



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II**

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

January 11, 2018

Mr. Joseph W. Shea  
Vice President, Nuclear Regulatory Affairs  
and Support Services  
Tennessee Valley Authority  
1101 Market Street, LP 3R-C  
Chattanooga, TN 37402-2801

**SUBJECT: WATTS BAR NUCLEAR PLANT – U.S. NUCLEAR REGULATORY COMMISSION  
EMERGENCY PREPAREDNESS INSPECTION REPORT 05000390/2017502  
AND 05000391/2017502**

Dear Mr. Shea:

On December 15, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Watts Bar Nuclear Plant. On December 15, 2017, the NRC inspectors discussed the results of this inspection with members of your staff. The results of this inspection are documented in the enclosed report.

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

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 Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

Eugene F. Guthrie, Chief  
Operator Licensing Branch 2  
Division of Reactor Safety

Docket Nos. 50-390 and 50-391  
License Nos. NPF-90 and NPF-96

Enclosure:  
NRC IR 05000390, 391/2017502  
w/Attachment: Supplemental Information

cc: Distribution via Listserv

SUBJECT: WATTS BAR NUCLEAR PLANT – U.S. NUCLEAR REGULATORY COMMISSION  
EMERGENCY PREPAREDNESS INSPECTION REPORT 05000390/2017502  
AND 05000391/2017502

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos: 50-390, 50-391

License No: NPF-90, NPF-96

Report No: 05000390/2017502 and 05000391/2017502

Licensee: Tennessee Valley Authority (TVA)

Facility: Watts Bar Nuclear Plant

Location: Spring City, TN

Dates: October 16 – 20, 2017

Inspectors: Steven P. Sanchez, Senior Emergency Preparedness Inspector  
Christopher A. Fontana, Emergency Preparedness Inspector  
Jacqwan Walker, Emergency Preparedness Inspector (trainee)  
John D. Hickman, Project Engineer  
Wade Loo, Senior Health Physicist  
Jacob Panfel, Health Physicist

Approved by: Eugene F. Guthrie, Chief  
Operator Licensing Branch 2  
Division of Reactor Safety

Enclosure

## **SUMMARY**

Inspection Report (IR) 05000390/2017502 and 05000391/2017502; 12/11/2017 – 12/15/2017; Watts Bar, Units 1 and 2; Exercise and Baseline Inspection

This report covers an announced inspection by three emergency preparedness inspectors, one project engineer, and two health physicists. The U.S. Nuclear Regulatory Commission's (NRC) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

The NRC inspectors did not identify any findings or violations of more than minor significance.

## REPORT DETAILS

### 1. REACTOR SAFETY

Cornerstone: Emergency Preparedness

#### 1EP1 Exercise Evaluation

##### a. Inspection Scope

The onsite inspection consisted of the following review and assessment:

- The adequacy of the licensee's performance in the biennial exercise, conducted on December 13, 2017, was reviewed and assessed regarding the implementation of the Risk Significant Planning Standards in 10 CFR 50.47(b)(4), (5), (9), and (10); which address emergency classification, offsite notification, radiological assessment, and protective action recommendations, respectively.
- The overall adequacy of the licensee's emergency response facilities with regard to NUREG-0696, "Functional Criteria for Emergency Response Facilities," and Emergency Plan commitments. The facilities assessed were the Control Room Simulator, Technical Support Center, Operations Support Center, and the corporate Emergency Operations Facility.
- Other performance areas, such as the emergency response organization's (ERO) recognition of abnormal plant conditions; command and control, intra- and inter-facility communications; prioritization of mitigation activities; utilization of repair and field monitoring teams; interface with offsite agencies; and the overall implementation of the emergency plan and its implementing procedures.
- Past performance issues from NRC inspection reports and Federal Emergency Management Agency (FEMA)/Department of Homeland Security (DHS) exercise reports to determine the effectiveness of corrective actions as demonstrated during this exercise to ensure compliance with 10 CFR 50.47(b)(14).
- The post-exercise critique process and the presentation to the licensee's senior management conducted on December 14, 2017, to evaluate the licensee's self-assessment of its ERO performance during the exercise, and to ensure compliance with 10 CFR Part 50, Appendix E, Subsection IV.F.2.g.

