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

July 29, 2013

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

SUBJECT: BABCOCK AND WILCOX NUCLEAR OPERATIONS GROUP – NRC INTEGRATED INSPECTION REPORT 70-27/2013-003

Dear Mr. Burch:

This refers to the inspections conducted from April 1 through June 30, 2013, at the Babcock and Wilcox (B&W) Nuclear Operations Group (NOG), Inc. facility in Lynchburg, VA. The purpose of the inspections was 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 the inspections. The findings were discussed with members of your staff at exit meetings held on May 24 and June 28, 2013, 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, and 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 examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of these inspections, no violations or deviations were identified.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 2.390 of the NRC's "Rules of Practice," a copy of this letter, and 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), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Should you have any questions concerning these inspections, please contact us.

Sincerely,

/RA/

Alan J. Blamey, Chief
Fuel Facility Inspection Branch 1
Division of Fuel Facility Inspection

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

Enclosure:
NRC Inspection Report 70-27/2013-003
w/Attachment: Supplementary Information

cc:
Charles A. England, Manager
Licensing and Safety Analysis
Babcock and Wilcox
Nuclear Operations Group, Inc.
P.O. Box 785
Lynchburg, VA 24505-0785

Steve Harrison, Director
Division of Radiological Health
Department of Health
109 Governor Street, Room 730
Richmond, VA 23219

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ADAMS: ☒ Yes ACCESSION NUMBER: ML13210A219 ☒ SUNSI REVIEW COMPLETE ☒ FORM 665 ATTACHED

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SIGNATURE	/RA/	/RA/	/RA/		/RA/	/RA/	
NAME	N. Peterka	R. Prince	P. Glenn	S. Subosits	P. Startz	M. Crespo	
DATE	7/ 25 /2013	7/ 24 /2013	7/ 22 /2013	7/ /2013	7/ 22 /2013	7/ 26 /2013	7/ /2013
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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No:	70-27
License No:	SNM-42
Report No:	70-27/2013-003
Licensee:	Babcock and Wilcox
Facility:	Lynchburg Facility
Location:	Lynchburg, VA 24505
Dates:	April 1, 2013 through June 30, 2013
Inspectors:	S. Subosits, Senior Resident Inspector P. Glenn, Fuel Facilities Inspector N. Peterka, Fuel Facilities Inspector P. Startz, Fuel Facilities Inspector
Approved by:	A. Blamey, Chief Fuel Facility Inspection Branch 1 Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

Babcock and Wilcox
NRC Integrated Inspection Report 70-27/2013-003
April 1 – June 30, 2013

Inspections were conducted by the resident and regional inspectors during normal and off normal 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 were properly maintained in order to perform their intended safety function in accordance with the license application and regulatory requirements. (Paragraph A.1)

- The facility was operated safely in accordance with operating procedures and nuclear criticality safety postings. (Paragraph A.2)

- The licensee adequately implemented the fire protection elements and area housekeeping was maintained in accordance with fire safety requirements for special nuclear material processing areas, equipment, and storage areas. (Paragraph A.3)

Radiological Controls

- Elements of the Radiation Protection program were implemented in accordance with the license application and regulatory requirements. (Paragraph B.1)

Facility Support

- Preventative and corrective maintenance tasks were completed in accordance with work instructions, and the affected equipment met post maintenance acceptance criteria for returning to service. (Paragraph C.1)

- Corrective action reports for safety-related issues identified corrective actions to prevent recurrence. Extent of condition and extent of cause reviews were conducted when required in accordance with the governing corrective action program procedure. (Paragraph C.2)

- The licensee's plant modifications program was implemented in accordance with the license application and regulatory requirements. (Paragraph C.3)

- The Maintenance and Surveillance of Safety Controls program was implemented in accordance with the license application and regulatory requirements. (Paragraph C.4)

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 were also conducted in the Uranium Recovery (UR) facility.

