Exelon Generation®

Nine Mile Point Nuclear Station
P.O. Box 63
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10 CFR 50.59(d)

NMP2L2697
February 12, 2019

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Nine Mile Point Nuclear Power Station, Unit 2
Renewed Facility Operating License No. NPF-69
NRC Docket No. 50-410

Subject: Submittal of 10 CFR 50.59 Evaluation Summary

Pursuant to the requirements of 10 CFR 50.59(d)(2), Exelon Generation Company, LLC hereby submits a 10 CFR 50.59 Evaluation Summary for Nine Mile Point Unit 2.

The attachment contains a brief description of changes, tests, and experiments and a summary of the associated 50.59 evaluation.

If you have any questions or require further information, please contact Ken Kristensen at (315) 349-2069.

Sincerely,

Dennis M. Moore
Regulatory Assurance Manager – Nine Mile Point Nuclear Station
Exelon Generation Company, LLC

Attachment: NMP2 10 CFR 50.59 Evaluation Summary Report

cc: NRC Regional Administrator, Region 1
NRC Resident Inspector
NRC Project Manager

IE47

NRR

Attachment

NMP2 10 CFR 50.59 Evaluation Summary Report

Nine Mile Point Nuclear Power Station, Unit 2

Renewed Facility Operating License No. NPF-69

NRC Docket No. 50-410

Title: Digital Upgrade for the EHC System

Units Affected: Unit 2

Brief Description: This upgrade will replace the GE Mark I analog Turbine Control System (referred to as the EHC system) with a Westinghouse digital Turbine Control and Protection System (referred to as the DEHC System). The DEHC system utilizes an Ovation Based Distributed Control System that includes a Turbine Control System (TCS) and an Emergency Trip System (ETS), each consisting of redundant controllers, power supplies, I/O and testable dump assemblies. The DEHC System TCS performs the reactor pressure control, turbine speed and load control, and system test functions and provides backup overspeed protection. The DEHC System ETS performs the primary turbine overspeed protection and all other turbine protection related functions.

The effect of this activity on plant operations is that the Pressure Regulator and Turbine-Generator Control System will now be controlled via a DEHC. The turbine-generator control functions for the DEHC system (speed control, load control, flow control, valve control, or load limit, and turbine protection) are the same or bound the existing EHC system. Valve positions will be measured by the existing Linear Variable Differential Transformers (LVDT). The DEHC system function of controlling Reactor pressure will be functionally the same as the existing EHC system. The operational requirements associated with Reactor pressure, turbine speed, trip setpoints, load limits, generator runback, maximum combined flow limit, valve stroke times and Bypass Valve response times remain the same for the DEHC System as the existing EHC System.

There is no impact on how the turbine operating parameters are controlled even though the operator interface with the turbine controls is changed (i.e., HMI software controls vs. hardware controls).

The transition from analog to digital control introduces new system failure modes; however, their failure effects are the same as previously analyzed in the USAR and the frequency of these events does not increase.

The effect of the proposed change on the design functions is that the logic for these functions will now be accomplished within the DEHC system software as opposed to the relays and transistor/amplifier logic of

the EHC system. The reliability of the DEHC system is improved through the use of a redundant design for critical functions. The guidance provided in TR-102348 Revision 1 "Guideline on Licensing Digital Upgrades" is utilized to address issues of Software Dependability, Human-System Interface, Failure Modes and Effects, and Electromagnetic Compatibility.

The position switches and pressure switches that provide Reactor Protection System trip inputs for Turbine Stop Valve Closure and Turbine Control Valve Fast Closure are not affected by this design change.

The 50.59 Evaluation has determined that the proposed activity does not result in operation of equipment outside the design functions as currently described in the USAR. The turbine and steam bypass pressure control system will perform the same functions within the same operational limits with the DEHC system as previously required for the EHC system. The malfunctions and accidents currently analyzed in the USAR for the EHC system will remain bounding for the DEHC system. The proposed change does NOT create the possibility for an accident or malfunction of equipment important to safety of a different type than previously analyzed in the USAR. With increased redundancy and improved reliability, the DEHC system will NOT increase the frequency of accidents previously evaluated in the USAR and will NOT increase the likelihood of a malfunction of equipment important to safety. There are no new system interfaces created by the proposed control system upgrade and no physical changes to the steam path, turbine-generator or steam bypass system. The design does not alter or affect any ECCS system or barrier credited in mitigating the consequences of an accident. The proposed activity does NOT increase the consequences of an accident or malfunction of equipment important to safety as previously analyzed in the USAR and will NOT result in a design basis limit for a fission product barrier being altered or exceeded.