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10 CFR 50.4(b)(6)  
10 CFR 50.71(e)  
10 CFR 50.59(d)(2)

RS-22-048

March 31, 2022

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

Clinton Power Station, Unit 1  
Facility Operating License No. NPF-62  
NRC Docket No. 50-461

Subject: Clinton Power Station Updated Safety Analysis Report (USAR), Revision 22

In accordance with the requirements of 10 CFR 50.71, "Maintenance of records, making of reports," paragraph (e)(4), Constellation Energy Generation, LLC (CEG) submits Revision 22 to the Updated Safety Analysis Report (USAR) for Clinton Power Station.

The USAR is being submitted on Optical Storage Media (OSM) in its entirety, including documents incorporated by reference (Clinton Operational Requirements Manual (ORM) updated through Revision 93, Clinton Technical Specifications Bases (TSB) updated through Revision 21-11). USAR pages changed as a result of this update are delineated with "Rev. 22, March 2022" in the page footer.

Changes to the USAR, ORM and TSB have been made under the provisions of 10 CFR 50.59, "Changes, tests, and experiments." CEG has evaluated these changes in accordance with 10 CFR 50.59 and concluded that the changes do not require prior NRC approval.

Attachment A provides a brief summary of the changes incorporated into USAR Revision 22.

Attachment B provides the required summary report pursuant to 10 CFR 50.59(d)(2).

Attachment C contains a summary of regulatory commitment changes.

Attachment D summarizes the changes to the ORM.

Attachment E provides a required summary report pursuant to 10 CFR 72.48.

Attachment F contains the directory path, filename, and size of each individual file.

A053  
NRR

One (1) OSM is included in this submission. The OSM labeled, "Constellation, Clinton Power Station, USAR Rev. 22, March 2022," contains the following components:

001 CPS USAR Rev 22.pdf, 862 megabytes (MB)  
002 CPS ORM.pdf, 1.15 MB  
003 CPS TSB.pdf, 1.79 MB


As required by 10 CFR 50.71(e)(2)(i), I certify that to the best of my knowledge, the information contained in the enclosures and attachments to this letter accurately reflect information and analyses submitted to the NRC or prepared pursuant to NRC requirements, and changes made under the provisions of 10 CFR 50.59.

There are no new commitments made in this document. Should you have any questions concerning this letter, please contact:

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Respectfully,

Gullott,  
David M.

  
Digitally signed by Gullott, David M.  
Date: 2022.03.31 13:55:03 -05'00'

David M. Gullott  
Director – Licensing  
Constellation Energy Generation, LLC

Enclosure: OSM – Constellation, Clinton Power Station, USAR Rev. 22,  
March 2022

Attachments:

Attachment A - CPS USAR Revision 22 Change Summary Report  
Attachment B - CPS 10 CFR 50.59 Summary Report  
Attachment C - CPS Summary of Regulatory Commitment Changes  
Attachment D - CPS Summary of Operational Requirements Manual Changes  
Attachment E - CPS 10 CFR 72.48 Summary Report  
Attachment F - CPS OSM Directory Structure

cc: NRC Regional Administrator – NRC Region III  
NRC Senior Resident Inspector – Clinton Power Station

**Attachment A**  
**CPS USAR Revision 22 Change Summary Report**  
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**USAR 2019-015**      **Revise Secondary Containment Tornado Design Criteria and Extend to Fuel Building Railroad Airlock**

Change provides additional information. The tornado wind and missile protection requirements for the secondary containment are removed. In addition, the secondary containment is extended to the Fuel Building Railroad Airlock. Table 3.2-1, Section 3.3.2.3, Section 3.5.2.2, Table 3.5-5, Section 3.8.4.1, Section 3.8.4.1.2, Section 3.8.4.3, Section 6.2.3, Section 6.2.3.2, Section 6.2.3.3.2.1, Section 6.2.3.3.2.2, Section 6.5.1.1.1, Section 6.5.1.2.1, Figure 6.2-132, Figure 6.4-3. 50.59 Evaluation CL-E-2019-031.

**USAR 2019-018**      **Update USAR Values for Containment Design Parameters (Upper Pool Makeup Volume)**

Change identifies Change Value for "Upper Pool Makeup Volume" from 14,748 ft<sup>3</sup> to 14,736 ft<sup>3</sup> in USAR Table 6.2-1 and Table 6.2-4. USAR Table 6.2-1, "Containment Design Parameters;" USAR Table 6.2-4, "Initial Conditions Employed in Containment Response Analysis (Case B2)" 50.59 Safety Screening CL-2019-S-032.

**USAR 2020-002**      **Implementation of License Amendment No. 226**

This change is for the removal of insertions description in systems operation Section 15.4.9.2.2.

**USAR 2020-003**      **IEEE Std 338 Clarification**

Change adds clarification that IEEE Std 338 Appendix contents are not requirements. IEEE Std 338-1977: Appendix states, "This appendix is not part of IEEE Std 338-1977" and "this appendix presents a discussion of good practices which are recommended for consideration". Based on this wording, the contents of the Appendix are not IEEE Std 338 requirements. This is a Non-Regulatory Change.

**USAR 2020-005**      **MCR Habitability Hazardous Chemical Survey Analysis 2019**

EC issues calculations for the Hazardous Chemical Survey that is routinely performed every 6 years. Updates to the USAR are for updated survey results. Section 2.2.3.1.3 is updated to remove historical information. The Section 2.2.3.3 is updated to reflect the current revisions of references. Table 2.2-7 is updated and made active to list the relevant hazards based on Reference 14. EC 630055, Calculation VC-94, 91-073.