A. Safety Operations

1. Plant Operations (Inspection Procedure 88135)

a. Inspection Scope and Observations

The inspectors performed routine tours of the facility's manufacturing areas housing special nuclear material (SNM), reviewed shift turnover log sheets, and observed two shift turnover exchanges. The inspectors interviewed operators, front-line managers (FLMs), maintenance mechanics, material control and accounting (MC&A) technicians, 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, and RTRT areas throughout the inspection period. The inspectors determined that the SNM processes and workstations in service at the time of walkdowns in the UR, Filler, and RTRT areas were operated in accordance with operating procedures.

During the inspection period, the inspectors interviewed three operators and eight MC&A technicians. Each of the individuals interviewed demonstrated adequate knowledge of the nuclear criticality safety (NCS) posting requirements, and the SNM administrative and operations procedures associated with their assigned duties.

The inspectors conducted a safety system walkdown review of portions of the Pharmacy area and the Metallurgical Laboratory area. The inspectors reviewed a sample of the safety-significant controls and support systems related to the processes in these areas. The inspectors verified that the existing configurations of the systems were correct and that items relied on for safety (IROFS) were available and operable to perform their function when needed to comply with the performance requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) 70.61.

The inspectors reviewed eight controls designated as IROFS as documented in the Integrated Safety Analysis (ISA) and Safety Analysis Report (SAR), Section 15.28 for the Pharmacy area, and SAR Section 15.32 for the Metallurgical Laboratory area, and verified their implementation in the field. During the walkdowns, the inspectors verified that the IROFS controls for the two areas were properly implemented by reviewing the system configuration in the field, and reviewing the NCS requirements of applicable NCS postings with personnel in the areas.

The inspectors verified that essential support systems, such as enclosure ventilation, were operational and that adequate lighting was available to aid in the identification of safety or process hazards at the workstations reviewed

b. Conclusion

No violations of NRC requirements were identified.

2. Nuclear Criticality Safety (Inspection Procedure 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 six NCS-related IROFS 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 the Filler area. The inspectors also reviewed the accuracy of three SNM mass log tracking sheets in the Specialty Fuel Facility area, and found the mass log entries matched the as-found inventories of the corresponding gloveboxes and workstations.

b. Conclusion

No violations of NRC requirements were identified.

3. Fire Safety (Inspection Procedure 88135)

a. Inspection Scope and Observations

During daily plant tours, the inspectors verified that transient combustibles were being adequately controlled and minimized in the general shop floor areas of Bay 5A, Bay 6A, Bay 7A, and Bay 8A. The inspectors conducted fire safety tours for Bay 3T and the Filler controlled area operations, and reviewed the control of transient combustible material, ignition sources, and fire detection and suppression capabilities in the areas. No compliance or regulatory issues were noted in the areas reviewed with respect to fire protection equipment. The inspectors verified that housekeeping in the areas reviewed was sufficient to minimize the risk of fire.

b. Conclusion

No violations of NRC requirements were identified.

B. Radiological Controls

1. Radiation Protection (Inspection Procedure 88135)

a. Inspection Scope and Observations

During tours of radiologically controlled areas, the inspectors verified that workers complied with RP procedural requirements contained in Radiological Work Permits (RWPs), and in area operating procedures. 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 and UR

controlled area exits, and verified that monitoring instructions were followed at the exit points. The inspectors reviewed one RWP concerning work activities for the UR controlled area and one RWP for the RTRT controlled area. The inspectors verified the RWPs contained appropriate instructions, were posted in the work areas for employee's review, and workers signed onto the applicable RWP. The inspectors noted that, for the portions of work activities observed, plant workers wore the required dosimetry, the required personal protective equipment, and performed tasks in accordance with the RWP guidance.

The inspectors walked down the Fuel Manufacturing Area (FMA), RTRT uncontrolled area, Bay 17 area, and the UR controlled area. Inspectors verified that areas with radiological signs and postings were in accordance with 10 CFR Part 20, and adequately reflected radiological conditions. The inspectors confirmed that a current Notice to Employees, NRC Form 3, was posted near the main facility entrance in accordance with 10 CFR 19.11.