The inspectors reviewed various documents, which are listed in the Attachment. The inspectors also attended the FEMA-sponsored public meeting on December 15, 2017. This inspection activity satisfied one inspection sample for the exercise evaluation on a biennial basis as defined in NRC Inspection Procedure (IP) 71114.01, "Exercise Evaluation".

##### b. Findings

No findings were identified.

#### 1EP4 Emergency Action Level and Emergency Plan Changes

##### a. Inspection Scope

Since the last NRC inspection of this program area, one revision to the emergency plan, one revision to the emergency action levels procedure, and several revisions to emergency plan implementing procedures had been made. The licensee determined that, in accordance with 10 CFR 50.54(q), the emergency plan continued to meet the requirements of 10 CFR 50.47(b), and Appendix E to 10 CFR Part 50. The inspectors reviewed the revisions, and sampled implementing procedure changes to evaluate potential reductions in the effectiveness of the Plan. As this review was not documented in a Safety Evaluation Report, and does not constitute formal NRC approval of the changes, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC IP 71114.04, "Emergency Action Level and Emergency Plan Changes". The applicable planning standards of 10 CFR 50.47(b), and its related requirements in 10 CFR Part 50, Appendix E, were used as reference criteria. The inspectors reviewed various documents, which are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

##### b. Findings

No findings were identified.

#### 1EP8 Exercise Evaluation – Scenario Review

##### a. Inspection Scope

Prior to the inspection activity, the inspectors conducted an in-office review of the exercise objectives and scenario submitted to the NRC using IP 71114.08, "Exercise Evaluation - Scenario Review," to determine if the exercise would test major elements of the emergency plan as required by 10 CFR 50.47(b)(14). The inspectors reviewed various documents, which are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the exercise evaluation on a biennial basis.

##### b. Findings

No findings were identified.

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator Verification

##### a. Inspection Scope

The inspectors sampled licensee submittals relative to the performance indicators (PIs) listed below for the period October 1, 2016, through September 30, 2017. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance

Indicator Guideline,” Revision 7, was used to confirm the reporting basis for each data element.

#### Emergency Preparedness Cornerstone

- Drill/Exercise Performance (DEP)
- Emergency Response Organization (ERO) Readiness
- Alert and Notification System (ANS) Reliability

For the specified review period, the inspectors examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspectors verified the accuracy of the PIs for ERO and DEP through review of a sample of drill and event records. The inspectors reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspectors verified the accuracy of the PI for ANS reliability through review of a sample of the licensee’s records of periodic system tests. The inspectors also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment. This inspection satisfied three inspection samples for PI verification on an annual basis as defined in NRC IP 71151, “Performance Indicator Verification”.

#### b. Findings

No findings were identified.

#### 4OA6 Meetings

On December 15, 2017, the inspection team presented the inspection results to Mr. M. Casner and other members of the plant staff. The inspectors confirmed that no proprietary information was provided during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee personnel**

G. Arent, Technical Advisor  
B. Belvin, Radiation Protection Manager  
M. Casner, Director Plant Operations  
T. Detchemendy, Emergency Preparedness Manager  
K. Hulvey, Licensing Manager  
W. Lee, Corporate Emergency Preparedness Director  
T. Marshall, Plant Manager  
A. Pate, Senior Licensing Program Manager  
A. Phillips, Emergency Preparedness Specialist  
L. Sanders, Director Plant Support  
S. Schiel, Program Manager for Drills & Exercises  
P. Simmons, Site Vice President  
R. Staggs, Human Performance/Safety Manager  
M. White, Emergency Preparedness Specialist  
A. White, Senior Manager Quality Assurance