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**CPS USAR Revision 21 Change Summary Report**  
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**USAR 2020-007**      **Turbine Missile Analysis Update**

Change updates description of turbine missile analysis to incorporate new MPR analysis 0958-0163-CALC-001, Effect of Extending Turbine Valves and Overspeed Protection System Test Intervals on Turbine Missile Generation Probability. Correct formatting on page 3.5-4 (move third paragraph to the left), and corrected Table U-1 to Table U.1 in third paragraph from the bottom. Add calc as new Reference 16. Sections 3.5.1.3 (p. 3.5-3 and 3.5-4); 3.5.4 (p. 3.5-18), MPR analysis 0958-0163-CALC-001. Rev. 0 and issued under EC 631000. NU REG 1048 Appendix U, Probability of Missile Generation in GE Nuclear Turbines.

**USAR 2020-008**      **Issue Calculation Incorporating MPR Analysis and USAR Change to Extend PM Frequency of Turbine Control Valves**

Changes frequency of Turbine Valve exercises will be governed by CPS PM Program instead of Manufacturer recommendation – See MPR Analysis 0958-0163-CALC-001 as basis for this change. Section 10.2.3.6. EC 631000.

**USAR 2020-09**      **NFPA Code of Record update**

Change aligns the CPS UFSAR NFPA Codes of Record with the NFPA Code Conformance Evaluation. This is an editorial change that adds all codes that CPS has committed to historically to the UFSAR. Section 9.5-5 and 9.5-6, pages 5244 and 5245.

**USAR 2020-011**      **USAR Table not updated as part of implementation of License Amendment 201**

Change updates USAR Table 6.5-3, Section C.4, description of operation of ESF atmosphere cleanup train should be operated from at least 10 hours per month to 15 minutes as required per Tech Specs. USAR Table: 6.5-3, Section C.4.

**USAR 2020-013**      **Remove RCIC from list of Engineered Safety Features in Section 6.0 of CPS USAR**

Change removes "Reactor Core Isolation Cooling System" from the list of Engineered Safety Features. Provides a note in Table 6.1-1 such that RCIC is not implied to be an ESF. Section 6.0, Page 6.1-1. Table 6.1-1, Page 6.1-9.

**USAR 2020-016**      **Update USAR as part of implementation of License Amendment No. 226**

This change is to the RPC may be bypassed as allowed by TS during shutdown provided coupling of all withdrawn control rods have been verified. This verification ensures that a CRDA cannot occur. Thus, minimizing the worth of control rods to mitigate a CRDA is not required. USAR 15.4.9.2.2.

**USAR 2020-017**      **Correct typo in USAR Table 6.2-47**

USAR Table 6.2-47, "Isolation Valve Summary for Line Penetrating Containment," on Page 6.2-164 has a typo. Containment Penetration No. 20, Valve 1E12F065B should be Valve 1E12F365B. USAR Table 6.2-47.

**USAR 2020-018**      **Implementation of ANSI/ANS 3.1-2014 to support Fleet Adoption**

Change removes of ANSI/ANS 3.1-1978 and replacing with ANSI/ANS 3.1-2014. Updating R.G. 1.8 Revision from 2 to 4. ORM: 6.5.3.1, USAR Sections: 13.1.2.2.1.3, 13.1.3.1, 13.1.3.2, and 13.2.1.1, Pages:1.8-6, 1.8-7, 1.8-8, 1.8-9, 1.8-10, 8.3-13.

**USAR 2020-019**      **Clarification for testing frequencies being controlled by the Surveillance Frequency Change Program (SFCP)**

Change provides clarification in regards to the testing frequencies being controlled by the Surveillance Frequency Change Program (SFCP). The specific Sections being updated are: 3.9.3.1.1.15 RCIC Turbine which discusses Quarterly Surveillance Testing; 3.9.3.1.1.16 RCIC Pump for quarterly operation test; 7.3.2.1.2.3.1.9 for accuracy checks and transmitters not needing to be valved out of service more than once per operating cycle 7.3.2.1.2.3.1.10 for ADS which states transmitters need only be calibrated once per fuel cycle.

**USAR 2020-021**      **ERAT Static Var Compensator (SVC) Long Term Abandonment**

This Design change package (DCP) 628200 is abandoning the Static Var Compensator (SVC) on Emergency Reserve Auxiliary Transformer (ERAT). Additionally, EC 628200 will install Mechanically Switched Capacitor Control (MSCC) system along with placing ON-LOAD Tap Changer (OLTC) on ERAT in "AUTO". UFSAR Sections 8.2.2.1, 8.3.1.1.1, 8.3.1.1.2.

**USAR 2020-024**      **EC 617767 Upgrade Spent Fuel Pool Gate 1FH04J Seals and Backup Air Supply**

Change provides description of design basis for spent fuel pool gate 1FH04J and safety-related backup air supply installed per EC617767. Table 3.2-1, Section 3.5.1.1, Section 9.1.4.1, Section 9.1.4.3, Section 9.3.1.1.1, Section 9.3.1.2, Section 9.3.1.3, Table 9.3-1, Table 9.3-2.

**USAR 2020-029**      **License Amendment 235 – Emergency Reserve Auxiliary Transformer (ERAT) Automatic Load Tap Changer (LTC)**

Change amends limitation on ERAT LTC mode of operation to allow automatic operation. Section 8.3.1.1.2, Unit Class 1E A-C Power System; Page 8.3-6.

**USAR 2020-033**      **Replace the 0FP01PA Centrifugal Fire Pump, Control Panel, Diesel Engine, and Right-Angle Gear Drive**

Change replaces the 0FP01PA centrifugal fire pump, control panel, diesel engine, and right-angle gear drive. Section 9.5.1.2.2.3, page 9.5-10.