The inspectors observed a contamination survey in the UR facility and subsequently reviewed the results. Based on a review of documentation and plant observations, the inspectors determined that the survey adequately evaluated the magnitude and extent of radiation levels in accordance with 10 CFR 20.1501.

SNM-Bearing Component Breach

On May 13, 2013, a breach of a SNM-bearing component occurred in the Bay 12A component disassembly area. The breach was detected by the operator during machining operations. The operator noted a very low number of counts on the detector scale and performed a routine smear of the component surface. The operator brought the smear results to the attention of RP and area supervision, who confirmed the component breach and surveyed the operator for contamination. Surveys discovered that the operator's shoes were contaminated from the component debris on the floor in the vicinity of the machine. The operator's shoes were disposed of as low level radioactive waste and a bioassay kit was issued as a precaution. The operator's bioassay results were at the minimum detectable level, and no bio-assay action levels were exceeded based on the result. The breached component was moved to the UR controlled area and the operation was shutdown. The area was decontaminated in less than 24 hours. The issue was entered into the corrective action (CA) system (CA201301004) for investigation of the cause of the breach and to identify actions to prevent recurrence.

The inspectors noted that licensee's follow-up investigation identified an unexpected condition with the machining of the component and implemented a modification to the machine which has been successful in preventing additional component breaches. During their initial follow-up after the event, the inspectors questioned the licensee's RP staff regarding the adequacy of the area's radiological controls to prevent future contamination incidents in the area. The inspectors verified that the licensee's corrective actions to prevent recurrence during the current disassembly campaign included, issuance of a hand held alpha detector capable of providing a direct readout for use by the area operators, as well as modifying the current personal protective equipment requirements for the area to include coveralls and shoe covers for contamination control, and cut-resistant gloves.

b. Conclusion

No violations of NRC requirements were identified.

C. Facility Support

1. Maintenance and Surveillance (Inspection Procedure 88135)

a. Inspection Scope and Observations

The inspectors reviewed 12 preventative maintenance work orders for accuracy and to ensure that they verified operability of IROFS and safety controls. The inspectors also reviewed 12 corrective maintenance work orders and verified that appropriate post maintenance testing was documented upon completion of the work. Completed work orders were adequately reviewed prior to returning equipment to service. The inspectors observed maintenance work activities on UR systems and processes, including valve replacements, and piping replacements. The inspectors verified that work activities were conducted in accordance with licensee requirements and approved procedures for maintenance in the UR area.

b. Conclusion

No violations of NRC requirements were identified.

2. Management Organization and Controls (Inspection Procedure 88135)

a. Inspection Scope and Observations

The inspectors reviewed a sample of items entered into the licensee's CA system. The inspectors reviewed 38 CAs in the licensee's CA system to ensure that items pertinent to safety, security, and non-conforming conditions were identified, investigated as necessary, and tracked to closure. The inspectors verified that the issues, in the sample of CAs reviewed, were classified and assigned an appropriate significance level per the licensee's CA system implementing procedure, Quality Work Instruction (QWI) 14.1.1.

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 was identified in the CAs reviewed and tracked to completion in accordance with the QWI 14.1.1.

b. Conclusion

No violations of NRC requirements were identified.

3. Permanent Plant Modifications (Inspection Procedure 88070)

a. Inspection Scope and Observations

The inspectors interviewed cognizant staff and management to verify that the licensee had established an effective configuration management system to evaluate, implement, and track permanent plant modifications to the site which could affect safety. During this

evaluation the inspectors conducted field walkdowns of various modifications, reviewed supporting technical bases and evaluations, and verified the related safety basis documents were appropriately updated.

The inspectors verified the configuration management system had adequate provisions to ensure that permanent plant modifications did not degrade the performance capabilities of items relied on for safety, or other safety controls, that are part of the safety design basis.

