NON-PUBLIC?: N
ACCESSION #: 9107110036
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Monticello Nuclear Generating Plant PAGE: 1 OF 5

DOCKET NUMBER: 05000263

TITLE: Spurious Signal Causes Main Steam Isolation and Reactor Scram
EVENT DATE: 06/05/91 LER #: 91-014-00 REPORT DATE: 07/05/91

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

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

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

A reactor scram occurred from 100% power due to a spurious Main Steam isolation signal occurring in the A channel while the B channel was tripped in accordance with an approved surveillance procedure which was in progress at the time. Normal post-scram recovery procedures were followed. Investigative efforts to determine the source of the signal did not identify the root cause. After the safety aspects of the occurrence were examined and found to be acceptable, the plant was restarted with data gathering instrumentation in place to give better resolution in the event of a recurrence. Plant Instrument and Control personnel were reminded that passive preparation work should never go beyond the channel that is currently tripped. A Technical Specification revision is being pursued which will minimize the time channels are tripped during surveillance procedures. Improvements are being cons
dered for the sensor relay inputs to the plant computer.

END OF ABSTRACT

DESCRIPTION

At 13:47 on June 5, 1991 a reactor (EIIS Component Identifier: RCT) scram occurred while at 100% power due to a spurious Main Steam (EIIS System Identifier: SB) isolation signal. While performing the Main Steam Line Low Pressure Group 1 Isolation Instrument Test (Procedure # 0054/0055) and Calibration, the A channel (EIIS Component Identifier: CHA) isolation relay coil (EIIS Component Identifier: RLY) experienced a spurious momentary trip signal. Because an isolation trip signal in the B channel had been inserted per the procedure, both channels were tripped, which resulted in a full isolation signal. Upon closure of the Main Steam Isolation Valves (EIIS Component Identifier: ISV), reactor scram and all other expected actuations occurred. All systems and equipment involved in the event were considered operable at the time of the event. Normal post-scram recovery procedures were followed. This event is reportable because it involved an automatic actuation of the primary containment isolation (EIIS system code: JM) and reactor protection systems (EIIS system code: JC).

CAUSE

The Main Steam isolation relays are kept energized through a logic string which includes a manual trip switch (EIIS Component Identifier: HS), and sensor relay contacts (EIIS Component Identifier: CNTR). The sensor relay coils are controlled by field sensors. The sensor relay coils are energized during normal operation. These sensor relays also have contacts which will give a computer alarm and/or annunciation upon sensor actuation (See Figure 1).

The actual local field sensor which caused the signal could not be determined. The isolation relay computer point was in alarm for 28 milliseconds. Because of the short duration of the alarm no computer point was recorded for any sensor relay. The sensor relay contacts which keep the isolation relay coils energized are closed under normal conditions. The sensor relay contacts which give computer indication of a sensor actuation are open under normal operating conditions (back contacts) and must close before a computer signal is received (as opposed to the isolation relay computer input contacts which are closed under normal conditions and opening causes the isolation. Since no sensor computer point came in, the signal which caused the trip came in and cleared such that there was enough time for the isolation relay contacts to open sufficiently to give an isolation signal and the corresponding

computer point input, but not enough time for sensor relay armature to fully move to the de-energized position. If the armature would have moved to the de-energized position, the computer point contacts would have closed and provided a computer point input.

An investigation into the possible cause included the "C" main steam line low pressure switch (sensor) which controls one sensor relay associated with the isolation relay which gave the spurious isolation signal. This pressure switch was the next one to be calibrated under the procedure which was in progress at the time the scram occurred. The interview with the technician performing the procedure revealed that the "C" pressure switch test jack cap on the division which had the spurious trip signal had been removed at about the time the spurious signal came in. This test jack was thoroughly inspected, and no deficiencies were found. The test jack and cover were physically manipulated and no spurious signal could be produced from this equipment.

A computer based multi-channel data recording system was connected to monitor the relay coil voltage of the sensor relay which is held energized by the "C" Main Steam Line low pressure switch, and various moderate physical shocks were applied to the switch housing and sensing lines. By examining the coil voltage data obtained, it was determined that the Main Steam low pressure sensing pressure switches are sensitive to physical shock directly on the switches, or to associated instrument lines.

Associated wiring, fusing and terminations were inspected, and a resistance check was made through the contact logic string for the isolation relay coil which tripped. No deficiencies were found.

Personnel access logs were reviewed to determine which personnel were in areas where sensitive equipment is located. Interviews were conducted to determine whether there were work activities which could have inadvertently caused a physical shock to equipment associated with this event. No likely scenarios were determined.

There was no actual equipment problem found. There was no apparent physical shock to sensitive equipment by personnel. The root cause of this event remains unknown.

ANALYSIS

This event had no direct effect on public health and safety. All safety equipment operated properly in response to the spurious actuation. The

event occurred within a system whose design is fail safe, therefore, the effect of the occurrence could not be any worse with other initial conditions.

CORRECTIVE ACTIONS

1. A multi-channel data gathering device was temporarily installed on the logic which will give greater resolution if this spurious actuation occurs again in the near future.

2. Instrument and Controls personnel were reminded that passive preparation work should never go beyond the channel which is currently tripped.

3. A Technical Specification change is currently being pursued which will change the frequency of this surveillance test from monthly to quarterly and provide for up to 6 hours of calibration work on this type of instrumentation without requiring that the channel be tripped. This will allow the channel to be tripped and reset as needed throughout the test, without having the channel tripped for the duration of the test, which will minimize the time spent with one channel tripped.

4. Investigation will be made into the possibility of improving the response time of the sensor relay inputs to the plant computer system by changing their contact orientation and the corresponding software. This would reduce the chance of field sensor signals being too fast to be recorded by the plant computer system.

ADDITIONAL INFORMATION

Failed Component Identification

To date there are no known component failures, although it is possible that this event was caused by an intermittent component problem.

Previous Similar Events

Because of uncertainty about the actual root cause of the event, it is unknown if there have been similar events.

Figure 1 omitted.

Northern States Power Company

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July 5, 1991 Report Required by
10 CFR Part 50, Section 50.73

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

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Spurious Signal Causes Main Steam Isolation and Reactor Scram

The Licensee Event Report for this occurrence is attached.

This event was reported via the Emergency Notification System in accordance with 10 CFR Part 50, Section 50.72 on June 5, 1991.

Thomas M Parker
Manager
Nuclear Support Services

c: Regional Administrator - III NRC
Sr Resident Inspector, NRC
NRR Project Manager, NRC
MPCA
Attn: Dr J W Ferman

Attachment

*** END OF DOCUMENT ***