UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

November 14, 2005

Charles D. Naslund, Senior Vice
President and Chief Nuclear Officer
Union Electric Company
P.O. Box 620
Fulton, MO 65251

SUBJECT: CALLAWAY PLANT - NRC INSPECTION REPORT 05000483/2005008

Dear Mr. Naslund:

On September 30, 2005, the NRC completed an inspection at your Callaway Plant. The enclosed report documents the inspection findings which were discussed on November 2, 2005, with Mr. M. Evans and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, no findings of significance were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

William B. Jones, Chief
Project Branch B
Division of Reactor Projects

Docket: 50-483
License: NPF-30

Enclosure:
NRC Inspection Report
05000483/2005008
w/attachment: Supplemental Information

cc w/enclosure:
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ROPreports
CWY Site Secretary **(DVY)**

SISP Review Completed: _WBJ__ ADAMS: / Yes ☐ No Initials: _WBJ_
/ Publicly Available ☐ Non-Publicly Available ☐ Sensitive / Non-Sensitive

R:_REACTORS_CW\2005\CW2005-08RP-RAK.wpd

SPE:DRP/B	C:DRS/EB1	C:DRS/EB2	C:DRS/OB	C:DRS/PSB
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-483
License:	NPF-30
Report:	05000483/2005008
Licensee:	Union Electric Company
Facility:	Callaway Plant
Location:	Junction Highway CC and Highway O Fulton, Missouri
Dates:	July 1 through September 30, 2005
Inspectors:	R. Kopriva, Senior Project Engineer, Branch B C. Stancil, Project Engineer, Branch B C. Paulk, Senior Reactor Inspector, Engineering Branch 1 G. George, Reactor Inspector, Engineering Branch 1 W. Sifre, Reactor Inspector, Engineering Branch 1 M. Peck, Senior Resident Inspector D. Dumbacher, Resident Inspector E. Owen, Reactor Inspector
Approved By:	W. B. Jones, Chief, Project Branch B

Enclosure

SUMMARY OF FINDINGS

IR 05000483/2005008; 07/01/05 - 09/30/05; Callaway Plant; Integrated Resident and Regional Report of Steam Generator Replacement Activities.

The report covers a 13-week period of inspection. No findings were identified. The significance of most issues is indicated by their color (Green, White, Yellow, or Red) using IMC 0609, "Significance Determination Process." Findings for which the significance determination process does not apply may be "Green" or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

There were no findings identified in these areas.

B. Licensee-Identified Violations

None

Enclosure

REPORT DETAILS

Plant Status

Callaway Plant began the inspection period at essentially full power and remained at this level until September 17, 2005, when the unit was shutdown to commence the fourteenth Refueling Outage (R14). At the end of the report period, the unit was in cold shutdown and defueled.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors reviewed two risk evaluations and overall plant configuration control for selected activities to verify compliance with Procedures EDP-ZZ-01129, "Callaway Plant Risk Assessment, Revision 8, and APA-ZZ-00150, "Outage Preparation and Execution, Revision 17. The inspectors discussed emergent work issues with work control personnel and reviewed the potential risk impact of these activities to verify that the work was adequately planned, controlled, and executed.

- September 22, 2005, evaluated controls and plans for the movement of heavy loads and equipment within containment during defueling.

- September 26-30, 2005, movement of Temporary Lifting Device and equipment into containment during operation of shutdown cooling systems and supporting systems.

b. Findings

No findings of significance were identified.

1R17 Evaluation of Permanent Plant Modifications for Steam Generator Replacement (71111.17)

a. Inspection Scope

The procedure requires the review of a minimum of five permanent plant modifications. The inspectors reviewed 10 permanent plant modification packages and associated documentation, including safety evaluation screenings, safety evaluations, and calculations, to verify that they were performed in accordance with plant procedures. The specific modifications reviewed are listed in the Attachment. The inspectors also reviewed the procedures governing plant modifications to evaluate the effectiveness of programs for implementing modifications to risk-significant systems, structures, and components, such that these changes did not adversely affect the design and licensing basis of the facility. As part of this review, the inspectors reviewed modification packages and safety evaluations associated with the steam generator replacement.

The inspectors interviewed the cognizant design and system engineers for the identified modifications as to their understanding of the modification packages.

