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UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

Regulatory Insights

EPRI/NEI Groundwater Workshop
San Jose, CA
30-Jun-2010

- 2010 Groundwater Task Force Final Report
- Annual Report Reviews (Reporting H-3)
- REMP Water Samples (GW, Drinking Water)
- “20 Questions” (to assist in a standard response)
- Sources/causes of GW Contamination
- List of Sites with Leaks and Spills >20,000 pCi/l H-3
- GW Contamination and its Component Parts
- Public Meetings
- Inspections & NRC progress on TI-2515/173



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Acronyms

- GW – Groundwater
- DW – Drinking water
- LRW – Liquid Radioactive Waste
- GRW – Gaseous Radioactive Waste
- SOP – Standard Operating Procedure
- PI – Performance Indicator
- Comm – Communication
- RETS – Radioactive Effluent Technical Specifications
- REMP – Radiological Environmental Monitoring Program
- AREOR – Annual Radiological Environmental Operating Report
- ARERR – Annual Radioactive Effluent Release Report
- OC – Oyster Creek
- IP – Indian Point
- ANO – Arkansas Nuclear One
- SFP – Spent Fuel Pool
- RWST – Refueling Water Storage Tank
- CST – Condensate Storage Tank
- pCi – picocuries
- l – Liters
- Liq – Liquid
- H-3 – Tritium
- NEI – Nuclear Energy Institute
- NRC – Nuclear Regulatory Commission
- EPA – Environmental Protection Agency

- Report Published 17-Jun-10 (ML101620023)
- 92 Pages
- 4 Themes
 - Regulatory Authority (Protect the Environment)
 - Confine Licensed Material (Engineering Issues)
 - NRC Response to Leaks/Spills (SOP/PI/Comm)
 - Strengthen Public Trust
- 16 Conclusions
- 4 Recommendations
- Sr Mgmt Team to evaluate recommendations

- NRC Reviews Licensee's Annual Effluent Reports
- Posted on the NRC public web page
- Reporting Groundwater Results
 - Should report or summarize all GW data
 - Some licensees only report:
 - “Formal” GW Program
 - NRC RETS Program
 - NRC REMP Program
 - Consider reporting a summary of all GW results
 - Not a requirement
 - Can be beneficial for transparency

- Leaks can create new routes of exposure (ROE)
- Leaks can create new release points
- If H-3 is seeping into ground \Rightarrow stream
 - And fishing in stream,
 - evaluate H-3-fish-man route of exposure
- If dose > existing route of exposure, report (AREOR)
- If 20% > existing route of exposure, add to program
- If exceed REPORTING LEVELS, report (30-day)
- Be aware how leaks can impact REMP

20 Questions – Leaks and Spills

- Information provided for leaks varies greatly
- There are some basic needs:
 - Demonstrate control, and
 - gain public confidence.
- Key facts should be known
- Some basic questions:
 - Date/Time of spill or leak discovered (& started)
 - Source known? Ongoing leak? Fixed?
 - Radionuclides? Concentrations? Total activity?
 - When will plume reach site boundary?, etc...

- Evaluation of many spills & leaks indicates commonalities
- Sources of GW Contamination
 - **SFP** (lining, cleanliness, others) (IP, Salem, ANO, Hatch)
 - **LRW line** (leakage) (Braidwood, Calvert, Byron, Calloway, River Bend, ...)
 - **CST piping** (aluminum) (OC, Dresden)
 - **RWST** (Vogtle, Millstone)
 - **Condensation, Evaporation**, predict and report
- By knowing causes, can initiate solutions (proactive)

List of Leaks and Spills

- NRC created a list of sites with leaks/spills
- Leaks $>20,000$ pCi/l tritium to soil at any time
- Used to respond to questions (media, public, others)
- 33 of 65 sites are on the list
- Leaks may have no safety consequence
- Compiling list of sites with current GW $>20,000$ pCi/l
- Will make list where H-3 migrated offsite (Liq)
- Will make list where H-3 was detectable offsite
- Will make list where offsite H-3 $> 20,000$ pCi/l
- Will make list where EPA std has been exceeded
- NRC responds to many questions on this issue

Component Parts of the Groundwater Issue

- There are 3 primary issues for GW Contamination
 - Component degradation is an **Engineering** issue
 - Dose impact is a **Health Physics** issue
 - Protection of the environment is a **Policy** issue
- Public trust and confidence is a separate issue
 - It contains elements of the 3 primary issues
 - It also involves a **Communication** issue
- To succeed, all issues should be addressed

Issues from Public Meetings

- NRC hosted several Public Meetings (GW & Piping)
- How can NRC allow components to leak H-3 & other nuclides to the ground?
- Why aren't NRC regulations preventing leaks/spills to Ground?
- Why doesn't the NRC protect the environment?
- Is NRC taking enforcement actions?

- NRC completed 47 of the 104 (45%) reactors
- 19 reactors satisfied all NEI 07-07 requirements (7 reactors only lacking independent review)
- Discrepancies at 21 (40%) of the reactors.
 - Objective 1.4 Remediation Process (13)
 - Objective 1.4 Site Risk Assessment (11)
- Only Objective 2.3 (30-day report) completed at all 47 reactors that were inspected.
- This is preliminary, complete summary this fall.

Simple Status Summary: Dose and Health Physics

- Essentially all 65 reactor sites have had some leak or spill or radioactive material to the ground
- No spill or leak caused contamination of drinking water that exceeds the drinking water standard in EPA's Safe Drinking Water Act
- No NRC dose limit has been exceeded
- No Technical Specification Limit has been exceeded
- No NRC design objective dose has been exceeded



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Questions ?