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)	DOCKET NUMBER (2)	PAGE (3)
Waterford Steam Electric Station Unit 3	0 5 0 0 0 3 8 2	1 OF 0 7

TITLE (4) Spurious ESF Control Room Ventilation Actuations Due to Equipment Malfunctions

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)
									N/A	0 5 0 0 0
0 2	1 9	8 8	8 8	0 0 3	0 1	0 6	1 6	8 8	N/A	0 5 0 0 0

OPERATING MODE (9)	1	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
D.W. Vinci, Maintenance Superintendent	AREA CODE 5 0 4 — 4 6 4 - 3 1 1 3 8

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	
B	I L	M O N	G 0 6 3	N							
B	E D	B K R	G 0 8 0	Y							

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 1032 hours on February 19, 1988, at 1026 hours on February 20, 1988, and at 0724 hours on March 14, 1988, Waterford Steam Electric Station Unit 3 was operating at 100% power when Control Room Outside Air Intake (CROAI) Radiation Monitor 200.1S spuriously actuated the Engineered Safeguards Features (ESF) portion of the Control Room Ventilation System. The radiation alarm cleared quickly and air samples of the area showed no detectable activity. At 1030 hours on March 1, 1988, with the plant operating at 100% power, the feeder breaker to the 3A312S Motor Control Center was inadvertently tripped, causing an automatic start of the 'A' Control Room Emergency Filtration Unit. All of these events are reportable as ESF actuations.

The root cause of these events was equipment malfunction. The first, second, and fourth events were caused by perforation of the CROAI beta shield which allowed light to illuminate the detector photomultiplier. The shield was replaced twice and a design change is under consideration. The third event resulted from a technician's ladder which bumped and tripped open the breaker. The cause of this trip was due to a below-minimum tolerance gap between a tripper bar and its associated trip paddle in the breaker. There was no safety significance to these events since the Control Room Isolation and Filtration systems functioned as designed.

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

Recently, there have been four instances when the Engineered Safeguards Features (ESF) portion of the Control Room Ventilation System (EIIS Identifier VI) has been actuated. At 1032 hours on February 19, 1988, at 1026 hours on February 20, 1988, and at 0724 hours on March 14, 1988, Waterford Steam Electric Station Unit 3 was operating at 100% power when a high alarm was received on the East Control Room Outside Air Intake (CROAI) Radiation Monitor, ARM-IRE-0200.1b (EIIS Identifier IL-MON). This caused a Control Room isolation and automatic start of the 'A' Control Room Emergency Filtration Unit (EIIS Identifier VI-AHU). All other CROAI Radiation Monitors were reading normally. In each instance, the alarm cleared after several minutes. Air samples taken in the area of the alarming radiation monitor showed no detectable activity. These events are reportable as ESF actuations since the Control Room Emergency Filtration Units are considered ESF filtration units.

The root cause of these events was equipment malfunction in that a small hole had developed in the CROAI Radiation Monitor aluminum foil beta shield causing the high alarm and Control Room isolation. After the February 19, 1988, event, Health Physics (HP) personnel noticed that the 28-day trend of this monitor's background radiation level was higher than the level previously used to set the alert and high alarm setpoints. It was thought that this was the root cause of the first occurrence, so the alert and high alarm setpoints were recalculated and entered into the instrument, and the monitor was declared operable at 1847 hours on February 19, 1988. The Emergency Filtration Unit was secured at 1914 hours on February 19, 1988.

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

During afternoon hours, when the sun shines on the west side of the plant, the intensity of light entering the East CROAI is significantly lower. Thus, the light entering the small hole in the beta shield during afternoon and evening hours on February 19, 1988, was not intense enough to cause the monitor to alarm until the next morning. After the second occurrence at 1026 hours on February 20, 1988, an investigation discovered a small hole in the monitor's aluminum foil beta shield. The foil was replaced under Work Authorization (WA) 01013735 and the monitor declared operable at 1630 hours on February 20, 1988. The Emergency Filtration Unit was secured at 1706 hours on February 20, 1988.

At 0724 hours on March 14, 1988, the monitor alarmed, causing an automatic start of the 'A' Control Room Emergency Filtration Unit. The cause of the alarm was due to a perforation of the aluminum foil beta shield installed on February 20, 1988. The foil was replaced under WA 01015089 and the monitor declared operable at 1525 hours on March 15, 1988. The Emergency Filtration Unit was secured at 2011 hours on March 14, 1988.

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

The shield is circular, approximately four square-inches, and constructed from thin aluminum foil. Aging, corrosion due to atmospheric heat and humidity, airflow-induced flexing, airborne dust, and mechanical contact by technicians working on nearby equipment are all mechanisms which may cause or contribute to perforation of this shield. Over a period of time these effects may create small holes in the foil allowing light to enter the monitor and illuminate the photomultiplier, thus producing high alarms. Licensee Event Report (LER) 85-036 also reported a CROAI Radiation Monitor alarm due to holes in the monitor's aluminum foil beta shield. Consideration was given to placing a protective cover over the foil, however, since this was the first failure of such a shield, the event was considered an isolated occurrence. Station Modification Request (SMR) 672 has been approved to evaluate a modification to correct this problem by installing brackets to mechanically protect the beta shield without preventing the monitor from performing its design function. An evaluation is also underway to determine if periodic replacement of these shields is warranted, and if so the appropriate replacement interval. Long term corrective action will be based on the outcome of these evaluations.

