



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

April 28, 2015

EN 50776

Mr. B. Joel Burch
Vice President and General Manager
Babcock and Wilcox
Nuclear Operations Group, Inc.
P.O. Box 785
Lynchburg, VA 24505-0785

SUBJECT: BABCOCK AND WILCOX NUCLEAR OPERATIONS GROUP – NUCLEAR
REGULATORY COMMISSION INTEGRATED INSPECTION REPORT 70-27/2015-
002

Dear Mr. Burch:

This refers to the inspections conducted from January 1 through March 31, 2015, at the Babcock and Wilcox (B&W) Nuclear Operations Group (NOG), Inc., facility in Lynchburg, VA. The inspections were conducted to determine whether activities authorized under the license were conducted safely and in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements. The enclosed report presents the results of these inspections. The results were discussed with you and members of your staff at an exit meeting held on April 13, 2015 for this integrated inspection report.

During the inspections, the NRC staff examined activities conducted under your license, as they related to public health and safety, to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Areas examined during the inspections are identified in the enclosed report. Within these areas, the inspections consisted of selected examinations of procedures and representative records, observations of activities, and interviews with personnel. Based on the results of these inspections, no violations were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room, or from the NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions concerning these inspections, please contact me at 404-997-4629.

Sincerely,

/RA/

Marvin D. Sykes, Chief
Projects Branch 2
Division of Fuel Facility Inspection

Docket No. 70-27
License No. SNM-42

Enclosure:
NRC Inspection Report 70-27/2015-002
w/Attachment: Supplementary Information

cc:
Joseph G. Henry
Chief Operating Officer
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Division of Radiological Health
Department of Health
109 Governor Street, Room 730
Richmond, VA 23219

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ACCESSION NUMBER: ML15119A006

☒ SUNSI REVIEW COMPLETE

☒ FORM 665 ATTACHED

OFFICE	RII:DFFI	RII:DFFI	RII:DFFI	DC			
SIGNATURE	/RA/	/RA/	/RA/	/RA/			
NAME	SSubosits	MThomas	JDiaz	MThomas			
DATE	4/28/2015	4/28/2015	4/28/2015	4/28/2015	4/ /2015	4/ /2015	4/ /2015
E-MAIL COPY	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

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Letter to Mr. B. Joel Burch from Marvin D. Sykes dated April 28, 2015

SUBJECT: BABCOCK AND WILCOX NUCLEAR OPERATIONS GROUP – NUCLEAR
REGULATORY COMMISSION INTEGRATED INSPECTION REPORT 70-27/2015-
002

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No: 70-27

License No: SNM-42

Report No: 70-27/2015-002

Licensee: Babcock and Wilcox

Facility: Nuclear Operations Group (NOG)

Location: Lynchburg, VA 24505

Dates: January 1 through March 31, 2015

Inspectors: S. Subosits, Senior Resident Inspector, RII/DFFI/PB2
J. Díaz-Vélez, Senior Fuel Facility Projects Inspector, RII/DFFI/SB

Approved by: M. Sykes, Chief
Projects Branch 2
Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

Babcock and Wilcox Nuclear Operations Group
NRC Integrated Inspection Report 70-27/2015-002
January 1 – March 31, 2015

Inspections were conducted by the senior resident inspector, regional staff, and headquarters staff during normal and back shifts in the areas of safety operations, radiological controls, and facility support. The inspectors performed a selective examination of licensee activities that were accomplished by direct observation of safety-significant activities and equipment, tours of the facility, interviews and discussions with licensee personnel, and a review of facility records.

