

NON-PUBLIC?: N
ACCESSION #: 9510030235
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Arkansas Nuclear One - Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000368

TITLE: Automatic Reactor Trip on `B' Steam Generator High Level
as a Result of Human Error Involving Use of an Improper
Work Surface by a Contract Painter
EVENT DATE: 09/01/95 LER #: 95-002-00 REPORT DATE: 09/28/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 98

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
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Safety and Licensing Specialist

COMPONENT FAILURE
DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On September 1, 1995, at 1130, ANO-2 experienced an automatic reactor trip due to high level in the `B' Steam Generator (S/G). The trip was preceded by an automatic increase in Main Feedwater (MFW) flow due to the inadvertent opening of a flow orifice flush valve on a MFW flow instrument sensing line which caused a false indication of low flow to the `B' S/G. Subsequent investigation determined that a contract painter had stepped from a scaffold pole onto a small angle iron support above the `B' MFW header flow transmitter and inadvertently opened the flow orifice flush valve for the instrument sensing line with his foot, venting the high pressure side of the transmitter. The feedwater control system responded by increasing the speed of both MFW pumps and opening the `B' MFW regulating valve, which overfed the 'B' S/G and caused the

reactor trip. The plant was stabilized in accordance with standard reactor trip recovery procedures for an uncomplicated reactor trip. The reactor was returned to criticality at 1526 on September 2, 1995. The root cause of this event was human error in that a contract painter did not utilize an appropriate work platform. Entergy management immediately suspended all plant painting and associated activities where trip sensitive equipment was located until further notice. The painter responsible was counseled on the seriousness of this event and a meeting was held with painting and housekeeping personnel to discuss management expectations.

END OF ABSTRACT

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A. Plant Status

At the time of this event, Arkansas Nuclear One, Unit 2 (ANO-2), was operating at approximately 98 percent power with an average Reactor Coolant System (RCS) temperature of 570 degrees Fahrenheit and an RCS pressure of 2250 psia. The reactor was near the end of core life, approximately three weeks before the start of a scheduled refueling outage.

B. Event Description

On September 1, 1995, at 1130, ANO-2 experienced an automatic reactor trip due to high level in the "B" Steam Generator (S/G). The trip was preceded by an automatic increase in Main Feedwater (MFW) flow due to the inadvertent opening of a flow orifice flush valve on a feedwater flow instrument sensing line which caused a false indication of low flow to the 'B' S/G.

Feedwater flow to each steam generator is controlled by modulating the main feed regulating valves and the main feedwater bypass valves in conjunction with speed control of the MFW pump turbine drivers. A three-element control system compares feedwater flow and S/G water level with the steam flow and programmed water level. The output signal determines control valve position and pump speed.

At 1130 on September 1, 1995, Control Room Operators observed several alarms, followed by 'B' S/G high level pre-trip alarms on all 4 channels of the Reactor Protective System (RPS). Both MFW pumps were observed to be increasing in speed for no apparent reason. The reactor and main turbine generator tripped almost immediately following the initial series of alarms. The trip was

confirmed to have been initiated on high level in the 'B' S/G (greater than 93.7 percent). The plant was stabilized in accordance with standard reactor trip recovery procedures for an uncomplicated reactor trip. All safety systems responded as expected and post-trip S/G levels were maintained in the normal band by the Emergency Feedwater System (EFW)BA!.

Subsequent investigation determined that a contract painter had stepped from a scaffold pole onto a small angle iron support above the 'B' MFW header flow transmitter in order to better access an area to be painted. In so doing, he inadvertently opened the flow orifice flush valve for the instrument sensing line. The resultant venting of the high pressure side of the transmitter caused the differential pressure cell to produce a signal corresponding to low 'B' feedwater header flow. The feedwater control system JB! responded to this signal by increasing the speed of both NEW pumps and opening the 'B' main feed regulating valve, which overfed the 'B' S/G and caused the reactor trip.

The reactor was returned to criticality at 1526 on September 2, 1995.

