



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II**

245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

May 26, 2016

Richard Michael Glover  
Site Vice President  
H. B. Robinson Steam Electric Plant  
Duke Energy  
3581 West Entrance Road, RNPA01  
Hartsville, SC 29550

**SUBJECT: H.B. ROBINSON STEAM ELECTRIC PLANT - NRC TEAM INSPECTION  
REPORT 05000261/2016009**

Dear Mr. Glover:

On April 15, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your H. B. Robinson Steam Electric Plant, Unit 2. The enclosed report documents the inspection results, which were discussed on April 15, 2016, with you and other members of your staff. A re-exit was conducted with Mr. D. Hoffman via telephone on May 18, 2016, to discuss the final results of the inspection.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

No NRC-identified or self-revealing findings were identified during this inspection.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS).

R. Glover

2

ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

Anthony D. Masters, Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

Docket No.: 50-261  
License No.: DPR-23

Enclosure:  
IR 05000261/2015009  
w/Attachment: Supplemental Information

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Sincerely,

**/RA/**

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SIGNATURE	RRR1	ADM2	GTH	GTM	JDH1 via email		
NAME	R. Rodriguez	A. Masters	G. Hopper	G. MacDonald	J. Hanna		
DATE	5/23/2016	05/26/2016	05/26/2016	5/23/2016	5/23/2016		
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R. Glover

3

Letter to Richard Michael Glover from Anthony D. Masters dated May 26, 2016

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT - NRC TEAM INSPECTION  
REPORT 05000261/2016009

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No.: 50-261

License No.: DPR-23

Report No.: 05000261/2016009

Licensee: Duke Energy Progress, Inc.

Facility: H. B. Robinson Steam Electric Plant, Unit 2

Location: 3581 West Entrance Road  
Hartsville, S.C. 29550

Dates: April 11– 15, 2016

Inspectors: G. MacDonald, Senior Reactor Analyst (Team Leader)  
J. Hanna, Senior Reactor Analyst  
R. Rodriguez, Senior Project Engineer

Approved by: Anthony D. Masters, Chief  
Reactor Projects Branch 7  
Division of Reactor Projects

Enclosure

## **SUMMARY**

IR 05000261/2016009; 4/11/2016 – 4/15/2016; H.B. Robinson Steam Electric Plant, Unit 2; Temporary Instruction 2515/191, Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans issued December 23, 2015.

The inspection covered a one week inspection by two senior reactor analysts and one senior project inspector. One licensee identified Green finding associated with the preventive maintenance schedule for FLEX equipment was identified and since the finding did not involve a violation, no further documentation per NRC Inspection Manual Chapter 0612 Appendix B is required. The significance of inspection findings are identified by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas" dated December 4, 2014. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

## REPORT DETAILS

### 4. Other Activities

#### 4OA5 Other Activities (TI 2515/191)

The objective of Temporary Instruction (TI) 2015/191 “Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans” is to verify that licensees have adequately implemented the mitigation strategies as described in the licensee’s Final Integrated Plan [ADAMS Accession No. ML15232A007] and the NRC’s plant safety evaluation (ADAMS Accession No. ML16075A377) and to verify that the licensees installed reliable water-level measurement instrumentation in their spent fuel pools. The purpose of this TI is also to verify the licensees have implemented Emergency Preparedness (EP) enhancements as described in their site-specific submittals and NRC safety assessments, including dose assessment capability and enhancements to ensure that staffing is sufficient and communications can be maintained during such an event.

The inspection verifies that plans for complying with NRC Orders EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (ADAMS Accession No. ML12229A174) and EA-12-051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12056A044) are in place and are being implemented by the licensee. Additionally, the inspection verifies implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter and multiunit dose assessment information provided per COMSECY-13-0010, “Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned”, dated March 27, 2013 (ADAMS Accession No. ML12339A262).