Safety Operations

- The items relied on for safety (IROFS) reviewed during this period were properly maintained in order to perform their intended safety function in accordance with the license application and regulatory requirements. (Section A.1)
- The facility was operated safely in accordance with operating procedures, nuclear criticality safety (NCS) postings and regulatory requirements. (Section A.2)
- Fire protection systems were maintained in accordance with site procedures. (Section A.3)

Radiological Controls

- The Radiation Protection program elements reviewed were implemented in accordance with the license and regulatory requirements. (Section B.1)

Facility Support

- The post maintenance testing and surveillance testing observed for IROFS were implemented in accordance with the license and applicable procedure. (Sections C.1 and C.2)
- Reports for tracking and resolution of safety-related issues included corrective actions to prevent recurrence. Extent of condition and extent of cause reviews were conducted when required by the governing corrective action program procedure. (Section C.3)

Other Areas

- Event Notification (EN) 50776/Licensee Event Report (LER) 70-27/2015-002-01 was reported to the NRC on January 28, 2015 regarding an abnormal condition found in the Low Level Dissolver catch tray (Paragraph D.2.a). NRC Inspection Report 70-27/2015-006 documented the results of the NRC inspection follow-up for this event.

Attachment

Key Points of Contact
List of Items Opened, Closed, and Discussed
List of Inspection Procedures Used
Documents Reviewed

REPORT DETAILS

Summary of Plant Status

During the inspection period, routine fuel manufacturing operations and maintenance activities were conducted in the fuel processing areas and in the Research Test Reactors and Targets (RTRT) facility. Routine operations and maintenance activities were conducted in the Uranium Recovery (UR) facility.

A. Safety Operations

1. Plant Operations (Inspection Procedures (IPs) 88135 and 88135.02)

a. Inspection Scope and Observations

The inspectors performed routine tours of the fuel manufacturing areas housing special nuclear material (SNM), reviewed shift turnover log sheets, and observed one shift turnover exchange in UR. The inspectors interviewed operators, front-line managers (FLMs), maintenance mechanics, radiation protection (RP) staff, and process engineering personnel regarding issues with plant equipment and to verify the status of the process operations.

The inspectors observed operations in progress in the UR, Filler, Wastewater Treatment Facility, Machine Shop, and RTRT areas throughout the inspection period. The inspectors determined that the SNM processes and workstations in service at the time of walk-downs were operated in accordance with applicable procedures.

During the inspection period, the inspectors interviewed five operators, one FLM, and one nuclear materials control (NMC) technician and determined that each of the individuals demonstrated adequate knowledge of the nuclear criticality safety (NCS) posting requirements, and the SNM administrative and operations procedures associated with their assigned duties.

Safety System Walk-down (IP 88135.04)

The inspectors performed a walk-down of a safety-significant system involved with the processing of SNM. As part of the walk-down, inspectors reviewed the NCS postings associated with the Specialty Fuels Facility (SFF) liquid waste handling area. The inspectors verified that items relied on for safety (IROFS) were available and operable to perform their intended functions when needed to comply with the performance requirements of 10 CFR 70.61. The inspectors also verified that four IROFS controls for the area were properly implemented in the field. No conditions that degraded plant equipment, the availability, or operability of IROFS were identified.

To determine if plant equipment was installed correctly, the inspectors reviewed the relevant drawings, as well as Integrated Safety Analysis (ISA)/Safety Analysis Reports (SAR) 15.19 for the SFF liquid waste handling process. During the walk-down, the inspectors verified some of the following as appropriate:

- Controls in place for potential criticality hazards;

- Process vessel configurations maintained in accordance with Nuclear Criticality Safety Evaluations (NCSEs);
- Correct valve position and material condition;
- Electrical power availability;
- Adequate lighting in and around workstations;
- Hangers and supports correctly installed and functional; and
- Lockout/Tag-Out program implementation.

b. Conclusion

No findings of significance were identified.

2. Nuclear Criticality Safety (IP 88135)

a. Inspection Scope and Observations

During daily tours of the Filler, UR, RTRT, and the general shop floor areas, the inspectors verified that NCS controls and postings were in place and available to perform their intended functions. The inspectors reviewed the field implementation of NCS-related administrative IROFS - one in the Filler area, three in the shop floor area, and two in the UR area. During these observations, the inspectors noted that the IROFS were properly implemented and that operations personnel complied with NCS posting requirements in their work areas. The inspectors reviewed the accuracy of one mass log tracking sheet in the SFF area and verified that the mass log entries matched the as-found inventories of the corresponding workstation.

b. Conclusion

No findings of significance were identified.