The inspectors evaluated the effectiveness of the licensee's corrective action process to identify and correct problems concerning the performance of permanent plant modifications. In this effort, the inspectors reviewed three corrective action documents and the subsequent corrective actions pertaining to licensee-identified problems and errors in the performance of permanent plant modifications.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors reviewed plant conditions and observed selected refueling outage activities associated with Refueling Outage R14 to verify that the licensee maintained the plant in a configuration consistent with the requirements of Technical Specifications and with the assumptions of the outage risk assessment. For this inspection, the inspectors reviewed the following activities as they related to entering conditions necessary for performing the steam generator replacement. The inspectors observed portions of the following activities:

- Monitoring of reactor shutdown and plant cooldown activities
- Clearance activities

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors sampled two temporary plant modifications based on the safety significance of the affected systems. The inspectors performed an in-office review and walked downed affected plant equipment to verify that the installation was consistent with the modification documents. The inspectors reviewed modification configuration controls to verify that the plant documents, such as drawings and procedures, were appropriately updated. The inspectors reviewed postinstallation test results to verify that the actual impact of the temporary modifications on permanent plant systems were satisfactory. The inspectors compared temporary modification documentation against the requirements established in Procedure APA-ZZ-00143, "10 CFR 50.59 Reviews" Revision 001, for screening, updated procedures, and drawings.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (50001, 71121.01)

a. Inspection Scope

The inspector reviewed work activities involving radiological controls for airborne radioactivity areas, radiation areas, and high radiation areas for the steam generator replacement work. The following items were reviewed and compared with regulatory requirements:

- Area postings and other access controls for steam generator work activities
- Contamination control activities

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls (71121.02)

a. Inspection Scope

The inspector reviewed work activities involving radiological controls for airborne radioactivity areas, radiation areas, and high radiation areas. The inspector interviewed radiation protection staff members and other radiation workers to determine the level of planning, communication, ALARA practices, and supervisory oversight integrated into work planning and work activities for the steam generator replacement work. In addition, the following items were reviewed and compared with procedural and regulatory requirements:

- One ALARA prejob and in progress job review for cutting of old steam generator hot and cold legs.

- ALARA work activity evaluations for removal of old steam generators.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (71152)

1. Steam Generator Replacement Outage Inspection (50001)

a. Inspection Scope

The inspectors reviewed the daily Callaway Action Request report summaries and nonconformance reports issued during the replacement project for risk-significant issues to see that the licensee was properly implementing the corrective action program. The inspectors verified that the licensee identified, evaluated, corrected, and trended in accordance with the program requirements were in place.

b. Findings

No findings of significance were identified.

4OA5 Other - Steam Generator Replacement Activities (50001)

4. Safety Evaluations

a. Inspection Scope

The inspection was conducted using Inspection Procedure 50001, “Steam Generator Replacement Inspection,” and Inspection Procedure 71111.02, “Evaluation of Changes, Tests, or Experiments,” as guidance. The inspectors reviewed 10 applicability determinations, 11 screenings, and 4 safety evaluations, required by 10 CFR 50.59, “Evaluation of Changes, Tests, or Experiments,” associated with the Callaway steam generator replacement. Additionally, the inspectors reviewed Callaway databases to verify qualifications of Callaway’s staff to perform, review, and approve 10 CFR 50.59 safety reviews.

b. Findings

No findings of significance were identified.

2. Replacement Steam Generator Transport and Lift

a. Inspection Scope

The inspector reviewed the applicable engineering analysis associated with old steam generator removals and new replacement steam generator transport and lift to final containment positions. The inspection was conducted using Inspection Procedure 50001, “Steam Generator Replacement Inspection” as guidance. Specifically, the inspectors reviewed applicable engineering design, modification, and

analysis associated with steam generator lifting and rigging including: crane and rigging equipment, steam generator component drop analysis, safe load paths, and load lay-down areas. Additionally, steam generator replacement processes were reviewed for Steam Generator Replacement Project identification, tracking, and resolution of problems related to the Steam Generator Replacement Project to ascertain that they were consistent with plant processes.

Containment Access and Closure

The cutting of the outer containment wall was not necessary, and therefore, evaluation of a temporary containment opening affecting integrity was not applicable. However, the inspector questioned containment closure capability during plant Modes 5 and 6. During the first two weeks of the outage, the steam generator Hatch Transfer System (HTS) rails were to be laid through the Equipment Hatch opening and used for moving the old and new steam generators in and out of containment, along with other equipment to support the steam generator replacement project. Due to the size and awkwardness of the rail system, the inspector questioned containment closure capability in the event of an external severe weather or internal radiological event (fuel handling accident or loss of inventory), particularly if an event occurred during the transport of a steam generator, in or out of containment. The licensee has historically demonstrated that the installation of the Containment Equipment Hatch takes approximately one hour. The procedure requirement to establish containment closure is two hours for an external/internal event. This left the licensee's contractor one hour to remove any item from the Equipment Hatch, remove the fast materials cart and push-pull rams, and remove the two sections of HTS rails. The contractor mocked up and validated HTS rail removal in eleven minutes. Removal of any item and the cart was expected to take approximately forty minutes based on contractor engineering judgement and experience, thus, meeting the two hour limit.

b. Findings

No findings of significance were identified.