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**CPS USAR Revision 21 Change Summary Report**  
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**USAR 2020-034**      **Update UFSAR 7.3.1.1.1.3.6 Bypasses and Interlocks to Reflect EC 633012**

Change adds a description of a key lock switch added by EC 633012 that will allow Operations personnel to bypass the 1E22-F004 Seal In for the Open and Closed Position as required by EOP-1A to allow for better Reactor Water Level Control. This will be added to CPS 4411.04 and take the place of previous steps which required that the associated cubicle be de-energized and leads cut to accomplish this outcome. Sections 7.3.1.1.1.3.6, Page 7.3-4

**USAR 2020-036**      **Add USAR 15.9 to reflect SBO SER (NUREG 0853 February 1992)**

Change adds new section 15.9 and Table 15.9-1, 2, 3, and 4 to the USAR which reflects the NRC approved SBO design and licensing bases as outlined in NUREG 0853 February 1992. This will include references to the applicable correspondence and capturing the various considerations that were part of the approval process. References to the new USAR section 15.9 are added to USAR Section 1.8 page 1.8-74 under Regulatory Guide 1.155 Station Blackout, and the USAR Section 8.3. The Chapter 15 index is updated to reflect the new section and associated tables.

**USAR 2021-002**      **Update UFSAR with OPIS Information**

Change updates the UFSAR with more detailed information on the Open Phase Isolation System to meet industry standards. Section 8.2.1.2 Switchyard, Page 8.2-4.

**USAR 2021-004**      **Update USAR Appendix E Fire Protection Drawings for Valve Team War Room on RW 762**

Change to USAR Appendix E: FP-19a, FP-19b, and Figure 17: Add approximate location and outline of Valve Team War Room. USAR Appendix E: FP-19a, FP-19b, and Figure 17.

**USAR 2021-005**      **Required USAR Changes based on Relief Request 2205**

Change clarifies that 10CFR 50.55a(z)1 is also a relief method to the requirements of 10CFR 50.55a(f). Chapter 3 Para 3.9.6, Page 3.9-96.

**USAR 2021-006**      **USAR Markup for Clinton Power Station GNF3 Fuel Introduction**

These changes are due to new GNF3 nuclear fuel assemblies. Note: USAR Change # 2021-016 will address "MEOD 2.0" after this package. This package includes moving certain Chapter 15 appendices to HISTORICAL consistent with NEI 98-03, as well as minor historical or updating corrections and editorial enhancements. It has been determined that there are no CL1C21 reload-related USAR changes. EC 630772 Rev, 00, Nuclear Fuel Transition to GNF3 at Clinton Power Station – Operations.

**USAR 2021-008**      **USAR Markup for New GNF3 Fuel Handling and Receipt**

This change makes EC 633756 allows the receipt and handling of new unirradiated GNF3 fuel to store in the New Fuel Vault, Spent Fuel Pool, Upper Containment Pool. 3.1.2.6.3.1, 9.1.1.1.3, 9.1.1.2, 9.1.1.3.1, 9.1.2, 9.1.2.1.1.2, 9.1.2.2.1.3, 9.1.2.2.1.4, 9.1.2.2.2.3, 9.1.2.3.1, 9.1.2.3.1.1, 9.1.2.3.1.2, 9.1.2.3.1.3, 9.1.2.3.1.4, 9.1.6.

**USAR 2021-012**      **Section 9.2.1 Screenwash Water Treatment Changes**

Change provides updated information to USAR Section 9.2.1.1.1 states that the screenwash discharge water is dechlorinated for NPDES permit compliance, this is no longer required since the sodium hypochloite injection point was moved from Plant Service Water (WS) pump suction to WS pump discharge header. Sections 9.2.1.1.3 & 9.2.1.2.2 state that WS pump suctions are treated with sodium hypochlorite, this injection point has been moved to WS pump discharge header. Sections 9.2.1.1.1, page 9.2-1; Section 9.2.1.1.3, Page 9.2-2; Section 9.2.1.2.2, Page 9.2-4.

**USAR 2021-014**      **License Amendment 237 - 50.69 Implementation**

Change updates the USAR to support implementation of License Amendment 237. USAR Sections: Table of Contents, 3.02, 3.09, 3.10, 3.11, 6.2, 6.6.

**USAR 2021-016**      **UFSAR Markup for Clinton Power Station MEOD2.0 (Expanded Maximum Extended Operating Domain)**

The changes are due to the new operating domain (with increased core flow window) for Clinton. There are some editorial/clarification edits (indicated on table). This package has been prepared to "follow" implementation of GNF3 NFI markup #2021-006, i.e. some of these changes may supersede/update USAR changes proposed for GNF3. EC 632262, Rev, 00, Expanded Maximum Extended Operating Domain (MEOD2.0).

**USAR 2021-018**      **Addition of Marathon Ultra MD Blades Description into CPS USAR**

Change provides updates the description of the Marathon Ultra MD Blades into the USAR. Section 4.2.3: add Marathon Ultra MD Pg. 4.2-4: Section 4.2.3, Section 4.2.8: Add Marathon Ultra MD report into References, Pg. 4.2-10: Section 4.2.8.

