NON-PUBLIC?: N
ACCESSION #: 8801140111

LICENSEE EVENT REPORT (LER)

FACILITY NAME: James A. Fitzpatrick Nuclear Power Plant PAGE: 1 of 5

DOCKET NUMBER: 05000333

TITLE: Reactor Trip From Low Water Level Actuation Due To Personnel Error During Surveillance Testing
EVENT DATE: 12/09/87 LER #: 87-020-00 REPORT DATE: 01/08/88

OPERATING MODE: N POWER LEVEL: 100

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

LICENSEE CONTACT FOR THIS LER:
NAME: Hartford N. Keith, Instrument and Controls Superintendent
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COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: BJ COMPONENT: RTV MANUFACTURER: D232
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: EIIS CODES SHOWN IN ( )

At 0913 hours on 12/9/87 with the plant operating at 100% power, and while making preparations to perform a Technical Specification Table 4.2-2 surveillance test on the High Pressure Injection Coolant (HPCI) System (BJ) Reactor High Water Level Switch (02-3-LIS-101D) a reactor trip was inadvertent initiated by an Instrument and Controls (I&C) technician.

The cause of the reactor trip was not fully closing instrument process isolation valves before valving in test equipment to the HPCI Reactor High Water Level Switch. This resulted in a false reactor water level transient occurring between the switch and Reactor Protection System (JC) Low Water Level Trip instrumentation on the common level header.

Corrective action was to counsel the I&C technician on ensuring instrument isolation valves are fully closed before preceding into the instrument testing mode. In addition instrument isolation valves will be replaced.

Similar events have been reported in LER 85-007-00, 85-012-00 and 86-016-00.

(End of Abstract)

EIIS Codes are shown in ()

Description Of Event

At 0913 hours on 12/9/87 with reactor power at 100% and while making preparations to perform a functional test required by Technical Specification Table 4.2-2 on the High Pressure Injection Coolant (HPCI) (BJ) Reactor High Water Level switch (02-3-LIS-101D) a false reactor low water level trip was inadvertently initiated by an Instrument and Controls technician.

The false low reactor water level trip initiated a reactor trip (scram). Actual reactor water level initially decreased (due to void collapse) from 202.0 inches (normal operating level) to 164.1 inches of water. Reactor water was turned around in the increasing direction by the reactor level-feedwater flow error signal as sensed by the Feedwater Control System (JB). From this action, reactor water level reached the high level trip (222.5 inches) causing automatic trip of the feedwater pump turbines (SJ). A reactor feedwater pump was restarted and reactor water level maintained via the low feedwater flow control valve.

The operators carried out the Reactor Scram procedure (F-AOP-1). Reactor pressure was controlled by the Main Turbine Bypass Valves (JI). The Reactor Core Isolation Cooling (RCIC) System (BN) and High Pressure Injection Coolant (HPCI) System (BJ) were not required to operate and no Safety Relief Valves (AD) lifted.

In addition, at the low reactor water level trip (Technical Specification setpoint of 177 inches above Top of Active Fuel) the Reactor Water Cleanup (RWCU) System (CE) isolated. Standby Gas Treatment System (BH) initiated and the required Primary Containment and reactor water sample lines isolated per design. After the plant was placed in a stable condition, the procedure for Recovery From Isolation (F-AOP-15) was carried out and these systems were returned to their normal condition.

Cause Of Event

Preceding the event, Instrument and Controls department surveillance testing technicians had attached test equipment to the HPCI High Reactor Water Level switch (02-3-LIS-101D) in preparation of performing a trip functional

test. Before test equipment was placed in the test mode, the technician performed procedure steps to hydraulically isolate the switch from the reactor vessel reference level header (level column) and variable level header. This placed instrument valving in the configuration shown in Figure 1. That is, valves 1, 2, 3, 4, 6 and 7 were closed and valves 5, 8 and 9 were open.

The next procedure step required the low pressure side test valve (valve 4) to be opened. When valve 4 was opened a reactor trip on false low level occurred.

Cause Of Event (continued)

The Instrument and Controls General Supervisor immediately started an investigation of the cause after an initial briefing by the surveillance test crew leader and operation personnel. At the test area i
was found
that the two (2) isolation valves for 02-3-LIS-101D, which provide for the isolation of the switch from the reference and variable level headers were not tightly closed. The supervisor then repeated the sequence of valve operations as close as possible to the original condition that existed preceding the reactor trip and was able to recreate a water level transient similar to one observed on control room level instrumentation at the time of the reactor trip.

It is concluded from these observations that the not fully closed valves caused a false reactor water level transient to occur between the HPCI High Reactor Water Level switch (02-3-LIS-101D) and Reactor Protection System (JC) Low Water Level Trip instrumentation (LT-101C and 101D) on the common level headers. A small leakage through valves 1 and 2 to the depressurized tubing between valves 4 and 6 could cause a hydraulic transient in the reference and variable level headers large enough to result in a false low level being sensed by LT-101C and 101D. Since LT-101C and 101D are in different Reactor Protection System (JC) divisions a reactor trip results.

A secondary cause of this event could have been the age of the isolation valve manifold which includes valves 1, 2 and 5, and was supplied as original plant equipment. In addition, the valve manipulations were being performed by an apprentice technician (under close supervision of a journeyman technician). The apprentice technician is experienced in the valve manipulations required for differential pressure type instruments similar to switch 02-3-LIS-101D including those that are installed with the 3-valve manifold, however had not performed a functional test (including valve

manipulations) of 02-3-LIS-101D prior to this event. As noted above, during investigation of the event, a number of valve manipulations of 02-3-LIS-101D were conducted. None of these manipulations revealed differences that could account for the apparent valving error except that valves 1 and 2 seem to require more torque to fully close them then similar valves.

Analysis of Event

During the event the plant operators responded to the transient by utilizing approved plant procedures. Plant response for the event was within the bounds of the transient analysis discussed in the plant Final Safety Analysis Report.

Corrective Actions

Immediate corrective action was to counsel the I&C technician on ensuring instrument isolation valves are fully closed before commencement of test activities.

Long term corrective action is to replace the three valve manifold with separate valves of the type currently being used on other newer instruments which will be easier to operate and provide a more positive fully closed indication to personnel manipulating the valves. In addition, journeyman technicians supervising apprentice technicians will be counselled to pay particular attention to minor (but important) differences in the type of valves that may exist between different instruments.

LER 87-007-00, 85-012-00 and 86-016-00 are related events in which an engineered safety feature actuation occurred due to personnel errors during instrument valve manipulations.

FIGURE 1
Instrument 02-3LIS-101D Valve Configuration Before Plant Scrammed on 12-9-87
FIGURE OMITTED - NOT KEYABLE (DRAWING)

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United States Nuclear Regulatory Commission
Document Control Desk
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LICENSEE EVENT REPORT: 87-020-00

Gentlemen:

In accordance with 10 CFR 50.73, enclosed is the subject Licensee Event Report.

If there are any questions concerning this report, please contact Mr. Hartford Keith at (315) 342-3840, Extension 6101.

Very truly yours,
/s/ R. Converse
RADFORD CONVERSE

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