Turkey Point Unit 3 and Unit 4

Reactor Protection System
Engineered Safety Feature Actuation System
Nuclear Instrumentation System
Replacements

Safety System Replacement Project LAR
NRC 5th Pre-submittal Meeting Telecon

June 9th ,2021

CLOSED MEETING

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FRAMATOME INC. PROPRIETARY

Proprietary information statement has been removed in this redacted file.

Agenda – Closed Portion

- RPS/ESFAS/NIS LAR Outline/Attachments and Discussion on Commitments
- D3 Overview of Progress to Completion
- Technical Specification Surveillance Extension/Reduction
- Project Lifecycle Schedule
- Action Items/Follow-up

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RPS/ESFAS/LAR Updated Table of Contents Following the ISG-06, Rev 2 AR Process

RPS/ESFAS/NIS LAR Table of Contents

- **Intro/Justification/Safety Analysis**
- **Detailed Description**
- **Technical Evaluation**
  - Existing Plant System Description (ISG-06 D1)
  - Existing and New Architecture (ISG-06 D2)
  - New Safety System Equipment
  - New System Functions (ISG-06 D2.3)
  - Functional Allocation (ISG-06 D2.4)
  - New Augmented Quality System Functions
  - System Interfaces (ISG-06 D2.5)
  - Defense-In-Depth and Diversity (D2.6)
  - Setpoint Methodology and Calculations (D2.7)
  - Response Time Performance

RPS/ESFAS/LAR Updated Table of Contents Following the ISG-06, Rev 2 AR Process

RPS/ESFAS/NIS LAR Table of Contents (Cont.)

- **Technical Evaluation (Cont.)**
  - Summary System Development Process (D.4)
  - Equipment Qualification (D.3)
  - Applying a Referenced Topical Report (D.5)
  - Tricon Plant Specific Action Items (D.5)
  - Human Factors Engineering (B.1.4)
  - Tests and Self Diagnostics
  - System Failure Analysis
  - Fundamental Design Principles in the new Architecture
  - Compliance with IEEE Std. 603-1991 and IEEE 7-4.3.2-2003 (D.6)
  - NRC ISG-04 Compliance Matrix
  - Reliability
  - Secure Development and Operational Environment (D.8)

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RPS/ESFAS/LAR Updated Table of Contents Following the ISG-06, Rev 2 AR Process

RPS/ESFAS/NIS LAR Table of Contents (Cont.)

- **Technical Evaluation (Cont.)**
  - Summary of Vendor Oversight Plan (C2.2)
  - Technical Specification Surveillance Reduction (a non ISG-06 item)
- **Regulatory Evaluation Basis**

  Turkey Point is a pre-IEEE 279-1971 plant and plans on maintaining its existing licensing basis. The new RPS\ESFAS\NIS system will be designed to more current RGs and Industry standards. There are too many to list, but key ones for discussion and feedback:
  - Key Regulatory Basis documents addressed in LAR
    - -- RG 1.153 and IEEE 601-1991
    - -- RG 1.152, Rev 3 and IEEE 7-4.3.2-2003
    - -- Qualification – IEEE 323-1974, IEEE 344-1987, and RG 1.180, Rev 1
  - Key NRC Review Guidance
    - -- ISG-04 and ISG-06, Rev 2
    - -- NUREG 0800, BTP 7-19, Rev 8, and 7-17, Rev 6

RPS/ESFAS/LAR Updated Table of Contents Following the ISG-06, Rev 2 AR Process

RPS/ESFAS/NIS LAR Table of Contents (Cont.)

