



September 11, 2023

L-2023-108
10 CFR 50.59(d)

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

Re: St. Lucie Unit 2
Docket No. 50-389
Report of 10 CFR 50.59 Plant Changes

Pursuant to 10 CFR 50.59(d)(2), the attached report contains a brief description of changes, tests and experiments, including a summary of the evaluation of each, which were made on Unit 2 during the period of October 2, 2021 through March 18, 2023. This submittal correlates with the information included in Amendment 28 of the Updated Final Safety Analysis Report to be submitted under separate cover.

Should you have any questions regarding this submittal, please contact Kenneth Mack at (561) 904-3635.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. Strand for', is written over a horizontal line.

Dianne Strand
General Manager, Regulatory Affairs
Florida Power & Light Company

Attachment: Changes, Tests and Experiments made as Allowed by 10 CFR 50.59

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, St. Lucie Nuclear Plant
USNRC Resident Inspector, St. Lucie Nuclear Plant

ST. LUCIE UNIT 2
DOCKET NUMBER 50-389
CHANGES, TESTS AND EXPERIMENTS
MADE AS ALLOWED BY 10 CFR 50.59
FOR THE PERIOD OF
OCTOBER 2, 2021 THROUGH MARCH 18, 2023

10 CFR 50.59 Evaluations

Title:

Extension of Turbine Overspeed Protection Valve Testing Frequency From 9 to 18 Months

Documentation Number:

EC 297993

Summary of Evaluation:

The activity extended the required St. Lucie, Unit 2, UFSAR Section 13.7.1.6, Turbine Overspeed Protection, Technical Specification Surveillance Requirement, Turbine Valve Testing interval from 9 months to 18 months. The change included updates to the FSAR and implementing procedures to reflect the change in testing frequency, and where applicable, included a discussion of, or reference to, the underlying bases, supporting analyses, etc.

St. Lucie Evaluation PSL-ENG-SENS-22-001, "Extension of Turbine Valve Testing Frequency From 9 to 18 Months," incorporated updated turbine overspeed probabilities from Westinghouse Topical Report PWROG-21018-P and updated probabilities of disc failure from Siemens CT-27455 Report. The total calculated probability per year of an external missile with an 18 month testing interval is updated to 6.50E-07. NEI 96-07, Rev. 1, Section 4.3.1 states that the licensee shall remain below plant specific criteria. The NRC set limit for probability of a missile ejection is 1.0E-05 per year or 11.42E-05 per 100,000 hours. The change did not result in a more than minimal increase in the frequency of occurrence of an accident previously evaluated in the UFSAR.

Extending the turbine valve testing from 9 to 18 months increased the likelihood of the occurrence of an overspeed event by a factor of 1.88 times (worst case using the updated analysis). Per NEI 96-07 Rev. 1, a change is considered adverse if the change in likelihood of occurrence of a malfunction increases by more than a factor of 2. The NRC requires that the probability of turbine missile generation remains below 1.0E-05 for unfavorably oriented turbines, which applies to St. Lucie Unit 2. Therefore, the likelihood of an occurrence of a malfunction of an SSC important to safety and the potential for unacceptable damage is precluded and this change is considered acceptable.

The turbine missile ejection accident resulting from an overspeed event is the only accident previously evaluated in the UFSAR that is credibly affected due to the proposed activity of extending the duration between turbine valve testing. Turbine missiles are not considered in any accidents evaluated in the UFSAR that have radiological consequences.

Failure of the turbine valves to close and prevent a turbine overspeed event are the only malfunctions that could credibly occur due to this activity. Radiological consequences are not postulated as a result of a turbine missile ejection event. Therefore, there is no increase in the radiological consequences of a malfunction of an SSC important to safety previously evaluated in the UFSAR.

The turbine missile ejection is the only event previously evaluated in the UFSAR that is credibly affected due to this activity. No new failure modes are introduced. As such, this activity does not create a possibility for an accident of a different type than previously evaluated in the UFSAR.

