



# Limerick Generating Station Digital Modernization Project (DMP) Installation Support LAR And Exemption Request

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# CEG Participants

- Licensing
  - Darani Reddick, Licensing Director
  - Dave Helker, Licensing Manager
  - Frank Mascitelli, Licensing Lead
  - Ashley Rickey, Licensing Engineer
  - Pareez Golub, Digital Licensing SME
  - Jim Berg, Site Regulatory Assurance
- Engineering
  - John Connelly, Central Design Organization (CDO) Manager
  - Mark Samselski, CDO - Lead Responsible Engineer
  - Baris Sarikaya, Senior Staff Engineer – Nuclear Fuels
- Project Management
  - Steve Hesse, Digital Modernization Project (DMP) Director
  - Jerry Segner, DMP Project Manager

# Opening Remarks

- NRC
- CEG

## DMP Installation Support LAR Overview

- The DMP Installation Support LAR currently contains 3 major sections:
  - Implement selected TSTFs 542, 582 and 583-T and STS (NUREG -1433 Rev 5) portions to facilitate DMP modification installation during the refuel outage.
  - Provide an ATWS-RPT LCO Applicability condition during the 30-day pre-outage period for demolition of both divisions of ATWS-RPT Trip systems such that the ATWS-RPT system is not required to be operational.
  - Request a temporary Exemption Request for the 30-day pre-outage demolition of the Redundant Reactivity Control System (RRCS) from the requirements of the ATWS Rule 10CFR50.62.

## LAR Overview - TSTF/STS Section

- At previous September 8, 2022 Presubmittal Meeting, CEG communicated the following:
  - Add a note to the Operational Condition (MODE) 5 Applicability of TS 3/4.3.1, "Reactor Protection System Instrumentation," Tables 3.3.1.1-1 and 4.3.1.1-1, Function 11, "Reactor Mode Switch Shutdown Position," and Function 12 "Manual Scram," consistent with NUREG-1433, "Standard Technical Specifications General Electric BWR/4 Plants," Revision 5.0;
  - Add a note to TS 3/4.8.1.2, "A.C. Sources – Shutdown," Surveillance Requirement (SR) 4.8.1.2 specifying the applicable Emergency Diesel Generator (EDG) SRs in MODE 5, consistent with Technical Specification Task Force (TSTF) Traveler -582 (TSTF-582), "RPV WIC Enhancements," and TSTF-583-T, "TSTF-582 Diesel Generator Variation;"
  - Revise the MODE 5 applicability of TS 3/4.3.3, "Emergency Core Cooling System Actuation Instrumentation," Tables 3.3.3-1 and 4.3.3-1, Function 5, "Loss of Power," consistent with TSTF-583-T;
  - Delete the TS 3/4.5.2, "Reactor Pressure Vessel (RPV) Water Inventory Control (WIC)," Action a, requirement to suspend core alterations, consistent with TSTF-542, "Reactor Pressure Vessel Water Inventory Control," and
  - Add a one-time Completion Time (CT) extension for TS 3/4.3.4, "ATWS Recirculation Pump Trip Actuation Instrumentation," Actions d. and e.

# LAR Overview

- At previous September 8, 2022 Presubmittal Meeting, CEG communicated the following:
  - Add a one-time Completion Time (CT) extension for TS 3/4.3.4, "ATWS Recirculation Pump Trip Actuation Instrumentation," Actions d. and e.
    - LCO 3.3.4.1 Action d: With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 72 hours or in accordance with the Risk Informed Completion Time Program, or be in at least STARTUP within the next 6 hours.
    - LCO 3.3.4.1 Action e: With both trip systems inoperable, restore at least one trip system to OPERABLE status within 1 hour or be in at least STARTUP within the next 6 hours.
  - Requesting CT extension to 30 days to support simultaneous demolition of both Trip systems planned to start 30 days prior to Refuel Outage.
  - Demolition of one trip system at a time was reviewed and judged not feasible.
  - Note in the PPS submittal (9/26/22) the RRCS system will be reclassified as a non-safety related system, removed from TS, and implemented on the non-safety relation Ovation Platform.
  - The justification will be based on a hybrid technical justification using both deterministic and risk insights.
  - A PRA analysis was completed that meets RG 1.177 thresholds for one time CT extensions.

# LAR Overview

- Current Proposal:
  - TSTF and ITS proposed changes remain the same as previously discussed.
  - No longer requesting a one-time CT Extension for TS 3/4.3.4, "ATWS Recirculation Pump Trip Actuation Instrumentation," Actions d. and e.
  - Replacing it with a temporary one-time LCO 3/4.3.4 non-Applicability condition for 30 days preceding the start of the DMP Refuel Outage modification installation work.
  - Requesting a temporary Exemption from ATWS Rule 10 CFR 50.62(c)(3), (4), and (5). During the 30-day concurrent demolition period of both divisions of RRCS, LGS would not be in compliance with the identified requirements of 10 CFR 50.62.
  - This meeting will focus on the ATWS-RPT and Exemption Request portions of the proposed NRC submittal.