3. Fire Protection Quarterly (IP 88135.05)

a. Inspection Scope and Observations

During daily plant tours, the inspectors verified that transient combustibles were being adequately controlled and minimized in Bay 14A, Bay 15 and Bay 16. The inspectors conducted fire safety tours of these areas and reviewed the fire detection and suppression capabilities in those areas. No compliance or regulatory issues were noted with respect to fire protection equipment. The inspectors also verified that housekeeping in the areas reviewed was sufficient to minimize the risk of fire.

b. Conclusion

No findings of significance were identified.

B. Radiological Controls

1. Radiation Protection Quarterly (IP 88135.02)

a. Inspection Scope and Observations

The inspectors toured the UR, Filler and RTRT areas and verified that radiological signs and postings accurately reflected radiological conditions within the posted areas. The inspectors observed plant personnel as they removed protective clothing at controlled area step-off pads. The inspectors also observed plant employees as they performed exit monitoring at the Filler controlled area exit and verified that monitoring instructions were followed at the exit point.

The inspectors reviewed radiological work permit (RWP) 15-0017 concerning removal of solids material from the low level dissolver catch tray in UR. The inspectors verified the RWP contained appropriate instructions, were posted in the work areas for employees' review, and that workers signed the applicable RWP. The inspectors noted that for the portions of work activities observed on March 23, 2015, plant workers wore the required respiratory protection and dosimetry; and performed tasks in accordance with the RWP requirements. The inspectors also noted that for certain work activities the RP staff took additional air samples to verify adequate ventilation and to ensure timely detection of airborne radioactive contamination in the vicinity of the workers outside the RWP barricaded area.

On March 30, 2015, an expansion joint on the Low Level Radioactive (LLR) liquid waste Plant Retention Tank line was found leaking onto the concrete pad under the pipeline. The licensee's wastewater treatment organization cleaned up the spill area and RP surveys were completed to release the area within 24 hours. As a precaution, soil samples of the area adjacent to the concrete pad were taken for analysis. The licensee entered the issue into the corrective action (CA) system (CA 201500561) for follow-up and identification of actions to prevent recurrence.

The inspectors performed a review of the licensee's semi-annual effluent monitoring report required by 10 CFR 70.59. The inspectors verified that liquid and gaseous effluents releases and the resultant off-site doses were appropriately documented for the period covering June 30, 2014 to January 4, 2015.

b. Conclusion

No findings of significance were identified.

C. Facility Support

1. Post Maintenance Testing (IP 88135.19)

a. Inspection Scope and Observations

The inspectors witnessed one post-maintenance test (PMT) per work order (WO) associated documentation. The inspectors witnessed performance of post maintenance leak check of a favorable geometry storage column utilized in SNM processing

operations in the UR facility. No evidence of leaks were found and as a result the surveillance check acceptance criterion was met. The inspectors also verified that PMT activities were conducted in accordance with applicable WO instructions or licensee procedural requirements for eight corrective maintenance WOs.

b. Conclusion

No findings of significance were identified.

2. Surveillance Testing (IP 88135.22)

a. Inspection Scope and Observations

The inspectors observed a preventive maintenance surveillance test on a level sensor in the contactor raffinate collection columns array in UR. The test was conducted to verify that the raffinate waste pump shutdown interlock and low level alarm for the column were actuated upon receipt of a low level. The inspectors reviewed completed preventive maintenance WOs for eight surveillance test work orders of safety-related systems and verified that the tests were suitable to confirm the availability and reliability of any associated IROFS and licensee operating procedure requirements.

b. Conclusion

No findings of significance were identified.