**USAR 2021-019**      **Revise USAR Section 11.3.2.4.1.1.4 to align with PMMR PMC-21-130670 Extending VJ, VL, VQ and VQ HVAC System Testing PMS**

PMMR PMC-21-130670 has been created to extend the current frequency of leakage testing based on good performance of the current equipment. A review of the testing performance has shown exemplary performance and repeatability. As such, an extension to 6Y frequency from 2Y frequency has been processed as allowed by 10 CFR 50.65(a)(3). Note: While not all the SSCs extended are within the scope of the Maintenance Rule, extending the PMS on these SSCs will allow maintenance to be focused on SSCs that require it which is the stated intent of the Maintenance Rule. Section 11.3.2.4.1.1.4.

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**USAR 2021-023**      **Section 9.5 Fire Pump Alarm Clarification and NFPA Code Update**

Change provides updates to the NFPA code year of the installed FP "A" pump as supplied by the vendor, and updates to section 9.5.1.2.2.3 to generalize the specific alarms listed that initiate a common trouble alarm at the central control station. The alarming conditions shall still be required to provide alarm, but this generalizes the specific alarm names. Section 9.5.1.1, NFPA Codes Table (page 9.5-5) and Section 9.5.1.2.2.3 (pages 9.5-10,9.5-11)

**USAR 2021-024**      **UFSAR Markup for Clinton Power Station MEOD2.0 (Expanded Maximum Extended Operating Domain) -R1**

Change the MEOD2.0 report 006N3212 is Revision 01 instead of 00 as shown in the USAR package 2021-016. That is the extent of the change. Pg 6.3-42, pg 15.0-14, pg 15.1-14, pg 15.2-36b, pg 15.4-21, pg 15.6-19, pg 15D-45, pg 15F-3. EC 632262, Rev, 00, Expanded Maximum Extended Operating Domain (MEOD2.0); 006N3212-R1, Clinton Power Station Maximum Extended Operating Domain Expansion (MEOD2.0)", GEH Report, October 2021.

**USAR 2021-025**      **Revert Changes made by EC 628233**

The NRC has identified a Severity Level IV Non-Cited Violation (NCV) of 10 CFR 50.59(d)(1), "Changes, Tests, and Experiments," for 50.59 Evaluation CL-2019-E-031 implemented with EC 628233. See IR 04444504. The changes made by Revision 0 of EC 628233 are changed back to the previous USAR descriptions. Table 3.2-1, Section 3.3.2.3, Section 3.5.2.2, Table 3.5-5, Section 3.8.4.1, Section 3.8.4.1.2, Section 3.8.4.3, Section 6.2.3, Section 6.2.3.2, Section 6.2.3.3.2.1, Section 6.2.3.3.2.2, Section 6.5.1.1.1, Section 6.5.1.2.1, Figure 6.2-132, Figure 6.4-3

**USAR 2021-026**      **Eliminate Unnecessary Detail on Opening MSIVs**

Change eliminates unnecessary details on opening MSIV's. Sections 10.3.2.



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This attachment contains 50.59 evaluation summaries performed for Clinton Power Station (CPS) during this reporting period.

**Activity Number /Title**

CL-2018-E-007

Abandon PASS Reactor Coolant Sample Line

**Description of Activity**

This activity abandons in place primary containment isolation valve (PCIV) 1PS038 (outboard) and removes PCIV 1PS037 (inboard), which are on the Post Accident Sampling System (PASS) reactor coolant sample line. A blind coupling will be installed to isolate this line and abandon this portion of containment penetration 1MC-210. Control power will be removed to the valve actuators, and valve position indication will also be removed at Main Control Room (MCR) panels 1H13P638/639. Abandonment tags will be hung on 1PS038, and labels placed on the MCR panels and PASS panel 1PS03J to indicate that the valves and reactor coolant sample line are abandoned in place/removed.

**Reason for Activity**

There is a history of valve 1PS037 failing to open. Several design changes have been implemented with different types of valves, but the problem continues. Therefore, the decision was made to abandon the line in place.

**Bases for Not Requiring Prior NRC Approval**

The proposed activity has no adverse impact on the containment isolation function of the line, but does have an adverse impact on the ability to sample reactor water in a post-accident scenario. Abandoning the valves and isolating the sample line will remove the ability to sample high pressure reactor water following an accident. There is an alternate method to sample reactor water through the RHR A and RHR B pump discharge, which allows the commitment made following License Amendment 155 to maintain contingency plans to sample reactor water post-accident. Though redundancy is reduced, Clinton maintains the ability to sample water from the reactor in a situation post-accident. The proposed activity does not result in more than a minimal increase in the frequency of occurrence of an accident, the likelihood of occurrence of a malfunction, the consequences of an accident, or the consequences of a malfunction.

**Activity Number /Title**

CL-2018-E-008

Power Recovery Via BELSIM Data Reconciliation & Validation (DVR) Methodology

**Description of Activity**

This activity provides the basis for accepting the use of the BELSIM software and the Data Validation and Reconciliation (DVR) thermal model of the plant provided by True North. This activity allows the addition of any new procedures, as applicable, and revision of existing procedures that determine and apply a correction factor to the feedwater flow measurement

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used to calculate core thermal power. This will change the calculated core thermal power that is used to calibrate the APRMs and ultimately will allow the calculated core thermal power to be closer to the actual core thermal power. No physical changes are made to the plant.

Core Thermal Power is currently indicated with the calorimetric heat balance via 3D Monicore and the Plant Process Computer (PPC) at CPS, and can be manually calculated using procedure 2208.01, OD-3, and data recorded in the PPC. The calculation relies on 18 different computer points involving Reactor Pressure, Feedwater Flow, Feedwater Temperature, Reactor Water Cleanup flow, Reactor Water Cleanup Temperature, Control Rod Drive flow, Recirculation Pump Motor Power. Values from the APRMs and Generator Electrical Output are also used to support and validate the results, but are not inputs to the calorimetric heat balance. An increase in Feedwater flow will increase core reactivity which will result in a higher thermal power. The model developed by True North using the BELSIM software will provide a more comprehensive analysis of plant conditions to determine a feedwater flow fouling correction factor that when applied will result in less uncertainty in the measured feedwater flow values used in the current procedure. The thermal model will use numerous inputs from the plant computer and reconcile the values based on inputs from other computer points, plant system pressure drops and other inefficiencies modeled in the system.

