



# **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 6th Pre-submittal Meeting Telecon**

**July 22, 2021**

**CLOSED MEETING**

# Agenda – Closed Portion

- **Diverse Actuation System Architecture and Reliability**
- **Leak-Before-Break Discussion with D3**
- **Modification Code Year Discussion for LAR**
- **Project LAR and Life Cycle Update**
- **Action Items/Follow-up**

# Diverse Actuation System

- **Diverse Actuation System (DAS) Background**

- **Automatic Diverse Actuations from D3 Evaluation**

# DCS/DAS Architecture (Conceptual)

# DAS System Inputs (Conceptual)

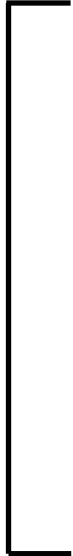


# DAS System Output Logic (Conceptual)

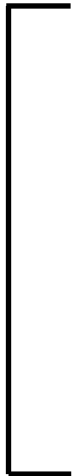


# DCS/DAS Reliability

- DCS Experience



- Reliability Features



# DCS/DAS Reliability

- **DCS Application Features**

- **DAS Application Features**

end of topic



# Leak-Before Break Analysis for PTN 3&4 D3 Report in accordance with BTP 7-19, Rev 8

- **Large Break LOCA Event (UFSAR Section 14.3.2.1)**
  - Automatic DAS actuation not required by D3 because of crediting Leak-Before Break (LBB)
    - Supported by NRC Safety Evaluation Report (ML19310D777), approved Dec. 4, 2019 for Section 4.7.3 (ML19310D777), *LBB Analysis for Reactor Coolant System Piping* and 4.7.4, *LBB Analysis for Class 1 Aux Piping* (ADAMS No. ML19191A057)
    - The evaluation addresses all potential pipe breaks sized 10 inches or above.
    - Review of primary piping identified no intermediate pipe sizes susceptible to breaks or cracking between 4 and 10 inches.

# Leak-Before Break Analysis for PTN 3&4 D3 Report

- **Large Break LOCA Event**
  - All piping locations considered in the LBB evaluation, approved by NRC, exhibit a minimum leakage rate of 10 GPM.
  - NUREG-1061 Vol. 3 recommends that the leakage detection system be capable of measuring 1/10th of the minimum leakage rate. TP 3&4 plant leak detection capability SER approved at 1 GPM.
- **Small Break LOCA Event (UFSAR Section 14.3.2.2)**

end of topic

# Modification Code Year Discussion in RPS/ESFAS/NIS LAR

## Major Codes and Standards Commitment Listing

No.	Code and Standard No.	Title	NUREG-0800 Rev 6 Chapter 7 Appendix 7.1-A,C,D or Chapter 3.10 (2016) or 3.11 (2007)	Project Commitment	Justification:
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# Modification Code Year Discussion in RPS/ESFAS/NIS LAR

## Major Codes and Standards Commitment Listing (continued)

No.	Code and Standard No.	Title	NUREG-0800 Rev 6 Chapter 7 Appendix 7.1-A,C,D or Chapter 3.10 (2016) or 3.11 (2007)	Project Commitment	Justification:
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# Modification Code Year Discussion in RPS/ESFAS/NIS LAR

## Major Codes and Standards Commitment Listing (continued)

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# Modification Code Year Discussion in RPS/ESFAS/NIS LAR

## Major Codes and Standards Commitment Listing (continued)

No.	Code and Standard No.	Title	NUREG-0800 or ISG-06 R/2	Project Commitments	Justification
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end of topic



# Modification Code Year Discussion in RPS/ESFAS/NIS LAR

## Major Codes and Standards Commitment Listing (continued)

No.	Code and Standard No.	Title	NUREG-0800 or ISG-06 R/2	Project Commitments	Justification
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end of topic



# Project LAR and Lifecycle Schedule

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



# Action Items/Follow-Up

- **Future Meeting Subjects**
- Open items
- Equipment replacement scope outside Tricon SER
- Command Prioritization
- Commercial grade dedication/qualification status
- Human Factors Engineering and simulator schedule
- Implementation Items
- Attachments to the LAR
- Remaining Follow-up Items



***Questions?***



# Acronym List

ATWS Mitigation System Actuation Circuitry	AMSAC
Alternate Review	AR
Anticipated Transient Without Scram	ATWS
Branch Technical Position	BTP
Control Processor	CP
Diverse Actuation System	DAS
Defense-in-Depth and Diversity	D3
Distributed Control System	DCS
Engineered Safety Features Actuation System	ESFAS
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
Improved Technical Specifications	ITS
Leak-Before-Break	LBB
License Amendment Request	LAR
Nuclear Instrumentation System	NIS
Nuclear Regulatory Commission	NRC
Operator Workstation	OWS
Regulatory Guide	RG
Quality Assurance	QA

# Acronym List (continued)

Reactor Protection System	RPS
Residual Heat Removal	RHR
Safety Evaluation Report	SER
Safety Injection	SI
Safety Related	SR
Safety Requirements Memoranda	SRM
Standard Review Plan	SRP
System Requirements Specification	SyRS
Safety Visual Display Unit	SVDU
Software Common Cause Failure	SWCCF
Subsequent License Renewal	SLR
Turkey Point	PTN
Vendor Oversight Program	VOP

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