



~~SECURITY-RELATED INFORMATION~~
~~WITHHOLD UNDER 10 CFR 2.390(d)~~

UPON REMOVAL OF ENCLOSURE 2 THIS LETTER IS UNCONTROLLED

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Serial: RA-20-0244

10 CFR 50.71(e)
10 CFR 54.37(b)
10 CFR 50.59(d)
10 CFR 72.48(d)

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

Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-71 and DPR-62
Docket Nos. 50-325 and 50-324

Subject: Submittal of Updated Final Safety Analysis Report (UFSAR) Revision 27,
10 CFR 54.37 Update, Technical Specifications Bases, Technical Requirements
Manuals, Quality Assurance Program Description, 10 CFR 50.59 and
10 CFR 72.48 Evaluation Summaries, and Commitment Changes

Ladies and Gentlemen:

Pursuant to 10 CFR 50.71(e), Duke Energy Progress, LLC (Duke Energy) hereby submits Revision 27 to the UFSAR for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. Enclosure 1 provides a copy of the UFSAR, on CD-ROM, that has been redacted for public use. Enclosure 2 provides a copy of the UFSAR, on CD-ROM, that contains sensitive information to be withheld from public disclosure per 10 CFR 2.390(d). Changes are identified by vertical lines in the margins of the pages that are indicated as Revision 27. Revision 27 incorporates applicable changes made to the facility through February 13, 2020.

10 CFR 54.37(b) requires that, after the renewed license is issued, the UFSAR update must include any systems, structures, and components (SSCs) newly identified that would have been subject to an aging management review or evaluation of time-limited aging analysis in accordance with 10 CFR 54.21. The UFSAR update must describe how the effects of aging are managed such that the intended function(s) in 10 CFR 54.4(b) will be effectively maintained during the period of extended operation. Revision 27 includes a new aging management program; described in Section 18.1.36, "Cryofit Coupling Hydrogen Embrittlement Program."

Documents that are incorporated by reference into the UFSAR are identified in Section 1.6 of the UFSAR and are also included on the Enclosure 1 CD-ROM. These documents are: (1) the Unit 1 and Unit 2 Technical Requirements Manuals (TRM), and (2) the Duke Energy Quality Assurance Program Description.

Pursuant to Technical Specification (TS) 5.5.10 for the BSEP, Unit Nos. 1 and 2, Duke Energy is providing the latest revisions of the TS Bases for each BSEP unit. The Enclosure 1 CD-ROM contains the Unit 1 TS Bases, which include those changes that have been incorporated since the last submittal of TS Bases revisions to the NRC (i.e., Revisions 99 through 110) and the

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Unit 2 TS Bases, which include those changes that have been incorporated since the last submittal of TS Bases (i.e., Revisions 98 through 109). For convenience, updated TS Table of Contents (TOCs) for Units 1 and 2 are also provided on the Enclosure 1 CD-ROM. These TS TOCs reflect license amendments implemented as of the date of this letter.

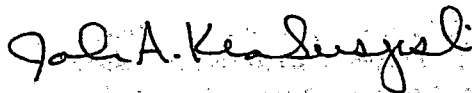
Pursuant to 10 CFR 50.59(d)(2) and 10 CFR 72.48(d)(2), Duke Energy is providing a report summarizing the 10 CFR 50.59 and 10 CFR 72.48 evaluations of changes, tests, and experiments implemented during the period from August 1, 2018, to July 31, 2020. The 10 CFR 50.59 Evaluation Summary Report is provided in Enclosure 3. No 10 CFR 72.48 evaluations were performed during this period.

Pursuant to procedure AD-LS-ALL-0010, "Commitment Management," a Commitment Change Summary Report is submitted with the 10CFR50.71(e) required UFSAR revision. No BSEP commitment changes requiring NRC notification were made during the period from August 1, 2018, to July 31, 2020.

This document contains no new regulatory commitments. Please refer any questions regarding this submittal to Mr. Art Zaremba, Director - Nuclear Fleet Licensing, at (980) 373-2062.

