PMFermiCOLPEm Resource

From: Nicholas A Latzy [latzyn@dteenergy.com]
Sent: Wednesday, July 02, 2014 10:18 AM
To: Brown, Christopher
Cc: Muniz, Adrian; Michael K Brandon; Govan, Tekia
Subject: Re: DTE Electric Chapter 20 ACRS Presentation
Attachments: Chapter 20_Final.pptx; Chapter 20 Presentation.pdf

Christopher,

Attached to the email is the DTE Electric's Chapter 20 ACRS Presentation.

You now have all of DTE Electric's ACRS presentations.

Thank you

Nicholas A. Latzy
Principal Engineer - Nuclear Engineering
Major Enterprise Projects
DTE Energy
(313)235-9226

(See attached file: Chapter 20_Final.pptx)(See attached file: Chapter 20 Presentation.pdf)

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Created By: latzyn@dteenergy.com

Recipients:
"Muniz, Adrian" <Adrian.Muniz@nrc.gov>
Tracking Status: None
"Michael K Brandon" <brandonm@dteenergy.com>
Tracking Status: None
"Govan, Tekia" <Tekia.Govan@nrc.gov>
Tracking Status: None
"Brown, Christopher" <Christopher.Brown@nrc.gov>
Tracking Status: None

Post Office: dteenergy.com

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Fermi 3 COLA
Presentation to ACRS Subcommittee
Chapter 20

Introduction

Discussion Topics:

- Fukushima Near-Term Task Force Tier 1 Recommendations Applicable to the ESBWR.
  - Mitigation Strategies (4.2)
  - Spent Fuel Pool Instrumentation (7.1)
  - Emergency Preparedness Staffing and Communications (9.3)

Chapter 20 – Request for Information (RAI)

DTE Electric received 5 RAIs to address the following Fukushima Near-Term Task Force recommendations.

Recommendation #	Subject Matter	RAI #	Disposition
4.2	Mitigating Strategies for Beyond-Design-Basis External Events	01.05-3 01.05-5	FSAR Section 1.5.1.1.1 License Condition 3.8.2
7.1	Reliable Spent Fuel Pool Instrumentation	01.05-4 01.05-6	FSAR Section 1.5.1.1.2 License Condition 3.8.3
9.3	Emergency Preparedness	01.05-2	License Condition 3.8.1

Mitigating Strategies
(Recommendation 4.2)

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1.5.1.1.1, “Recommendation 4.2, Mitigating Strategies for Beyond-Design-Basis External Events”

- Order EA-12-049 specifies a three-phase approach for mitigating beyond-design-basis external events.
  - **Initial Phase**: use of installed equipment and resources
  - **Transition Phase**: use of portable/FLEX equipment and consumables.
  - **Final Phase**: use sufficient offsite resources to sustain functions indefinitely.
- DTE follows the implementation guidance as applied to the passive ESBWR design.
  - JLD-ISG-2012-01, “Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events.”
  - NEI 12-06, “Diverse and Flexible Coping Strategies (FLEX) Implementation Guide.”

Mitigating Strategies (cont'd)

ESBWR strategies for coping with extended loss of AC power events involving the three-phase approach

- **Initial Phase**: Installed plant equipment without AC power or makeup to ultimate heat sink (safety-related Isolation Condenser System, Passive Containment Cooling System pools or Gravity-Driven Cooling System)
    - For ESBWR, this phase is covered in standard design passive safety features for 72-hour period of passive systems performance for core, containment, and spent fuel storage pools cooling
        - 72-hours batteries
        - Passive core and containment cooling
        - Passive cooling in spent fuel storage pools based on required sufficient water levels

Mitigating Strategies (cont'd)

ESBWR strategies for coping with extended loss of AC power events involving the three-phase approach (continued)

- **Transition Phase**: Following 72-hours passive system coping time, support systems continue cooling and makeup to pools with resources available onsite.
    - Nonsafety-related systems are used to replenish passive systems or to perform functions directly (DCD Sections 9.1.3 and 19A.3.1).
        - Post-72 hours, Regulatory Treatment of Non-Safety Systems (RTNSS) equipment provides core, containment, and spent fuel cooling functions (post-72 hour RTNSS structures, systems, and components have augmented design requirements to provide reasonable assurance of functioning when needed).
        - Makeup water can be provided through installed safety-related connections to the Fire Protection System or spent fuel storage pools with onsite portable equipment.

Mitigating Strategies (cont'd)

ESBWR strategies for coping with extended loss of AC power events involving the three-phase approach (continued)

- **Final Phase**: Extend passive system cooling beyond 7 days to an indefinite time.
  - Commodities can be replaced or replenished from offsite sources.
    - Diesel fuel for ancillary diesel generator or diesel fire pump.
  - Plant conditions can be monitored to ensure that reactor, spent fuel pools, and containment conditions are stable (ancillary diesels power monitoring instrumentation).
  - Strategies include procedures, guidance, training, and acquisition, staging, or installation of equipment (including FLEX portable equipment) to maintain core, containment, and spent fuel storage pools cooling for extended period of time and will be implemented prior to initial fuel load.

