



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

August 11, 2006

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 05000483/2006010

Dear Mr. Naslund:

On July 13, 2006, the US Nuclear Regulatory Commission (NRC) completed an inspection at your Callaway Plant. The purpose of the inspection was to followup on a number of issues with the Callaway Plant licensed operator requalification program and to respond to your letter dated March 14, 2006, in which you disputed a Green finding associated with inadequate documentation of simulator testing as described in ANSI/ANS 3.5, "Nuclear Power Plant Simulators for use in Operator Training and Examination," 1998. Each of the requalification program issues were documented in NRC Inspection Report 05000483/2005005 dated February 14, 2006. The enclosed report documents the inspection findings, which were discussed with Mr. Mike Evans and members of your staff on July 13, 2006.

The inspection results demonstrated that the disputed Green finding associated with inadequate documentation of simulator testing as described in ANSI/ANS 3.5 was appropriate. Your staff have implemented a number of changes in the simulator testing program to address these issues. In addition, despite the documentation issues, the inspection concluded that the Callaway Plant simulator model had fidelity for use in the administration of both the operating test and experience requirements and that the simulator demonstrated adequate fidelity, such that, significant control manipulations could be completed without procedural exceptions, simulator performance exceptions, or deviations from the approved training scenario. Since the Callaway Plant-referenced simulator utilized thermal-hydraulic models that adequately replicated the most recent core load, the NRC agreed with your staff's determination that the Callaway Plant simulator was adequate for significant control manipulations in accordance with 10 CFR 55.46(c)(2).

With respect to the 2005 biennial requalification examination related issues, the inspection concluded that, although there were some biennial written examination quality issues the overall examination was acceptable and that the annual operating test was developed, administered, and graded in accordance with NUREG-1021, "Operator Licensing Examinations for Power Reactors," Revision 9. Of particular note, was that the 2005 annual operating test was found to be both equitable and consistent as required by 10 CFR 55.49, "Integrity of Examinations and Tests," and that effective remedial training for those operators who failed their first annual operating test was conducted prior to returning them to shift duties.

If you contest this determination, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region IV, 611 Ryan Plaza Drive, Suite 400, Arlington, Texas 76011-4005; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Callaway Plant facility. 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).

Sincerely,

/RA/

Anthony T. Gody, Chief
Operations Branch
Division of Reactor Safety

Docket: 50-483
License: NPF-30

Enclosure:
Inspection Report 05000483/2006010

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SUNSI Review Completed: Y ___ ADAMS: / ___ Yes No Initials: JFD ___
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OE:OB	C:OB	C:PBB	C:OB
JFDrake/lmb	ATGody	WBJones	ATGody
/RA/	/RA/	/RA/	/RA/
8/8/06	8/9/06	8/9/06	8/11/06

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U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 50-483
License: NPF-30
Report: 05000483/2006010
Licensee: AmerenUE
Facility: Callaway Plant
Location: Junction Highway CC and Highway O
Fulton, Missouri
Dates: March 21 through July 13, 2006
Inspector: J. Drake, Operations Engineer, Operations Branch
Approved By: A.T. Gody , Chief, Operations Branch , Division Reactor Safety

SUMMARY OF FINDINGS

IR 05000483/2006010; 3/21-7/13/2006; Callaway Plant: Inspection to address unresolved issues and evaluate AmerenUE's dispute of the GREEN finding (2005005-05) that simulator performance test records were not sufficient to meet the requirements of ANSI/ANS 3.5, "Nuclear Power Plant Simulators for use in Operator Training and Examination," 1998.

This report covered an inspection conducted from March 21, 2006, through July 13, 2006, by one operations engineer. One disputed GREEN finding was found appropriate. 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

None

B. Licensee-Identified Findings

None

REPORT DETAILS

1. REACTOR SAFETY

1R11 Licensed Operator Requalification (71111.11B)

a. Inspection Scope

The inspection was conducted to followup on a number of issues with the Callaway Plant licensed operator requalification program. Each of these issues were identified in NRC Inspection Report 05000483/2005005, dated February 14, 2006. The first issue was a Green finding associated with inadequate documentation of simulator testing as described in ANSI/ANS 3.5, "Nuclear Power Plant Simulators for use in Operator Training and Examination," 1998 [(FIN) 05000483/2005005-05]. The licensee disputed this finding in a letter to the NRC dated March 14, 2006. Second, an unresolved item associated with the quality of the NRC written biennial requalification examination was identified [(URI) 05000483/2005005-04]. Third, an unresolved item associated with the adequacy of the documentation to verify that the simulator was acceptable for control manipulations in accordance with 10 CFR 55.46(c)(2)(ii) was identified [(URI) 05000483/ 200505-06]. Last, the inspectors conducted a review of the entire 2005 annual operating test development, administration, and grading including remediation and retesting a crew that failed.

