



Insights from Siting New Nuclear Power Plants in the Central and Eastern United States

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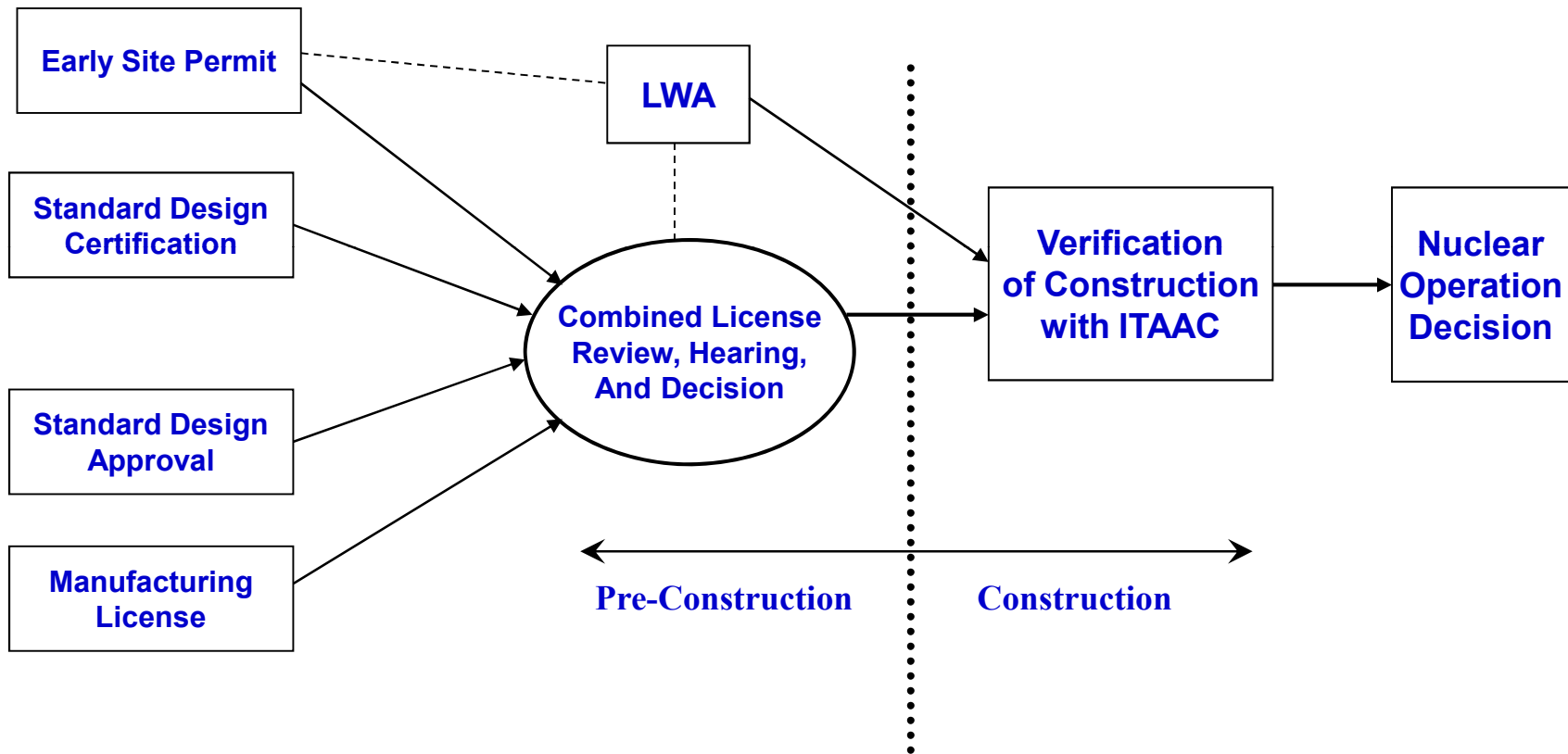
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Status of Reviews

- Design Certifications (DCs)
 - 4 certified (AP600, AP1000, ABWR, System 80+)
 - 3 in review (ESBWR, EPR, US-APWR)
- Licensing Actions
 - 4 early site permits (ESPs) completed, 2 applications pending
 - 14 combined license (COL) applications in review (23 units)

Part 52 Combined License Review Process





Combined License Review

- Pre-application interactions
- Acceptance Review & Schedule Development
- Staff review – RAIs and Confirmatory Analyses
- Site Audits
- Public meetings (environmental)
- Evaluate RAI responses
- Safety Evaluation Report and Environmental Impact Statement
- Advisory Committee on Reactor Safeguards briefings (SER only)
- ASLB Hearings
- License Issued
- Inspection, Test, Analysis and Acceptance Criteria (ITAAC)
Inspection Activities



Siting Safety Review

- Geology and Surface Faulting
- Seismology
- Geotechnical Engineering
- Hydrology/Flooding/Groundwater
- Meteorology
- Demographics
- Site Hazards
- Dose Consequences
 - Design Basis Accident Analysis
 - Severe Accident Analysis



Insights: Siting Reviews

- Pre-application interactions are important
 - Especially sites with unique hydrological, geotechnical or seismic aspects
 - Facilitate scheduling of NRC resources to complete COL/ESP review
- Keys to executing a review as planned
 - Complete, technically sufficient applications from the start
 - Minimal applicant or vendor-driven design/siting changes
 - Timely RAI responses



Insights: Siting Reviews

- **Geology, Seismology, Geotechnical**
 - Critical to evaluate recent literature
 - Documentation of applicant siting field studies is critical
 - Complete subsurface characterization is critical
 - Potential updates to seismic models need to be evaluated
 - Use of Probabilistic Seismic Hazard Analysis together with Performance-Based Approach has stabilized development of site-specific design ground motions



