



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1200

August 24, 2021

Mr. Jim Barstow
Vice President, Nuclear Regulatory Affairs and Support Services
Tennessee Valley Authority
1101 Market Street, LP 4A-C
Chattanooga, TN 37402-2801

**SUBJECT: BROWNS FERRY NUCLEAR PLANT – TEMPORARY INSTRUCTION
2515/TI-193 INSPECTION REPORT 05000259/2021011, 05000260/2021011,
AND 05000296/2021011**

Dear Mr. Barstow:

On August 6, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Browns Ferry Nuclear Plant. On August 13, 2021, the NRC inspectors discussed the results of this inspection with Mr. M. Rasmussen and other members of your staff. The results of this inspection are documented in the enclosed report.

One finding of very low safety significance (Green) is documented in this report. This finding did not involve a violation of NRC requirements.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at Browns Ferry Nuclear Plant.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document

J. Barstow

2

Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Steven P. Smith, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos. 05000259, 05000260, and 05000296
License Nos. DPR-33, DPR-52, and DPR-68

Enclosure:
As stated

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SUBJECT: BROWNS FERRY NUCLEAR PLANT – TEMPORARY INSTRUCTION 2515/TI-193 INSPECTION REPORT 05000259/2021011, 05000260/2021011, AND 05000296/2021011 – DATED August 24, 2021

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DATE	8/12/2021	8/17/2021	8/24/2021		

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000259, 05000260 and 05000296

License Numbers: DPR-33, DPR-52 and DPR-68

Report Numbers: 05000259/2021011, 05000260/2021011 and 05000296/2021011

Enterprise Identifier: I-2021-011-0031

Licensee: TVA

Facility: Browns Ferry Nuclear Plant

Location: Athens, Alabama

Inspection Dates: August 02, 2021 to August 06, 2021

Inspectors: B. Bishop, Senior Project Engineer
S. Ninh, Senior Project Engineer

Approved By: Steven P. Smith, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting a Temporary Instruction 2515/TI-193 Inspection at Browns Ferry Nuclear 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

Hardened Containment Vent System Preventative Maintenance not Performed Within Periodicity			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green FIN 05000259,05000260,05000296/202101 1-01 Open/Closed	[H.5] - Work Management	2515/193
<p>The inspectors identified a finding of very low safety significance (Green) for the failure to perform the required surveillances within periodicity for the hardened containment vent system (HCVS). Specifically, HCVS valves are required to be stroked once per operating cycle per TVA final integrated plan, CNL-19-004, Table 3-3, Testing and Inspection Requirements. At the time of the inspection, the HCVS valves for each unit had been in service for greater than one cycle on each unit; however, these surveillances had never been performed.</p>			

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. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

2515/193 - Inspection of the Implementation of EA-13-109: Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions

Inspection of the Implementation of EA-13-109: Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions (1 Sample)

Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the reliable hardened containment wetwell vent as described in the plant specific submittals and the associated NRC safety evaluation (ADAMS Accession No. ML19329E319), and determined that the licensee was in compliance with NRC Order EA-13-109 Phase 1, "Reliable, Severe Accident Capable Wetwell Venting System" (ADAMS Accession No. ML13143A321).

The inspectors evaluated licensee implementation of the appropriate elements of the reliable hardened containment wetwell vent as described in the plant specific submittals and the associated NRC safety evaluation (ADAMS Accession No. ML19329E319). Specifically, the inspectors evaluated licensee implementation of the Hardened Containment Vent System (HCVS) functional requirements, design features, maintenance and testing, quality standards, and programmatic requirements as described in Appendix A of TI 2515/193 Revision 1.

The inspectors verified that the licensee satisfactorily:

- Installed the HCVS to meet the performance objectives outlined in Order EA-13-109;
- Installed the HCVS system with the design features specified in Order EA-13-109;
- Designed the HCVS to meet the quality standards described in Order EA-13-109;

- Developed and implemented adequate maintenance and testing of HCVS equipment to ensure their availability and capability;
- Developed and issued procedures to safely operate the HCVS using normal power supplies, during Extended Loss of All AC Power (ELAP), and a postulated severe accident scenario, and integrated the procedures into existing plant procedures; and
- Trained their staff to assure personnel can proficiently operate the HCVS.

Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the reliable wetwell venting strategy as described in the plant specific submittals and the associated safety evaluation (ADAMS Accession No. ML19329E319) and determined that the licensee was in compliance with NRC Order EA-13-109 Phase 2, “Reliable, Severe Accident Capable Drywell (or alternative strategy) Venting System” (ADAMS Accession No. ML13143A321).