With respect to the disputed Green finding, the licensee asserted in their letter that a mis-communication contributed to a faulty conclusion that simulator performance test records were not sufficient to meet the requirements of ANSI/ANS 3.5. Accordingly, the inspectors conducted an additional onsite inspection of simulator annual performance test records for 2005 to assess adequacy of documentation. Specifically, the inspectors reviewed the entire simulator test packages for (1) steady state operation at 30, 50, and 80 percent reactor power at middle of cycle; and (2) a reactor startup from cold shutdown to reactor critical (Mode 2), including reactor coolant heat up. In addition, the inspectors conducted interviews with members of the expert review panel and reviewed available documentation of the licensee's expert panel review.

To address the unresolved item associated with the NRC written biennial requalification examination quality, the inspectors conducted an onsite review of the 2005 written and operating biennial requalification examinations. The inspectors evaluated the written examinations to determine if they were developed in accordance with the standards described in NUREG 1021, "Operator Licensing Examinations for Power Reactors," Revision 9. In addition, an independent in-office inspection was conducted through a review panel of three qualified NRC operator license examiners. The results of this inspection are contained in Section 4OA5.1 below.

Further onsite inspection was conducted to address the unresolved item associated with the adequacy of the documentation to verify that the simulator was acceptable for control manipulations in accordance with 10 CFR 55.46(c)(2)(ii). The results of this inspection are contained in Section 4OA5.2 below.

The entire set of 2005 annual operating test scenarios were reviewed to verify that the examination was developed and administered in accordance with NUREG 1021. Specifically, the inspector reviewed 16 operating scenarios used in the 2005 annual operating test against the guidance contained in NUREG 1021, ES-604, "Dynamic Simulator Requalification Examinations," to ascertain if each scenario was adequate for use in the NRC annual operating tests. Furthermore, the administration, grading, and construction of the entire body of scenarios was reviewed to determine if the operating test was equitable for all the Callaway Plant operators. The inspectors also reviewed the remediation of a crew, which had failed their first operating test and the retest of that crew.

b. Findings

The inspectors concluded that the Green finding associated with inadequate documentation of simulator testing as described in ANSI/ANS 3.5 [(FIN) 05000483/2005005-05] that the licensee disputed was appropriate. This conclusion was based on further verification that adequate documentation for simulator testing did not exist through a review of licensee records. Specifically, the inspectors identified that some documentation of plant data used during the expert panel reviews was missing.

The inspectors agreed with the licensee's conclusion that the Callaway Plant simulator model had sufficient fidelity for use in the administration of both the operating test and experience requirements in 10 CFR 55.31(a)(5), as described in 10 CFR 55.46(c)(1) for a plant-referenced simulator. The inspectors also agreed with the licensee's conclusion that the simulator demonstrated adequate fidelity, such that, significant control manipulations could be completed without procedural exceptions, simulator performance exceptions, or deviations from the approved training scenario. In addition, the inspectors found that the Callaway Plant-referenced simulator utilized thermal-hydraulic models that adequately replicated the most recent core load. Therefore, the inspectors agreed with the licensee's conclusion that the Callaway Plant simulator was adequate for use in significant control manipulations in accordance with 10 CFR 55.46(c)(2). These conclusions were based on independent verification of simulator fidelity by the inspector. This independent verification included a review of actual simulator test data collected by the licensee as compared to actual plant data for similar evolutions.

The inspectors concluded that the 2005 annual operating test was developed, administered, and graded in accordance with NUREG-1021. The 2005 annual operating test was found to be both equitable and consistent as required by 10 CFR 55.49, "Integrity of Examinations and Tests." Additionally, the inspectors concluded that the licensee implemented effective remedial training for those operators who failed their first annual operating test prior to returning them to shift duties. These conclusions were based on the inspector completing an in-depth evaluation of 100 percent of the operating test against the guidance contained in NUREG 1021 ES-604, and a review of the remediation and testing of the crew that failed their initial test.

40A5 OTHER

.1 (Closed) Unresolved Item 05000483/2005005-04: Adequacy of the Biennial Written Requalification Examination

The inspectors evaluated the written examinations administered in 2005 to determine whether they were developed and administered in accordance with the standards described in NUREG 1021. The written examination review focused on the quality of the examination questions, such as discrimination validity, psychometric quality, and overall examination integrity. In accordance with 10 CFR 55.59 (a)(4), the requalification program is required to include comprehensive biennial written requalification examinations and annual operating tests to identify licensed operator knowledge and ability weaknesses for which retraining is needed.

