

UNITED STATES NUCLEAR REGULATORY COMMISSION REGION I 475 ALLENDALE RD, STE 102 KING OF PRUSSIA, PENNSYLVANIA 19406-1415

June 27, 2022

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

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT – REISSUED DESIGN BASIS ASSURANCE INSPECTION (TEAMS) INSPECTION REPORT 05000333/2022010

Dear Mr. Rhoades:

The U.S. Nuclear Regulatory Commission (NRC) identified one factual error in Design Basis Assurance Inspection (Teams) Inspection Report 05000333/2022010, dated June 2, 2022 (ADAMS Accession No. ML22153A261). The cover letter and report cover page listed the inspection end date as May 20, 2022, whereas the inspection ended on May 19, 2022. As a result, the NRC has reissued the report in its entirety to correct the error.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <u>http://www.nrc.gov/reading-rm/adams.html</u> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

Mel Gray, Chief Engineering Branch 1 Division of Operating Reactor Safety

Docket No. 05000333 License No. DPR-59

Enclosure: As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT – REISSUED DESIGN BASIS ASSURANCE INSPECTION (TEAMS) INSPECTION REPORT 05000333/2022010 DATED JUNE 27, 2022

DISTRIBUTION:

ECarfang, DORS SHaney, DORS CSwisher, DORS EMiller, DORS, SRI JEngland, DORS, RI ATrudell, DORS AA ROrlikowski, RI OEDO RidsNrrPMFitzPatrick Resource RidsNrrDorlLpl1 Resource

DOCUMENT NAME: https://usnrc.sharepoint.com/teams/Region-I-EB1/Inspections/DBAI (Teams)/Fitzpatrick/Fitz DBAI IR 2022-010 Reissued.docx ADAMS ACCESSION NUMBER: ML22178A137

X SUNSI Review		X Non-Sensitive☐ Sensitive		хП	Publicly Availal Non-Publicly A	ole vailable
OFFICE	RI/DORS	RI/DORS				
NAME	JSchoppy/JGS	MGray				
DATE	6/26/22	6/22/22				

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION Inspection Report

Docket Number:	05000333
License Number:	DPR-59
Report Number:	05000333/2022010
Enterprise Identifier:	I-2022-010-0045
Licensee:	Constellation Energy Generation, LLC
Facility:	James A. FitzPatrick Nuclear Power Plant
Location:	Scriba, NY
Inspection Dates:	May 2, 2022 to May 19, 2022
Inspectors:	 C. Bickett, Senior Reactor Inspector J. Brand, Reactor Inspector P. Cataldo, Senior Reactor Inspector E. Dipaolo, Senior Reactor Inspector E. Eve, Senior Reactor Inspector J. Schoppy, Senior Reactor Inspector
Approved By:	Mel Gray, Chief Engineering Branch 1 Division of Operating Reactor Safety

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a design basis assurance inspection (teams) inspection at James A. FitzPatrick Nuclear Power Plant, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to

https://www.nrc.gov/reactors/operating/oversight.html for more information.

List of Findings and Violations

Inadequate Test Control for Modified Performance Discharge Testing of 'B' Station Battery							
Cornerstone	Significance	Cross-Cutting	Report				
	-	Aspect	Section				
Mitigating	Green	[H.8] -	71111.21M				
Systems	NCV 05000333/2022010-01	Procedure					
Open/Closed Adherence							
The team identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B,							
Criterion XI "Test Control " because Constellation personnel did not perform battery testing in							

Criterion XI, "Test Control," because Constellation personnel did not perform battery testing in accordance with written test procedures. Specifically, the test deficiencies included: 1) the initial battery terminal voltage did not meet the test prerequisite; 2) technicians did not ensure that an adequate and reliable power supply was available for test equipment as required in the test prerequisites which resulted in a pause in testing; 3) the duration of the pause in testing was inappropriately included in the total duration of the battery discharge; and 4) records of individual cell voltages and battery terminal voltages required to be read and recorded at various stages of the test were not included in the official test record.

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

REACTOR SAFETY

71111.21M - Design Bases Assurance Inspection (Teams)

The inspectors evaluated the following components and listed applicable attributes, permanent modifications, and operating experience:

<u>Design Review - Risk-Significant/Low Design Margin Components (IP Section 02.02)</u> (<u>4 Samples</u>)

The team evaluated the following components, permanent modifications, and operating experience during the weeks of May 2 and May 16, 2022.