**Reason for Activity**

EPRi published Evaluation of Data Reconciliation Methods for Power Recovery (3002005345) in July 2015. This report documents the evaluation of utilizing Data Reconciliation Methods to reduce the uncertainty in the final feedwater flow measurement and thereby accomplish power recovery. This report provides the Thermal Performance Engineer with information that can be used to determine if the Data Reconciliation Methods described in the report could be beneficial in a respective plant application. CPS was the subject of the study. The results of the report indicate that there is a possible power recovery from 8 to 15 MWe.

**Bases for Not Requiring Prior NRC Approval**

This activity provides a new method for determining a feedwater flow correction factor used in the determination of reactor thermal power. The objective is to correct the actual power produced by the reactor while remaining within the current licensing commitments. The methodology used to provide input to the reactor heat balance based on the feedwater flow measurements is not described in the USAR. As a result, the introduction of software to correct for bias and report uncertainty in the feedwater flow measurement and determine a feedwater flow correction factor does not involve an adverse change to an element of a USAR described evaluation methodology, or use of an alternative evaluation methodology, that is used in establishing the design bases or used in the safety analyses.

The result of this activity will be a small change in reactor power while remaining within the current licensing commitments. The likelihood of occurrence of accidents or malfunctions evaluated in the USAR is already based on the appropriate limiting conditions, such as licensed reactor power. Consequently, a change in reactor power that is still within the limit will not result in a more than a minimal increase in the frequency of occurrence of any accident or malfunction.

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evaluated in the USAR. Similarly, the dose consequences of accidents and malfunctions evaluated in the USAR are already based on the appropriate limiting conditions, such as maximum neutron flux and licensed reactor power. As a result, the consequences of accidents and malfunctions as evaluated in the USAR are unaffected by this activity. The small change in reactor power and neutron flux resulting from this activity will remain within the current licensing commitments. Consequently, this change does not create the possibility of an accident of a different type or with a different result than any previously evaluated in the evaluated in the USAR. Evaluations in the USAR of the design basis limits associated with fission product barriers are also based on the appropriate limiting conditions. This activity does not change those limiting conditions and, consequently, does not result in a design basis limit for a fission product barrier as described in the USAR being exceeded or altered.

**Activity Number /Title**

CL-2020-E-046

ERAT SVC Long Term Abandonment

**Description of Activity**

This activity abandons the Static VAR Compensator (SVC) on the Emergency Reserve Auxiliary Transformer (ERAT) and will install mechanically switched capacitor (MSC) banks along with placing the on-load tap changer (OLTC) for the ERAT in "AUTO" to regulate the voltage on Class 1E buses (1A1, 1B1, and 1C1). Currently, the SVC controls the voltage supplied by the ERAT for the downstream Class 1E equipment to perform its design function. Also, the OLTC currently installed on the ERAT is only operated manually to provide consistent secondary voltage output. The scope of the design change is:

- Set the ERAT OLTC in AUTO mode.
- Install MSC banks and MSC Control (MSCC) system to provide reactive power support to the 4.16 kV BUS of the auxiliary power transformer at the ERAT.
- Install an overvoltage protection scheme for the OLTC to de-energize the drive motor assembly of the OLTC prior to exceeding the 30 minute allowable over voltage limit of 4454 V at the associated bus.
- Abandon the SVC and the associated control system.

**Reason for Activity**

The CPS ERAT power system SVC has experienced age degradation, increased age-related component malfunctions, and parts obsolescence. Discussions with the original equipment manufacturer have concluded that many components required do not have spare parts available, and some components of the SVC are operating beyond their life expectancy. The activity implements a solution to eliminate further age-related component failures from the SVC without having to perform a major upgrade. The solution is to utilize an automatic OLTC integral to the corresponding ERAT large power supply transformer for controlling voltage to the station's auxiliary power systems, and when necessary, automatically connect MSC to provide additional voltage support to CPS's connected auxiliary power system.

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**Bases for Not Requiring Prior NRC Approval**

The new integrated system (OLTC/MSCC) will continue to maintain the voltage at the ESF buses within the current design and licensing limits. The over-voltage protection system will prevent the maximum steady state Class 1E bus voltage from exceeding the design limit of 4300 V and operation above 4300 V but less than 4454 V is allowed for 30 minutes per USAR 8.3.1.1.2. The ERAT OLTC operating in automatic voltage control, in conjunction with MSCs, ensures that a reliable offsite source of power remains available at the associated bus with voltage within acceptable ranges. A failure mode and effects analysis concluded that the probability of the OLTC and MSCC failing in a manner to impact allowable bus voltage is negligible and bounded by the effects of the failure of the current SVC system. The effect of the modified component failure on bus operation following a LOCA or LOOP is the same as the current SVC design. The function and operation of the ERAT and associated buses as described in the USAR remain unchanged. The activity does not alter the function of any safety system and does not degrade or prevent those systems from performing their intended safety function. No new failure modes are introduced that will result in an accident of a different type.

