



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 3, 2023

Mr. David P. Rhoades
Senior Vice President
Constellation Energy Generation, LLC
President and Chief Nuclear Officer
Constellation Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 – ISSUANCE OF
AMENDMENT NOS. 282 AND 275 RE: CONTROL ROD SCRAM TIMES
(EPID L-2022-LLA-0125)

Dear Mr. Rhoades:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 282 to Renewed Facility Operating License No. DPR-19 and Amendment No. 275 to Renewed Facility Operating License No. DPR-25 for Dresden Nuclear Power Station, Units 2 and 3. These amendments consist of changes to the technical specifications (TSs) in response to your application dated August 25, 2022, as supplemented by letter dated June 16, 2023.

The amendments revise control rod scram time limits in TS table 3.1.4-1 “Control Rod Scram Times.”

A copy of the safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's monthly *Federal Register* notice.

Sincerely,

/RA/

Surinder S. Arora, Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-237 and 50-249

Enclosures:

1. Amendment No. 282 to DPR-19
2. Amendment No. 275 to DPR-25
3. Safety Evaluation

cc: Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CONSTELLATION ENERGY GENERATION, LLC

DOCKET NO. 50-237

DRESDEN NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 282
Renewed License No. DPR-19

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Constellation Energy Generation, LLC (the licensee), dated August 25, 2022, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-19 is hereby amended to read as follows:

- (2) Technical Specifications

- The Technical Specifications contained in Appendix A, as revised through Amendment No. 282, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented during the Dresden Nuclear Power Station, Unit 2, fall 2023 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Jeffrey A. Whited, Chief
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and Technical
Specifications

Date of Issuance: August 3, 2023



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

CONSTELLATION ENERGY GENERATION, LLC

DOCKET NO. 50-249

DRESDEN NUCLEAR POWER STATION, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 275
Renewed License No. DPR-25

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Constellation Energy Generation, LLC (the licensee), dated August 25, 2022, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 3.B. of Renewed Facility Operating License No. DPR-25 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 275, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented during the Dresden Nuclear Power Station, Unit 2, fall 2023 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

Jeffrey A. Whited, Chief
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and Technical
Specifications

Date of Issuance: August 3, 2023

ATTACHMENT TO LICENSE AMENDMENT NOS. 282 AND 275

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

RENEWED FACILITY OPERATING LICENSE NOS. DPR-19 AND DPR-25

DOCKET NOS. 50-237 AND 50-249

Replace the following pages of the Renewed Facility Operating License with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

REMOVE

License DPR-19
Page 3

License DPR-25
Page 4

INSERT

License DPR-19
Page 3

License DPR-25
Page 4

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

REMOVE
3.1.4-3

INSERT
3.1.4-3

- (2) Constellation Energy Generation, LLC, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear materials as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Updated Final Safety Analysis Report, as supplemented and amended;
- (3) Constellation Energy Generation, LLC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
- (4) Constellation Energy Generation, LLC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
- (5) Constellation Energy Generation, LLC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproduct special nuclear materials as may be produced by the operation of the facility.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2957 megawatts thermal (100 percent rated power) in accordance with the conditions specified herein.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 282, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Operation in the coastdown mode is permitted to 40% power.

f. Surveillance Requirement 4.9.A.10 - Diesel Storage Tank Cleaning
(Unit 3 and Unit 2/3 only)

Each of the above Surveillance Requirements shall be successfully demonstrated prior to entering into MODE 2 on the first plant startup following the fourteenth refueling outage (D3R14).

3. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Sections 50.54 and 50.59 of 10 CFR Part 50, and Section 70.32 of 10 CFR Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

A. Maximum Power Level

The licensee is authorized to operate the facility at steady state power levels not in excess of 2957 megawatts (thermal), except that the licensee shall not operate the facility at power levels in excess of five (5) megawatts (thermal), until satisfactory completion of modifications and final testing of the station output transformer, the auto-depressurization interlock, and the feedwater system, as described in the licensee's telegrams; dated February 26, 1971, have been verified in writing by the Commission.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 275, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. Reports

The licensee shall make certain reports in accordance with the requirements of the Technical Specifications.

D. Records

The licensee shall keep facility operating records in accordance with the requirements of the Technical Specifications.

E. Restrictions

Operation in the coastdown mode is permitted to 40% power.