For the components, the team reviewed the attributes listed in IP 71111.21M, Appendix A, *Component Review Attributes,* such as those listed below. Specifically, the team evaluated these attributes as per IP 71111.21M, Appendix B, *Component Design Review Considerations* and 71111.21M, Appendix C, *Component Walkdown Considerations.* Specific documents reviewed are listed in the Documents Reviewed section.

(1) Loss of AC Bus 10500 Initiating Event

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- Maintenance records and corrective action history
- Adequacy of design (calculations and modifications)
- Surveillance testing and test results
- System and component level performance monitoring
- Equipment protection from fire, flood, water intrusion, or spray
- Heat removal, cooling water and ventilation
- Control logic
- Component adequacy for minimum voltage
- Protection coordination (load in-rush and full load current)
- Range, accuracy, and setpoint of installed instrumentation
- Operator actions
- Process medium availability (water, air, electrical signal)
- Energy source availability (electricity, steam, fuel, air)

The team used Appendix B guidance for *Instrumentation, Circuit Breakers and Fuses, Cables, Electrical Loads, and Motor Control Centers (MCCs).*

- (2) <u>High Pressure Coolant Injection System (Failure to Run)</u>
 - Material condition and installed configuration (e.g., visual inspection/walkdown)
 - Normal, abnormal, and emergency operating procedures
 - Consistency among design and licensing bases and other documents/procedures
 - System health report, maintenance records, and corrective action history
 - Surveillance testing and test results
 - System and component level performance monitoring
 - Control logic
 - Operator actions
 - Process medium availability (water, air, electrical signal)
 - Energy source availability (electricity, steam, fuel, air)

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, and As-Built System*.

(3) <u>Containment Venting (Loss of Function)</u>

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- System health report, maintenance records, and corrective action history
- Equipment/environmental controls and qualification
- Adequacy of design (calculations and modifications)
- Surveillance testing and test results
- System and component level performance monitoring
- Equipment protection from fire, flood, steam, water intrusion, or spray
- Heat removal, cooling water and ventilation
- Control logic
- Range, accuracy, and setpoint of installed instrumentation
- Operator actions
- Process medium availability (water, air, electrical signal)
- Energy source availability (electricity, steam, fuel, air)

The team used Appendix B guidance for Valves, Pumps, Instrumentation, and As-Built System.

(4) <u>'B' 125 Vdc Battery (SB-2) and Battery B Control Board (BCB-2B)</u>

- Material condition and installed configuration (e.g., visual inspection/walkdown)
- Normal, abnormal, and emergency operating procedures
- Consistency among design and licensing bases and other documents/procedures
- Maintenance records and corrective action history
- Equipment/environmental controls and qualification
- Adequacy of design (calculations and modifications)

- Surveillance testing and test results
- System and component level performance monitoring
- Equipment protection from fire, flood, steam, water intrusion, or spray
- Ventilation for temperature control and hydrogen removal
- Circuit breaker and fuse ratings
- Component adequacy for minimum voltage
- Protection coordination (load in-rush, full load current, and short-circuit protection)
- Range, accuracy, and setpoint of installed instrumentation
- Operator actions
- Energy source availability (charger availability, capability, and reliability)

The team used Appendix B guidance for *Instrumentation, Circuit Breakers and Fuses, Cables, Electric Loads, and Motor Control Centers (MCCs)*.

Design Review - Large Early Release Frequency (LERFs) (IP Section 02.02) (1 Sample)

- (1) <u>'B' Loop Suppression Pool Cooling and Containment Spray (Loss of Function)</u>
 - Material condition and installed configuration (e.g., visual inspection/walkdown)
 - Normal, abnormal, and emergency operating procedures
 - Consistency among design and licensing bases and other documents/procedures
 - System health report, maintenance records, and corrective action history
 - Equipment/environmental controls and qualification
 - Adequacy of design (calculations and modifications)
 - Surveillance testing and test results
 - System and component level performance monitoring
 - Equipment protection from fire, flood, steam, water intrusion, or spray
 - Heat removal, cooling water and ventilation
 - Control logic
 - Range, accuracy, and setpoint of installed instrumentation
 - Operator actions
 - Process medium availability (water, air, electrical signal)
 - Energy source availability (electricity, steam, fuel, air)

The team used Appendix B guidance for *Valves, Pumps, Instrumentation, and As-Built System*.