The inspectors evaluated licensee implementation of the appropriate elements of the reliable wetwell venting strategy as described in the plant specific submittal(s) and the associated NRC safety evaluation (ADAMS Accession No. ML19329E319). Specifically, the inspectors evaluated licensee implementation of Severe Accident Water Addition / Severe Accident Water Management (SAWA/SAWM) functional requirements, installed instrumentation, maintenance and testing, and programmatic requirements as described in Appendix B of TI 2515/193 Revision 1.

The inspectors verified that the licensee satisfactorily developed a strategy making it unlikely that venting from the containment drywell would be necessary. As part of that strategy, the licensee:

- Implemented the Severe Accident Water Addition (SAWA)/Severe Accident Water Management (SAWM) systems as defined and fulfilled functional requirements for installed and portable equipment.
- Installed and/or identified the previously-installed instrumentation necessary to implement SAWM;
- Developed and implemented adequate maintenance and testing of SAWA/SAWM equipment to ensure availability and capability;
- Developed and issued procedures to safely operate the SAWA/SAWM during an ELAP and during postulated severe accident scenario, and integrated their procedures into their existing plant procedures such that entry into and exiting from the procedures are clear when using existing plant procedures; and
- Trained their staff to assure personnel can proficiently operate the HCVS during ELAP and accident scenarios.

INSPECTION RESULTS

Hardened Containment Vent System Preventative Maintenance not Performed Within Periodicity			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Barrier Integrity	Green FIN 05000259,05000260,05000296/20210 11-01 Open/Closed	[H.5] - Work Management	2515/193
<p>The inspectors identified a finding of very low safety significance (Green) for the failure to perform the required surveillances within periodicity for the hardened containment vent system (HCVS). Specifically, HCVS valves are required to be stroked once per operating cycle per TVA final integrated plan, CNL-19-004, Table 3-3, Testing and Inspection Requirements. At the time of the inspection, the HCVS valves for each unit had been in service for greater than one cycle on each unit; however, these surveillances had never been performed.</p>			
<p><u>Description:</u> Order EA-13-109, Attachment 2, Section 1.2.13 requires that the HCVS include features and provisions for the operation, testing, inspection, and maintenance adequate to ensure that reliable function and capability are maintained. Relevant guidance is found in NEI 13-02 Sections 5.4 and 6.2; and HCVS-FAQs-05 and -06. TVA's Final Integrated Plan, CNL-19-004, Table 3-3, (Testing and Inspection Requirements) defines the surveillance requirements for the HCVS system.</p> <p>Browns Ferry Hardened Containment Vent System PMs 137277,137278, 137279, 137280, 138726, 149220, 149222, 149223 were not completed within periodicity. Under the testing requirements of DCNs 71389, 71390, and 71391, cycling of the HCVS valves and the interfacing system boundary valves not used to maintain containment integrity during operations must be cycled once every operating period. After 2 successful performances the test frequency may then be reduced to a maximum of once every other operating cycle. The compliance dates which signal the start of the frequency clock are Unit 1, Nov 2018 (1R12), Unit 3, March 2018 (3R18) and Unit 2, April 2019 (2R20). These frequency due dates have been surpassed by one operating period for each unit. (CR1712139). At the time of the inspection, the HCVS valves for each unit had been in service for greater than one cycle on each unit, however, these surveillances had never been performed.</p> <p>There were missed opportunities to identify and correct this issue based on related deficiencies identified by TVA. See bulleted examples below.</p> <ul style="list-style-type: none"> · A TVA Self-Assessment for NRC Order EA 13-109 conducted in 2019 noted that PMs required to be performed in accordance with NEI 13-02 had not been created for all HCVS and SAWA components. (CR 1548744). · Inspectors noted that Browns Ferry had identified in 2018 that PMs for HCVS batteries were not in periodicity (CR 1396691) <p>Corrective Action References: CR 1396691, CR 1548744, CR 1712139</p>			
<u>Performance Assessment:</u>			

Performance Deficiency: Failure to comply with TVA's Final Integrated Plan, CNL-19-004, Table 3-3, Test and Inspection Requirements, was a performance deficiency. The self-imposed surveillance requirements for Browns Ferry Hardened Containment Vent System, PMs 137277, 137278, 137279, 137280, 138726, 149220, 149222, 149223, were not completed within periodicity. Under the testing requirements of DCNs 71389, 71390, and 71391, cycling of the HCVS valves and the interfacing system boundary valves not used to maintain containment integrity during operations must be cycled once every operating period. The compliance dates which signal the start of the frequency clock are Unit 1, Nov 2018 (1R12), Unit 3, March 2018 (3R18) and Unit 2, April 2019 (2R20). These frequency due dates have been surpassed by one operating period for each unit. (CR1712139).