I declare, under penalty of perjury, that the foregoing is true and correct. Executed on August 12, 2020

Sincerely,



John A. Krakuszeski

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Enclosures:

1. Brunswick Steam Electric Plant UFSAR Revision 27 - Redacted Version, CD-ROM
The CD-ROM also includes:
 - Brunswick Steam Electric Plant Unit 1 Technical Requirements Manual, Revision 83
 - Brunswick Steam Electric Plant Unit 2 Technical Requirements Manual, Revision 76
 - Duke Energy Quality Assurance Program Description, Revision 45
 - Brunswick Steam Electric Plant Unit 1 Technical Specification Bases, Revision 110
 - Brunswick Steam Electric Plant Unit 2 Technical Specification Bases, Revision 109
 - Brunswick Steam Electric Plant Unit 1 Technical Specification Table of Contents
 - Brunswick Steam Electric Plant Unit 2 Technical Specification Table of Contents
2. Brunswick Steam Electric Plant UFSAR Revision 27 - Non-Redacted Version, CD ROM
(Withhold from Public Disclosure per 10 CFR 2.390(d))
3. 10 CFR 50.59 Evaluation Summary Report

cc:

Ms. Laura Dudes, Regional Administrator, Region II
Mr. Andrew Hon, Project Manager
Mr. Gale Smith, NRC Senior Resident Inspector

Chair - North Carolina Utilities Commission (w/o Enclosure 2)
Mr. W. Lee Cox, III Section Chief, Radiation Protection Section, NC DHHS (w/o Enclosure 2)

Brunswick Steam Electric Plant UFSAR Revision 27 Redacted Version, CD ROM

The CD-ROM also includes:

- Brunswick Steam Electric Plant Unit 1 Technical Requirements Manual, Revision 83
 - Brunswick Steam Electric Plant Unit 2 Technical Requirements Manual, Revision 76
 - Duke Energy Quality Assurance Program Description, Revision 45
 - Brunswick Steam Electric Plant Unit 1 Technical Specification Bases, Revision 110
 - Brunswick Steam Electric Plant Unit 2 Technical Specification Bases, Revision 109
 - Brunswick Steam Electric Plant Unit 1 Technical Specification Table of Contents
 - Brunswick Steam Electric Plant Unit 2 Technical Specification Table of Contents
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Brunswick Steam Electric Plant UFSAR Revision 27
CD ROM

Security-Related Information
Withhold Under 10 CFR 2.390(d)

10 CFR 50.59 Evaluation Summary Report

Summary of Changes, Tests, and Experiments Requiring 10 CFR 50.59 Evaluations

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Title: Unit 1 Feed Water Level Control

Evaluation Identification Number: Action Request (AR) 01971453

Brief Description:

This activity (i.e., EC 298746) upgraded the Brunswick Unit 1 feedwater heater (FWH) drain level control valves and instrumentation on the shell side of FWHs 3A/3B, 4A/4B and 5A/5B. The replacement valves, actuators, controllers, and instrumentation more accurately control the extraction steam condensate level on the shell side of FWHs 4A/4B and 5A/5B optimizing the required heat transfer prior to the reactor coolant entering the vessel. With more accurate level control of the FWHs, reactor steam generation availability increases with higher efficiency due to a reduction in unplanned outages related to feedwater level control valve failures. The increased reliability of the new valves, actuators, and associated components, as well more technologically advanced instrumentation and controls, reduces radiation exposure to plant personnel by reducing maintenance activities associated with the FWHs.

Summary of 10 CFR 50.59 Evaluation:

The electrical and mechanical properties of the FWH drain level control system will not be changed in such a way that would affect the operational capabilities of the FWH drain system. The response time of the FWH drain level control system is not adversely affected by the proposed activity. The new system will not increase burdens or place constraints on an operator's ability to adequately respond to an accident. The initial accident assessments contained in the UFSAR remain unchanged as a result of the implementing activity. The proposed activity cannot result in more than a minimal increase in the consequences of an accident previously evaluated in the UFSAR since the FWH drain level control system does not perform any accident mitigation functions. The new equipment has been evaluated to verify compliance with its environment including temperature, humidity, seismic, and electromagnetic interference, and the new equipment will have no adverse impact on its installed environment or another plant structure, system, or component (SSC).