Table 3.1.4-1 (page 1 of 1)
Control Rod Scram Times

-----NOTES-----

1. OPERABLE control rods with scram times not within the limits of this Table are considered "slow."
 2. Enter applicable Conditions and Required Actions of LCO 3.1.3, "Control Rod OPERABILITY," for control rods with scram times > 7 seconds to 90% insertion. These control rods are inoperable, in accordance with SR 3.1.3.4, and are not considered "slow."
-

PERCENT INSERTION	SCRAM TIMES ^(a) ^(b) (seconds) when REACTOR STEAM DOME PRESSURE ≥ 800 psig
5	0.45
20	0.85
50	1.80
90	3.00

(a) Maximum scram time from fully withdrawn position based on de-energization of scram pilot valve solenoids at time zero.

(b) Scram times as a function of reactor steam dome pressure when < 800 psig are within established limits.



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 282 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-19

AND AMENDMENT NO. 275 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-25

CONSTELLATION ENERGY GENERATION, LLC

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

By letter dated August 25, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22237A233), as supplemented by letter dated June 16, 2023 (ML23167C159), Constellation Energy Generation, LLC (Constellation or the licensee), requested changes to the technical specifications (TSs) involving surveillance requirements (SRs) in the renewed facility operating license for the Dresden Nuclear Power Station (DNPS), Units 2 and 3.

The amendment would revise the control rod scram time limits in TS table 3.1.4-1, "Control Rod Scram Times," to regain margin for reactor pressure vessel (RPV) overpressure.

2.0 REGULATORY EVALUATION

2.1 Description of the Licensee's Proposed Changes

The license amendment request (LAR) proposed the changes to TS for Dresden, Units 2 and 3, to revise the control rod scram time limits in TS table 3.1.4-1 to regain margin for RPV overpressure. The changes to table 3.1.4-1 would revise the scram times as follows:

- for 5 percent insertion, scram time would be revised from 0.48 to 0.45 seconds,
- for 20 percent insertion, scram time would be revised from 0.89 to 0.85 seconds,
- for 50 percent insertion, scram time would be revised from 1.98 to 1.80 seconds, and
- for 90 percent insertion, scram time would be revised from 3.44 to 3.00 seconds.

2.2 Regulatory Review

The U.S. Nuclear Regulatory Commission (NRC or Commission) staff considered the following regulations and guidance during its review of the proposed changes.

Regulations

The regulations at Title 10 of the *Code of Federal Regulations* (10 CFR), section 50.36, require that TSs include items in the following categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation [LCOs]; (3) SRs; (4) design features; (5) administrative controls; (6) decommissioning; (7) initial notification; and (8) written reports.

The regulation at 10 CFR 50.36(c)(2) states LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility. 10 CFR 50.36 (c)(2)(ii) requires the LCOs to be established for each item meeting one or more of four criteria stated in that subsection. Criterion 3 of that list states: "A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier."

The regulation at 10 CFR 50.36(c)(3) states SRs are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

The original license of DNPS, Units 2 and 3, was reviewed and approved against the draft General Design Criteria (GDC) issued in July 1967. In its Updated Final Safety Analysis Report, section 3.1, "Conformance with NRC General Design Criteria," the applicant provides an assessment of the 70 draft GDC published in 1967 and concluded that the plant-specific requirements are sufficiently similar to the GDC that are in Appendix A to Part 50. The staff concurs that the equivalent draft GDC used at DNPS is functionally equivalent to Appendix A, GDC 10. The regulation at 10 CFR part 50, appendix A, GDC 10, states that: "The reactor core and associated coolant, control, and protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences."

2.3 Reasons for the Proposed Changes

The licensee plans for fuel transition to Global Nuclear Fuels America, LLC (GNF) 3, as approved by the NRC staff in amendment numbers 281 and 274, issued by letter dated July 6, 2023 (ADAMS Accession No. ML23144A310). The licensee's plan is to load GNF3 fuel into Unit 2 during the fall 2023 refueling outage and into Unit 3 the following fall. Therefore, a revised set of scram times are required to support the improvements on the margin to the American Society of Mechanical Engineers (ASME) Code reactor vessel overpressure limit.

3.0 TECHNICAL EVALUATION

The NRC staff evaluated the licensee's application to determine whether the proposed changes are consistent with the regulations, guidance, and licensing and design basis information as discussed in section 2.0 of this safety evaluation. The NRC staff reviewed the licensee's

proposed TS changes in the LAR to verify that the revised control rod scram time limits are acceptable.