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the SSC and Barrier Performance attribute of the Barrier Integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." The inspectors consulted Exhibit 3, Barrier Integrity, screening questions, Section C, Reactor Containment. The finding screened as Green, or of very low safety significance.

Cross-Cutting Aspect: H.5 - Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups or job activities.

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

EXIT MEETINGS AND DEBRIEFS

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

- On August 13, 2021, the inspectors presented the Final NRC inspection results to Mr. M. Rasmussen and other members of the licensee staff.
- On August 6, 2021, the inspectors conducted an Onsite Exit Meeting to communicate preliminary inspection results to Mr. Rasmussen and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
2515/193	Corrective Action Documents	1069208 1139619 1221098 1223245 1227133 1247751 1268370 1280296 1289350 1338591 1396191 1396691 1397180 1399201 1399627 1417198 1417207 1428829 1502376 1548744 1548751 1548757 1548759 1548763 1611594 1645279		
	Corrective Action Documents	1712118	BFN HCVS Inspection - NRC observation CILRT spool piece	08/04/2021
	Resulting from Inspection	1711983	BFN HCVS Inspection - NRC observation- the lighting is very poor in the diesel generator buildings	08/04/2021
		1711987	BFN HCVS Inspection - NRC observation- there are large doors/panels stored under the stairs in the area of the HCVS	08/04/2021

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Nitrogen bottles that could possibly impact an operator's ability to operate the equipment.	
		1712139	HCVS PMs 137277,137278,137279,137280,138726,149220,149222,149223 not completed within periodicity	08/04/2021
		1712329	HCVS Flex Inspection item concerning throttling Dominator flowrate	08/05/2021
		1712439	During the NRC HCVS Inspection, the NRC Inspector noted the need for an enhancement to FSIs	08/04/2021
	Miscellaneous		Tennessee Valley Authority, Browns Ferry Nuclear Plant, Unit 3, Completion of Required Action for NRC Order EA-13-109, Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (CAC No. MF4542)	05/31/2018
			Tennessee Valley Authority, Browns Ferry Nuclear Plant, Unit 2, Completion of Required Action for NRC Order EA-13-109, Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (CAC No. MF4541)	6/01/2019
			Tennessee Valley Authority, Browns Ferry Nuclear Plant, Unit 1, Completion of Required Action for NRC Order EA-13-109, Reliable Hardened Containment Vents Capable of Operation Under Severe Accident Conditions (CAC No. MF4540)	01/22/2019
			Browns Ferry Nuclear Plant, Units 1, 2, and 3 – Safety Evaluation Regarding Implementation of Hardened Containment Vents Capable of Operation Under Severe Accident Conditions Related to Order EA-13-109 (CAC NOS. MF4540, MF4541, AND MF4542; EPID NO. L-2014-JLD-0044)	01/02/2020
			Licensed operator Requalification TPD-LQR Training Program Description	Revision 16
			TVA NPG Fleet Attachment A Browns Ferry Non-Licensed Operator Initial Training and Qualification Curricula List, TPD-NLO/ATT A Training Program Description	Revision 4
			TVA NPG Fleet Attachment A Browns Ferry ILT Training and Qualification Curricula List TPD-ILT/ATT A Training Program Description,	Revision 15

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Procedures	0-TPP-ENG-632(Bases)	Diverse and Flexible Coping Strategies (FLEX) Program Bases Document	Revision 5
		BFN-ODM-4.20	Strategies for Successful Transient Mitigation	Revision 8
		0-AOI-57-1A	Loss of Offsite Power (161 and 500 KV)/Station Blackout	Revision 114
		0-FSI-1	Flex Response	Revision 4
		0-TI-641, Time Critical Operator Actions, Revision 0000	Time Critical Operator Actions	Revision 0
		1-AOI-64-1	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	Revision 3
		1-EOI Appendix-13	Emergency Venting Primary Containment	Revision 4
		2-AOI-64-1	Drywell Pressure and/or Temperature High, or Excessive Leakage into Drywell	Revision 27
		2-EOI Appendix-13	Emergency Venting Primary Containment	Revision 10
		3-AOI-64-1	Drywell Pressure and/or Temperature High, or Excessive Leakage Into Drywell	Revision 6
		3-EOI Appendix-13	Emergency Venting Primary Containment	Revision 7
		OPDP-8	Operability Determination Process and Limiting Conditions for Operation,	Revision 27
		Work Orders	118805616 118805646 119057106 119062924 119573383 119610739 119617796 119673383 119920141 120122431 120251758	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		120446347 120486376 120537137 120622950 120746573 120746979 120747395 120904051 120921315 120972793 121035985 121035987 121036645 121144575 121159471 121292184 121346543 119617796 119920141 120446347 120486376 121035985 121035987		