### **LIST OF DOCUMENTS REVIEWED**

#### **1EP1 Exercise Evaluation**

##### **Procedures**

1-A01-17, Turbine Trip, WBN Unit 1, Abnormal Operating Instruction, Rev. 6  
1-ECA-3.1, SGTR and LOCA- Subcooled Recovery, WBN Unit 1, Rev. 3  
1-E-0, Reactor Trip or Safety Injection, WBN Unit 1, Emergency Operating Instruction, Rev. 15  
1-E-2, Faulted Steam generator Isolation, WBN Unit 1, Rev. 3  
1-E-3, Steam Generator Tube Rupture, WBN Unit 1, Rev. 6  
1-ES-1.1, SI Termination, WBN Unit 1, Emergency Operations Instruction, Rev. 3  
1-FR-5.1, Nuclear Power Generation/ATWS, WBN Unit 1, Rev. 1  
CECC EPIP-1, Central Emergency Control Center (CECC) Operations, Rev. 63  
CECC EPIP-3, Operations Duty Specialist Procedure for Alert, Site Area Emergency, or General Emergency, Rev. 49  
CECC EPIP-6, CECC Plant Assessment Staff Procedure for Alert, Site Area Emergency, or General Emergency, Rev. 40  
CECC EPIP-7, CECC Radiological Assessment Staff Procedure for Alert, Site Area Emergency, & General Emergency, Rev. 38  
CECC EPIP-8, Dose Assessment Staff Activities During Nuclear Plant Radiological Emergencies, Rev. 45  
CECC EPIP-9, Emergency Environmental Radiological Monitoring Procedures, Rev. 57  
CECC EPIP-14, Nuclear Emergency Public Information Organization and Operations, Rev. 36  
CECC-EPIP-16, Termination and Recovery, Rev. 10  
CECC EPIP-17, Central Emergency Control Center Meteorologist Procedures, Rev. 23  
CECC EPIP-21, Emergency Duty Officer Procedure for Notification of Unusual Event, Alert, Site Area Emergency, or General Emergency, Rev. 17  
EPDP-3, Emergency Plan Exercises & Preparedness Drills, Rev. 15  
EPIP-1, Emergency Plan Classification Logic, Rev. 47  
EPIP-4, Site Area Emergency, Rev. 40



EPIP-5, General Emergency, Rev. 47  
 EPIP-6, Activation and Operation of Technical Support Center, Rev. 50  
 EPIP-8, Assembly & Accountability, Rev. 31  
 EPIP-13, Initial Dose Assessment for Radiological Emergencies, Rev. 24  
 EPIP-14, Radiological Control Response, Rev. 26  
 NP-REP, Radiological Emergency Plan, Appendix C, Watts Bar Nuclear Plant, Rev. 111  
 NPG-SPP-18.3, Emergency Preparedness, Rev. 14  
 NPG-SPP-22.300, Corrective Action Program, Rev. 9

#### Records and Data

2017 WBN Graded Exercise Scenario, TVA, Watts Bar, dated 12/13/17  
 Simulator Control Room, Technical Support Center, Operations Support Center, and the Central Emergency Control Center Documentation packages (logs, event notification forms, Protective Action Recommendations, Media releases, and Radiological Dose Assessments)