Insights: Siting Reviews

- Hydrology
 - Complete Groundwater flow and transport analyses in COLs are critical
 - Key assumptions of ground water flow, especially post-construction, may require detailed analysis
 - Consider appropriateness of groundwater model
 - Sensitivity analyses are critical to demonstrate adequate safety margin



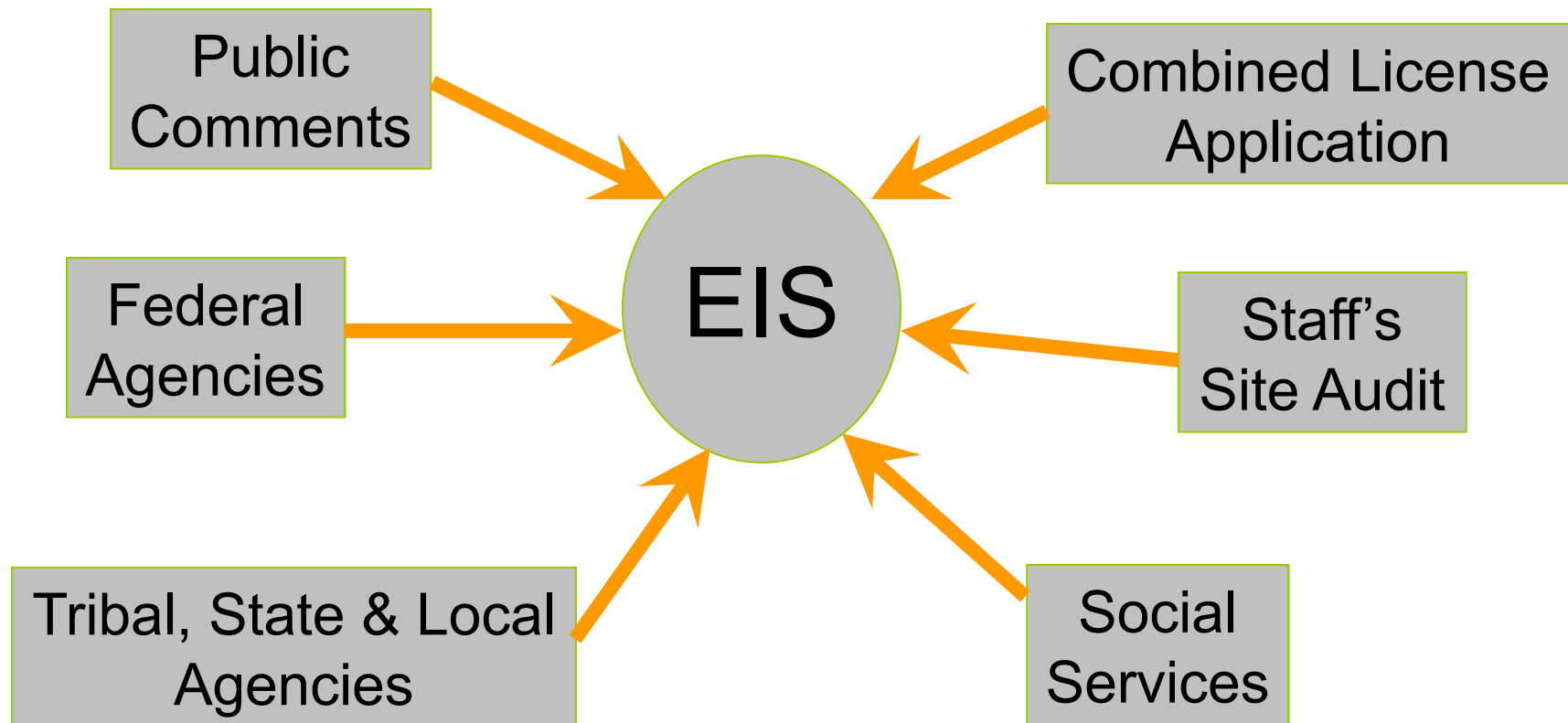
Insights: Accident Consequences

- DBA Dose Analysis
 - Passive or unusual design features or novel analysis methods result in detailed staff review
- Meteorology
 - Important to include complete meteorological data
- On-site and Near Site Hazards
 - Important to include complete information on transported and stored chemicals as well as dispersion model assumptions and inputs

Environmental Review

- National Environmental Policy Act requires environmental review – separate from Atomic Energy Act (safety) requirements/review
- Environmental review proceeds in parallel with safety review - EIS is one input to the hearing and the Commission's decision
- Environmental review includes typical issues (e.g., ecology, hydrology) plus human health, cultural resources, socioeconomics, alternatives, etc.

Environmental Review Information Sources





Insights: Environmental Reviews

- Regulatory Issues
 - Issues with information in applications, e.g.,
 - Age and sources of data
 - Conflicting information in parallel applications
 - Interagency coordination, e.g.,
 - Clarifying roles and responsibilities
 - Coordination and conflict resolution
 - Importance of pre-application interactions

Role of Public Stakeholders

- Compared to the 1970's, public groups:
 - Are better informed
 - Are better organized
 - Communicate instantly
 - Expect more from their Government agencies
- Agencies must:
 - Find better ways to communicate
 - Plan for higher levels of public involvement



Technical Matters

- Internet and GIS as tools
- It's all about the water
- Siting process guidance and experience
 - All applicants deviate from the guidance
 - Existing sites versus new sites
 - “Among the best” versus “best possible” site
 - Comparing apples to fish?





Summary

- New licensing process is being successfully implemented
- Issues and challenges have emerged during the reviews
- Challenges addressed through
 - Interactions between applicants and NRC staff
 - Development of Interim Staff Guidance
 - Revisions to Regulatory Guidance