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Buried Piping

U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

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Purpose

- Describe NRC activities related to degradation of buried piping

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Issue

- Groundwater incidents in the 2005 timeframe led to improved groundwater monitoring by the industry
- Several leaks from buried piping in 2009 and 2010 resulted in groundwater contamination

NRC Response

- September 3, 2009, Chairman Jaczko tasked the staff with providing a summary of activities related to buried pipe
- December 3, 2009 the staff issued SECY 09-0174 in response to the Chairman's tasking memo

Tasking Memo Conclusions

- SECY 09-0174 examined
  - Current regulations
  - ASME Code requirements
  - Industry activities
- Considered safety-related and nonsafety-related piping
- Concluded these areas to be acceptable for
  - Operating plants
  - Plants undergoing license renewal
  - New plants

Regulations

- All reactors
  - 10 CFR Part 50 Appendix A, "General Design Criteria"
  - 10 CFR 50.55a, "Codes and Standards,"
  - 10 CFR 20.1301, "Dose Limits…"
  - 10 CFR 50, Appendix I, "Numerical Guides and Design Objectives…"
- License renewal
  - 10 CFR part 54.21(a), "Aging Management"
- New reactors
  - 10 CFR 20.1406, "Minimization of Contamination"
- Current regulations are adequate to ensure safety function and to maintain releases below limits

Codes and Standards

- ASME Code
  - Scope is safety-related piping and structural integrity, not leak tightness
  - Section III
  - Section XI
- Current ASME Code requirements are adequate to ensure structural integrity is maintained for buried, safety-related piping
- NACE International (formerly National Association of Corrosion Engineers)

NRC Inspection

- ROP
  - No specific guidance that directs NRC inspectors to review buried piping activities
  - Smart samples when buried piping is available to inspect.
  - NRC inspects performance related to industry initiatives

- Priority of NRC inspection of buried piping activities is adequate based on safety significance of observed leaks

Industry Activities

- NEI 07-07, Groundwater Protection Initiative
  - Focused on detecting leaks
- INPO
  - Reviews since 2007
- EPRI
  - Workshops and training
  - "Recommendations for Effective Program to Control the Degradation of Buried Pipe," December 2008

Basis for Conclusions

- Existing Regulations establish criteria for NRC actions
  - Intended functions of systems must be maintained
    - Intended function of is to supply cooling water to allow for and maintain safe shutdown
  - Exposure of plant personnel and the public may not exceed regulatory limits

Basis for Conclusion

- Leaks have not adversely impacted intended function
- Leaks which would affect intended function are inconsistent with observed corrosion mechanisms
- Leaks have not resulted in any radiation exposure to the public

Current Activities

- Review industry Buried Piping Initiative
  - Public Meeting February 24
- Update GALL Report
- Monitor current buried piping leaks / groundwater contamination
- Conduct operating experience review

Ongoing Activities

- Participate in ASME Code
- Participate in NACE standards activities
- ROP
  - Smart samples
  - Temporary Inspection of implementation of the initiative
  - Potential audits
- Continue operating experience review
- Preparing Information Notice

Conclusions

- NRCs objectives related to buried piping
  - Maintenance of intended function
  - Releases remain below regulatory limits
- Current regulations and industry activities are compatible with these objectives
- NRC is monitoring current events related to buried piping
- NRC is updating the GALL Report for license renewal