**Activity Number /Title**

CL-2020-E-112

Clinton Emergency Operating Procedure (EOP) Updates

**Description of Activity**

This activity revises CPS Emergency Operating Procedures (EOPs) based upon the generic Boiling Water Reactor Owners' Group (BWROG) Emergency Procedures Guidelines (EPGs), Revision 4, issued in June 2018. The EPG/Severe Accident Guidelines (SAG) Revision 4 is divided into six volumes and now addresses emergency response from all five modes of operation. This activity revises the CPS EOPs to implement the Revision 4 changes.

**Reason for Activity**

NUREG-0737, "Clarification of TMI Action Plan Requirements" Item LC.I established a requirement for EOP upgrades that led to the creation of generic EPGs (i.e., BWROG EPG Revision 0 through Revision 4). NEI 91-04, "Severe Accident Issue Closure Guidelines," Revision 1, Section 5 describes the industry initiative for severe accident management which led to the creation of BWROG SAGs. CPS EOPs currently conform to BWROG EPG Revision 3 Guidelines. Industry insights gained in the wake of the Fukushima accident in March 2011 and other improvements have resulted in enhancements to the strategies contained in the EPGs and the BWROG has issued EPG Revision 4 to include changes associated with the accident and other enhancements.

**Bases for Not Requiring Prior NRC Approval**

The changes to procedures developed from EPG Revision 4 to the CPS EOPs provide direction for operator action as the result of transients or accidents. The changes do not cause any transient or accident; therefore, they cannot cause an increase in the frequency of occurrence of

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an accident evaluated in the USAR. The ability to bypass interlocks and isolations is shown to not be required unless conditions have placed the unit outside of design basis conditions. Consequently, the change in these procedures do not result in more than a minimum increase in the frequency of occurrence of a malfunction of an SSC important to safety previously evaluated in the USAR. The actions taken meet the assumptions in the safety analysis for the limiting small break loss-of-coolant accident (SBLOCA) which occurs at a higher RPV water level than does the analysis. The symptom-based EOPs allow the Operations staff to respond to a variety of events in an effective manner, and will not result in a change to the consequences of a malfunction as the EPG Revision 4 changes are designed to mitigate those malfunctions. The procedure changes are used to respond to accidents but do not create the possibility for accidents of different types because the actions are controlled to be implemented in response to symptoms from the as-found conditions. These actions are designed and validated and cannot create the possibility for an accident of a different type than any previously evaluated in the USAR. The procedure changes do not create the possibility of a malfunction of an SSC important to safety with different results, as the operator actions are designed to mitigate events. The procedures developed from EPG Revision 4 seek to limit PCT to 1500°F or less with allowance to rise to 1800°F under certain conditions, which is less than the USAR PCT limit of <2200°F. The actions specified are constructed to maintain the fission product barriers and minimize offsite dose rates, incorporating experience from industry events.

**Activity Number /Title**

CL-2021-E-017

Criticality Safety Analyses (CSAs) for Clinton (Holtec Calc HI-2033135 and GESTAR)

**Description of Activity**

This activity is a subset activity of the 2021 CPS new fuel introduction (NFI) for GNF3 fuel. The NFI is applicable to CPS Unit 1 for powering future reload cycles. The scope of this activity subject to 50.59 evaluation CL-2021-E-017 is the criticality safety analysis (CSA) which covers the fuel racks fabricated by NES and Holtec, located in the spent fuel storage pool and the fuel cask storage pool. The Holtec CSA is documented in Revision 3 and Revision 4 of design analysis 01FC41, "Criticality Safety Analysis for Clinton."

**Reason for Activity**

The plant nuclear fuel storage criticality safety design basis is being updated such that it will also cover the storage of new or spent GNF3 fuel in the CPS Unit 1 SFP. This is needed because CPS is changing fuel types to new GNF3 fuel.

**Bases for Not Requiring Prior NRC Approval**

There is a small increase in the in-rack  $k_{inf}$  for GNF3 fuel with respect to the design basis fuel in the Holtec CSA main report. The maximum calculated reactivity includes a margin for uncertainty in reactivity calculations and in mechanical tolerances, statistically combined, giving assurance that the true  $k_{eff}$  will be less than 0.95 with a 95% probability at a 95% confidence level. The maximum GNF3 fuel reactivity was determined to be less than the regulatory limit of

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0.95. The CSAs are not an input to any dose analyses, as a criticality event is not part of the design or licensing basis and is not explicitly evaluated. The changes in the CSAs to accommodate the introduction of GNF3 fuel does not result in a change to the plant that could create a scenario different than has been previously analyzed in the USAR. The potential failures have already been established to be minimal, and such failures have already been analyzed. GNF3 fuel is the next generation of GE fuel, which has many similarities with GNF2 fuel and other GE fuel types previously used at CPS. The activity does not result in the introduction of new failure modes or changing the result of a specific failure mode that already exists. The changes in design analysis 01FC41 to accommodate the introduction of GNF3 fuel does not modify any design basis limits for a fission product barrier. Accordingly, this activity does not result in a design basis limit for a fission product barrier as described in the USAR being exceeded or altered.

**Activity Number /Title**

CL-2021-E-020

AST Dose and LOCA Method Change for Clinton GNF3 New Fuel Introduction

**Description of Activity**

This activity is an update to the core inventory source term calculations as a result of transitioning fuel types to GNF3 fuel. Additionally, the activity supports the change in methodology associated with the Loss-of Coolant Accident (LOCA) from the SAFER/GESTR-LOCA methodology to the SAFER/PRIME methodology.