## ATWS–RPT Section

- Proposed TS Changes:
  - TS 3.3.4.1, "ATWS Recirculation Pump Trip Actuation Instrumentation," "Applicability" to add a note stating that for a period of 30 days preceding entry into OPCON 2 at the start of the 2024 refueling outage (Unit 1) or 2025 refueling outage (Unit 2), the LCO is not applicable if specified conditions are met. A table with these conditions is included as part of the note.
  - SR 4.1.5.b.4 (i.e., "Standby Liquid Control System") to add footnote (\*\*\*) stating that for a period of 30 days preceding entry into OPCON 2 at the start of the 2024 refueling outage (Unit 1) or 2025 refueling outage (Unit 2), no pumps are required to start automatically.
  - TS Table 3.3.2-1, "Isolation Instrumentation," Trip Function 3.d, "SLCS Initiation," to add footnote (h) stating that for a period of 30 days preceding entry into OPCON 2 at the start of the 2024 refueling outage (Unit 1) or 2025 refueling outage (Unit 2), the Reactor Water Cleanup System Isolation on SLCS Initiation Trip Function is not required to be OPERABLE.
  - SR Table 4.3.2.1-1, "Isolation Actuation Instrumentation Surveillance Requirements," Trip Function 3.d, "SLCS Initiation," to add footnote (b) stating that for a period of 30 days preceding entry into OPCON 2 at the start of the 2024 refueling outage (Unit 1) or 2025 refueling outage (Unit 2), the Reactor Water Cleanup System Isolation on SLCS Initiation Trip Function is not required to be OPERABLE.



# ATWS–RPT Section

## Justification

- During this out of service time duration, RRCS automatic functions credited in the ATWS analysis of record (AOR) will be unavailable.
  - RRCS Functions: ATWS Recirculation Pump Trip (RPT), Automatic SLCS operation, Alternate Rod Insertion (ARI) function
  - Both the ATWS-RPT function and automatic SLCS pump operation for ATWS mitigation are credited in the ATWS AOR.
  - ARI has never been credited in any Limerick ATWS analyses. Therefore, loss of this automatic function will not affect the analysis results.
- With these automatic RRCS functions inhibited, the following ATWS mitigation actions are imposed on operation and/or credited in the supplemental ATWS analysis:
  - Reduced power operation
  - Elimination of SRV OOS flexibility
  - An existing automatic plant feature that runs back the Reactor Recirculation Pumps (RRP) is credited in the analysis
  - An operator manual action to start two Standby Liquid Control System (SLCS) pumps from the main control room is credited in the analysis (with additional delay).

# ATWS–RPT Section

## Justification (continued)

- The **Supplemental ATWS analysis** was performed to demonstrate compliance to the ATWS acceptance criteria, by utilizing these substituted mitigation features/actions, when RRCS is unavailable.

Global Nuclear Fuel (GNF) **007N5226**, Revision 0, “Limerick ATWS Analysis without Automatic RRCS Function,” December 2022

Reactor Thermal Power	SRVs out of service	SLCS manual initiation time	Suppression Pool Water Level
90 %	0	5 minutes	23 feet
87 %	0	5 minutes	22 feet
84 %	1	5 minutes	22 feet

# ATWS–RPT Section

## Justification (continued)

- Proposed TS requirements (in red text):
- LCO 3.3.4.1 The anticipated transient without scram recirculation pump trip (ATWS-RPT) system instrumentation channels shown in Table 3.3.4.1-1 shall be OPERABLE with their trip setpoints set consistent with values shown in the Trip Setpoint column of Table 3.3.4.1-2.
- APPLICABILITY: OPERATIONAL CONDITION 1.

*Note: For a period of 30 days preceding entry into OPERATIONAL CONDITION 2 at the start of the 2024 refueling outage, the LCO is not applicable when the following conditions are met:*

<i>Maximum</i>	<i>Maximum Inoperable</i>	<i>Minimum Suppression</i>
<i>THERMAL POWER</i>	<i>Safety/Relief Valves</i>	<i>Pool Water Level</i>
<i>90% RTP</i>	<i>0 of 14</i>	<i>23 feet</i>
<i>87% RTP</i>	<i>0 of 14</i>	<i>22 feet</i>
<i>84% RTP</i>	<i>1 of 14</i>	<i>22 feet</i>

*Recirc Runback on Level 3 Function is Available and not in Bypass.*

- ACTION:
  - a. With an ATWS recirculation pump trip system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values column of Table 3.3.4.1-2, declare the channel inoperable until the channel is restored to OPERABLE status with the channel trip setpoint adjusted consistent with the Trip Setpoint value....