The activity was evaluated per 10 CFR 50.59, and the guidance provided in NEI 96-07 and NEI 01-01. The conclusion of the evaluation was that the proposed activity could be implemented under 10 CFR 50.59 without requiring prior NRC review or approval.

Plant References:

EC 298746

Title: Change to The Allen Bradley 700-RTC Relays

Evaluation Identification Number: Action Request 02207965

Brief Description:

This activity (i.e., EC 411346) evaluated the change in the Allen Bradley 700-RTC relay to include a Complex Programmable Logic Device (CPLD) timing chip in place of the Application Specific Integrated Circuit (ASIC) based timing chip. This evaluation addressed the acceptability of using the CPLD version of this Allen Bradley timing relay in two additional locations at the Brunswick Steam Electric Plant (BSEP), 2-DG3-STR and 2-DG4-STR. These relays support the start logic of Diesel Generators.

Summary of 10 CFR 50.59 Evaluation:

The electrical and mechanical properties of the Emergency Diesel Generator (EDG) system was not changed in such a way as to affect the operational capabilities of the EDG system. Installation of the CPLD based timing relays did not increase burdens or constraints on the operators' ability to adequately respond to an accident. The initial accident assessments contained in the UFSAR remain unchanged as a result of the implementing activity. The new equipment has been evaluated to verify compliance with its environment including temperature, humidity, seismic, and electromagnetic interference, and the new equipment will have no adverse impact on its installed environment or another plant SSC. This evaluation addressed the acceptability of using the CPLD version of this Allen Bradley timing relay in all locations that it is currently installed at BSEP.

The activity was evaluated per 10 CFR 50.59, and the guidance provided in NEI 96-07 and NEI 01-01. The conclusion of the evaluation was that the proposed activity could be implemented under 10 CFR 50.59 without requiring prior NRC review or approval.

Plant References:

EC 411346

Title: Replacement of the Unit 1 Refueling Platform Bridge

Evaluation Identification Number: Action Request 2055486

Action Request 02237606 (revision of AR 2055486)
Action Request 02247875 (revision of AR 02237606)
Action Request 02270838 (revision of AR 0224785)
Action Request 02311389 (revision of AR 02270838)

Brief Description:

This activity (i.e., EC 300707) replaced the Unit 1 Refueling Platform Bridge. The new Refueling Platform is similar to the original platform in design and overall function and utilized the existing rails. The platform has enhanced features and capabilities to improve the efficiency and safety of the refueling process. This activity replaced the existing refueling bridge with a new designed bridge, equipment and controls. The existing mast, GE NF 500, and grapple were evaluated as being compatible with the new bridge and were reused. The new Refueling Platform was replaced to improve the reliability and efficiency of the platforms as well as to address component obsolescence.

Summary of 10 CFR 50.59 Evaluation:

The evaluation considered:

- Mechanical stops are maintained on the bridge and trolley
- Design, Manufacturing, Installation and Testing in accordance with Site and Industry Standards
- No new failure modes identified
- No new fuel manipulations outside of the current design
- Satisfactory Electromagnetic Interference/Radio Frequency Interference (EMI/RFI) frequency interference testing of emissions and susceptibility
- Components suitable for the installed operating environment
- Seismic evaluation demonstrates the Refueling Bridge is capable of withstanding a design basis event and the floor loading increase is acceptable.
- A new e-STOP design that will operate outside of the digital system ensuring a positive control by the platform operator plus additional e-STOP buttons available to the spotter and SRO
- Enhanced Human Machine Interface results in reduction of Operator burden

Later revisions are described below:

- Action Request 02237606 (Revision of AR 2055486) - This 50.59 Evaluation is a revision to Evaluation AR Number 02055486 to support EC 300707, Rev. 3. This revision incorporates findings from the final test results from BWR Refueling Platform Electromagnetic Interference/Radio Frequency Interference Test Report, F.503100.