The team discussed the plans and strategies with plant staff, reviewed documentation, and where appropriate, performed plant walk downs to verify that the strategies could be implemented as stated in the licensee’s submittals and the NRC staff prepared safety evaluation. For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the team’s inspection activities are described in the following sections.

#### 1. Mitigation Strategies for Beyond-Design Basis External Events

##### a. Inspection Scope

The team examined the licensee’s established guidelines and implementing procedures for the beyond-design basis mitigation strategies. The team assessed how the licensee coordinated and documented the interface/transition between existing off-normal and Emergency Operating Procedures with the newly developed mitigation strategies. The

team selected a number of mitigation strategies and conducted plant walk downs with licensed operators and responsible plant staff to assess: the adequacy and completeness of the procedures; familiarity of operators with the procedure objectives and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios.

The team verified that a preventive maintenance program had been established for the FLEX portable equipment and that periodic equipment inventories were in place and being conducted. Additionally, the team examined the introductory and planned periodic/refresher training provided to the Operations and Security staffs most likely to be tasked with implementation of the FLEX mitigation strategies. The team also reviewed the introductory and planned periodic training provided to the Emergency Response Organization personnel. Documents reviewed are listed in the attachment.

b. Assessment

Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittal(s) and the associated safety evaluation and determined that the licensee is generally in compliance with NRC Order EA-12-049. The inspectors verified that the licensee satisfactorily:

- developed and issued FLEX Support Guidelines (FSG) to implement the FLEX strategies for postulated external events
- integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs are clear when using existing plant procedures.
- protected FLEX equipment from site-specific hazards.
- developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability.
- trained their staff to assure personnel proficiency in the mitigation of beyond-design-basis events.
- developed means to ensure that the necessary off-site FLEX equipment will be available from off-site locations.

The inspectors verified that noncompliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

2. Spent Fuel Pool Instrumentation

a. Inspection Scope

The team examined the licensee's newly installed spent fuel pool instrumentation. Specifically, the inspectors verified the sensors were installed as described in the plant specific submittals and the associated safety evaluation and that the cabling for the power supplies and the indications for each channel are physically and electrically separated. Additionally, environmental conditions and accessibility of the instruments were evaluated. Documents reviewed are listed in the attachment.



b. Assessment

Based on samples selected for review, the inspectors determined that the licensee satisfactorily installed and established control of the SFP instrumentation as described in the plant specific submittal(s) and the associated safety evaluation and determined that the licensee is generally in compliance with NRC Order EA-12-051. The inspectors verified that the licensee satisfactorily:

- installed the SFP instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittal(s) and safety evaluation.
- installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittal(s)
- trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation.

The inspectors verified that noncompliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

3. Staffing and Communication Request for Information

a. Inspection Scope

Through discussions with plant staff, review of documentation and plant walk downs, the team verified that the licensee has implemented required changes to staffing, communications equipment and facilities to support an Extended Loss of AC Power (ELAP) scenario as described in the licensee's staffing assessment and the NRC safety assessment. The team also verified that the licensee has implemented dose assessment (including releases from spent fuel pools) capability using the licensee's site-specific dose assessment software and approach as described in the licensee's dose assessment submittal. Documents reviewed are listed in the attachment.

b. Assessment

The inspectors reviewed information provided in the licensee's dose assessment submittal and in response to the NRC's March 12, 2012, request for information letter and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force Recommendation 9.3 response to a large scale natural emergency event that results in an extended loss of all ac power to the site and impedes access to the site. The inspectors verified the following:

- Licensee satisfactorily implemented required staffing change(s) to support an ELAP scenario.
- EP communications equipment and facilities are sufficient for dealing with an ELAP scenario.
- Implemented dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that noncompliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

4OA6 Exit

Exit Meeting Summary

On April 15, 2016, the inspectors presented the inspection results Mr. R.M Glover and other members of the site staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection. A re-exit was conducted with Mr. D. Hoffman via telephone on May 18, 2016, to discuss the final results of the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee personnel:**

