NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): Cooper Nuclear Station

DOCKET NUMBER (2): 0 5 0 0 0 2 9 8

PAGE (3): 1 OF 0 4

TITLE (4): Reactor Scram and Main Steam Isolation Valve Closure Due to Spurious Signal Spikes on the Main Steam Line Radiation Monitors

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(S)
0 8	2 5	8 8	8 8	— 0 2 1	— 0 0	0 9	2 6	8 8		0 5 0 0 0
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OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 0 0	20.402(b)	20.405(c)	X 50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Ralph W. Krause	4 0 2 8 2 5 - 3 8 1 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

At approximately 12:40 A.M. on August 25, 1988, a reactor scram, and Group 1 and 7 Isolations occurred as a result of signal spikes on all four Main Steam Line Radiation Monitors. The resulting water level "shrink" caused Group 2, 3, and 6 Isolations, and the automatic start of the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems. The HPCI and RCIC systems were used to restore and maintain reactor water level, while the designated safety/relief valves operated in the low-low set mode to control reactor pressure.

Reactor water samples taken following the scram indicated normal chemistry and radioactivity levels. Radiation levels in the main steam lines, off-gas system, drywell, and main turbine area were normal and steady prior to the event. The signal spikes were attributed to electrical noise.

Immediate corrective actions taken were to respond to the scram and group isolations to stabilize the plant. A troubleshooting effort was unable to exactly duplicate the signal spikes, therefore no specific cause could be positively identified. To minimize the chance for recurrence, a separate chassis ground was added to each Main Steam Line Radiation Monitor. In addition, the station directive stipulating control over portable radios was expanded to include stricter requirements in certain areas of the plant. Furthermore, the adequacy of the instrument and cable shielding for the Main Steam Line Radiation Monitors will be verified during the 1989 Maintenance and Refueling Outage.

A. Event Description

At approximately 12:40 A.M. on August 25, 1988, a reactor scram, and Group 1 and 7 Isolations (Main Steam Isolation Valve [MSIV] closure, Reactor Water Sample Valve closure) occurred as a result of signal spikes on all four Main Steam Line Radiation Monitors. The plant was in steady state, full power operation at the time of the event, with no surveillance testing in progress. The initial water level "shrink" after the scram resulted in Groups 2, 3, and 6 (Primary Containment, Reactor Water Cleanup, and Secondary Containment including the start of the Standby Gas Treatment System) Isolations, and automatic start of the High Pressure Coolant Injection System (HPCI) and Reactor Core Isolation Cooling System (RCIC). Reactor water level was restored by HPCI and RCIC. Reactor pressure was initially controlled by the low-low set mode of the safety/relief valves. Subsequent level and pressure control was performed using HPCI and RCIC until the MSIVs were opened approximately one and one-half hours after the scram. All safety systems responded as required, including the start of both Emergency Diesel Generators when the main turbine generator tripped.

B. Plant Status

At the time of the event, the plant was in steady state operation at 100% of full power (789 MWe).

C. Basis for Report

The event is reportable in accordance with 10CFR50.73(a)(2)(iv), an unplanned automatic actuation of Engineered Safety Features, reactor scram, Emergency Diesel Generator starts, Standby Gas Treatment System starts, and Groups 1, 2, 3, 6, and 7 Isolations.

D. Cause

The probable cause of the signal spikes was electrical noise. A reactor water sample taken 30 minutes after the scram revealed normal values of conductivity, pH, and equivalent Iodine-131 concentration. Subsequent reactor water samples taken at 1 1/2, 4, and 14 hours after the scram showed no abnormal increases in conductivity, pH, or equivalent Iodine-131 concentration. A review of the charts for the Main Steam Line Radiation Monitors, the Off-Gas Radiation Monitors, the Drywell Area Radiation Monitors, and the Area Radiation Monitor in the vicinity of the main turbine throttle valves showed normal, steady radiation levels prior to the event. Therefore, based on the chemistry and radiation data collected, it was concluded the high Main Steam Line Radiation Monitor trips were not caused by an actual high radiation condition.

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

D. Cause (Continued)

Activities occurring at the time of the event which may have caused electrical noise were identified. A Licensed Reactor Operator was performing a radiation source check of the Service Water Radiation Monitor at an adjacent instrument panel in the main Control Room, and a contract Security Officer carrying a two-way radio was performing a routine tour in the Control Building. After the event, the source check was repeated while observing the Main Steam Line Radiation Monitors, with no spiking noted. Also, the two-way radio used by the Security Officer was retrieved, and the probable tour path retraced while periodically transmitting a test message. Again, no spiking was observed.

Additional actions taken to identify a probable cause were to inspect the instrument panel wiring, perform an electronic calibration of each Main Steam Line Radiation Monitor, inspect the instrument grounding arrangement in the instrument panels and outside the Control Building, and to inspect the radiation detectors in the Reactor Building. None of these activities identified a faulty component or design, nor could the signal spikes be duplicated.

E. Safety Consequences

None. A full closure of the MSIVs at 100 percent power is part of the plant design basis. The plant responded properly to the spurious high Main Steam Line Radiation Monitor trip, and the scram and group isolations occurred as required.

F. Safety Implications

Had the event occurred late in the fuel cycle, when decay heat generation is greater, there would have been more safety/relief valve actuations. This would have resulted in a higher suppression pool temperature. However, existing procedures would have provided sufficient guidance to Operations personnel to alleviate this concern.

G. Corrective Action

Immediate corrective actions taken were to respond to the scram and group isolations to stabilize the plant. A reactor water sample was ordered, and when the results showed normal conductivity, pH, and Iodine-131 concentration, the MSIVs were opened to divert steam to the main condenser and establish normal feedwater flow.

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

G. Corrective Action (Continued)

The troubleshooting effort undertaken was unable to duplicate the signal spiking on the Main Steam Line Radiation Monitors. Therefore, no specific repair activity can be positively identified as correcting the cause. However, at the recommendation of a General Electric consultant brought in to assist in the troubleshooting, a chassis ground strap was added between each Main Steam Line Radiation Monitor and the instrument ground bus. Additionally, in an effort to limit the potential sources of electrical noise, a station directive restricting the use of two-way radios in certain areas of the plant was revised to include the Reactor Building near the Main Steam Line Radiation detectors. To further ensure resolution of the Main Steam Line Radiation Monitor sensitivity to electrical noise, the adequacy of the instrument and cable shielding for the Main Steam Line Radiation Monitors will be verified during the 1989 Maintenance and Refueling Outage.

H. Past Similar Events

A reactor scram and Group 1 Isolation caused by electrical noise induced in the Main Steam Line Radiation Monitors was previously reported by Licensee Event Report 86-016. That event, however, was caused when an electrical maintenance technician was removing a power wire of an energized relay located in the main Control Room with the noise suppressor disconnected from the circuit. There was no maintenance taking place at the time of the event on August 25, 1988.