- ☐ Seismotectonic studies for DBGM establishment & establishment of MEQ stations
- ☐ Site Specific Radiological Impact Assessment (RIA)
- ☐ Flood & Area drainage studies for fixing safe grade level of site.
- ☐ Landslide hazard zonation mapping
- ☐ Extreme Value Analysis A for Meteorological parameters

contd.

Pre-project Activities for NPPs

Site-specific Studies & Investigations required for Siting consent and establishing design bases:

- ☐ Water availability studies, bathymetry studies, finalisation of intake & outfall and water conveyance system from the water body.
- ☐ Sectorial Maps for population, demography, land use, etc.
- ☐ Health & dietary survey
- ☐ ToR & EIA studies for MoEF clearance
- ☐ External hazard Analysis (explosion/ toxic gas release)
- ☐ Construction water supply and power scheme
- ☐ Power Evacuation scheme



Pre-project Activities for NPPs

Documentation required for Application of Siting Consent

- ☐ Finalisation of plant layout
- ☐ Design Basis Information
- ☐ Preliminary Safety Analysis Reports (PSARs)
- ☐ Report on feasibility for implementation of Emergency Preparedness & Response
- ☐ Report on feasibility for implementation of Nuclear Security measures
- ☐ Preparation of Site Evaluation Report
- ☐ Report on Compliance with AERB Safety Codes & Guides (SC / G, SC / S, SC / NRE, Security requirements for NPP)
- ☐ Report on Compliance with statutory requirements.

Land Acquisition Challenges

- ☐ Support of State Government for Nuclear Power
- ☐ High Population density in the country
- ☐ Public Opinion – Addressing local public concerns
- ☐ Resettlement & Rehabilitation
 - ✓ Compensation & Rehabilitation (as per RFCTLARR Act)
 - ✓ Resettlement if displacement involved
 - ✓ Livelihood Issues
 - ✓ Demands for Jobs

Optimizing Available Land

- ❑ Brownfield Expansion
 - ✓ New units at existing sites use of existing infrastructure
 - ✓ Possible with reduced exclusion zone & optimizing layout (eg. KAPP 5&6, RAPP 9&10, NAPP-3&4)
- ❑ Locating new sites with potential to set up multiple units
 - ✓ Sites to locate 4,6,8,10 or more units
 - ✓ Share infrastructure reduces costs
- ❑ Adequate Land & Water Availability & Assurance of water the key for both the above

Possible Incentives for Home States

- ❑ Support of State Government is Critical hence it is important to incentivize states to offer sites for future NPPs
- ❑ Possible Incentives:
 - ✓ Higher Allocation of power from the NPP to home state
 - ✓ Incentive to the state on every unit of electricity sold for development of local area
 - ✓ Equity Participation of states in NPP, profit sharing
- ❑ Project de-risking by establishing a coordination mechanism between utility and state / local government for quick resolution of issues during the entire life of the plant
- ❑ Evolution of new & flexible business models e.g. shared responsibility for land acquisition, various statutory clearances, public awareness to create positive environment.

Thank you

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Land Requirements

No. of Reactors of 700 MW	Optimal Land Requirement in Hectares (Ha)
2 (2X700 MW)	179
4 (4X700 MW)	300
6 (6X700 MW)	418
8 (8X700 MW)	563
10 (10X700 MW)	691