- **ATTACHMENTS (Available thru Electronic Reading Room)**
  - Markup Technical Specification Pages
  - Markup Technical Specification Bases (Information Only)
  - Qualification Summary Reports
  - Defense-In-Depth and Diversity Analysis (D3)
  - HFE Program Plan
  - RPS/ESFAS/NIS SyRS
  - Technical Specification Surveillance Reduction Report
  - Framatome Affidavit in support of Attachments
  - Listing of Regulatory Commitments

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PS/ESFAS/NIS LAR - Commitments Discussion

- FPL does not anticipate any new Commitments.
- Implementation Items discussion

Plant Specific Action Items (PSAIs)

- **The Turkey Point LAR will address the 19 Tricon PSAIs following DI&C-ISG-06, Rev. 2, Section D.5.1.2, "Resolution of Topical Report Plant-Specific Action Items" states"**
  - "Based on a topical report review in accordance with SRP BTP 7-14, some topical reports include plant-specific items stating that the NRC staff should review detailed design, implementation, testing and ongoing life cycle activities. For the Alternate Review Process, the licensee will provide oversight of the performance of these activities, in accordance with the licensee's QA program and Vendor Oversight Plan."
  - 15 of the 19 Plant Specific Action Items were addressed for Turkey Point specifically as regards the validation of completion, in a similar manner that was done for Diablo Canyon, but specific to Turkey Point 3&4. The following four (4) PSAIs, not previously addressed for Diablo Canyon due to its specific application, will be addressed for Turkey Point:

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Plant Specific Action Items (Turkey Point Specific)

- **Tricon V10 PSAI 8 (Section 3.4.3, “Diagnostic and Test Capabilities,” of the Tricon V10 SE): The Turkey Point 3&4 LAR will provide the engineering basis for crediting the diagnostic and self-test capabilities of the Tricon for review by NRC and inclusion in the SER.**
- **Tricon V10 PSAI 12 (Section 3.7.3.2, “”DI&C-ISG-04, Staff Position 2 – Command Prioritization,” of the Tricon V10 SE): The Turkey Point 3&4 LAR will include the design of field device interface and the determination of means for command prioritization because the relay logic replacement scope is included in the LAR for NRC review.**

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Plant Specific Action Items (Turkey Point Specific)

- Tricon V10 PSAI 13 (Section 3.7.3.3, “DI&C-ISG-04, Section 3 – Multidivisional Control and Display Stations,” of the Tricon V10 SE). The Turkey Point 3&4 LAR will address the role of information displays and operator work stations for the determination of information sources and interconnections. This information will be included in the LAR; [

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- Tricon V10 PSAI 18 (Section 3.7.1, “Tricon-Based PPS Equipment Communications,” of the Tricon V10 SE). The Turkey Point 3&4 LAR will include a description of the application-specific communication and functions for the SVDU including any testing and verification of the session announcement protocol library for control room interface.

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Overview of RPS/ESFAS/NIS Architecture (Scope of Replacement)

RPS/ESFAS/NIS D3 Update Since Our Last Presentation on February 18, 2021

ATWS Requirement

Key D3 Assumptions

D3 Assumptions (Continued)

D3 Evaluation Process-Step 1

Platform Diversity -Step 2

D3 Block Selection Process-Step 3

D3 Evaluation Process-Step 4

D3 Validation Process after Initial Development of the D3 Report -- March – May, 2021

- Project Team retained Zachry Nuclear Engineering to perform [ ] quantitative analyses and [ ] detailed qualitative analyses to address verification of bounding analyses based on final selected automatic actuations.
- Validation completed May 24, 2021
- Analyses included:

[ ]

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DAS

DAS automatic actuations-Step 5
Validated Results included in Final D3 Report

D3 Conclusions

- **Turkey Point I&C upgrade architecture is designed with a high level of Quality, Diversity and Defense-In-Depth**
- **The I&C Diversity and Defense-in-Depth qualitative methodology conforms with regulatory guidance and meets criteria with the addition of certain DAS functions**

Tech Spec Surveillance Test Extension/Reduction For RPS/ESFAS/NIS LAR – Re-review

Turkey Point's Plan forward for Surveillance Reduction

- Continue to utilize the NEI 04-10 surveillance frequency control program to extend SR frequencies (not a part of this LAR).

