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Guidance for the Implementation of 10CFR20.1406: Groundwater Protection Requirements for Advanced Plant Designs

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EPRI

EPRI Advanced Nuclear Plants Activities

- **Westinghouse AP1000:**
  - Review of Westinghouse AP1000 LLW Management Program (TR-1008016, 2003).
  - AP 1000 Radioactive Waste Management – Utility Position Report (TR-1008129 , 2004)
  - Mobile Processing and Treatment Systems (2005)
  - Review of Westinghouse AP1000 ALARA/RP Program (Ongoing into 2007)

- **GE ESBWR:**
  - Technical Support for GE ESBWR Radwaste System Design (TR-1013503, Nov. 2006)
  - EPRI Review of the GE ESBWR ALARA/RP Design Provisions (2nd Quarter 2007)

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EPRI Advanced Nuclear Plants Activities

EPRI Utilities Requirement Document Update

The EPRI URD is intended to be used by reactor NSSS vendors as a foundation for developing plant systems and plant design configurations consistent with current utility operations and performance.

- URD Chapter 12: Radwaste Management (2006)
- Development of URD Chapter on RP/ALARA (2006-2007)
- Review and Revision of URD with respect to Water Chemistry (2006-2007)
- Review and Revision of URD with respect to Groundwater Protection (2006-2007)

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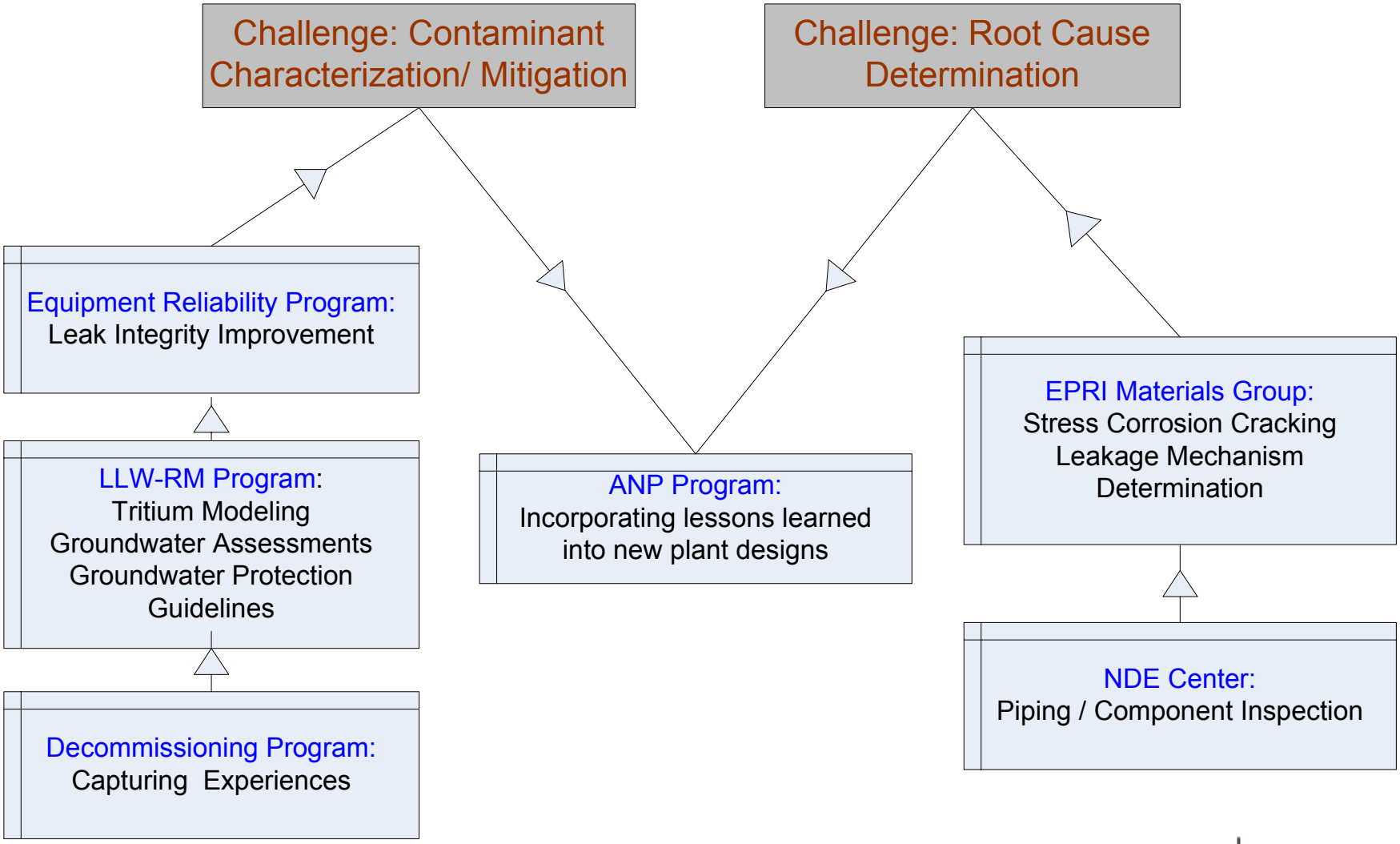
EPRI TASK FORCE ON GROUNDWATER CONTAMINATION