- Action Request 02247875 (revision of AR 02237606) - This 50.59 Evaluation is a revision to Evaluation AR Number 2237606 to support EC 300707, Rev. 4. This revision was editorial as it removed a statement that incorrectly stated the proposed Technical Requirements Manual change required NRC approval.
- Action Request 02270838 (revision of AR 0224785) - This evaluation was a revision to evaluation AR Number 2247875 to support revision 8 of EC 300707. This evaluation revision was an administrative change that facilitates installation and turnover of the refuel platforms for outage operation. The change addressed operator enhancements identified during the final Site Acceptance Testing that could not be developed in time to support turnover. The subject changes are not new scope for the refueling platforms, but are software enhancements that Fleet Reactor Services has requested to mitigate human performance error traps.
- Action Request 02311389 (revision of AR 02270838) - This evaluation AR 2311389 is a revision to evaluation AR Number 2270838 to support revision 10 of EC 300707. This evaluation is in regard to a change to replace the dual redundant 7/16" diameter main hoist wire ropes with dual redundant 5/16" diameter main hoist wire ropes. This change has been performed to ensure the BSEP refuel platform is consistent with all other BWR refuel platforms in the industry for the main hoist dual redundant wire rope configuration. This revision also updates the original digital portion of the evaluation to include guidance from RIS 2002-22, Supplement 1. The design of the new control system provides for a higher degree of defense-in-depth than its predecessor. The new system takes advantage of state-of-the-art technology yet retains the protective mechanical features used in the previous system. In addition, implementation of a dual-redundant hoist system, over a single-wire rope system, will further reduce the likelihood of occurrence of a malfunction of an SSC important to safety.

The activity was evaluated per 10 CFR 50.59, and the guidance provided in NEI 96-07 and NEI 01-01. The conclusion of the evaluation was that the proposed activity could be implemented under 10 CFR 50.59 without requiring prior NRC review or approval.

Plant References:

EC 300707

Title: Atrium 11 Fuel

Evaluation Identification Number: Action Request 02303568

Brief Description:

This activity (i.e., EC 416605) is for the ATRIUM 11 fuel design which has become the fuel used at the Brunswick Steam Electric Plant (BSEP), replacing the last fuel, ATRIUM 10XM. The introduction of ATRIUM 11 fuel at BSEP required additional nuclear criticality safety (NCS) analyses performed to support storage of ATRIUM 11 in the spent fuel pool (SFP) and new fuel storage vault (NFSV) to ensure the new fuel design may safely be stored in the same conditions as the previous fuel.

Summary of 10 CFR 50.59 Evaluation:

Storage of ATRIUM 11 fuel at BSEP must be in accordance with Technical Specifications as well as the design bases of the NFSV and SFP related to NCS. The k-eff of the SFP must remain ≤ 0.95 under all conditions. The k-eff of the NFSV must remain ≤ 0.95 under flooded conditions and ≤ 0.90 under dry conditions. The SFP NCS analysis in shows the ATRIUM 11 fuel stored in the SFP will not exceed k-eff of 0.95, provided the ATRIUM 11 fuel meets the design limits. The SFP NCS analysis shows the ATRIUM 11 fuel may be stored without restrictions, including being co-resident with all other fuel types present in the SFP.

The NFSV NCS analysis in demonstrates the ATRIUM 11 fuel stored in the NFSV will not exceed the k-eff limit of 0.95 in a flooded condition, nor will it exceed k-eff of 0.90 in dry conditions, provided the ATRIUM 11 fuel meets the design limits.

The activity was evaluated per 10 CFR 50.59, and the guidance provided in NEI 96-07 and NEI 01-01. The conclusion of the evaluation was that the proposed activity could be implemented under 10 CFR 50.59 without requiring prior NRC review or approval.

Plant References:

EC 416605