#### Corrective Action Program Documents (Condition Reports)

CR 1368549, 2017 REP Graded Exercise – procedure guidance lacking for monitoring & mitigating the radiological/environmental implications of spraying down the plume  
 CR 1368645, 2017 REP Graded Exercise – enhance EPIP-8  
 CR 1368655, 2017 REP Graded Exercise – assembly & accountability enhancements  
 CR 1368658, 2017 REP Graded Exercise – puff release data  
 CR 1368659, 2017 REP Graded Exercise – Ops turnover sheet different than that used in the plant  
 CR 1368660, 2017 REP Graded Exercise – drill participant left drill for several hours  
 CR 1368663, 2017 REP Graded Exercise – simulated Fire Ops participation  
 CR 1368665, 2017 REP Graded Exercise – OSC team member not engaged  
 CR 1368668, 2017 REP Graded Exercise – dose assessment training  
 CR 1368670, 2017 REP Graded Exercise – facility announcement enhancement  
 CR 1368674, 2017 REP Graded Exercise – KI authorization  
 CR 1368683, 2017 REP Graded Exercise – failure to follow procedure by dose assessor performing RED  
 CR 1368690, 2017 REP Graded Exercise – CECC EPIP-19 enhancement  
 CR 1368692, 2017 REP Graded Exercise – CECC EPIP-7 enhancement  
 CR 1368703, 2017 REP Graded Exercise – Objective 14 failure  
 CR 1368712, 2017 REP Graded Exercise – NRC phone talker addition  
 CR 1368811, 2017 REP Graded Exercise – TSC/SED did not inform simulator/MCR staff that a GE had been declared  
 CR 1368813, 2017 REP Graded Exercise – simulator fault mis-identified  
 CR 1368815, 2017 REP Graded Exercise – equipment issues during the exercise  
 CR 1368976, TSC conducted an abbreviated critique following conclusion of the graded exercise (NRC-identified)

#### 1EP4 Emergency Action Level and Emergency Plan Changes

##### Procedures

EPDP-17, NPG Emergency Plan Effectiveness Review [10 CFR 50.54(q)], Rev. 5  
 EPIP-1, Emergency Plan Classification Logic, Rev. 46 & 47  
 EPIP-2, Notification of Unusual Event, Rev. 37 & 38  
 EPIP-3, Alert, Rev. 41 & 42  
 EPIP-4, Site Area Emergency, Rev. 39 & 40  
 EPIP-5, General Emergency, Rev. 45, 46, & 47

EPIP-13, Initial Dose Assessment for Radiological Emergencies, Rev. 23 & 24  
 EPIP-14, Radiological Control Response, Rev. 25 & 26  
 TVA Radiological Emergency Plan, Generic Part, Rev. 107  
 TVA Radiological Emergency Plan, Appendix C, Watts Bar Nuclear Plant, Rev. 110 & 111

#### Change Packages

CECC-2016-024, EPDP-17, Att. 2 Screening Evaluation Form for REP App. C, Section C.2, Rev. 111, dated 11/14/16  
 CECC-2016-059, EPDP-17, Att. 2 Screening Evaluation Form for REP App. C, Rev. 111, dated 11/14/16  
 CECC-2016-059, EPDP-17, Att. 2 Effectiveness Evaluation Form for REP App. C, Rev. 111, dated 11/14/16  
 CECC-2016-060, EPDP-17, Att. 2 Screening Evaluation Form for REP App. C, Table 7.2, Rev. 111, dated 11/14/16  
 WBN-2016-012, EPDP-17, Att. 2 Screening Evaluation Form for EPIP-14, Rev. 26, dated 8/8/16  
 WBN-2016-016, EPDP-17, Att. 2 Screening Evaluation form for EPIP-5, Rev. 46, dated 9/7/16  
 WBN-2016-018, EPDP-17, Att. 2 Screening Evaluation Form for EPIP-3, Rev. 42, dated 9/29/16  
 WBN-2016-019, EPDP-17, Att. 2 Screening Evaluation Form for EPIP-4, Rev. 40, dated 9/29/16  
 WBN-2016-020, EPDP-17, Att. 2 Screening Evaluation form for EPIP-5, Rev. 47, dated 9/30/16  
 WBN-2016-021, EPDP-17, Att. 2 Screening Evaluation Form for EPIP-1, Rev. 47, dated 12/1/16  
 WBN-2016-021, EPDP-17, Att. 4 Effectiveness Evaluation Form for EPIP-1, Rev. 47, dated 12/1/16  
 WBN-2017-002, EPDP-17, Att. 2 Screening Evaluation Form for EPIP-2, Rev. 38, dated 1/9/17  
 WBN-2017-006, EPDP-17, Att. 2 Screening Evaluation Form for EPIP-13, Rev. 24, dated 10/5/17

