

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): Callaway Plant Unit 1 DOCKET NUMBER (2): 05000483 PAGE (3): 1 OF 03

TITLE (4): Manual Reactor Trip Due To Failure of The 'C' Main Feedwater Regulating Valve

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER (5)
04	21	88	88	006	00	05	23	88			050000
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)											

OPERATING MODE (9): 1	20.402(e)	20.406(e)	X	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10): 0.94	20.406(a)(1)(i)	50.36(e)(1)		50.73(a)(2)(v)	73.71(c)
	20.406(a)(1)(ii)	50.36(e)(2)		50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iii)	50.73(a)(2)(i)		50.73(a)(2)(vii)(A)	
	20.406(a)(1)(iv)	50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)	
	20.406(a)(1)(v)	50.73(a)(2)(iii)		50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12):
 NAME: D. S. Hollabaugh - Superintendent, Systems Engineering
 D. E. Young - Superintendent, Maintenance
 TELEPHONE NUMBER: 314 676-8238
 AREA CODE: 314 676-8206

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS
X	SJ	FCV	C635	Y					

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

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

On 4/21/88 at 0217 CDT, a manual reactor trip was initiated immediately following the failure of the 'C' main Feedwater Regulating Valve (FRV), AE-PE-530. The manual reactor trip was followed by a Feedwater Isolation and an Auxiliary Feedwater actuation by design. At the time of the event the plant was in Mode 1, Power Operations at 94% power and a Reactor Coolant System temperature of 587 degrees F and pressure of 2234 psig.

The 'C' main FRV failed due to material fatigue of the roll pin which secures the valve plug to the valve stem. The plug unthreaded and dropped from the stem blocking feedwater flow through the valve.

The roll pin in the 'C' FRV was replaced with a solid pin of greater strength tack welded in position. Additionally, the roll pins in the three remaining FRV's and in the four feedwater bypass valves were replaced with solid pins.

The manual reactor trip and Engineered Safety Features performed as required. There were no adverse effects on the public health and safety.

8805310109 880523
 PDR ADOCK 05000483
 S PDR

IER2
 11

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Callaway Plant Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 8 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 8	0 0 6	0 0	0 2	OF	0 3

TEXT (if more space is required, use additional NRC Form 366A's) (17)

Basis for Reportability

On 4/21/88 at 0217 CDT, a manual reactor trip was initiated immediately following the failure of the 'C' main Feedwater Regulating Valve (FRV)⁽¹⁾, AE-FCV-530. The reactor trip was followed by a Feedwater Isolation⁽²⁾ and an Auxiliary Feedwater⁽³⁾ Actuation by design.

This report is submitted pursuant to 10CFR50.73(a)(2)(iv)⁽⁴⁾ to document a manual actuation of the Reactor Protection System (RPS)⁽⁵⁾ and the automatic actuation of the Engineered Safety Features (ESF).

Conditions at the Time of Event

Mode 1 - Power Operations

Reactor Power - 94%

Reactor Coolant System (RCS)⁽⁶⁾

temperature (average) - 587 degrees F

pressure - 2234 psig

Event Description

On 4/20/88 at 2230 CDT, indications of a problem with the 'C' FRV were noted by the Balance of Plant (BOP) operator. The 'C' FRV Main Control Board (MCB) demand signal⁽⁷⁾, AE-FK-530, was indicating full open (100%), while the remaining three MCB demand signals were indicating lower values. In an attempt⁽⁸⁾ to correct the condition, the 'C' main feedwater (FW) bypass valve, AE-FCV-570, was opened and power was reduced to 94.5%. This action lowered the 'C' MCB demand signal indication to less than 100%.

At approximately midnight, the valve stem on the 'C' FRV was mechanically adjusted causing the MCB demand signal indication to decrease from 94% to 84%. By 0110 the demand signal had increased from 84% to 92%. Utility engineering personnel investigating the condition determined that the roll pin, which prevents the plug from unthreading from the valve stem, may have vibrated loose thereby allowing the plug to begin separating from the valve stem. This item was discussed with operators, and the Shift Supervisor determined that a manual reactor trip would be initiated if the FRV failed. The plug provides the same function as a valve disc or gate.

At 0212, a manual plant shutdown was approved in anticipation of a potential 'C' FRV failure. At 0217 a loud noise, caused by a water hammer in the main FW system, was heard in the control room. The noise was in coincidence with the receipt of a seismic recorder MCB annunciator alarm⁽⁹⁾ and feedwater mismatch annunciator alarms⁽¹⁰⁾ in all four loops. The shift supervisor immediately directed a manual reactor trip which was followed by an automatic ESF Feedwater Isolation and an Auxiliary Feedwater Actuation.