3. Security Considerations

a. Inspection Scope

The inspector evaluated security compensatory measures associated with affected vital and protected area barriers that were necessary to facilitate transporting the replacement steam generators into the protected area, and subsequently, into the containment. The inspection was conducted using Inspection Procedure 50001, "Steam Generator Replacement Inspection" as guidance. The inspector reviewed plans to control access during the outage, when the number of personnel on site increases significantly. Temporary physical changes to the security system were inspected.

b. Findings

No findings of significance were identified.

4. Design and Planning Inspections

a. Inspection Scope

The inspectors used the guidance in Inspection Procedure 50001 to perform the following steam generator design and planning inspection activities.

Engineering and Technical Support

A review of engineering and technical support activities was performed prior to the steam generator replacement outage by resident and regional office-based specialist inspectors. The results of the inspection are documented in Sections 1R13, 1R17, and 1R23.

Lifting and Rigging

Inspections to review engineering design, modification, and analysis associated with steam generator lifting and rigging activities were performed by resident and regional inspectors.

Security Considerations

Inspectors checked for potential adverse impacts caused by outage activities, equipment configurations, etc., in accordance with Inspection Procedure 50001. The inspectors made frequent observations of security practices to verify that the licensee provided appropriate support for affected vital and protected area barriers during outage activities.

b. Findings

No findings of significance were identified.

5. Steam Generator Removal and Replacement Inspections

a. Inspection Scope

The inspectors used the guidance in Inspection Procedure 50001 to perform the following steam generator removal and replacement inspection activities.

Lifting and Rigging Activities (50001 and 71111.23)

The inspectors observed and reviewed several activities throughout the outage associated with lifting and rigging. The inspectors observed and reviewed preparations, procedures, crane and rigging inspections, and lay-down areas associated with the following activities:

- Construction of the outside lift system
- Temporary handling device construction and removal
- Reactor cavity decking construction and removal

Radiation Protection Controls

An inspection to review radiation protection controls was performed during the steam generator replacement outage by regional office-based specialist inspectors. The results of the inspection are documented in Sections 2OS1 and 2OS2.

Foreign Materials Control

The inspectors performed frequent observations of the refueling outage and steam generator replacement activities to verify the licensee was implementing proper foreign materials controls. In particular, the inspectors observed controls related to defueling preparation and reactor coolant system and secondary side openings controls.

4OA6 Meetings

On August 25, 2005, the inspector debriefed lifting, rigging, and security inspection results to Mr. L. Kanuckel, Manager, Quality Assurance and other members of licensee management. It was noted that this was a debrief and not an exit as further inspection efforts under IR 2005-008 were scheduled. The inspector asked the licensee whether any materials examined during the inspection should be considered proprietary. There were several items identified during the inspection. No proprietary information was removed from the site.

On November 2, 2005, the Senior Project Engineer presented inspection results to Mr. M. Evans, Manager, Business Operations, and other members of his staff who acknowledged the findings. The inspectors confirmed that proprietary information was provided and returned during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

F. Diya, Superintendent, Design Engineering
M. Evans, Manager, Business Operations
E. Henson, Specialist, Regional Regulatory Affairs
T. Herrmann, Manager, Engineering Services
L. Kanuckel, Manager, Quality Assurance
R. Lamb, Manager, Maintenance
P. LeRoy, Project Engineering Manager, Steam Generating Team, Ltd.
S. Meyer, Supervising Engineer, Quality Assurance
T. Moser, Manager, Plant Engineering
S. Petzel, Engineer, Regional Regulatory Affairs
T. Pettus, Consulting Engineer, Steam Generating Team, Ltd.
M. Reidmeyer, Supervisor, Regional Regulatory Affairs

NRC

M. Peck, Senior Resident Inspector
D. Dumbacher, Resident Inspector
L. Owen, Reactor Inspector, Engineering Branch 1
C. Stancil, Project Engineer, Projects Branch B

DOCUMENTS REVIEWED

Calculations:

NUMBER	TITLE	REVISION
51-5062435	Callaway/SGT RSG Project Scaling Manual Section 23	01
51-5063028	Callaway RSG Scaling Manual Section 20 Feedwater and Steam Flow Cal. Markup	00
51-5068626	Callaway RSG Calculation AE-82 Markup	00
BB-161	Callaway Steam Generator Narrow Range Level Instrument Uncertainty for EOPs	0
BB-163	Replacement Steam Generator Wide Range Level Instrument Uncertainty for EOPs	0

Corrective Action Documents:

CAR 200407539	NCR 04-06064	NCR 05-06004
CAR 200407778	NCR 05-06003	

Modifications:

