Mitigation Strategies Order Interim Staff Guidance

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and

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Meeting Purpose

- Provide stakeholders with the NRC staff's assessment of NEI 12-06 and our Interim Staff Guidance (ISG) -2012-01.
- Afford stakeholders an opportunity to ask the NRC staff questions to clarify ISG.
- The meeting is neither designed nor intended to solicit or receive comments - use the guidance in the Federal Register (77 FR 33779) to provide your written comments by **July 7, 2012.**
  - www.regulations.gov, NRC-2012-0068
  - Mail comments
  - Fax comments

Topic Agenda

- Background
- NEI 12-06 Guidance
- JLD ISG-12-01
- Significance Determination

Background – Order EA-12-049

- In SRM-SECY-11-0137, the Commission directed the staff to take certain actions related to SBO mitigation capabilities.
  - Supported the NTTF recommendation to pursue an Order to provide reasonable protection for equipment provided pursuant to 10 CFR 50.54(hh)(2) from the effects of design-basis external events and to add equipment as needed to address multiunit events.
- The Steering Committee revised the direction of the recommendation to have licensees develop mitigation strategies for beyond-design-basis external events.

Background – Order EA-12-049

- Order EA-12-049, required that licensees develop a three-phase approach for mitigating beyond-design-basis external events to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities
  - Initial phase - installed equipment and resources
  - Transition phase - sufficient, portable onsite equipment and consumables
  - Final phase – sufficient offsite resources to sustain functions indefinitely
- SECY-12-0025 approved the issuance of the Order on Mitigation Strategies for Beyond-Design-Basis External Events
- Mitigation Strategies Order issued March 12, 2012

NEI 12-06 Guidance Document

- On May 4, NEI submitted for NRC review and endorsement NEI 12-06, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, Revision B
- On May 13, NEI submitted Revision B1, following a public meeting with the NRC

NEI 12-06 Guidance Document

- NEI document provides implementation guidance on a site-specific basis for FLEX
- Each site is to follow an assessment process
  - Initial conditions and boundary conditions
  - Establish plant-specific baseline coping capability
  - Determine applicable extreme external hazards
  - Define site-specific FLEX capabilities
  - Programmatic controls
  - Offsite resources

Boundary Conditions

- Beyond-design-basis external event impacts all units at the site
- All reactors initially at 100% power
  - ISG specifies power history of 100 days, following the usage for 10 CFR 50.63
- Each reactor is shutdown successfully
- Staffing at administrative minimum shift levels
- No independent, concurrent events
- All personnel on-site are available to support site response

Initial Conditions

- Loss of off-site power
- All installed sources of emergency ac power and SBO alternate ac power sources are not available
- Normal access to the ultimate heat sink (UHS) is lost
- Installed electrical distribution systems, including inverters and battery chargers, remain available
- Equipment, fuel, and water inventory contained in systems or structures with designs robust with respect to the external event are available

Baseline Coping Capabilities

- Establish minimum coping capabilities consistent with unit-specific evaluation of the potential impacts and responses to an extended loss of ac power (ELAP) and loss of normal access to the (LUHS)
  - Use engineering analysis
  - Develop plant procedures and guidance

Applicable Extreme External Hazards

- Identify site-specific extreme external hazards
  - Seismic
  - Flooding
    - ISG specifies consideration of adjacent flooding design bases
  - Storms – hurricanes, high winds, tornadoes
  - Snow and ice storms, cold
  - Extreme high temperature
- Access Impact on site

External Hazards Assessment

- Relationship to ELAP and LUHS
- Challenges
- Protection of FLEX Equipment
- Deployment of FLEX Equipment
- Procedural Interfaces
- Off-site Resource Utilization

Define Site-Specific FLEX Capabilities

- Integrate the aggregate external hazards to the FLEX capabilities for the site
  - Protection of equipment
  - Deployment of equipment
  - Procedural interfaces
  - Off-site resources
- Need to have N+1 sets of portable on-site equipment

Programmatic Controls

- FLEX equipment will be commercial grade, stored in locations based on the external events at the site
- Procedures developed for FLEX implementation to support EOPs, EDMGs, and SAMGs
- Maintenance and testing of FLEX equipment
- Training and staffing

Off-site Resources

- Each site will have arrangements necessary to address scope of equipment necessary for the final (off-site) phase
  - Mobilization of equipment to the site
  - Deployment of this equipment
  - Storage, maintenance and testing
  - Inspection and auditing by NRC

JLD ISG-2012-01

- Endorsement of NEI-12-06 with exceptions
  - External flooding for multi-unit site or another site in close proximity, need to provide evaluation for other unit or adjacent site
  - Provide means to monitor for imminent or actual core damage

JLD ISG-2012-01 (cont.)

- Licensees must know the time that they can withstand a BDBEE using installed equipment
- External communications and other command and controls elements
- Initial damage assessment due to unbounded nature of the event
- Licensees need to have an engineering basis for flow rates which are available and auditable

JLD ISG-2012-01 (cont.)

- Control of degree and rate of cooldown/depressurization
- Performance-based criterion for decision to maintain RCS make-up capability on site vice reliance on of low-leak RCP seals
- Monitoring for imminent or actual core damage (exit criteria)
- Performance-based criteria for human factors (allow use of marking, etc., vice reliance on portable lighting)

JLD ISG-2012-01 (cont.)

- Spent fuel pool strategies
  - Use of fire protection ring header contingent on "robustness"
  - Make-up flow rates based on boil off due to design basis heat loads
  - Spray minimum flows to match B.5.b/10 CFR 50.54(hh)(2) strategies
- BWR Mark I and Mark II containments need to have ability to remove heat locally using EA-12-050 RHCVS

JLD ISG-2012-01 (cont.)

- Backup power supply for hydrogen igniters for Mark III and ice condenser containments
- Augmented quality of the equipment, using consensus standards, providing regulatory alignment with fire protection QA programs and SBO augmented quality requirements
- Licensee oversight of off-site resources

JLD ISG-2012-01 (cont.)

– Appendix F for AP1000 Design
  - Include instrumentation and control measurement equipment and power
  - Provide standard plant assessment for extreme external hazards since unbounded
  - External flooding to be treated like operating plants

JLD ISG-2012-01 (cont.)

- Reporting requirements
  - Overall integrated plan to include:
    - Guidance and strategies
    - Major system components and applicable protection
    - Implementation in all modes
    - Procedures, guidance, training acquisition, staging or installation of equipment
    - P&IDs
    - Schedule for implementation

JLD ISG-2012-01 (cont.)

- Status report
  - Accomplishments since last report
  - Changes to schedule
  - Changes to integrated plan
- Full implementation letter

Significance Determination

- Potential use of update to IMC 0609, Appendix L (ML093520169)
- Substitution of beyond-design-basis external event for B.5.b event in text
- Provide feedback to Steve Bloom or Eric Bowman