The emergency plant operating procedures were completed and the plant was stabilized. At 0500 the NRC was notified of the event via a four-hour report pursuant to the requirements of 10CFR50.72(b)(2)(ii).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1) Callaway Plant Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 8 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 8	— 0 0 6	— 0 0	0 3	OF	0 3

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Root Cause

The root cause of the event is attributed to the failure of the 'C' FRV roll pin which secures the valve plug to the valve stem. The roll pin failure was caused by flow induced fatigue failure.

Corrective Actions and Actions Taken to Prevent Recurrence

The 'C' FRV was disassembled and the roll pin was replaced with a solid pin of greater strength. To ensure the solid pin would not vibrate loose, it was tack welded into position. Since the design of the remaining three FRV's and the four FW bypass valves contained the roll pin configuration, these valves were also modified to include the solid pins.

An engineering evaluation and system walkdown verified no adverse effects on plant system as a result of the water hammer.

Safety Significance

The manual reactor trip and the ESF actuations (Feedwater Isolation and Auxiliary Feedwater Actuation) performed as required. There were no adverse effects on the public health and safety.

Previous Occurrences

None

Footnotes

The system and component codes listed below are from IEEE Standards 805-1983 and 803A-1983, respectively.

- (1) System - SJ, Component - FCV
- (2) System - JE
- (3) System - BA
- (4) System - JC
- (5) System - JE
- (6) System - AB
- (7) System - SJ, Component - FIK
- (8) System - SJ, Component - FCV
- (9) System - IN, Component - AIM
- (10) System - JE, Component - ALM
- (11) System - JE, Component - P
- (12) System - IN, Component - MCBD
- (13) System - BA, Component - SIK
- (14) System - BA, Component - SIK
- (15) System - SJ, Component - ISV
- (16) System - KP
- (17) System - SJ, Component - SOL



Callaway Plant

May 23, 1988

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

ULNRC-1776

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 88-006-00
MANUAL REACTOR TRIP DUE TO FAILURE
OF THE 'C' MAIN FEEDWATER REGULATING VALVE

The enclosed Licensee Event Report is submitted pursuant to 10 CFR 50.73(a)(2)(iv) concerning a manual actuation of the Reactor Protection System and the automatic actuation of Engineered Safety Features.

J. D. Blosser
for J. D. Blosser
Manager, Callaway Plant

TPS *psp*
TPS/PSP:jlh

Enclosure

cc: Distribution attached

IE22
1/1

cc distribution for ULNRC-1776

Mr. A. Bert Davis
Regional Administrator
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Mr. Thomas Alexion (2 copies)
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Mail Stop 13-E-21
Washington, D.C. 20555

American Nuclear Insurers
c/o Dottie Sherman, Library
The Exchange Suite 245
270 Farmington Avenue
Farmington, CT 06032

Mr. O. Maynard
Wolf Creek Nuclear Operating Corp.
P. O. Box 411
Burlington, KS 66839

Manager, Electric Department
Missouri Public Service Commission
P. O. Box 360
Jefferson City, MO 65102

Mr. Merlin Williams
Supt. of Regulatory Quality &
Administrative Services
Wolf Creek Nuclear Operating Corp.
P. O. Box 411
Burlington, KS 66839

Records Center
Institute of Nuclear Power Operations
Suite 1500
1100 Circle 75 Parkway
Atlanta, GA 30339

Mr. R. W. DeFayette
Chief, Project Section 3A
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

NRC Resident Inspector

D. F. Schnell (400)
R. J. Schukai (470)
G. L. Randolph
J. F. McLaughlin
W. R. Campbell
R. P. Wendling (470)
F. D. Field (480)
A. P. Neuhalfen
A. C. Passwater/D. E. Shafer/D. J. Walker (470)
G. A. Hughes
Z170.03 (QA Record)
Z40LER (Z170.09 Commercial Record)
D. S. Hollabaugh
D. E. Young
M. S. Evans
M. E. Taylor
H. Wuertenbaecher, Jr. (100)
S. L. Auston (470) (NSRB)
S. J. Bellers/J. D. Schnack
JDB Chrono
3456-0021.6
3456-0260
Z40ULNRC
A160.761
N. Date (Sandra Auston) (470)