Modification Review - Permanent Mods (IP Section 02.03) (5 Samples)

- (1) EC 626665, Replace 10MOV-26B Double Lead Screw Form Stem with Single Lead Screw Form Stem
- (2) EC 627111, Torus Wide Range Pressure Transmitter 27PT-101A Replacement
- (3) EC 628065, 72MOD-101B(OP) Replacement with New Model Operator
- (4) EC 629418, Evaluate Use of 3 Basket Hold Down Bolts in ESW Strainer
- (5) EC 632618, Evaluate Replacement of 23HPI-149 from Vogt Ball Check to a Velan Piston Check

Review of Operating Experience Issues (IP Section 02.06) (2 Samples)

- (1) NRC Information Notice 2019-01: Inadequate Evaluation of Temporary Alterations
- (2) NRC Information Notice 2020-02: FLEX Diesel Generator Operational Challenges; Operating Experience Smart Sample (OpESS) 2020/01 was used to inform the inspection sample

INSPECTION RESULTS

Inadequate Test Control for Modified Performance Discharge Testing of 'B' Station Battery						
Cornerstone	Significance	Cross-Cutting	Report			
		Aspect	Section			
Mitigating	Green	[H.8] -	71111.21M			
Systems	NCV 05000333/2022010-01	Procedure				
-	Open/Closed	Adherence				

The team identified a Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," because Constellation personnel did not perform battery testing in accordance with written test procedures. Specifically, the test deficiencies included: 1) the initial battery terminal voltage did not meet the test prerequisite; 2) technicians did not ensure that an adequate and reliable power supply was available for test equipment as required in the test prerequisites which resulted in a pause in testing; 3) the duration of the pause in testing was inappropriately included in the total duration of the battery discharge; and 4) records of individual cell voltages and battery terminal voltages required to be read and recorded at various stages of the test were not included in the official test record. Description: Constellation completed a battery modified performance discharge test on the

<u>Description</u>: Constellation completed a battery modified performance discharge test on the 'B' 125V DC station service battery (71SB-2) on September 18, 2020, to satisfy Technical Specification (TS) Surveillance Requirement (SR) 3.8.4.3, to verify adequate battery capacity to support emergency loads, and TS SR 3.8.4.4, to verify battery capacity was > 80 percent of the manufacturer's rating. Per the TS SR 3.8.4.4 Bases, the acceptance criteria for battery testing are consistent with Institute of Electrical and Electronics Engineers Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications, 1995" (IEEE 450).

The team reviewed the documentation for the battery modified performance discharge test performed in accordance with Constellation procedure MST-071.24, "Station Battery B Modified Performance Test," Revision 19. The team identified several instances where the test procedure was not followed and/or the problem was not entered into the corrective action program.

First, the battery terminal voltage before starting the test did not meet the test prerequisite. MST-071.24, Prerequisite Step 8.13 required that the battery be on a float charge with battery terminal voltage between 131 – 133V DC. Actual voltage was 136V DC due to the battery being charged by the swing charger and technicians believed the swing charger voltage could not be adjusted to the required range. This was discussed with the on-shift senior reactor operator and the decision made to continue with the test. The actual voltage of 136V DC was within the equalizing charge range. IEEE 450 specifies that the battery be on a float charge for a minimum of 72 hours following being on an equalizing charge prior to starting the discharge test.

Second, technicians did not ensure that adequate and reliable power was available for test equipment as stated in the test prerequisites. MST-071.24, Prerequisite Step 8.11 required technicians to "Ensure an AC outlet (nominal 120 VAC, 20 Amp) is available for test equipment and other outlets on circuit are not used during test except to power test equipment. Tag other outlets as necessary." The purpose of this step was to ensure a reliable control power source to the battery test equipment during the performance of the test. Constellation personnel did not adequately perform this step. As a result, at approximately 16 minutes into the test, the power supply was lost to the test equipment. This resulted in an 11.53 minute pause in testing. IEEE 450 only provides for one short duration pause in testing (10 percent of the test duration or 6 minutes, whichever is shorter) for the specific purpose of disconnecting a battery cell that is approaching reversal of polarity early in the test. Test data showed that battery terminal voltage was higher when the load was reapplied than prior to the pause in testing. This demonstrated that the battery recovered during the pause and that the battery test would indicate a higher battery capacity than if no pause occurred. The team noted that technicians did not initiate a corrective action issue report (IR) for this problem encountered during the testing.

Third, the 11.53 minute duration of the pause in testing was inappropriately included in the total duration of the battery discharge. This resulted in a higher and non-conservative calculated battery capacity versus actual capacity.

