



# **NRC Staff Perspectives on Hydrogen Production at Nuclear Power Plants**

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# **LWRS MOU NRC/DOE**

## **ML21124A125**

- **The purpose of the MOU is to coordinate DOE and NRC technical readiness and sharing of technical expertise and knowledge on advanced nuclear reactor technologies and nuclear energy innovation.**
- **NRC's Role - Provide current information on licensing and regulatory reviews of emerging technologies to prioritize regulatory needs.**



# **NRC Technical Letter Report**

- **NRC Technical Letter Report, “Safety and Regulatory Considerations for On-Site Hydrogen Production Facilities Co-located with Nuclear Power Plants” (ADAMS Accession No. ML24207A174) issued in June 2024.**
- **An overview of the NRC’s existing regulatory framework and oversight are discussed in the report.**
- **Technical Letter Report discussion consistent with this presentation.**



# NRC Regulatory Framework

- Existing NRC regulatory framework adequately supports installation and operations associated with hydrogen production and storage.
- Need for a License Amendment Request (LAR) prior to installation and operation will be determined by site specific license basis considerations.
- Topical Reports can be used as a basis for LARs to alleviate potential licensing uncertainties within the general aspects of designs.
- Installation and operations associated with hydrogen production and storage could potentially be reviewed during NRC oversight activities.



# **Changes to Facilities and Procedures as Described in UFSAR**

- **Changes to facilities and procedures as described in UFSAR are governed by 10 CFR 50.59, “Changes, tests and experiments.”**
- **10 CFR 50.59 discusses when a LAR is needed prior to making changes.**
- **NRC guidance found in Regulatory Guide (RG) 1.187, Revision 3, “Guidance for Implementation of 10 CFR 50.59, ‘Changes, tests and experiments’” (ADAMS Accession No. ML21109A002)**
- **10 CFR 50.59 does not apply to aspects of changes to the facility or procedures when other applicable regulations establish more specific criteria for accomplishing such changes.**



# Fire Protection Considerations

- **Changes that impact onsite fires and explosions are governed by site specific fire protection program license conditions.**
- **Focus is on maintaining provisions of General Design Criterion (GDC) 3, “Fire Protection,” of Appendix A to Part 50, “General Design Criteria for Nuclear Power Plants.”**
- **NRC guidance found in:**
  - **RG 1.189, Revision 5, “Fire Protection for Nuclear Power Plants” (ADAMS Accession No. ML23214A287)**
  - **RG 1.205, Revision 2, “Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants” (ADAMS Accession No. ML21048A448)**



# Emergency Plan Considerations

- **Site configuration changes require a review per 10 CFR 50.54(q)(2) regardless of any changes to the actual emergency plan. See Information Notice 2005-19 (ADAMS Accession No. ML051530520).**
- **Changes to emergency plans are governed by 10 CFR 50.54, “Conditions of licenses” (specifically 10 CFR 50.54(q)). Changes to a licensee’s emergency plan that reduce the effectiveness of the plan may not be implemented without prior approval by the NRC.**
- **NRC guidance found in RG 1.219, Revision 1 “Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors” (ADAMS Accession No. ML16061A104)**
- **As an example, consider impacts to Emergency Response Facilities and Emergency Action Levels**



# Security Plan Considerations

- Site configuration changes require a review per 10 CFR 73.58, “Safety / security interface requirements for nuclear power reactors.” Licensees shall assess and manage the potential for adverse effects on safety and security before implementing changes.
- Changes to security plans are governed by 10 CFR 50.54, “Conditions of licenses” (specifically 10 CFR 50.54(p)). Changes to a licensee’s security plan that reduce the effectiveness of the plan may not be implemented without prior approval by the NRC.
- NRC guidance found in:
  - RG 5.74, Revision 1 “Managing the Safety / Security Interface” (ADAMS Accession No. ML14323A549)
  - RG 5.76, Revision 1, “Physical Protection Programs at Nuclear Power Reactors” (Safeguards Information)
- As an example, consider impacts to target sets, staging areas, response locations, and barriers.





# ISFSI Considerations

- **Changes that can impact ISFSIs are governed by 10 CFR 72.48, “Changes, tests, and experiments,” and 10 CFR 72.212, “Conditions of general license issued under § 72.210.”**
- **10 CFR 72.48 discusses when a LAR is needed prior to making changes.**
- **NRC guidance found in RG 3.72, Revision 1, “Guidance for Implementation of 10 CFR 72.48, Changes, Tests, and Experiments” (ADAMS Accession No. ML20220A185)**
- **As an example, consider impacts to facility / cask designs which may differ from safety-related SSCs.**



# Questions?