The inspectors reviewed eight permanent plant modification design packages and other changes to the licensing basis since the last permanent plant modifications inspection. The changes were reviewed for accuracy and compliance with the licensee's configuration management program and other license commitments. The inspectors verified that applicable post maintenance installation and testing requirements were adequately identified, and included in the permanent plant modification design packages. Completed modifications were appropriately tested prior to returning the affected equipment to service.

The inspectors verified that the licensee addressed baseline design criteria required in 10 CFR 70.64 for the designs of permanent plant modifications. The inspectors verified that the licensee addressed the impacts of modifications to the ISA, ISA Summary, and other safety program information developed in accordance with 10 CFR 70.62.

The inspectors reviewed the licensee's problem identification and resolution program to verify that issues relating to the preparation and installation of permanent plant modifications were entered into the corrective action program and the adequacy of corrective actions.

b. Conclusion

No findings of significance were identified.

4. Maintenance and Surveillance of Safety Controls (Inspection Procedure 88025)

a. Inspection Scope and Observations

The inspectors interviewed managers, production supervisors, and technical staff to evaluate maintenance and surveillance program activities. The inspectors verified that IROFS, and other safety controls, were adequate to assure that IROFS and safety controls were maintained available and reliable to perform their safety function when needed. The inspectors focused on the SNM recovery area. Production activities conducted in the recovery areas required many administrative safety controls, strict adherence to training and posted safety limits, and engineering active and passive controls. The inspectors conducted in-depth examination of the production processes with technical operations staff, engineering specialists, and technical support groups. Discussions with technical staff included the migration and testing of the old Eberline criticality detection system versus the new Pajarito criticality monitoring system.

The inspectors verified that the licensee's maintenance work program had provisions to ensure the adequate pre-job planning and preparation of work packages to support maintenance and surveillance activities. The inspectors reviewed maintenance and surveillance work packages for accuracy and to ensure that test packages adequately challenged and verified operability of IROFS and safety controls.

The inspectors observed maintenance work activities on selected systems and processes in the UR areas, and determined that work activities were conducted in accordance with licensee requirements and approved procedures. Effective corrective actions were taken when a safety control failed or had degraded. The inspectors verified that post-maintenance testing and calibrations, as specified by the licensee requirements, were adequately performed prior to restoring equipment to operational status. Completed work packages were adequately reviewed prior to returning equipment to service.

The inspectors reviewed the licensee's problem identification and resolution program to verify that performance issues relating to the maintenance and surveillance of IROFS and safety controls were entered into the corrective action program, and evaluated the adequacy of corrective actions taken.

b. Conclusion

No violations of NRC requirements were identified.

D. Exit Meeting

On May 24 and June 28, 2013, the inspectors presented the inspection results to G. Camper 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

Name	Title
B.J. Burch	General Manager
J. Calvert	Unit Manager IH&S
G. Camper	Department Manager, Operations
K. Conway	Unit Manager Radiation Protection
D. Faidley	Unit Manager, Nuclear Criticality Safety
L. Hall	Unit Manager, NMC Operations
R. Johnson	Engineer, Licensing &Safety Analysis
D. Miller	Unit Manager, UPRR
S. Nagley	Department Manager UPRR
M. Suwala	Section Manager, NMC
D. Ward	Department Manager, ESH&S
C. Yates	Section Manager, Uranium Processing Operations

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Discussed

None

Closed

None

3. LIST OF INSPECTION PROCEDURES USED

IP 88025, Maintenance and Surveillance of Safety Controls
IP 88070, Permanent Plant Modifications
IP 88135, Resident Inspection Program for Category I Fuel Cycle Facilities

4. DOCUMENTS REVIEWED

Records:
CA2375-SC RTRT OTEMP INSP SMT 162 RTRTO 1Y
COM-35268
COM-38022
CR 1037903, Change Request 1037903
CR 1038741, Change Request 1038741
CR 1037449, Change Request 1037449
CR 1038349, Change Request 1038349
CR 1036964, Change Request 1036964
CR 1037566, Change Request 1037566