Fourth, records of individual cell voltages and battery terminal voltages required to be read and recorded at the beginning of the test, at specified intervals, and at the completion of the test per the guidance contained in IEEE 450 were not included in the official test record. Specifically, personnel did not comply with Step 10.7 which stated to "Obtain a printout of the individual cell voltages from the Alber BCT 2000 test equipment and include in work package."

Corrective Actions: Constellation's short-term corrective actions included performing a technical evaluation (EC 636754) to assess battery operability and capacity of the 'B' 125V DC station service battery and entering the issues into their corrective action program. Factoring in the pause in the testing and other considerations, Constellation staff determined that the worst-case battery capacity was 101.08 percent (as compared to the battery capacity of 106.8 percent recorded following the test in September 2020). This demonstrated that the battery had margin to the TS required > 80 percent capacity and that the battery did not show signs of degradation (i.e., capacity was not greater than 10 percent lower than the previous modified performance discharge test).

Corrective Action References: IRs 4497226, 4497328, 4497663, and 4497832. Performance Assessment:

Performance Deficiency: The licensee failed to conduct modified performance discharge testing on the 'B' 125V DC station service battery (71SB-2) on September 18, 2020, in accordance with written test procedures consistent with the recommendations and acceptance criteria contained in IEEE 450. Specifically, the test was started with battery terminal voltage in the equalize range, technicians did not ensure that an adequate and reliable power supply was available for test equipment as required in the test prerequisites which resulted in a pause in testing, the duration of the pause in testing was inappropriately included in the total duration of the battery discharge, and records of individual cell voltages and battery terminal voltages were not included in the official test record.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Though the performance deficiency occurred while the plant was shut down, the assessment of risk was best represented by using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," using Exhibit 2, "Mitigating Systems Screening Questions," of IMC 0609, Appendix A. The team determined that this finding was a deficiency affecting the design or qualification of mitigating structures, systems, or components, where the structures, systems, or components maintained their operability or functionality. Although not performed consistent with the acceptance criteria of IEEE 450, the test did demonstrate with reasonable confidence that there was sufficient margin to the TS required battery capacity of > 80 percent. Therefore, the team determined the finding to be of very low safety significance (Green).

Cross-Cutting Aspect: H.8 - Procedure Adherence: Individuals follow processes, procedures, and work instructions. Specifically, Constellation personnel did not follow the modified performance discharge test procedure when performing the test on the 'B' 125V DC station service battery on September 18, 2020.

Enforcement:

Violation: 10 CFR 50, Appendix B, Criterion XI, "Test Control," requires, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Constellation was committed to perform battery modified performance discharge testing consistent with the recommendations and acceptance criteria of IEEE 450 and required to perform battery modified performance discharge testing service battery in accordance with MST-071.24, "Station Battery B Modified Performance Test," Revision 19.

Contrary to the above, on September 18, 2020, Constellation personnel did not perform battery modified performance discharge testing on the 'B' 125V DC station service battery (71SB-2) in accordance with written test procedures consistent with the recommendations and acceptance criteria contained in IEEE 450. Specifically, the test deficiencies included: 1) the initial battery terminal voltage did not meet the test prerequisite (required range 131-133V DC versus actual 136V DC and was in the equalizing charge range which was not consistent with IEEE 450); 2) technicians did not ensure that adequate and reliable power was available for test equipment as stated in the test prerequisites (the loss of power to test equipment during the test resulted in an 11.53--minute test interruption which was not consistent with IEEE 450); 3) including the 11.53 minute duration of the pause in testing from the total duration of the battery discharge resulted in a higher and non-conservative calculated battery capacity versus actual capacity; and 4) records of individual cell voltages and battery terminal voltages required to be read and recorded at the beginning of the test, at specified intervals, and at the completion of the test per IEEE 450 guidance were not included in the official test record. Because this violation was of very low safety significance (Green) and has been entered into Constellation's corrective action program, the NRC is treating this violation as a Non-Cited Violation (NCV), consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000333/20220010-01, Inadequate Test Control for Modified Performance Discharge Testing of 'B' Station Battery)