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EPRI Groundwater Protection Program

- EPRI Groundwater Monitoring Guidance (2005)
- EPRI Groundwater Assessments
- EPRI Groundwater Protection Guidelines (2006-2007)
  - Provide utilities with a standardized and site specific approach for implementing a technically sound groundwater monitoring and protection program.
- Investigation and Development of Advanced Technologies for Groundwater Monitoring and Remediation (2007-2009)

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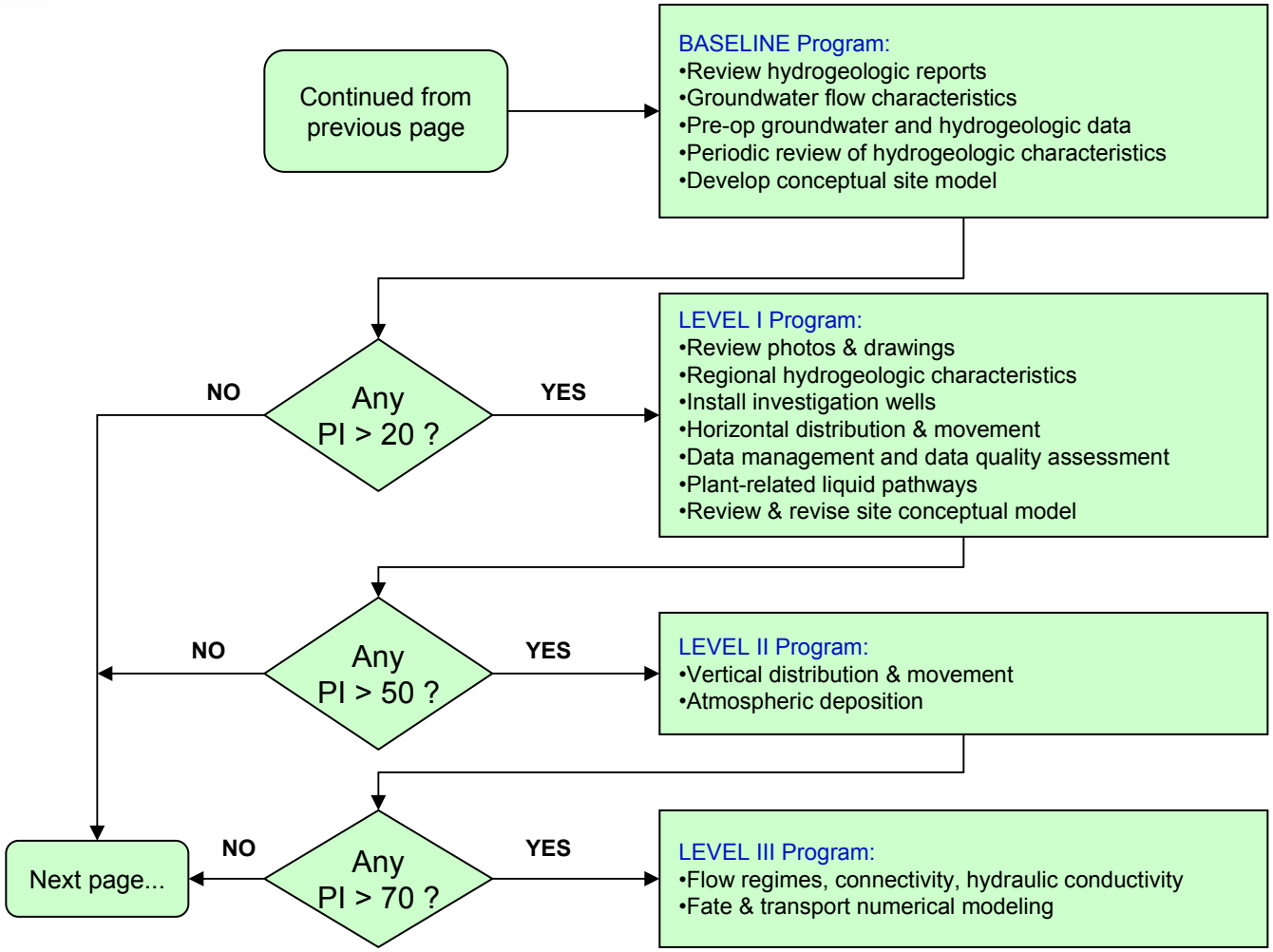
EPRI Groundwater Protection Guidelines: Graded Approach Strategy