CR1038054, Change Request 1038054
CR1037718, Change Request 1037718
CR1037066, Change Request 1037066
NCS Posting, NCS 15-28-003
NCS Posting, NCS 15-28-014
NCS Posting, NCS 15-28-013
NCS Posting, NCS 15-32-001
NCS Posting, NCS 15-32-007
NCS Posting, NCS 15-32-015
NCS Posting, NCS 15-32-019
SAR 15.9, Main Extraction and Drum Dryer
SAR 15.10, 3" Extraction
SAR 15.16, Conversion Process Operations
SAR 15.28, Metallographic Laboratories
SAR 15.32, Pharmacy Operations
SAR 15.30, NMC Vaults and Storage Rooms
SAR 15.40 Lynchburg Technology Center

Procedures:
QWI 2.1.2, Preparation and Maintenance of Safety Analysis Reports (SAR), Rev. 12
QWI 4.1.4, "Design Reviews," Rev. 34
QWI 5.1.7, Safety Evaluation Request, Rev. 27
QWI 5.1.12, Change Management
A62-01, Safety Evaluation Request (SERs), Rev. 34, dated November 22, 2010
RP-07-054, Criticality System Calibration, Rev. 20
RP-07-054, RMS-11 Criticality/Area Monitor and CIDAS Detector Calibration, Rev. 20
RP-07-028, Maintaining and Testing the Plant Criticality Monitoring System and RMSII Area Monitor, Rev. 29
RP-02, Contamination Control, Rev. 9, dated September 15, 2012
RP-06, Radiation Work Permits, Rev. 11, dated June 15, 2012
RP-02-001, Contamination Control Procedure, Rev. 14, dated March 26, 2012
RWP 13-034, Radiological Work Permit 2013-034, Rev. 1
RWP 13-015, Radiological Work Permit 2013-015, Rev. 0
OP-0061234, Maintenance in Uranium Recovery, Downblend and SFF/PDL Facility, Rev. 44
OP-0061450, General Safety and Safeguards Guidelines – UPRR Area, Rev. 32
OP-0061141, Low Level Leach Hood Operation
OP-0061242, Inline Monitor System, Rev. 29
OP-0061525, Calibration of Sodium Iodide (NAI) Inline Monitor, Rev. 10
QWI 14.1.1, Preventive/Corrective Action System, Rev. 25
QWI 14.1.10, Safety Evaluation of Unusual Incidents, Rev. 14

Corrective Action Reports Written as a Result of the Inspection:

CA201301078, Documented Comments Identified by NRC during IP 88070 inspection, dated May 24, 2013

Corrective Action (CA) Reports Review:
CA201300603, CA201300861, CA201300864, CA201300876, CA201300884, CA201300889, CA201300892, CA201300895, CA201300901, CA201300906, CA201300911, CA201300919, CA201300930, CA201300932, CA201300937, CA201300941, CA201301004, CA201301005, CA201301009, CA201301014,

CA201301018, CA201301023, CA201301035, CA201301046, CA201301088, CA201301118, CA201301126, CA201301133, CA201301145, CA201301160, CA201301167, CA201301171, CA201301213, CA201301225, CA201301252, CA201301260, CA201301264, CA201301270, CA201300071, CA201203431, CA201101233, CA201101987, CA201102446, CA201000471, CA201300518, CA201201613, CA201200894, CA201300551,CA201202947

Other Documents:

NCS-2000-206, dated June 26, 2000

NCS-2011-171, dated December 15, 2011

NCS-2011-224, “Re-evaluation of Backflow Scenarios Associated with Evaporators and Steam Condensate Cooling Heat Exchangers”

NCS-2012-045, dated April 30, 2012

NCS-2012-063, dated May 16, 2012

NCS-2012-064, “Analysis to Remove Irradiate Fuel Assemblies from SAR 15.40, dated May 1, 2012

NCS-2012-099, June 27, 2012, NCS Safety Analysis for CR-1038741, “Changes to IROFS in SAR 15.30, Shipping and Receiving Area Worktables”