R.M. Glover, Site Vice President - Robinson  
D. Pitsley, Nuclear Operations Manager  
J. Kunzman, Director Nuclear (Design) Engineering  
D. Hoffman, Director Nuclear Organizational Effectiveness  
J. Kammer, General Manager Nuclear Engineering  
S. Connelly, Acting Regulatory Affairs Manager  
R. Drehs, Supervisor, Nuclear Operator Training  
T. Pilo, Nuclear Emergency Planning Manager  
A. Maysam, Lead Nuclear Engineer - Regulatory Affairs  
L. Belton, Senior Engineer - Design Engineering  
D. Hall, Nuclear Oversight Manager  
L. Smith, Robinson Nuclear Operations Specialist  
R. Treadway, Duke Corporate Functional Area Manager - Regulatory Affairs  
T. Byrne, Duke Nuclear Licensing Consultant – Regulatory Affairs  
G. Levy, Duke Fukushima Response Organization  
P. Guill, Lead Nuclear Engineer - Fukushima Response Organization  
J. Thomas, Nuclear Programs Manager - Fukushima Response Organization  
A. Musselwhite, Fukushima Response Organization  
R. Mullis, Brunswick Fukushima Response Organization  
T. Owusu, Senior Nuclear Engineer - Catawba Regulatory Affairs

#### **NRC personnel:**

K. Ellis, Senior Resident Inspector  
A. Masters, Chief, Reactor Projects Branch 7  
M. Franovich, Deputy Director, Division of Reactor Projects

### **LIST OF REPORT ITEMS**

#### **Opened and Closed**

None

#### **Discussed**

None

## **LIST OF DOCUMENTS REVIEWED**

### Procedures

EOP-ECA-0.0, Loss of all AC Power, Rev. 4  
FSG-001, Long Term RCS Inventory Control, Rev. 0  
FSG-002, Alternate SDAFW Suction Source, Rev. 2  
FSG-002-BD, Alternate SDAFW Suction Source Basis Document, Rev.2  
FSG-003, Alternate Feedwater, Rev. 0  
FSG-004, ELAP DC Load Shed/Management, Rev.0  
FSG-005, Initial Assessment and Flex Equipment Staging, Rev.0  
FSG-006, Alternate CST Makeup, Rev.0  
FSG-007, Loss of Instrumentation or Control Power, Rev.0  
FSG-008, Alternate RCS Boration, Rev.0  
FSG-009, Low Decay Heat Temperature Control, Rev.0  
FSG-010, SI Accumulator Isolation, Rev.0  
FSG-011, Alternate SFP Makeup and Cooling, Rev.0  
FSG-012, Alternate Containment Cooling, Rev.0  
FSG-013, Transition From Flex Equipment, Rev.0  
FSG-014, Electrical Power Restoration, Rev.0  
FSG-015, Water Management, Rev.0  
AP-053, Sever Weather Response, Rev.6  
AP-010, Annunciator Panel Procedure, HVAC – Emergency Generators & Miscellaneous Systems, Rev. 82  
OP-601, DC Supply System, Rev. 48  
OP-906, Heating, Ventilation, and Air Conditioning, Rev. 73  
OST-453, Fukushima FLEX 4.2 Diesel Generator 1A and 1B Surveillance Test, Rev. 0  
GP-008, Draining the Reactor Coolant System, Rev. 88  
PM-548-1, Spent Fuel Pool Level Indication, Channel 1, Rev.0