Reducing the frequency of valve testing from a 9-month interval to an 18-month interval results in a minimal decrease in the calculated reliability of the valves to perform their design function. Because the probability of occurrence of a turbine missile accident remains within plant specific NRC criteria, the potential for impact to any fission product barrier is precluded.

Based on the results of the 10 CFR 50.59 Evaluation, a License Amendment Request and prior NRC approval is not required for implementation of the extension of the functional test interval of the Turbine Overspeed Protection system from 9 months to 12 months. The basis for this conclusion is that the change does not result in a more than minimal increase in the likelihood for an accident or malfunction, does not increase the consequences of an accident or malfunction, does not result in any new accident or malfunction types or with a different result and does not impact any fission product barriers.

Title:

Implementation of Framatome Topical Report EMF-2310, Revision 1, Supplement 2P, Revision 0 for St. Lucie Units 1 and 2 Post-Scram Main Steam Line Break Events

Documentation Number:

EC 298475

Summary of Evaluation:

The implementation of Topical Report (TR) EMF-2310, Revision 1, Supplement 2P, Revision 0, for Biasi CHF Correlation design limits in the post-scrum Main Steam Line Break analyses for St. Lucie Units 1 and 2 is a new methodology. According to NEI 96-

07 (Section 4.3.8), in order to demonstrate that the change is not considered a departure from a method of evaluation described in the UFSAR used in establishing the design bases or the safety analyses, all of the following must be met:

- Use of a new NRC-approved methodology,
 - Such use is based on sound engineering practice,
 - Appropriate for the intended application and
 - Within the limitations of the applicable SER.
- (1) The NRC approved the TR EMF-2310, Rev. 1, Supp. 2P, Rev. 0 via NRC SER dated February 9, 2023, "*FINAL SAFETY EVALUATION FOR FRAMATOME TOPICAL REPORT EMF-2310, REVISION 1 SUPPLEMENT 2P, REVISION 0, "SRP CHAPTER 15 NON-LOCA METHODOLOGY FOR PRESSURIZED WATER REACTORS"*." The topical was developed by Framatome and provides a design limit for the Biasi CHF correlation suitable for application to HTP and HMP grids, specifically for the Post-Scram Main Steam Line Break (MSLB) analysis.
- (2) The methodology was developed and used by Framatome based on sound engineering practice. This TR (EMF-2310 - Revision 1, Supplement 2P, Revision 0) is a supplement to EMF-2310, Revision 1. The original TR was initially approved by the NRC in 2001, with Revision 1 being approved in 2004. This TR provides a design limit for the Biasi CHF correlation suitable for application to HTP and HMP grids, specifically for the Post-Scram Main Steam Line Break (MSLB) analysis.

Framatome applied the Biasi correlation within its initially approved application domain with an extension of the domain to higher pressures in the new methodology. To support the extension to higher pressures, Framatome provided a significant amount of validation data demonstrating that the correlation can be conservatively applied in the new pressure region. The Framatome analysis showed that the Biasi correlation is more conservative (i.e., will predict less margin to CHF) than was predicted by the previously approved CHF correlation. In addition, Framatome biased and applied correction factors appropriately in the methodology when needed, and it has demonstrated that the Biasi application will result in conservative predictions of DNB margin. The NRC performed a very rigorous validation process to approve the new methodology, as documented in the SER, which also reinforces the conclusion that Framatome used sound engineering in the development and use of the new methodology.

- (3) The methodology is appropriately used for its intended application, as it was approved by the NRC for the new design limits for Framatome post-scrum MSLB analyses, suitable for application to HTP and HMP grids, and is applicable to St. Lucie Units 1 and 2 as shown in Table 2-3 of the Topical Report, which is referenced in Section 2.0 – *Summary and Range of Applicability*, as well as Section 7.5 - *Intended Application*.

- (4) And finally, the limitations and conditions established in the NRC SER and Topical Report have been met for the latest cycle analyses of record in both units as documented in Reference 1.

In conclusion, the new NRC approved methodology used in the post-scrum MSLB event for St. Lucie Units 1 and 2 with new design limits for the Biasi CHF correlation does not constitute a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses.