AmerenUE
Callaway Plant

PO Box 620
Fulton, MO 65251

June 25, 2004

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

ULNRC-05008

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 2002-006-01
Hot short issue reveals potential for draining RWST to Containment Sumps
Revision

Ladies and Gentlemen:
The enclosed licensee event report is a revision to LER 2002-006-00 submitted on August 6, 2002. This revision documents the progress and present plant status on resolving the Hot Short issue originally identified.

Sincerely,

Warren A. Witt
Manager, Callaway Plant

Enclosure

IE22

Mr. Bruce S. Mallett
Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011-4005

Senior Resident Inspector
Callaway Resident Office
U.S. Nuclear Regulatory Commission
8201 NRC Road
Steedman, MO 65077

Mr. Jack N. Donohew (2 copies)
Licensing Project Manager, Callaway Plant
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop 7E1
Washington, DC 20555-2738

Missouri Public Service Commission
Governor Office Building
200 Madison Street
PO Box 360
Jefferson City, MO 65102-0360

Records Center
Institute of Nuclear Power Operations
700 Galleria Parkway
Atlanta, GA 30339

bcc: G. L. Randolph
R. D. Affolter
W. A. Witt (2 copies)
K. D. Young
G. A. Hughes
D. E. Shafer (470) (2 copies)
S. L. Gallagher (100)
S. L. Klang (NSRB)
M. A. Reidmeyer
J. E. Ready
msp@nrc.gov
LEREvents@inpo.org
babrook@wcnoc.com
E210.0001
A160.0761

Bill Muilenberg
Supervisor, Licensing
WCNOC
P.O. Box 411
Burlington, KS 66839

Diane Hooper
STARS Projects Manager
WCNOC
P.O. Box 411
Burlington, KS 66839

Mr. Scott Bauer
Regulatory Affairs
Palo Verde NGS
P.O. Box 52034,
Mail Station 7636
Phoenix, AZ 85072-2034

Mr. Dennis Buschbaum
Comanche Peak SES
P.O. Box 1002
Glen Rose, TX 76043

Mr. Scott Head
Supervisor, Licensing
South Texas Project NOC
Mail Code N5014
P.O. Box 289
Wadsworth, TX 77483

Mr. Stan Ketelsen
Manager, Regulatory Services
Pacific Gas & Electric
Mail Stop 104/5/536
P.O. Box 56
Avila Beach, CA 93424

Mr. John O'Neill
Shaw, Pittman
2300 N. Street N.W.
Washington, DC 20037

Certrec Corporation
4200 South Hulen, Suite 630
Fort Worth, TX 76109

LIST OF COMMITMENTS

The following table identifies those actions committed to by AmerenUE in this document. Any other statements in this document are provided for information purposes and are not considered commitments. Please direct questions regarding these commitments to:.

COMMITMENT	Due Date/Event
None	

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
CALLAWAY PLANT UNIT 1	05000 483	1 OF 4

4. TITLE
Hot short issue reveals potential for draining RWST to Containment Sump

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
6	7	2002	2002	- 006 -	01	6	25	2004	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE	1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)							
10. POWER LEVEL	100		20.2201(b)		20.2203(a)(3)(ii)	X	50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
			20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
			20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)
			20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
			20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		
			20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		
			20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)		
			20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
			20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Mark A. Reidmeyer	(573) 676-4306

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO				

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On 6/7/2002, Wolf Creek Nuclear Operating Corporation (WCNOC) contacted the Callaway Plant Fire Protection Engineer and informed the engineer of a potential hot short issue involving EJHV8811A, BNHV8812A, EJHV8811B, and BNHV8812B where it would be possible to drain the Refueling Water Storage Tank (RWST) to containment sumps if a fire were to occur in a location where the control circuit cables for these valves are run in the same electrical raceway. Callaway Engineering conducted extensive investigations and concluded that this was a credible threat. A GL 91-18 Operability Determination was performed, the on-shift Control Room Shift Supervisor was appraised of the situation, and hourly fire watches were instituted for the affected rooms. Long term corrective actions are under evaluation pending NRC endorsement of NEI guidance.

Revision 1: Thus far, the NRC has not endorsed the NEI guidance for fire induced circuit failure issues. The NRC did issue RIS 2004-04 on March 2, 2004. This revision of the LER is in response to the NRC guidance documented in the RIS.

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Callaway Plant Unit 1	05000483	2002	- 006 -	01	2 OF 4

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* (17)

I. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

Based upon initial information, this event was classified as requiring an 8-hour Emergency Notification System (ENS) call under the requirements of 10CFR50.72(b)(3)(ii)(B), an unanalyzed condition that significantly degraded plant safety, and 10CFR50.72(b)(3)(v)(A), (B), and (D), a condition that could have prevented fulfillment of a safety function of systems or structures that are needed to shutdown the reactor and maintain it in a safe shutdown condition, remove residual heat, and mitigate the consequences of an accident.
Further evaluation of this condition and additional reviews of NUREG 1022, "Event Reporting Guidelines 10CFR50.72 and 50.73" determined that this event is only reportable as an unanalyzed condition under 10CFR50.72(b)(3)(ii)(B). It is not reportable under 10CFR50.72(b)(3)(v)(A), (B), and (D) because this situation does not pose a reasonable expectation of preventing the fulfillment of a safety function.
Thus, this LER is reportable under 10CFR50.73(a)(2)(ii)(B), an unanalyzed condition that significantly degraded plant safety.

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

Callaway Plant was in Mode 1 at 100 percent power.

C. STATUS OF STRUCTURES, SYSTEMS OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

Not Applicable for this event.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES

On 6/7/02, Callaway Plant's Fire Protection Engineer was notified by Wolf Creek Nuclear Operating Corporation (WCNOC) that they were evaluating a potential concern involving post fire safe shutdown circuits. The concern identified is that control cables for two redundant motor operated valves, EJHV8811A and BNHV8812A, are routed in the same electrical raceway. These two valves are in the same electrical separation group, but are redundant in their function of conserving water inventory in the Refueling Water Storage Tank (RWST). Further investigations determined that the opposite electrical separation group involving EJHV8811B and BNHV8812B, has the same configuration.

Valves EJHV8811A and BNHV8812A provide a barrier to draining the RWST into the Containment Emergency Core Cooling System (ECCS) sump. The control circuit cables for these two valves are routed together in the "A" Safety Injection (SI) pump room (Fire Area A-2) and in Auxiliary Building corridors (Fire Areas A-1 and A-8). Control circuit cables for EJHV8811B and BNHV8812B are routed together in the 'B' SI pump room (Fire Area A-4) and in the Auxiliary Building corridor (Fire Area A-1).

A single fire in any of these areas has the potential to damage EJHV8811A (or B) cables in a manner which causes this valve to spuriously open and damage the BNHV8812A (or B) cables in a manner which causes that valve to not respond to a "CLOSE" signal. This could cause the RWST water inventory to drain to the containment sump. As noted above, the control cables for all four valves are routed through the Auxiliary Building Fire Area A-1. With this configuration, a fire in this area would have the potential to disable all four valves.

According to 10CFR50, Appendix R, paragraph III.G.1.a, "one train of systems necessary to achieve and maintain hot shutdown conditions...is free of fire damage...". FSAR Table 9.5E-1 states, "Redundant trains of systems required to achieve and maintain hot standby are separated by 3-hour rated fire barriers, or the equivalent provided

by III.G.2, or else a diverse means of providing the safe shut-down capability exists and is unaffected by the fire."

In this case, the cables do not meet the separation criteria of III.G.2, and there is no diverse water supply.

Callaway's Regional Regulatory Affairs department determined that this issue was potentially applicable and Callaway Nuclear Engineering developed the following response to this concern.
Callaway Nuclear Engineering considers that the Fire Hazards Analysis performed by Bechtel to support the licensing of the Callaway plant, to be valid and that it had considered the 'hot short ' circuit cable fault scenario in a reasonable and relevant manner. It should be noted that there was no regulatory guidance during the early 1980's to specify the 'hot short' circuit cable fault scenario or configuration.

The following are some relevant facts to be used in the resolution of this concern:
Recent cable fire testing by NEI to support the draft NEI 00-001 Circuit Failure Analysis document, revealed that cable to cable hot shorts only occurred after the cables were burned to failure. The time to failure was in excess of 1 hour with a constant ignition source applied.

If EJHV8811A or B were to inadvertently open it would take approximately 26 minutes for the RWST to drain to the LO-LO alarm setpoint and approximately 43 minutes to completely drain. This assumes a 8069 gpm backflow from the RWST to the containment recirculation sump (REF. calculation M-BN-21 Rev. 0).

