

Common Q Platform Elimination of Technical Specification Surveillance Requirements (WCAP-18461) NRC Meeting November 2019

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OUR VISION & VALUES

Westinghouse will remain the first choice for safe, clean and efficient energy solutions.

We enhance our delivery of that vision by living our values:

- ▶ Safety & Quality First
- ▶ Valuing Ethics, Integrity & Diversity
- ▶ Passion for Serving Our Customers Globally
- ▶ Dedication to Each Other Through Servant Leadership
- ▶ Creating Value for Shareholders, Customers & Employees
- ▶ Consistently Delivering Our Commitments

Agenda

- Overview of WCAP-18461
 - Purpose/Benefits of Tech Spec Surveillance Requirement (SR) Elimination
 - Proposed Applications/Architectures
 - Discuss types of SRs that are within the scope of WCAP-18461
 - Overview of Self-Diagnostics
 - Outline of Methodology
 - Current Efforts
- Walkthrough WCAP-18461
- Schedule of Documents for NRC Review

WCAP-18461 Overview

Introduction

- Current Tech Spec Surveillance Requirements (SRs) are mostly based on analog technology
 - Westinghouse Plant Standard Tech Specs, NUREG-1431
 - Combustion Engineering (CE) Plant Standard Tech Specs, NUREG-1432
- Leveraging self-diagnostics of the Common Q Platform can eliminate safety system SRs

Benefits of Tech Spec Surveillance Reduction

- Increased Safety
 - Minimize the time the system is at less than full redundancy
 - Minimize how often the system is “touched”, which in turn reduces human performance errors.
 - Increasing the amount of time the system is “checked” by crediting self-diagnostics
- Reduced Costs
 - Less hours/effort spent testing the safety system
 - Less development and maintenance of testing procedures
 - Cost savings from reducing manual testing will help offset upgrade costs

Proposed Applications

- Reactor Protection Systems/Engineered Safety Feature Actuation Systems (PPS)
- Core Protection Calculator Systems (CPCS)
- Diesel Loading Sequencer (DLS) Systems
- Post-Accident Monitoring (PAM) Systems

Proposed SR Candidates for Elimination

- Channel Checks (performed up to every 12 hours per NUREG-1431 and NUREG-1432)
- Safety System Functional Logic Tests (Westinghouse)
 - Channel Operational Tests (COT)
 - Actuation Logic Tests (ALT)
 - Actuating Device Tests (ADT)*
- Safety System Functional Logic Tests (CE)
 - Channel Functional Tests (includes Bistable Testing, Matrix Logic Testing, and Trip Logic Testing)
- Response Time Testing of the Safety System (excluding sensors/actuating devices)

*Not part of NUREG-1431

Self-diagnostics

- Platform Software Self-diagnostics
 - AC160
 - Component Interface Module (CIM) Diagnostics*
- Application Software Self-Diagnostics
 - Inter-channel Comparisons
 - Termination Unit Faults
 - Addressable Constant Verification

*CIM equipment is only used for ESFAS implementations

Methodology

- Equipment-based approach to SR Elimination is utilized
 - Common Q component identification
 - Determine the failure modes for the identified components
 - Mapped self-diagnostic functions to the identified component failure modes
 - SRs are then reviewed to assure failure modes of applicable components are covered

Current Efforts

- Vogtle 3&4 License Amendment Request (LAR) 19-001 (ML19084A309)
 - Protection and Safety Monitoring System (PMS) Tech Spec Surveillance Elimination for Vogtle Units 3&4
 - Removal of manual Channel Checks, COTs, ALTs, and ALOTs
 - Removal of Response Time Testing of the PMS Rack Components
 - Currently in review by the NRC which has produced positive discussions (anticipated SER prior to the end of 2019).

Conclusions

- The majority of I&C Safety System Tech Spec SRs can be eliminated for equipment replaced with Common Q
- All Failure Modes were found to be covered by more than one self-diagnostic
- Cost savings from reduced testing are expected to incentivize upgrading vintage safety I&C systems

NRC Expedited Review/Schedule

Applicability of this Review to the NRC Expedited Topical Report Review Process

- 1) The review scope is limited due to the NRC's approval of an SNC/AP1000 LAR for a similar methodology. This Topical Report is a generic version of the LAR and addresses additional Common Q systems.
- 2) This Topical Report does not invalidate the original safety evaluation conclusions for the Common Q platform. It remains as an acceptable digital I&C platform for safety-related systems in nuclear power plants.
- 3) The staffs methods for establishing the safety conclusions for the SNC/AP1000 LAR are unchanged for this review.

Schedule of Documents

- Submit WCAP-18461-P/NP to the NRC in December 2019

WCAP-18461-P (DRAFT) Walkthrough