3. Management Organization and Controls (IP 88135)

a. Inspection Scope and Observations

The inspectors reviewed a sample of 41 items entered into the licensee's CA system during the inspection period to ensure that items pertinent to safety, security, and non-conforming conditions were identified, investigated as necessary, and tracked to closure. The inspector verified that the issues of high safety significance were properly identified and reviewed for apparent causes. The inspectors noted that, for those issues requiring extent of condition/extent of cause reviews, the reviews were completed and documented in the applicable CAs. The inspectors verified that appropriate CAs to prevent recurrence were identified in the CA system, and were reviewed and tracked to completion in accordance with the licensee's CA system implementing procedure, Quality Work Instruction (QWI) 14.1.1, "Preventive/Corrective Action System." The inspectors reviewed two internal audits of the RP program area for the inspection period. The internal audits reviewed were the licensee's assessments of the RP ALARA Program (258-3J) and RP Inspections, Audits and Assessments (258-3L).

b. Conclusion

No findings of significance were identified.

D. Other Areas**1. Follow-up on Previously Identified Issues**

None

2. Event Follow-up (IP 88135.02)**a. Event Notification (EN) 50776: Licensee Event Report (LER) 70-27/ 2015-002-01: Unanalyzed Condition While Cleaning the Catch Tray**

On January 9, 2015, a routine clean-out of solids build-up on the Low Level Dissolver (LLD) catch tray was initiated by UR Operations personnel based on the inspection results of surveillance WO 20173414. The solids material was scraped into 4-5 piles that exceeded 2.5 liters in volume, though the piles were spaced 15 inches apart. The material was left for the oncoming shift to be collected into safe geometry 2.5 liter bottles. The front line manager of the oncoming shift questioned the size of the piles after observing the condition in the catch tray and the NCS organization was notified later on the afternoon of January 9, 2015. NCS authorized collection of the material into 2.5 liter bottles and assay of the bottles showed a total mass of 74.5 grams of Uranium-235. The licensee performed a NCS Concern Analysis of the LLD catch tray condition which concluded that the performance requirements of 10 CFR 70.61 were met based on the remaining mass and spacing controls. The senior resident inspector (SRI) requested a copy of the NCS Concern Analysis (NCS-2015-008) and reviewed it on January 26, 2015. The SRI questioned the conclusion in NCS-2015-008 that the performance requirements of 10 CFR 70.61(b) for a high consequence event were met and provided NCS-2015-008 to two NCS inspectors on-site for further follow-up. The review by the NCS inspectors determined that the condition was unanalyzed and sufficient IROFS were not available to meet the performance requirements for criticality.

On January 28, 2015, the licensee made a notification under the reporting requirements of 10 CFR 70.74(a) and 10 CFR 70 Appendix A, (b)(1) for an unanalyzed condition that failed to meet the performance requirements of 10 CFR 70.61. The licensee conducted an extent of condition review for the event and updated EN 50776 on February 10, 2015, because the potential condition of greater than 2.5 liter piles found in the LLD catch tray could be encountered in the High Level Dissolver (HLD) during clean-out activities. The licensee conducted further analysis of the HLD clean-out activities and determined that a criticality from cleanout of a HLD recirculation column was not credible. The licensee retracted the February 10, 2015 amendment to EN 50776 on March 16, 2015. The licensee provided a 60-Day written report for EN 50776 on March 20, 2015, in accordance with 10 CFR 70.74(b). This item will be tracked as LER 70-27/2015-002-01. The results of the NCS inspection review of EN 50776 are captured in NRC Inspection Report 70-27/2015-006.

E. Exit Meeting

On April 13, 2015, the inspectors presented the inspection results to B.J. Burch and members of the staff. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

SUPPLEMENTARY INFORMATION

1. KEY POINTS OF CONTACT

<u>Name</u>	<u>Title</u>
B.J. Burch	Vice President and General Manager
K. Conway	Unit Manager, Radiation Protection
J. Calvert	Unit Manager, Industrial Health and Safety
D. Spangler	Section Manager, Nuclear Safety and Licensing
C. England	Unit Manager, Licensing and Safety Analysis
D. Faidley	Unit Manager, Nuclear Criticality Safety
A. Rander	Security Department Manager
K. Kirby	Front Line Manager, Nuclear Materials Control
W. Lemon	Section Manager, Filler Manufacturing Operations
D. Miller	Unit Manager, Uranium Processing and Research Reactors
L. Morrell	Section Manager, Environmental Protection and Industrial Safety
M. Spraker	Unit Manager, Filler Manufacturing Operations
D. Ward	Dept. Manager, Environmental, Safety Health and Safeguards
C. Yates	Section Manager, Uranium Processing and Research Reactors