- FPL Upgrade Project is working in conjunction with the Turkey Point ITS project to ensure proper integration and implementation efficiency both internal and with the staff.

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Tech Spec Surveillance Test Extension/Reduction For RPS/ESFAS/NIS LAR – Implementation

Key Areas for Implementation

- Use of "Triconex Approved Topical Report, 7286-545-1-A, Revision 4: Nuclear Qualification of Tricon V10 Triple Modular Redundant (TMR) PLC System," dated May 15, 2012, including U.S. Nuclear Regulatory Commission Safety Evaluation Report dated April 12, 2012 (ML120900889)).
- LAR will address as plant-specific application-dependent issues as required by the NRC SER along with proposed Tech Spec changes and supporting documentation.
- [

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Tech Spec Surveillance Test Extension/Reduction For RPS/ESFAS/NIS LAR – Channel Check

Tech Spec Surveillance Test Extension/Reduction For RPS/ESFAS/NIS LAR – Channel Check

Tech Spec Surveillance Test Extension/Reduction For RPS/ESFAS/NIS LAR – COTs and ALTs Reduction

Tech Spec Surveillance Test Extension/Reduction For RPS/ESFAS/NIS LAR – Surveillance Reduction Analysis

Tech Spec Surveillance Test Extension/Reduction For RPS/ESFAS/NIS LAR – System Level FMEA

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Project LAR and Lifecycle Schedule

- **LAR Submittal target is September, 2021**
- **Design Phase**
  - June thought November 2021
- **Equipment Qualification Schedule**
  - July 2021 through February 2022
- **Implementation Phase**
  - September through April 2022
- **Factory Acceptant Testing**
  - May through October 2022
- **Human Factor Engineering (HFE)**
  - April 2021 thru October 2022

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Action Items/Follow-Up

- **Future Meeting Subjects**
  - Vendor Oversight Plan Update
  - Cyber Security Scope
  - Equipment Scope of Supply not covered by SER
  - Project Life Cycle Schedule
  - Remaining Open Issues

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Questions?

Acronym List

Actuation Logic Test	ALT
ATWS Mitigation System Actuation Circuitry	AMSAC
Alternate Review	AR
Anticipated Transient Without Scram	ATWS
Branch Technical Position	BTP
Channel Operational Test	COT
Diverse Actuation System	DAS
Digital Instrumentation and Control	DI&C
Defense-in-Depth and Diversity	D3
Engineered Safety Features Actuation System	ESFAS
Failure Modes and Effects Analysis	FMEA
Failure Modes and Effects Diagnostic Analysis	FMEDA
Florida Power and Light	FPL
Feedwater Isolation	FWI
Human Factors engineering	HFE
Instrumentation and Control	I&C

Acronym List (continued)

Institute of Electrical and Electronic engineers	IEEE
Interim Staff Guidance	ISG
International Organization for Standardization	ISO
Improved Technical Specifications	ITS
License Amendment Request	LAR
Main Control Board	MCB
Main Control Room	MCR
Nuclear Energy Institute	NEI
Nuclear Instrumentation System	NIS
Nuclear Regulatory Commission	NRC
NRC Publication for Knowledge and Guidance	NUREG
Programmable Logic Computer	PLC
Postulated Initiating Event	PIE
Plant Specific Action Items	PSAI
Regulatory Guide	RG
Quality Assurance	QA
Qualified Display Processing System	QDPS

Acronym List (continued)

Reactor Protection System	RPS
Self-Diagnostics	SD
Safety Evaluation Report	SER
Safety Injection	SI
Safety Related	SR
Safety Requirements Memoranda	SRM
Standard Review Plan	SRP
Steam Generator	STGR
System Requirements Specification	SyRS
Safety Visual Display Unit	SVDU
Software Common Cause Failure	SWCCF
Passive Actuation Device Test	TADOT
Triple Modular Redundant	TMR
Turkey Point	TP
Vendor Oversight Program	VOP