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

• On May 19, 2022, the inspectors presented the design basis assurance inspection (teams) inspection results to Mr. Timothy Peter, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Туре	Designation	Description or Title	Revision or Date
71111.21M	Calculations	JAF-CALC-15- 00031	FLEX Strategy - Portable Generator System Sizing	Revision 0
		JAF-CALC-CAD- 04481	Design Basis Calculations for the Torus Inner and Outer Exhaust AOVs 27AOV-117 & 27AOV-118 at FitzPatrick NPP	Revision 0
		JAF-CALC- ELEC-02016	125V DC System Short-Circuit Calculation and Coordination Evaluation	Revision 1
		JAF-CALC- ELEC-02551	Determination of Float and Equalize Voltage for Station Batteries 71SB-1 & 71SB2	Revision 1
		JAF-CALC-SWS- 04170	Local Wall Thinning Evaluation for ESW Strainers 46STR- 5A/B	Revision 2C
	Corrective Action Documents	04036374 04176609 04221269 04246355 04252619 04252625 04266619 04290349 04319445 04323766 04335008	ЗА/В	
		04339876 04347868 04348143 04369686 04371604 04371715 04372411 04372680 04373277 04374549 04377286		

Inspection	Туре	Designation	Description or Title	Revision or
Procedure	•			Date
		04381156		
		04384096		
		04384807		
		04385340		
		04389930		
		04394054		
		04401931		
		04407061		
		04425606		
		04425805		
		04428931		
		04455782		
		04467798		
		04483344		
		04483639		
		04483997		
		04496433		
		04496616		
		04497610		
		CR-JAF-2007-		
		03363		
	Corrective Action	04497169		
	Documents	04497226		
	Resulting from	04497328		
	Inspection	04497349		
	·	04497394		
		04497395		
		04497409		
		04497663		
		04497664		
		04497672		
		04497680		
		04497832		
		04497910		

Inspection	Туре	Designation	Description or Title	Revision or
Procedure				Date
		04497962		
		04497964		
		04497965		
		04497967		
		04497969		
		04497970		
		04497997		
		04498019		
		04498006		
		04498022		
		04498129		
		04498210		
		04499080		
		04500102		
		04500121		
		04500293		
		04500320		
		04500330		
		04500418		
		04500553		
		04500554		
		04500555		
		04500563		
		04500635		
		04500821		
	Drawings	FE-1H Sh. 4	4160V One Line Diagram Emergency Bus 10500	Revision 14
		FM-20A	Residual Heat Removal System Flow Diagram	Revision 73
		FM-25A	High Pressure Coolant Injection Flow Diagram	Revision 75
	Miscellaneous	DBD-023	Design Basis Document for the High Pressure Coolant	Revision 12
			Injection System	
		E406-0001	200 KW FLEX Diesel Generator	Revision 1
		G185-0029	Instruction Manuals for 60 Cells NCN-33 or NCN-35 (GNB	dated
			Industrial Power)	9/11/11
		JAF-SPEC-MISC-	James A. FitzPatrick Nuclear Power Plant Piping	Revision 15

Inspection	Туре	Designation	Description or Title	Revision or
Procedure				Date
		00334	Specification	
		NRC Information	Battery and Battery Charger Short-Circuit Current	dated
		Notice 2017-06	Contributions to a Fault on the Direct Current Distribution System	9/26/17
		OP-AA-102-106, Att. 1	Operator Response Time Validation Sheet	performed 11/12/20
		P319-0047	Three-Phase Magnetic Amplifier Controlled CP Battery Charger	Revision 8
		RHR 2B 10E-2B	Preliminary Report of Eddy Current Inspections	dated 11/20/13
		SDLP-23	High Pressure Coolant Injection System	Revision 28
		ST-1CA	Outside Primary Containment Isolation Valve Exercise Test (IST)	performed 3/16/22
		ST-2AK	RHR Loop B Containment Spray Headers and Nozzles Air Test (ISI)	performed 9/23/12
		ST-2AM	RHR Loop B Quarterly Operability Test (IST)	performed 3/10/21 & 3/8/22
	Procedures	AOP-18	Loss of 10500 Bus	Revision 18
		AOP-19	Loss of 10600 Bus	Revision 18
		CC-JF-118	Site Implementation of Diverse and Flexible Coping Strategies (FLEX) and Spent Fuel Instrumentation Program	Revision 5
		EP-6	Post Accident Containment Venting and Gas Control	Revision 13
		OP-13	Residual Heat Removal System	Revision 100
		OP-15	High Pressure Coolant Injection	Revision 69
	Work Orders	00205886		
		00340684		
		04655870		
		04806288		
		04806289		
		04915450		
		04938333		
		04938334		
		04938915		

Inspection Procedure	Туре	Designation	Description or Title	Revision or Date
		04943427		
		04964506		
		05043091		
		05047158		
		05131958		
		05131959		
		05150464		
		05150801		
		82606584		
		82705256		
		82740044		
		99-01814-00		