3.1 Description of the Revisions to Control Rod Scram Time Limits

As discussed in section 2.3, the licensee proposed modifications to the scram speed profiles to regain overpressure margin. To ensure that the specified acceptable fuel design limits are not exceeded, the control rod drive system scram functions control the reactivity changes during anticipated operational occurrences. In the design-basis accident (DBA) and transient analysis, it is assumed that all control rods scram at a specified insertion rate. The negative reactivity resulting from the control rod scram insertion determines the basis of plant thermal limits such as the minimum critical power ratio (MCPR). Other scram time distributions (e.g., several control rods scrambling slower than the average time with several control rods scrambling faster than the average time) can also provide sufficient scram reactivity. It is through the surveillance of each individual control rod's scram time that sufficient scram reactivity is ensured for DBA and transient analyses.

For pressures ≥ 800 pound per square inch gauge (psig), the negative reactivity is inserted at a fast enough rate controlled by the scram function to ensure that during the analyzed limiting power transient, the actual MCPR does not reach a level lower than the MCPR safety limit. For pressures ≤ 800 psig, during the control rod drop accident, the scram function provides protection against violating fuel design limits during reactivity insertion accidents. For the reactor function overpressure protection analysis, the scram function and the safety/relief valves control the peak vessel pressure to be maintained within the applicable ASME code limits.

The GNF analysis provided to the licensee showed that the scram speed profiles modifications can be used to regain overpressure margin. GNF also showed that these modifications do not affect the design, functional performance, normal operation of the facility and design or operation of any component in the facility leading to creation of new equipment failure modes.

To determine the revised TS scram speed limits, the NRC-approved ODYN computer code, which involves General Electric transient calculation methodology, is used by the licensee (Reference 1, 2, 3). The licensee applied an NRC-imposed uncertainty factor of 1.044 in their proposed revision of the TS scram time values described in section 2.1. The existing TS SRs for each individual control rod's scram time, which ensures meeting the scram reactivity assumed in DBA and transient analysis, are sufficient for the current ODYN calculations operating limits for pressurization events. The revised TS scram times, which result in the development of the fuel cycle dependent MCPR operating limits, will be used in analyzing all cores containing GNF3 fuels. The NRC staff finds that the resulting TS changes meet the criteria in 10 CFR 50.36 (c)(2) and (c)(3) because the LCO for scram times will continue to exist and will continue to list the lowest functional capability or performance levels of equipment required for safe operation of the facility. Further, the criteria are met because the SRs will continue to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. The NRC staff concurs that the equivalent draft GDC used at DNPS is functionally equivalent to Appendix A, GDC 10. Therefore, the NRC staff finds that the resulting TS meets the requirements in GDC 10 of 10 CFR 50 Appendix A. Therefore, the NRC staff finds the licensee's proposed TS changes in the LAR and the revisions to control rod scram time limits acceptable.

3.2 Technical Conclusions

The licensee proposed to modify control rod scram time limits in DNPS TS table 3.1.4-1 with no other changes to TS 3.1.4.4, "Control Rod Scram Times." The proposed changes to control rod scram times are used to regain margin for RPV overpressure. The NRC staff concludes that the proposed TS changes are acceptable as the licensee's calculations to revise TS scram speed limits were performed consistent with the NRC approved methodology and using appropriately conservative assumptions. The NRC staff concurs that the equivalent draft GDC used at DNPS is functionally equivalent to Appendix A, GDC 10. Therefore, the NRC staff finds that the resulting TS, as amended by the proposed changes, meets the requirements in 10 CFR 50.36 and GDC 10 of 10 CFR 50 Appendix A.

3.3 References

1. Safety Evaluation for the General Electric Topical Report Qualification of the One-Dimensional Core Transient Model for Boiling Water Reactors, NEDO-24154 and NEDE-24154-P, Volumes I, II, and III, dated June 1980 (ML031210215).
2. Supplemental Safety Evaluation for the General Electric Topical Report Qualification of the One-Dimensional Core Transient Model for Boiling Water Reactors, NEDO-24154 and NEDE-24154-P, Volumes I, II, and III, dated January 1981 (ML031210226).
3. "General Electric Standard Application for Reactor Fuel, GESTAR II, NEDE-24011-P-A," Revision 31, Accepted Proprietary and Non-Proprietary Versions, dated November 25, 2020 (ML20330A196).

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendment on April 28, 2023. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change the requirements with respect to installation or use of a facility's components located within the restricted area as defined in 10 CFR part 20 or a change to SRs. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (87 FR 65833). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSIONS

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: C. Jackson, NRR
M. Hamm, NRR

Date of Issuance: August 3, 2023

SUBJECT: DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 – ISSUANCE OF AMENDMENT NOS. 282 AND 275 RE: CONTROL ROD SCRAM TIMES (EPID L-2022-LLA-0125) DATED AUGUST 3, 2023

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