Mitigating Strategies (cont'd)

COLA Part 10 License Condition 3.8.2

Mitigation Strategies for Beyond-Design-Basis External Events, Compliance with Order EA-12-049 (Recommendation 4.2)

- The development of strategies and guidance for maintaining and, if necessary restoring core cooling, containment, and spent fuel pool cooling capabilities beginning 72 hours after the loss of all normal and emergency ac power sources. These strategies must be capable of:
  - Mitigating a simultaneous loss of all ac power sources, from both onsite and offsite power systems, and loss of normal access to normal heat sink.
  - Maintaining core cooling, containment, and spent fuel pool cooling capabilities for Fermi 3 during and after an event affecting both Fermi Units 2 and 3.
  - Being implemented in all plant modes.
- Strategies and guidance fully implemented before initial fuel load.

Reliable Spent Fuel Pool (SFP) Instrumentation (Recommendation 7.1)

1.5.1.1.2, “Recommendation 7.1, Reliable Spent Fuel Pool Instrumentation”

- Order EA-12-051 specifies safety enhancements for reliable spent fuel pool instrumentation for beyond-design-basis external events.
- DTE follows the implementation guidance as applied to the passive ESBWR design.
    - JLD-ISG-2013-02, “Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation.”
    - NEI 12-02, “Industry Guidance for Compliance with NRC Order EA-12-051, To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation.”

Reliable SFP Instrumentation (cont'd)

- ESBWR design provides reliable indication of water level in spent fuel storage pools for monitoring pool water level conditions by trained personnel.

- Areas of Storage for spent fuel assemblies are:

  - Spent Fuel Pool in Fuel Building.

  - Deep Pit Buffer Pool in Reactor Building for use during refueling.

Reliable SFP Instrumentation (cont'd)

- Safety-related, Seismic Category I level instrumentation is installed in both pools to detect a low water level that would indicate a loss of decay heat removal ability.
  - Each pool has two wide-range safety-related level transmitters that transmit signals to the Main Control Room.
  - Signals identify collapsed water level indication and initiate high/low-level alarms, locally and in the Main Control Room.
  - Alarm set points alert operators of loss of inventory to ensure sufficient water level for passive cooling for 72 hours.
    - at an elevation just below normal water level.
    - at an adequate shielding level.
    - at the top of active fuel.

Reliable SFP Instrumentation (cont'd)

- Instrumentation channels provide for power connections from sources independent of the plant power distribution systems.
- Normal power or onsite alternative power available using onsite resources from 72 hours to 7 days.
- Connections available for power from portable generator or replaceable batteries, consistent with guidance for use of portable equipment with offsite resources after 7 days.
- Minimum instrument accuracy of +/- 300 mm (1 ft), which is consistent with guidance in JLD-ISG-2012-03.
- Instrumentation designed to maintain accuracy following a power interruption or change in power source without recalibration.
- Section 3.7.5 of the Technical Specifications specifies periodic surveillance of fuel pools water level during movement of irradiated fuel assemblies.
- Operating, testing, and calibrating level instruments, training programs, and procedures are described (DCD Sections 13.2 and 13.6).

Reliable SFP Instrumentation (cont'd)

COLA Part 10 License Condition 3.8.3

Reliable Spent Fuel Pool/Buffer Pool Level Instrumentation, Compliance with Order EA-2012-051 (Recommendation 7.1)

- Spent Fuel Pool/Buffer instrumentation shall be maintained available and reliable through the development and implementation of a training program. The training program shall include provisions to ensure trained personnel can route the temporary power lines from the alternate power source to the appropriate connection points, and connect the alternate power source to the safety-related level instrument channels.

Emergency Preparedness
(Recommendation 9.3)

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COLA Part 10 License Condition 3.8.1

Emergency Planning Actions (Recommendation 9.3)

- At least two (2) years prior to scheduled initial fuel load, the licensee shall:
  - have performed an assessment of the on-site and augmented staffing capabilities to satisfy the regulatory requirements for response to a multi-unit event. The Staffing Assessment will be performed in accordance with NEI 12-01.
  - Revise the Fermi 3 Emergency Plan to include the incorporation of corrective actions identified in the staffing assessment.
  - Identify how the augmented staff will be notified given degraded communication capabilities.
  - Have performed an assessment of on-site and offsite communication systems and equipment required during an emergency event to ensure communication capabilities can be maintained during prolonged station blackout conditions in accordance with NEI 12-01.

- At least one hundred eighty (180) days prior to fuel load, the licensee shall complete implementation of corrective actions identified in the communications capability assessment.

Conclusion

- The ESBWR passive safety and design features described in the DCD and proposed License Conditions are in accordance with industry documents and staff guidance.

- The Fukushima Near Term Task Force Recommendations 4.2, 7.1, and 9.3 are fully implemented.

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(Recommendation 4.2)

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Mitigating Strategies (cont'd)

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Mitigating Strategies (cont'd)

COLA Part 10 License Condition 3.8.2

Mitigation Strategies for Beyond-Design-Basis External Events, Compliance with Order EA-12-049 (Recommendation 4.2)

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(Recommendation 9.3)

COLA Part 10 License Condition 3.8.1

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