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Discussed

70-27/2015-002-01	LER	EN 50776: Unanalyzed Condition While Cleaning the Catch Tray (Paragraph D.2.a)
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3. LIST OF INSPECTION PROCEDURES USED

88135	Resident Inspection Program For Category I Fuel Cycle Facilities
88135.02	Resident Inspection Program Plant Status Activities
88135.04	ISA Implementation
88135.05	Fire Protection
88135.17	Permanent Plant Modifications
88135.19	Post Maintenance Testing
88135.22	Surveillance Testing

4. DOCUMENTS REVIEWED

Records:

Audit 258-3J, "Radiation Protection ALARA Program," dated December 2014
Audit 258-3L, "Radiation Protection Inspections, Audits and Assessments," dated December 2014
Letter GWP-2015-001, "RP Audits, Inspections, 4th Quarter 2014"
Letter NCS-2015-001, "NCS Violation & Observation Summary – 4th Quarter 2014"
Letter 15-027, "Semi-Annual Effluent Monitoring Report, dated February 25, 2015
RWP 15-0002 Radiological Work Permit 15-0002
RWP 15-0017, Radiological Work Permit 15-0017

SAR 15.19, "Waste Handling, Vacuum System and Ventilation for SFF Operations",
Revision (Rev.) 67

Procedures:

OP-0061141, "Low Level Leach Hood Operation," Rev. 61
OP-0061167, "Spill and Leak Handling Emergency Procedure," Rev. 30
OP-0061234, "Maintenance in UPRR", Rev. 49
OP-0061450, "General Safety and Safeguards Guidelines-UPRR Area," Rev. 35
OP-1001827, (Classified Title), Rev. 20
OP-1005350, (Classified Title), Rev. 9
OP-1019574, "Control of Item/Container Entry Into UP CCA," Rev. 5
Emergency Plan, Rev. 26, dated October 30, 2013
Quality Work Instruction 14.1.1, Preventive/Corrective Action System, Rev. 26
Quality Work Instruction 17.1.2, Internal Quality Audits, Rev. 17

Corrective Action (CA) Reports Review:

CA210401424, CA201402126, CA201402135, CA201402140, CA201402143,
CA201402146, CA201402148, CA201402177, CA201500001, CA201500038,
CA201500039, CA201500058, CA201500093, CA201500103, CA201500119,
CA201500141, CA201500154, CA201500156, CA201500188, CA201500206,
CA201500212, CA201500237, CA201500250, CA201500308, CA201500314,
CA201500385, CA201500424, CA201500561

Corrective Action System Entries Written as a Result of the Inspection:

CA201500391

Work Orders:

NPDM 20173046, NPDM 20174046, NPDM 20174785, NPDM 20175429, NPDM 20176115,
NPDM 20177097, NPDM 20177587, NPDM 20177629, NPDM 20178669, NPDP 20172753,
NPDP 20173111, NPDP 20173420, NPDP 20173443, NPDP 20173468, NPDP 20174278,
NPDP 20177174, NPDP 20177550, NPDP 20175524

Other Documents:

Form E61-57, "Container Inspection Form," Rev. 37
NCS Posting 15-19-001, Rev. 0
NCS Posting 15-19-002, Rev. 0
NCS Posting 15-19-003, Rev. 0
NCS-2014-042, dated April 29, 2014
NCS-2014-137, dated November 13, 2014
NCS-2005-272, dated December 9, 2005
Drawing CRF-674, "Liquid Waste Column Vent Modifications," Rev. 0
Drawing CRF-322, "CRF Liquid Waste System Flow Diagram," Rev. 11
Drawing CRF-681, "Waste Sink PFD"
SAP Maintenance Plan, MP# 3329