**Reason for Activity**

The GNF3 fuel transition is an evolutionary change to the fuel design. The design provides more efficient fuel utilization while continuing to maintain appropriate safety margins. The more efficient design results in a change to the core source term inventory which requires an update to various calculations related to accident dose. This evaluation is performed to show that the increase in dose does not exceed the more than minimal increase for each type of accident at the various boundaries and that the doses remain within the acceptance criteria. The LOCA methodology is being updated from SAFER/GESTR-LOCA to the approved LOCA method, SAFER/PRIME. The change is required as GNF3 fuel design requires use of the PRIME methodology.

**Bases for Not Requiring Prior NRC Approval**

The total effective dose equivalent (TEDE) results for dose-significant accident scenarios have increased slightly at select locations of interest. These increases are no more than minimal and remain within the acceptance criteria. The update to the LOCA methodology from SAFER/GESTR-LOCA to SAFER/PRIME is an acceptable method of evaluation change because the SAFER/PRIME method is an approved methodology and is being implemented within the requirements of the PRIME method approval.

**Attachment C**  
**CPS Summary of Regulatory Commitment Changes**  
**Page 1 of 2**

**Subject**

Change to Commitment for Staged Dosimetry for B5B Fire Brigade Staging Area Located in NTD Building

**Existing Commitment Description**

Staged dosimetry, etc. for B-5-B Fire Brigade Staging Area located in NTD Building

75 TLDs

75 PDs (0-1500 mr)

PD Charger

Dosimetry Assignment Form

Area Change Out Log and Vendor Label List have been revised to ensure replacement dosimetry for TLD changeouts and ensure that this dosimetry will be available for first responders.

**Revised Commitment Description**

Staged dosimetry, etc. for B-5-B Fire Brigade Staging Area located in NTD Building

75 DLRs

75 Electronic Dosimeters

20 AAA spare batteries

Dosimetry Assignment Form

Area Change Out Log and Vendor Label List have been revised to ensure replacement dosimetry for DLR changeouts and ensure that this dosimetry will be available for first responders.

**Justification**

DLRs perform the same function as TLDs as they are both Dosimeters of Legal Record for dose of an individual. Pocket Dosimeters (PDs) and Electronic Dosimeters both give indications of the accumulated dose an individual has received during their entry into a Radiological Controlled Area. PDs require the use of a charger and "D" cell batteries to run the charger and Electronic Dosimeters operate off one "AAA" battery. Additionally, it will save 48 hours of RP resources on calibrations of the PDs.

**Subject**

One Time Frequency Extension for Testing Air to Water Heat Exchanger Air Flow

**Existing Commitment Description**

- CPS 1003.10, Appendix R, CM-4 states: ATI 401275-04: Air to Water heat exchangers will be periodically tested to measure and verify cooler air flows within design (CM-4).
- The basis for the frequency of each test will be documented in the preventive maintenance database.
- Each Hx inspection frequency will be adjusted individually within the 5-year (plus 25% grace) limit based on test results.

**Revised Commitment Description**

1VH07SB (SX Pump Room 1B Cooler) heat exchanger is included in the GL 89-13 program (see CPS 1003.10 Appendix A). The commitment to inspect 1VH07SB coils 1VH02AA and

**Attachment C**  
**CPS Summary of Regulatory Commitment Changes**  
**Page 2 of 2**

1VH02AB under 157573-02 and 157574-02 is being temporarily revised to allow one-time inspection frequency extensions from 75 months to 79 months.

**Justification**

The one-time frequency extensions of 157573-02 and 157574-02 are supported by good performance histories of these PMs. The results of the last inspection performances in 2015 identified, via boroscope, minor accumulation of scale along the entire length of the tubes, but no blockage existed. The layer of scale was approximately 2 to 3 mils thick and was smooth with no nodules; chemical cleaning removed 90-95% of the scale. Eddy current testing was also performed and no tubes were identified for plugging. The previous boroscope inspections in 2011 and 2005 also had similar results. A heat exchanger performance test was last performed in July 2020 with satisfactory results. Based on the previous inspection results and satisfactory performance test, there is reasonable assurance that minor scale accumulation is present and will not have a significant adverse impact on the ability of the heat exchanger to perform its function during the 4-month extension interval.



**Attachment D**  
**CPS Summary of Operational Requirements Manual Changes**  
**Page 1 of 1**

There were eight revisions to the Clinton Power Station (CPS) Operational Requirements Manual (ORM) that were made during this reporting period.

The current revision of the CPS ORM is Revision 93.

| Revision Number | Scope of Revision   |
|-----------------|---|
| 86              | Revised Section 2.2 to change the surveillance interval from 184 days to 24 months for the Channel Functional Test for the Feedwater System/ Main Turbine Trip on reactor vessel water level high (Level 8) to match the loop calibration frequency.  |
| 87              | Changed test interval from 7 days to 31 days for Testing Requirement (TR) 4.5.3.1, which verifies that battery cell parameters meet Table 2.5.3-1 Category A limits.  |
| 88              | Extended ORM Section 2.2.12 TR 4.2.12.2 frequency for performing Channel Functional Test from every 184 days to 12 months to avoid half-trip risk to the plant.   |
| 89              | Revised Section 2.2 to change test interval for channel calibration from 24 months to 48 months for the Intermediate Range Monitor (IRM) Control Rod Block Functions b (upscale trip) and d (downscale trip). Updated ORM 2.3.2 Structural Integrity TR "2.3.3 Operational Requirement 1.3.5" to read "4.3.2" instead of "2.3.3." Revised Section 6.5.3.1 to replace ANSI/ANS 3.1-1978 with NSI/ANS 3.1-2014, and updated reference to Regulatory Guide 1.8 from Revision 2 to 4. |
| 90              | Removed the ## from the applicable modes listed for 1E12-F008 and 1E12-F009 in ORM Attachment 4, page 2. Removed the ## note from ORM Attachment 4, page 36. Clarified the Note and Section 3.4 actions to eliminate potential confusion and bring ORM Section 2.4.1 into alignment with LCO Section 3.0.8. Revised Section 2.2.9 to require two moveable and calibrated detectors instead of three.  |
| 91              | Revised various trip setpoint values in ORM Attachment 2 Table 7, Table 17, and Table 5 to accommodate a larger drift value from a longer loop calibration interval. Also revised Table 17 to include nominal trip setpoint values for both the open and close LLS.   |
| 92              | Revised nominal trip setpoint values in ORM Attachment 2 Table 17, for the Reactor Vessel Water Level – Low Low Low, Level 1 Function due to a longer calibration interval for the ATMs and the replacement of transmitters with a different model. The values in Table 17 for Table 5 Functions 1.a, 2.a, 4.a, and 5.a are changed to show separate values for the model 1153DB and 3153ND transmitters.   |
| 93              | Revised Section 2.5 (4.5.1.b and 4.5.1.b.2) to extend molded case circuit breaker (MCCB) testing frequency from 96 months to 120 months plus 25% grace.   |