# Exemption Request

- 10 CFR 50.62(c)(3), (4), and (5) states:
- (3) Each boiling water reactor must have an alternate rod injection (ARI) system that is diverse (from the reactor trip system) from sensor output to the final actuation device. The ARI system must have redundant scram air header exhaust valves. The ARI must be designed to perform its function in a reliable manner and be independent (from the existing reactor trip system) from sensor output to the final actuation device.
- (4) Each boiling water reactor must have a standby liquid control system (SLCS) with the capability of injecting into the reactor pressure vessel a borated water solution at such a flow rate, level of boron concentration and boron-10 isotope enrichment, and accounting for reactor pressure vessel volume, that the resulting reactivity control is at least equivalent to that resulting from injection of 86 gallons per minute of 13 weight percent sodium pentaborate decahydrate solution at the natural boron-10 isotope abundance into a 251-inch inside diameter reactor pressure vessel for a given core design. The SLCS and its injection location must be designed to perform its function in a reliable manner. The SLCS initiation must be automatic and must be designed to perform its function in a reliable manner for plants granted a construction permit after July 26, 1984, and for plants granted a construction permit prior to July 26, 1984, that have already been designed and built to include this feature.
- (5) Each boiling water reactor must have equipment to trip the reactor coolant recirculating pumps automatically under conditions indicative of an ATWS. This equipment must be designed to perform its function in a reliable manner."

# Exemption Request

- During the RRCS 30-day demolition period ARI, SLCS automatic initiation, and automatic ATWS-RPT will not be operable.
- The exemption request is permissible under 10 CFR 50.12 because it is authorized by law, will not present an undue risk to the public health and safety, is consistent with the common defense and security, and presents special circumstances.
- The exemption is authorized by law
  - The NRC has authority under the Atomic Energy Act of 1954, as amended, to grant exemptions from its regulations if doing so would not violate the requirements of law. 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR Part 50 with provision of proper justification. Approval of the exemption from 10 CFR 50.62(c)(3), (4), and (5) would not result in a violation of the Atomic Energy Act of 1954, as amended. Therefore, the exemption is authorized by law.

# Exemption Request

- The exemption will not present an undue risk to public health and safety
  - A risk analysis has been performed and demonstrates with reasonable assurance that the proposed changes are within the current risk acceptance guidelines in RG 1.177 for one-time changes.
    - The probability of an ATWS occurring during the 30-day temporary exemption period is very low.
  - A Supplemental GNF Limerick ATWS Analysis has demonstrated that the consequences of an ATWS during this period are mitigated and within acceptance criteria of existing ATWS analysis of record when:
    - lower reactor power limits are imposed;
    - higher number of operable safety relief valves are imposed (SRVOOS flexibility removed);
    - an additional non-credited automatic action (recirculation pump runback) is credited; and
    - operator manual actions are taken for SLCS initiation during execution of existing emergency operation procedures.

# Exemption Request

- The exemption is consistent with the common defense and security
  - Removing both trains of RRCS for 30 days would not affect continued protection of the common defense and security at Limerick Generation Station Limerick Units 1 and 2. Units 1 and 2 safeguards and security programs will remain in full effect during 30-day RRCS demolition period. Further, RRCS demolition activities are outside the scope of the Limerick security programs.
- Special Circumstances Supporting the Issuance of an Exemption
- In accordance with 10 CFR 50.12(a)(2), the NRC will not consider granting an exemption to its regulations unless special circumstances are present. Special circumstances are present as discussed below.
  - 10 CFR 50.12(a)(2)(iii): Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated.

# Exemption Request

- It is estimated that performing the RRCS demolition activities during the outage would add an additional 8 days to the refuel outage length.
- During original 10 CFR 50.62 Rulemaking when considering of cost impacts of implementing the newly proposed rule, it was estimated that installation of original systems/equipment to implement 10 CFR 50.62 would add an additional 2 days to typical outage length to install the plant modifications. Reference SECY 83-293, “Amendments to 10 CFR 50 Related to Anticipated Transients Without SCRAM (ATWS) Events,” for discussions and determination that this outage impact was judged acceptable. The additional 6-day impact resulting from compliance to 10 CFR 50.62 would result in undue or other costs that are significantly in excess of those contemplated (i.e., 2 days ) when the regulation was adopted.



## Closeout Remarks

- Questions?
- Next Steps?
- Final Remarks
  - CEG
  - NRC