E. METHOD OF DISCOVERY OF EACH COMPONENT, SYSTEM FAILURE, OR PROCEDURAL ERROR

This scenario was discovered by WCNOC and subsequently confirmed by Callaway Plant Engineering staff.

II. EVENT DRIVEN INFORMATION

A. SAFETY SYSTEMS THAT RESPONDED

Not Applicable for this event.

B. DURATION OF SAFETY SYSTEM INOPERABILITY

Not Applicable for this event.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT.

A risk evaluation was performed of the potential for a fire-induced hot short that could cause the loss of any injection/recirculation for a fire in fire areas A-1, A-2, A-4, and A-8. There is a high probability of successful mitigation of the effects of a fire in any of these areas by maintaining Reactor Coolant Pump (RCP) seal cooling and providing decay heat removal via the Auxiliary Feedwater (AFW) system, negating the need for injection/recirculation. In addition, based upon the NEI information on hot shorts cited in PRAER 02-172 report, there is a low probability of a hot short occurring prior to successful suppression of a fire in any of these areas. The conclusion is that this issue has very low risk significance.

III. CAUSE OF THE EVENT

The control cable configuration for valves EJHV8811A, EJHV8811B, BNHV8812A, and BNHV8812B are per original plant design. Cable to cable hot shorts associated with the event in question were not analyzed as part of the Bechtel Fire Hazards Analysis. Thus, this condition is due to cable to cable interaction not being considered in the initial plant design but currently being considered under draft industry guidance in NEI 00-001.

IV. CORRECTIVE ACTIONS

An Operability Determination was completed on 6/7/02. Equipment Out of Service Log (EOSL) entry 9633 was created to track this open issue. Fire Protection Impairment Plan (FPIP) 4017 was initiated to implement an hourly fire watch for the effected rooms.
Long term corrective actions are under evaluation pending NRC endorsement of NEI guidance.

Revision 1: Thus far, the NRC has not endorsed the NEI guidance for fire induced circuit failure issues. The NRC did issue RIS 2004-04 on March 2, 2004. This revision of the LER is in response to the NRC guidance documented in the RIS.

To resolve the concern identified by this LER, Callaway identified two items needed for corrective action. 1) Modification of the circuitry of the four affected valves, and 2) Updating the Fire Preplans to list the necessary operator actions to cope with this event. These actions are discussed in more detail below:

1) Modification package 98-1020A has been developed which involves modifying the circuitry of motor operated valves, and relocating the position of limit switches within the electrical circuit. As originally designed, if the motor operator is given an open signal due to a hot short condition, protection circuitry is bypassed, thereby allowing the motor operator to continue trying to open the valve. It will continue forcing the valve open until the valve operator or valve fails. At this point the valve may not be able to be closed, manually or electrically. Once modified, the limit switch is placed in the circuit such that it will limit the opening, preventing consequential valve and operator damage. This modification was installed on EJHV8811B on 10/14/99; on BNHV8812A on 4/4/00; on BNHV8812B on 9/12/00; and is currently scheduled to be implemented to EJHV8811A in Refuel 14. A GL 91-18 review was performed and determined that the schedule for implementing the modification to EJHV8811A is appropriate. FPIP 4017 will remain in place until this Modification is implemented on EJHV8811A.

2) Fire Preplans were updated for the affected fire areas to instruct the operators to remote manually close the EJHV8811A and EJHV8811B valves from the Control Room. The Fire Preplan for Fire Area A-8 was updated to instruct the operators to local manually close the BNHV8812A and BNHV8812B valves by accessing the pump rooms where the valves are located. These actions can be completed before the RWST tank drains to an unacceptable level. These manual actions are appropriate since Callaway's license allows post fire safe shutdown by diverse means.

V. PREVIOUS SIMILAR EVENTS

A review of Callaway Action Request System (CARs) documents from the last three years revealed one CAR that dealt with a cable separation issue, which was not directly related to these valves. This CAR was:

200002070 – Concern with separation of redundant equipment trains in fire area.

A review of LERs submitted during the last three years did not reveal any similar LERs.

VI. ADDITIONAL INFORMATION

The system and component codes listed below are from the IEEE Standard 805-1984 and IEEE Standard 803A-1983 respectively.

System: BP, ED

Component: HCV