**Attachment E**  
**CPS 10 CFR 72.48 Summary Report**  
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There were no 72.48 evaluations performed for Clinton Power Station (CPS) during this reporting period.

**Attachment F**  
**CPS OSM Directory Structure**  
**Page 1 of 1**

| <b>Directory Path</b> | <b>File Name</b>                          | <b>Size</b> |
|-----------------------|---|-------------|
| 001 CPS USAR REV 22   | 000 USAR Cover and LOEP.pdf               | 430 KB      |
| 001 CPS USAR REV 22   | 001 CH 01 Intro and General Desc.pdf      | 1082 KB     |
| 001 CPS USAR REV 22   | 002 CH 02 Site Characteristics.pdf        | 2318 KB     |
| 001 CPS USAR REV 22   | 003 CH 02 Figures Part 1 of 2.pdf         | 98522 KB    |
| 001 CPS USAR REV 22   | 004 CH 02 Figures Part 2 of 2.pdf         | 98849 KB    |
| 001 CPS USAR REV 22   | 005 CH 03 Design of Struct Comp Equip.pdf | 4123 KB     |
| 001 CPS USAR REV 22   | 006 CH 03 Figures Part 1 of 5.pdf         | 41837 KB    |
| 001 CPS USAR REV 22   | 007 CH 03 Figures Part 2 of 5.pdf         | 77531 KB    |
| 001 CPS USAR REV 22   | 008 CH 03 Figures Part 3 of 5.pdf         | 76572 KB    |
| 001 CPS USAR REV 22   | 009 CH 03 Figures Part 4 of 5.pdf         | 75705 KB    |
| 001 CPS USAR REV 22   | 010 CH 03 Figures Part 5 of 5.pdf         | 99467 KB    |
| 001 CPS USAR REV 22   | 011 CH 04 Reactor.pdf                     | 5034 KB     |
| 001 CPS USAR REV 22   | 012 CH 05 RCS and Connect Systems.pdf     | 3888 KB     |
| 001 CPS USAR REV 22   | 013 CH 06 Engineered Safety Features.pdf  | 34201 KB    |
| 001 CPS USAR REV 22   | 014 CH 07 Instrument and Control Sys.pdf  | 7262 KB     |
| 001 CPS USAR REV 22   | 015 CH 08 Electric Power.pdf              | 2120 KB     |
| 001 CPS USAR REV 22   | 016 CH 09 Auxiliary Systems.pdf           | 6863 KB     |
| 001 CPS USAR REV 22   | 017 CH 10 Steam and Power Conv.pdf        | 1445 KB     |
| 001 CPS USAR REV 22   | 018 CH 11 Radioactive Waste Mgmt.pdf      | 1094 KB     |
| 001 CPS USAR REV 22   | 019 CH 12 Radiation Protection.pdf        | 2108 KB     |
| 001 CPS USAR REV 22   | 020 CH 13 Conduct of Operations.pdf       | 285 KB      |
| 001 CPS USAR REV 22   | 021 CH 14 Initial Test Program.pdf        | 955 KB      |
| 001 CPS USAR REV 22   | 022 CH 15 Accident Analysis.pdf           | 14023 KB    |
| 001 CPS USAR REV 22   | 023 CH 16 Technical Specifications.pdf    | 41 KB       |
| 001 CPS USAR REV 22   | 024 CH 17 Quality Assurance.pdf           | 42 KB       |
| 001 CPS USAR REV 22   | 025 APP A Glossary.pdf                    | 80 KB       |
| 001 CPS USAR REV 22   | 026 APP B Const Matl Stds and QC.pdf      | 125 KB      |
| 001 CPS USAR REV 22   | 027 APP C Computer Programs.pdf           | 7092 KB     |
| 001 CPS USAR REV 22   | 028 APP D TMI Requirements.pdf            | 3484 KB     |
| 001 CPS USAR REV 22   | 029 APP E Fire Protection Report.pdf      | 949 KB      |
| 001 CPS USAR REV 22   | 030 APP E Figures Part 1 of 2             | 79365 KB    |
| 001 CPS USAR REV 22   | 031 APP E Figures Part 2 of 2             | 62837 KB    |
| 001 CPS USAR REV 22   | 032 APP F Safe Shutdown.pdf               | 73640 KB    |
|                       |   |             |
| 002 CPS ORM           | 001 CPS ORM.pdf                           | 1183 KB     |
|                       |   |             |
| 003 CPS TSB           | 001 CPS TSB.pdf                           | 1837 KB     |