NUMBER	TITLE	REVISION
02-2002	Missouri River Docking Facility	0
03-1006	RSG Instrumentation	0
03-1007	Construct an Old S/G Storage Facility	0
03-1008	Construct a New Equipment Hatch Platform	0
03-1011	Install New Steam Generators	0
03-1013	Replace New Steam Generators	B, FCN 0
03-1028	Small Bore Piping Modifications	0
03-2001	SGRP Inprocessing, Warehouse and Laydown	0
03-2003	Construct S/G Replacement Support Facility	0
04-1004	Remove Trip Time Delay Circuits	A

Miscellaneous:

NUMBER	TITLE	REVISION / DATE
AP04-010	Quality Assurance Audit of Engineering	October 29, 2004
VA03148	Duke Power Company Supplier Verification Section Supplier Evaluation Report	June 30, 2003
FSAR CN 04-042	Steam Generator Blowdown	December 15, 2004

Procedures:

NUMBER	TITLE	REVISION
EDP ZZ-04023	Calculations	16, 17

Section 4OA5

Applicability Determinations:

NUMBER	TITLE	REVISION
MP 00-1013	RSG Component Modification	0
MP 01-1026-1	Modify Sludge Lance Platform and Add Access Opening through Secondary Shield Wall - Sludge Lance Platform	2
MP 01-1026-2	SG Sludge Lance Platforms/Secondary Shield Wall Opening Modification-Secondary Shield Wall Opening	2
MP 03-1006-1	Replacement Steam Generator Instrumentation Modification	0
MP 03-1009-1	Install Secondary Manway Platforms around the RSGs and Modify the A-D Primary Platform-Install Secondary Manway Platforms around the RSGs	0
MP 03-1011-1	Modification for Replacement Steam Generator Installation - Primary Piping and SG Supports	0
MP 03-1011-2	Modifications for Replacement Steam Generator Installation - Main Steam and Feedwater Piping	0
MP 03-1011-41	Modifications for Replacement Steam Generator Installation - Containment SGR Preparation - Mechanical/Structural	0
MP 03-1028-1	Small Bore Piping Modifications for Steam Generator Replacement	0
MP 03-1011-42	Modifications for Replacement Steam Generator Installation - Containment SGR Preparation- Electrical	0

Calculations:

NUMBER	TITLE	REVISION
C-02-101-F Add. 2	Evaluation of Surge Line Whip Restraints BB4-1 and BB4-3 with Removal of Restraint BB4-2	01
ZZ-247 Add. 2	Addition of Step Over Platform for the A/D Primary Platform and Fill in of SG A Primary Platform.	00

Corrective Action Documents:

200506003
200506009

Document Transmittals:

NUMBER	DATE
24430-2004-00532	April 15, 2004
24430-2004-01205	November 05, 2004
24430-2005-00267	February 03, 2005
24430-2005-02187	July 29, 2005

Engineering Change Requests:

NUMBER	DATE
077	September 09, 2004
090	September 09, 2004
129	March 10, 2005
155	March 10, 2005
165	March 10, 2005

Procedures:

NUMBER	TITLE	REVISION
APA-ZZ-00143	10CFR50.59 Reviews	00
APA -ZZ-00600	Design Change Control	24
EDP-ZZ-04005	Design Development	40

Safety Evaluations:

NUMBER	TITLE	REVISION
MP 00-1013-1	RSG Component Modification	0
MP 01-1026-2	SG Sludge Lance Platforms/Secondary Shield Wall Opening Modification-Secondary Shield Wall Opening	2
EVAL 04-25	Callaway Replacement Steam Generators	0
RFR 23374	Evaluate Use of Gothic Software	A

Safety Screenings:

NUMBER	TITLE	REVISION
MP 01-1026-1	Modify Sludge Lance Platform and Add Access Opening through Secondary Shield Wall - Sludge Lance Platform	2
MP 01-1026-2	SG Sludge Lance Platforms/Secondary Shield Wall Opening Modification-Secondary Shield Wall Opening	2
MP 03-1006-1	Replacement Steam Generator Instrumentation Modification	0
MP 03-1009-1	Install Secondary Manway Platforms around the RSGs and Modify the A-D Primary Platform-Install Secondary Manway Platforms around the RSGs	0
MP 03-1011-1	Modification for Replacement Steam Generator Installation - Primary Piping and SG Supports	0

Safety Screenings:

NUMBER	TITLE	REVISION
MP 03-1011-2	Modifications for Replacement Steam Generator Installation - Main Steam and Feedwater Piping	0
MP 03-1011-41	Modifications for Replacement Steam Generator Installation - Containment SGR Preparation - Mechanical/Structural	0
MP 03-1011-42	Modifications for Replacement Steam Generator Installation - Containment SGR Preparation- Electrical	0
MP 03-1028-1	Small Bore Piping Modifications for Steam Generator Replacement	0
RFR 23372	Evaluate Use of RADTRAD	A
RFR 23374	Evaluate the Use of GOTHIC Software	A