

Reactor Decommissioning Emergency Planning Aspects

San Onofre Nuclear Generating Station (SONGS)
Community Engagement Panel
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Regulatory Process

- NRC regulations for emergency planning (EP) do not distinguish between an operating power reactor and one that is permanently shutdown/defueled.
- After shutdown, the risks associated with potential accidents is significantly reduced
- **Historically, exemption requests have been used to seek regulatory relief on a case-by-case basis**
 - Until an exemption is issued, onsite and offsite EP programs must be maintained and all EP requirements met, including exercises

Regulatory Process

- Exemption process (10 CFR 50.12) applies to licensees seeking regulatory relief
- Application of regulations may not be necessary to achieve the underlying purpose.
 - An Exemption to EP regulations contained in 10 CFR 50.47(b) and Appendix E to Part 50 requires Commission approval

Regulatory Process

Documents supporting implementation of exemptions, if granted:

- Permanently Defueled Emergency Plan (PDEP)
- Emergency Action Level Scheme (permanently defueled)

Accident Considerations

- After a reactor is defueled, the traditional accidents that dominate operating plant risk are no longer applicable
 - Risk to public is primarily associated with the spent fuel stored in the Spent Fuel Pool (SFP)
- Short-term radioisotopes no longer of concern (radioiodine)
 - Distribution of potassium iodide (KI) is not necessary
- SFP accident would evolve slowly versus accident at an operating reactor
 - Provide adequate time to initiate mitigation measures, or if necessary, protective actions.

Exemption Considerations

- Past EP Exemptions
 - Zion (8/31/99)
 - Big Rock (9/30/98)
 - Maine Yankee (9/3/98)
 - Haddem Neck (8/28/98)
- Proposed Integrated Rulemaking Plan for Nuclear Power Plant Decommissioning (SECY-00-145), June 28, 2000
 - NUREG-1738, “Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants,” February 2001
- Informed by recent SFP Studies
 - NUREG-2161, “Consequence Study of a Beyond Design Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor,” September 2014

Exemption Precedent

Licensee site-specific SFP analyses demonstrate that:

- Applicable Design Basis Accident(s) would not result in projected doses to public exceeding U.S. Environmental Protection Agency (EPA) protective action guides;

AND

- Spent fuel is not susceptible to a zirconium fire or sufficient time would be available to take mitigation measures, and if needed, implement offsite protective measures
 - “all hazards” basis

Exemption Criteria

- Examples of applicable Design Basis Accident(s):
 - Radioactive waste system leak or failure
 - Spent fuel cask drop accident
 - Fuel handling accident
- Examples of SFP accidents considered:
 - Complete loss of SFP water inventory with air cooling
 - Complete loss of SFP water inventory with no air cooling
 - Loss of SFP normal cooling

Exemption Criteria

Sufficient time available to take mitigation measures:

- Minimum of 10 hours
 - T+0: Time ALL cooling is lost
 - T+ \geq 10 hours: 900° C (potential spent fuel fire)
- Conservatively does not consider time from initiating event to point where loss of all SFP cooling occurs
- Historically takes 15-20 months from time of shutdown to meet this criterion
 - SONGS Units 2 & 3: January 2012

Exemption Criteria

- Capability to take prompt SFP mitigation measures:
 - Identified SFP mitigation strategy(ies)
 - Availability of “on-shift” staffing and equipment to promptly initiate
- Focus of initial mitigation actions is on providing cooling to spent fuel (spray, etc.)

Exemption Precedent



Past exemptions reduced EP requirements similar to that for an Independent Spent Fuel Storage Installation (ISFSI)

<u>Operating Reactor(s)</u>	<u>Decommissioning Site</u>
Focused on response to variety of emergencies related to an operating reactor.	Focused on SFP events (permanently shutdown/defueled reactor)
<ul style="list-style-type: none"> • Formal offsite REP plans <ul style="list-style-type: none"> ○ EPZ / Alert and Notification System (ANS) 	<ul style="list-style-type: none"> • Comprehensive (“all hazards”) planning <ul style="list-style-type: none"> ○ Coordination with firefighting, medical, etc. responding onsite
<ul style="list-style-type: none"> • Event Classification <ul style="list-style-type: none"> ○ NOUE → General Emergency 	<ul style="list-style-type: none"> • Event Classification <ul style="list-style-type: none"> ○ NOUE → ALERT
<ul style="list-style-type: none"> • Notification of event classification <ul style="list-style-type: none"> ○ 15 min. (State/local counties) 	<ul style="list-style-type: none"> • Notification of event classification <ul style="list-style-type: none"> ○ “Prompt” (designated agencies)
<ul style="list-style-type: none"> • Dedicated on- & off-site facilities 	<ul style="list-style-type: none"> • Onsite “Command Center”
<ul style="list-style-type: none"> • Joint, biennial exercises 	<ul style="list-style-type: none"> • Onsite biennial exercise <ul style="list-style-type: none"> ○ Offsite response organizations invited to participate in exercises

Decommissioning: EP Inspection Program

- Resident Inspector will typically remain onsite for a period of 6 to 12 months after reactor is permanently shutdown / defueled
- Inspection program comprises two major elements:
 - Baseline Inspection
 - Discretionary Inspection (i.e., Reactive and Initiative Inspections)
- Inspection Program will remain until the license is terminated

Moving Forward

- Possible Decommissioning Rulemaking

SRM to SECY-14-006 (Kewaunee EP Exemption Request):

Based on lessons learned from the most recent operating plant closures, the staff should report to the Commission in January 2015 its views on the need for an integrated rulemaking for decommissioning and, as appropriate, provide the potential schedule and resources required for completion.

- Interim Staff Guidance NSIR/DPR-ISG-02, “Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants”

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Thank You