#### Corrective Action Program Documents

CR 1367722, 2017 NRC inspection – 50.54(q) tracking number was not recorded on document  
 CR 1367726, 2017 NRC inspection – 50.54(q) grammar errors in multiple documents

#### 1EP8 Exercise Evaluation

##### Procedures

CECC-EPIP-9, Emergency Environmental Radiological Monitoring Procedures, Rev. 57  
 CECC-EPIP-19, Post Accident Fuel Damage Assessment, Rev. 22  
 EPDP-3, Emergency Plan Exercises & Preparedness Drills, Rev. 15  
 EPIP-1, Emergency Plan Classification Logic, Rev. 47  
 EPIP-2, Notification of Unusual Event, Rev. 38  
 EPIP-3, Alert, Rev. 42  
 EPIP-4, Site Area Emergency, Rev. 40  
 EPIP-5, General Emergency, Rev. 47  
 EPIP-6, Activation & Operation of the Technical Support Center, Rev. 50  
 EPIP-7, Activation & Operation of the Operational Support Center, Rev. 37  
 TVA Radiological Emergency Plan, Appendix C, Watts Bar Nuclear Plant, Rev. 111

##### Records and Data

2017 WBN Graded Exercise Scenario, TVA, Watts Bar, dated 12/13/17  
 2017 WBN Integrated Training Drill 8/16/17  
 Drill Report Watts Bar Graded Exercise 11/18/15, dated 12/2/15  
 Drill Report Watts Bar Training Drill 3/3/16  
 Drill Report Watts Bar Training Drill 6/1/16, dated 6/22/16

Drill Report Watts Bar Training Drill 10/26/16, dated 11/10/16  
 Exercise Report Watts Bar PASS Drill 12/9/16, dated 12/28/16  
 Drill Report Watts Bar Training Drill 2/8/17, dated 2/21/17  
 Drill Report Watts Bar Training Drill 6/21/17, dated 8/4/17  
 Drill Report Watts Bar Training Drill 7/17/17, dated 8/17/17

#### 4OA1 Performance Indicator Verification

##### Procedures

EPDP-11, Emergency Preparedness Performance Indicators, Rev. 8

##### Records and Data

DEP opportunities documentation for 4th quarter 2016; 1st, 2nd, & 3rd quarters 2017  
 Siren test data for 4th quarter 2016; 1st, 2nd, & 3rd quarters 2017  
 Drill and exercise participation records of ERO personnel for 4th quarter 2016; 1st, 2nd, & 3rd quarters 2017

##### Corrective Action Program Documents

CR 1231058, SED incorrectly contacted actual state of Tennessee during an LOR drill  
 CR 1251630, OSC computer not working during a virtual drill  
 CR 1367722, 2017 NRC inspection - DEP paperwork was missing for two separate REP classifications during the fourth quarter 2016

#### **LIST OF ACRONYMS USED**

ANS	Alert and Notification System
CECC	Central Emergency Control Center
CR	Condition Report
DEP	Drill and Exercise Performance
DHS	Department of Homeland Security
EAL	Emergency Action Level
EOF	Emergency Operations Facility
EP	Emergency Preparedness
EPIP	Emergency Plan Implementing Procedure
E-Plan	Emergency Plan
ERO	Emergency Response Organization
FEMA	Federal Emergency Management Agency
IP	Inspection Procedure
NEI	Nuclear Energy Institute
OSC	Operations Support Center
PIs	Performance Indicators
TSC	Technical Support Center
TVA	Tennessee Valley Authority
WBN	Watts Bar Nuclear