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C. Root Cause

The root cause of this event was human error in that a contract painter did not utilize an appropriate work platform. In stepping from the scaffolding pole to the angle iron support, he inadvertently opened the flow orifice flush valve on the sensing line for the 'B' MFW header flow transmitter with his foot, venting the high pressure side. Use of the plant structures to access work areas is in conflict with approved plant procedures, the painting training manual, and accepted safe work practices.

There were two contributing causes to this event: lack of identification of the feedwater flow transmitters as sensitive equipment and failure to cap the flow orifice flush valve on the instrument sensing line.

Pre-job walkdowns of areas to be painted are conducted by Operations so that sensitive equipment may be flagged at that time. The feedwater flow transmitter that initiated this event had not been previously identified as trip sensitive equipment and was not flagged as such subsequent to the pre-job walkdown. The Operator that performed the pre-job walkdown discussed the significance of

the flow transmitters with the painting supervisor but did not specifically list them on the appropriate procedure attachment. Consequently, the flagging did not occur.

Vents and drains are typically capped when they are not in use. Although the flush valve for the instrument sensing line flow orifice is technically not a vent or drain, there would have been no adverse effects associated with capping it. Had this line been capped, the inadvertent venting of the high pressure side and resultant trip would have been prevented.

D. Corrective Actions

Entergy management immediately suspended all plant painting and associated activities where trip sensitive equipment was located until further notice.

The painter responsible for the inadvertent opening of the flush valve was counseled on the seriousness of this event. In addition, a follow-up meeting was held with painting and housekeeping personnel to discuss this event, review the trip sensitive equipment training video, and discuss management expectations regarding improper use of structures or equipment to access work locations.

The ANO-2 Turbine and Auxiliary Buildings were walked down to identify lines which needed to be capped. Sixteen caps were installed during this walkdown.

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The following additional corrective actions will be completed by December 31, 1995:

Both units will evaluate their respective operations and maintenance pre-job walkdowns for painting activities to determine if improvements in the processes are needed.

The program/process by which caps are installed on sensing lines vents and drains will be evaluated to determine if any enhancements are necessary.

The ANO-1 Turbine and Auxiliary Buildings will be walked down to identify and install caps on sensing lines as needed.

E. Safety Significance

The MFW pumps and regulating valves reacted to the perceived loss of 'B' header feedwater flow as expected. The RPS tripped the reactor when the 'B' S/G level exceeded the trip setpoint. The plant was stabilized in accordance with standard reactor trip recovery procedures for an uncomplicated reactor trip. The safety system response to the transient was normal and EFW maintained the S/G within the normal band after the trip. For these reasons, this event is considered to be of low safety significance.

F. Basis for Reportability

This event involved the automatic actuation of the RPS that is reportable pursuant to 10CFR50.73(a)(2)(iv). It was reported to the NRC Operations Center at 1425 on September 1, 1995 as required by 10CFR50.72(b)(2)(ii).

G. Additional Information

A similar event was reported in LER 50-313/89-018-00 in that Maintenance personnel inadvertently tripped the plant by stepping on the turbine control panel and jarring switches for turbine trip functions. However, the corrective actions taken were specific to the equipment involved in that event and could not have prevented the personnel error and subsequent reactor trip described in this report.

Energy Industry Identification System (EIIS) codes are identified in the text as XX!.

ATTACHMENT TO 9510030235 PAGE 1 OF 2

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(illegible print)
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September 28, 1995

2CAN099504

U. S. Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, DC 20555

Subject: Arkansas Nuclear One - Unit 2

Docket No. 50-368
License No. NPF-6
Licensee Event Report 50-368/95-002-00

Gentlemen:

In accordance with 10CFR50.72(a)(2)(iv), enclosed is the subject report concerning an automatic reactor trip.

Very truly yours,

Dwight C. Mims,
Director, Licensing

DCM/kjm

enclosure

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U. S. NRC
September 28, 1995
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