During the initial review of the written requalification examinations, the inspectors noted that the quality of some of the questions contained in the 2005 biennial written examinations developed by the licensee did not meet the guidance set forth in NUREG 1021, ES-602, Attachment 1, Section B, "Open-Reference Guidelines." The term "open reference" in ES-602 means that the candidates are allowed to use any reference material which would be available to them while on watch in the control room to assist them when taking the examination. Open-reference questions should require the operators to demonstrate an understanding of a concept by using their knowledge to address real-life situations and problems. Open reference examination questions should be developed so that they test more than mere recall and/or memorization of facts and procedures. The inspectors found that some of the questions were not satisfactory in that they did not adequately test an operator's understanding of the knowledge being tested given the fact that the examination was an open-reference examination.

Using criteria for discriminating between an unsatisfactory examination question and an acceptable question based on the guidance contained in NUREG-1021, Revision 9, ES-602, Attachment 1, "Guidelines for Developing and Reviewing Open-Reference Examinations," and Appendix B, "Written Examination Guidelines," the inspector reviewed an expanded sample of the 2005 biennial written requalification examination. In addition, a panel of three certified licensing examiners was tasked with independently evaluating a sample of 20 questions, which had been evaluated by the inspector. The sample included 3 questions, which the inspector considered satisfactory as a control group, and 17 questions, which the inspector had originally categorized as unsatisfactory. The purpose of the independent evaluation was to demonstrate that the criteria applied to discriminate between an unacceptable and an acceptable examination question was repeatable and in accordance with NRC standards.

Five examinations of 40 questions each were selected for the sample. After eliminating duplicate questions, the total sample size reviewed was 163 questions. Overall, 31 of 163 sampled questions were evaluated as unsatisfactory. This resulted in approximately 19 percent of the sampled questions being unsatisfactory. Since this value was less than the 20 percent threshold value cited for a finding in NRC Manual Chapter 0609, Appendix I, "Operator Requalification Human Performance Significance

Determination Process (SDP)," (Appendix I), Unresolved Item 05000483/2005005-04 (Callaway Action Request 200600528) is closed.

.2 (Closed) Unresolved Item 05000483/2005005-06: Adequacy of Plant-Referenced Simulator to Conform with Simulator Requirements for Reactivity and Control Manipulation Credits

The licensee used their simulator to meet reactivity and control manipulation experience requirements for initial operator and senior operator license applicants in accordance with 10 CFR 55.46(c)(2)(ii). The inspector noted that the licensee considered the reactivity and control manipulations to be "Normal evolutions" in accordance with ANSI/ANS 3.5 and elected to use a scenario-based testing method, as permitted in ANSI/ANS 3.5. However, the licensee used a single page "sign-off" or "check" sheet for documentation of the scenario-based testing. As a result, the inspector observed licensee simulator testing to independently verify that the simulator had sufficient fidelity for use in reactivity and control manipulations to use the simulator for reactivity and control manipulation credit. The requirements in 10 CFR 55.46 specify that significant control manipulations be completed without procedural exceptions, simulator performance exceptions, or deviation from the approved training scenario sequence. Furthermore, ANSI/ANS 3.5 requires that these items be performed without offsets in the simulator and without time-compression techniques and that expected alarms are generated as required in real time with no unexpected alarms generated during the scenario sequence. Since the single page "sign-off" sheet for documentation of the scenario-based testing did not provide data for the inspector to independently verify each of the requirements, the inspector observed the performance of a number of control manipulations. Specifically, the inspector observed the licensee conduct a 10 percent power reduction using boration and a reactor startup from all control rod groups on the bottom to criticality, which were two of the three actual evolutions used for control manipulation credit on the NRC Form 398, "Personal Qualification Statement," for the initial licensed operator class who took their initial operator license examination in August 2005. The inspector confirmed that the reactivity manipulations performed on the simulator used actual plant procedures without exception and confirmed that simulator data collected during the tests demonstrated adequate fidelity with reference plant data for similar evolutions. Finally, the inspector confirmed that the thermal-hydraulic models used by the simulator adequately replicated the core load in the plant when the reactivity and control manipulation credit was given. Based on the observations conducted by the inspectors, it was determined that NRC agreed with the licensee's determination that the plant reference simulator was adequate for reactivity and control manipulations. In addition, the licensee implemented several changes in the retention of documentation of simulator test results. Accordingly, Unresolved Item 05000483/2005005-06 is closed.

4OA6 Meetings, Including Exit

On March 22, 2006, the team presented the status of the inspection, to date, to Mr. Dave Hopkins, Superintendent, Operations Training, and other members of his staff.

On June 7, 2006, the team leader conducted a debrief meeting with Mr. Dave Hopkins, Superintendent, Operations Training, and other members of his staff.

On July 13, 2006, the team leader conducted an exit meeting with Mike Evans, Manager, Training, and other members of his staff.

