3. Excavation of Soil & Sediments and Pumping of Surface and Groundwater

Problem Statement:

Licensed material, resulting from the operation of an existing neighboring nuclear power plant, may be present in the environment i.e. soil, sediments, surface water and groundwater on the site selected for of a new nuclear power plant. Construction workers may be exposed to this licensed material during construction activities involving soil excavation, and/or surface and ground water management.

Applicability of Regulatory Requirements:

- 10 CFR 19, "Notices, Instructions and Reports to Workers: Inspection and Investigations."
- 10 CFR 20, "Standards for Protection against Radiation."
- 10 CFR 50, Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion "As Low as is Reasonably Achievable" for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents."
- USNRC IE Bulletin No. 80-10, "Contamination of Non-radioactive Systems And Resulting Potential For Unmonitored, Uncontrolled Release Of Radioactivity To Environment," May 6, 1980.
- USNRC Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, October 1977.
- USNRC Regulatory Guide 4.15, "Quality Assurance For Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment," Revision 1, February 1979
- USNRC Regulatory Guide 4.15, "Quality Assurance For Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment," Interim Revision 2, March 2007.
- Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)
- Regulatory Issue Summary (RIS) 2002-02 –Lessons Learned Related to Recently Submitted Decommissioning Plans and License Termination Plans.
- RIS 2008-03, Return/Re-Use of Previously Discharged Radioactive Effluents

Understanding:

Prior to excavation of the proposed construction site, a determination of the presence of licensed material should be made. Reasonable efforts should be taken to determine if historical events might have resulted in residual activity of licensed material in the soil, sediments, surface and groundwater that has not been previously evaluated for remediation. Consideration of the following items include:

1. Site ownership history that may have involved radioactive material licensee owners, ie DOE, DOD
2. Evaluation of the site's 10 CFR 50.75(g) records of spills or leaks, and
3. A review of licensee's history for a spill or leak that may have resulted in releases of licensed material not previously identified, evaluated and documented in the 10 CFR 50.75 (g) file.

The minimum evaluation of the radiological conditions and potential hazards should be consistent with what is reasonable to determine the extent of radiation levels and concentrations or quantities

of radioactive material present. The historical annual environmental and effluent reports should be the basis of the potential radiological hazard of the construction area. Consistent with the information in RIS 2008-03, licensees are responsible for evaluating any new exposure pathways that result from the return of radioactive material discharged in liquid and gaseous effluents and returned to the operating facility. This RIS does not apply to radioactive material in solid materials or soil.

The information contained in the MARSSIM guidance would be an acceptable process for conducting due diligence of an area that had known spills or leaks, or approval by the 10 CFR 20.2002 process for disposal of licensed material. The Nuclear Regulatory Commission, the U.S. Environmental Protection Agency, the U.S. Department of Energy and the U.S. Department of Defense to provide a statistical and risk-based methodology for evaluating radiation survey data developed the MARSSIM guidance.

Greenfield sites should be treated as any non-nuclear construction site. Evaluation of the site for radioactive material would not normally be expected.

4. Final Site Configuration Post Construction

Problem Statement:

The final site configuration post construction is needed as input for the implementation of NEI 08-08A "Minimization of Contamination Program". Although the post construction groundwater characterization is modeled in the Early Site Permit (ESP) or the Final Safety Analysis Report (FSAR) in the Construction and Operating License (COL), the information needed to update the model with the final 'as-built' site configuration following construction is not clear.

Applicability of Regulatory Requirements:

- 10 CFR 20.1406, "Minimization of Contamination"
- TI 2515/173, "Review of the Implementation of the Industry Ground Water Protection Voluntary Initiative" (TI to be completed by August 30, 2010)

Understanding:

The FSAR Section 2 includes site characteristics information on hydrological, groundwater and geological data to support current as well as post-construction groundwater conditions.

The post-construction hydrogeological configuration of the plant site should be verified as valid from the pre-construction evaluation, or initially evaluated as part of a technically sound groundwater protection program. The elements of an acceptable program include those elements that constitute a Baseline Program for establishing a Site Conceptual Model as described in Sections 2.1, 4 and Appendix A of EPRI document number 1016099 (January 2009), "Groundwater Protection Guidelines for Nuclear Power Plants."