### Drawings

G-190197 Sheet 1 of 5, Rev.85, Feedwater, Condensate & Air Evacuation System Flow Diagram  
G-190197 Sheet 4 of 5, Rev. 69, Feedwater, Condensate & Air Evacuation System Flow Diagram  
G-190199, Sheet 2 of 13, Rev. 66, Service and Cooling Water System Flow Diagram  
G-190797, Sheet 1 of 1, Rev. 5, Circulating Water System General Plan and Profile  
5379-1082 Sheet 2 of 5, Rev. 54, Safety Injection System Flow Diagram  
5379-1485, Sheet 1 of 1, Rev. 29, Spent Fuel Pit Cooling System Flow Diagram  
G-190626, Sheet 3 of 3, Rev. 20, 125 VDC & 120V Vital AC One Line Diagram  
G-190190, Rev. 31, General Arrangement Reactor Auxiliary Building Plans  
G-190181, Sheet 1 of 1, Rev. 28, General Arrangement Turbine Building Ground Floor Plan  
HBR2-9800, Rev. 36, Plot Plan

### Calculations

RNP-M/FLEX-0001, Rev.0, RNP Reactor Auxiliary Building Extended Loss of AC Power Flex Response

RNP-M/HVAC-1087, Rev.0, Drumming Room HVAC System for Fukushima Diesels  
 RNP-M/MECH-1877, Rev.0, RNP Extended Loss of AC Power (ELAP) Containment Response  
 RNP-M/MECH-1878, Rev.0, Hydraulic Analysis to Support Fukushima FLEX 4.2 Strategy for  
 AFW System  
 RNP-E-6.032, Fukushima Flex 4.2 phase 1 – Load Profile Calculation for Battery A and B,  
 Rev.0

#### CRs Reviewed

2020608, Flex Pump PMs not Performed  
 2020219, Insufficient Information provided on NCRs on CAQ vs NCAQ  
 2020402, TI-191 FLEX PFSB HVAC discovered Off during NRC tour  
 2020665, FSG-005 Procedure Revision Request  
 744048, Partial Loss of Power to PFSB (Building 468)  
 1982256, No PMs generated for FLEX pumps FLEX-PMP-LP-A and FLEX-PMP-LP-B  
 745370, OAO Comp Time Exceeds 60 Min During Cold Weather  
 746077, EC 90625 Post Closeout Actions  
 748085, FME found in Fukushima Elec Project Diesels Fuel Tanks  
 748641, Prefabbed Pipe Spool Installed in Adjacent Line  
 750895, Wire Disconnected From Splice on “B” RCP  
 752838, FLEX Equipment PM for the Batteries and Block Heater  
 753145, Fukushima Response Organization Flex Turnover To RNP Site

#### Other

H.B. Robinson Steam Electric Plant, Unit No. 2 Safety Evaluation Regarding Implementation of  
 Mitigating Strategies and Reliable Spent Fuel Instrumentation Related to Orders EA-12-049  
 and EA-12-051 (CAC Nos. MF0720 and MF0793)  
 Compliance Letter and Final Integrated Plan in Response to the March 12, 2012 Commission  
 Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for  
 Beyond-Design-Basis External Events (Order Number EA-12-049) For H.B. Robinson Steam  
 Electric Plant, Unit 2. Serial RNP-RA/15-0053, August 19, 2015  
 Simulator Run Output for Several ELAP Scenarios, A S/G Pressure, S/G Steam Flow, S/G WR  
 Level, SDAFW Flow, CET Temperature, RCS Loop Thot, RCS Loop Tcold, Pressurizer  
 Pressure, RCS Subcooled Margin, RVLIS, Core Reactivity, and Global Boron Concentration  
 ECA-0.0 Timeline and Resources – Wind Event  
 Robinson Nuclear Plant (RNP) NEI 12-01 Phase 2 Extended Loss of AC Power (ELAP) ERO  
 Staffing Analysis Report, Rev.0  
 Lesson Plans for FSG-004 ELAP DC Load Shed/Management  
 Training Records for Completion of FSG-004 Walkthrough  
 Work Order 2009877-21, Quarterly Permanent FLEX Storage Building, Dated 3/31/2016  
 Annual PM Inspection/Maintenance Checklist, Dated 3/30/2016  
 Robinson Technical Specification 3.7.8, Ultimate Heat Sink, Amendment No. 191  
 Plot of Containment Temperature Weighted Average vs Time from 4/15/2015 until 4/14/2016