No proprietary information is being retained or included in this report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

Mike Evans, Manager, Training
Dave Hopkins, Superintendent, Operations Training
Larry Wilhelm, Training Supervisor Engineer
Steve Aufdemberge, Lead Instructor, Licensed Operator Continuing Training
Dave Neterer, Manager, Operations
Bob Barton, Shift Assistant Operations Manager,
Steve. Petzel, Engineer, Regional Regulatory Affairs
Scott Halverson, General Supervisor, Simulator

LIST OF ITEMS CLOSED, AND DISCUSSED

Closed

05000483/2005005-04	URI	Adequacy of the Biennial Requalification Written Examination (Section 4OA5.1)
05000483/ 200505-06	URI	Adequacy of Plant-Referenced Simulator to Conform with Simulator Requirements for Reactivity and Control Manipulation Credits (Section 4OA5.2)

Discussed

05000483/2005005-05	FIN	Inadequate documentation of simulator testing as described in ANSI/ANS 3.5 was found to be appropriate (Section 1R11)
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LIST OF DOCUMENTS REVIEWED

Procedures

E-0, Reactor Trip or Safety Injection, Revision 5
E-1, Loss Of Reactor or Secondary Coolant, Revision 5
ES-0.1, Reactor trip Response, Revision 5
FR-S.1, Response to Nuclear Power Generation/ATWS, Revision 5
BD-FR-S.1, Response to Nuclear Power Generation/ATWS, Revision 0
ODP-ZZ-00025, EOP/OTO User's Guide, Revision 6
OSP-SE-00004, NIS Power Range Heat Balance, Revision 23
OTA-RK-00020, Alarm Response Procedure
OTG-ZZ-00006, Plant Cooldown to Cold Shutdown, Revision 34

OTG-ZZ-00001, Plant Heatup Cold Shutdown to Hot Standby, Revision 42
OTO-AE-00002, Steam Generator Water Level Control Instrument Malfunctions, Revision 3
OTO-NB-00002, Loss of Power to NB02, Revision 7
OTO-SA-00001, Engineered Safety Feature Actuation Verification and Restoration, Revision 5
OTO-SF-00001, Rod Control Malfunctions, Revision 6
OTO-SK-00001, Plant Security Event-Hostile Intrusion, Revision 10
OTO-NN-00001, Loss of Safety Related Instrument Power, Revision 9
OTN-BB-00005, Pressurizer and Pressurizer Control, Revision 6
EPIP-ZZ-00102, Emergency Plan Implementing Procedure, Revision 33
EIP-ZZ-SK001, Response to Security Events, Revision 2
TDP-IS-00002, Simulator Configuration Management, Revision 4
TDP-IS-00001, Simulator Operation and Maintenance, Revision 3

Scenarios

DS-01, ATWS
DS-04, Loss of Heat Sink without Bleed and Feed Required
DS-05, Faulted-Ruptured S/G
DS-07, Small Break LOCA with Failure of CPIS and CCP/Loss of NB01
DS-08, Feedline Break Inside Containment with CCP and SLIS Failures
DS-14, Separate Faulted and Ruptured S/Gs
DS-15, Load Increase with Multiple Rod Drop/Pressurizer Steam Space Leak
DS-18, SGTR Without Pzr Pressure Control
DS-19, Turbine Trip Failure with Loss of Heat Sink
DS-22, SGTR with RCP Off-Normal (High Vibration)
DS-24, Loss of Letdown, ATWS with Stuck Open Pzr Safety Valve
DS-26, Large LOCA and Transfer to Cold Leg Recirc
DS-32, Faulted-Ruptured S/G
DS-33, Loss of Core Cooling
DS-35, Earthquake with Flooding Causing Loss of All AC
DS-37, Station Blackout Due to Seismic Event
DS-40, Faulted/Ruptured Steam Generator

Reactivity Manipulation Scenarios

Reactor Startup - Simulator Lesson # T61.003A.6 SA-23
Boration - Simulator Lesson # T61.003A.6 SA-04 (CVCS Operations)

Written Examinations

T61.0810 8, LOCT Cycle 05-4 Biennial Exams,

Miscellaneous

2003-2005 Continuing Sample Plan

Job-Duty-Task by Job for URO [Unit Reactor Operator] dated 3/17/05

Job-Duty-Task by Job for SRO dated 4/14/05

Written Summary of Simulator Testing Topic Public Meeting with Industry Focus Group (FG) on Operator Licensing Issues (DRAFT)

Callaway Plant Simulator White Paper showing how all parameters are demonstrated, June 8, 2005

Simulator Annual Performance Test Book

Simulator "Differences" List, May 16, 2005

Technical Specification Bases, Revision 0