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EPRI/NEI 10CFR20.1406 Involvement

Task

Provide *input to the regulatory guidance* for the implementation of 10CFR20.1406 based on *industry experiences and lessons learned*.

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Design Element: Spent Fuel Pool and Buildings

- For Spent fuel pools, cask pit, transfer canals, and any other interconnected liquid containment cells:
  - Effective leak detection systems with clearly defined zones for the quantification of small leakage rates and isolation of such leaks.
  - Minimize potential for weld seam failures through advanced fabrication and inspection methods

- For liquid storage tanks that contain large volumes of radioactive liquids:
  - Avoid underground tanks (buried or vaulted)
  - Tanks should be constructed of materials that will minimize corrosion and weld failures.
  - Tanks shall be designed with adequate provision to prevent and/or contain overflows.

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Design Element: Tanks

- For sub-surface building walls and floors, including sumps, moats, and berms, that may be pathways of leakage to soil and groundwater:
  - Advanced, durable material liners or durable, deep penetrating, smooth finish coatings should be applied to moats, sumps, and below grade structures within the RCA.
  - Below grade conduits and piping through exterior building walls should be minimized.

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Design Element: Fluid and Steam Systems

- For all piping, valves, and connections in radioactively contaminated fluid systems that may become sources of soil and groundwater contamination:
  - Should be protected from the environment and should be accessible for inspection.
  - Should not be constructed of concrete as concrete absorbs contamination and increases decommissioning waste volumes.

- For HVAC systems that may contribute to soil and groundwater contamination:
  - Condensation from all plant coolers carrying potentially contaminated air should be collected and routed to a monitored liquid effluent discharge
  - Potentially contaminated fluid systems should not interface directly with HVAC systems

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EPRI Groundwater Committee: Utilities (Operating and Decommissioning), New Plant Vendors, and Other Organizations

Utilities:

Ameren UE
American E Power
Constellation
Dominion
Duke
Energy-Northwest
Entergy
Exelon
FENOC
FPL
NMC
Ontario Power Generation
OPPD
PG&E
PSE&G
PPL
Progress
Southern
Southern California Edison
STPNOC
TVA
Yankee Atomic

Other Organizations:

ANI

NEI

New Plant Vendors:

GE

Areva

Westinghouse

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Approach & Timeline

December 2006
EPRI ANP Design Provisions for Groundwater Protection Meeting in Washington D.C. – Develop Project Scope for Industry Input to the Guidance Development (December 13th)
February 2007
Review of the Working Draft of Industry Input to the Guidance for Implementation of 10CFR20.1406 with NEI
March 2007
Submit Industry Input to the Guidance for Implementation of 10CFR20.1406 to NRC

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