At 1030 hours on March 1, 1988, with the plant operating at 100% power, the feeder breaker to the 3A312-S Motor Control Center (MCC) (EIIS Identifier ED-MCC) was inadvertently tripped, causing an automatic start of the 'A' Control Room Emergency Filtration Unit. A technician was moving a ladder which contacted the rackout screw cover on the feeder breaker door to the 3A312-S MCC. The operating pin for this cover was depressed by a leg of the ladder. The breaker tripped, causing a loss of power to the 3A312-S MCC and its associated loads. One of these loads, Power Distribution Panel (PDP) (EIIS Identifier ED-PL) 360-SA Circuit 6, feeds the relay, ARM-EREL-2675-RAD (EIIS Identifier RLY), which causes an automatic start of the Control Room Emergency Filtration Unit when deenergized. This event is therefore reportable as an ESF actuation. The feeder breaker was reclosed at 1031 hours and the Control Room Emergency Filtration Unit was secured at 1035 hours on March 1, 1988.

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

The sliding cover plate for the racking screw on this 480V breaker is designed such that it cannot be moved to the side with the breaker closed unless an interlocked TRIP/RESET button is first depressed. With the breaker closed, a linkage is inserted down into a slot on the racking screw cover to prevent its movement. Misalignment of this cover could cause this linkage to be bypassed, allowing the cover to slide freely. As an added precaution, this cover is interlocked to depress the TRIP/RESET button when the cover is moved to ensure the breaker is open prior to operating the racking screw.

The 3A312-S MCC feeder breaker was removed from the 6C position in the 3A31-S switchgear during the second refueling outage for troubleshooting. A spare breaker of the same type was satisfactorily tested and installed in the 6C position in the 3A31-S switchgear. Procedure, ME-4-145, "480V GE Switchgear Breaker," was performed on the removed breaker. This procedure provides instructions for maintenance and functional testing of General Electric (GE) Type AKR Low Voltage Switchgear Breakers. After performing this testing, Maintenance technicians discovered that there was less than the required minimum gap between the TRIP/RESET Button tripper bar and its associated trip paddle when the breaker was closed. This would cause the TRIP/RESET Button to trip the breaker if it was depressed less than the 0.187 inch depression of the button which is specified to not trip the breaker. Thus, when the operating pin of the racking screw cover was depressed by a leg of the ladder, this depressed the TRIP/RESET Button sufficiently to cause the breaker to trip open. After the proper adjustments were made, Maintenance personnel attempted to trip open the breaker by striking the racking screw cover operating pin to simulate the event which caused the breaker to trip open. The breaker did not trip open during this testing. Thus, the root cause of this event has been attributed to the below-minimum tolerance gap between the manual tripper bar and its associated trip paddle. Due to the low mass of these components, the seismic qualification of the breaker was not affected by this condition.

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A review of maintenance records determined that the cause of the breaker trip has not previously been identified as a cause for spurious trips of these types of breakers prior to this event. No information has been received from the vendor identifying this mechanism as a cause of spurious trips. The adjustment of this clearance every 60 months during overhaul reduces the probability of such events to an acceptable level. Thus, this event is classified as an isolated occurrence.

LER-87-022 reported a similar spurious actuation of related ESF components including the 'B' train Control Room Emergency Filtration Unit. The cause of this event was due to a failed circuit card which had caused a relay to cycle excessively, overheat, and short to ground. The resulting overcurrent caused the supply breaker, PDP 391-SB Circuit 34, to trip, resulting in the ESF actuations. Engineering evaluations determined there was no set pattern of failures in either the circuit card or relay, so the event was considered an isolated occurrence.

Most other ESF ventilation actuations have been attributed to electrical spiking phenomena. On September 10, 1987, an engineering evaluation on CROAI Radiation Monitor electrical spiking was completed by Maintenance personnel. This evaluation identified and corrected two mechanisms which cause this spiking. The first mechanism was due to multiple connections between instrument and plant grounds which allow transient circulating currents to flow and cause false counts and subsequent spiking. The second mechanism was due to the induction of high frequency noise into the circuitry from the 120VAC Control Room isolation relay circuits.

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

The first mechanism of spiking was corrected by installing insulating washers which placed the monitor in a single-point grounding configuration. The noise level from the second mechanism was substantially reduced by the installation of Electrocube-brand resistance-capacitance filter networks. Testing revealed that this significantly decreased the monitors' sensitivity to noise. No actuations attributable to electrical spiking have occurred since implementation of these modifications.

The Control Room Isolation and Filtration system functioned as designed and there was no actual radioactive release in these events. The CROAI Radiation Monitor would have performed as designed in the event of a radioactive release. Thus, there was no safety significance to these events.

SIMILAR EVENTS

Spurious Control Room Emergency Filtration Unit actuations were reported in LERs 84-001, 85-002, 85-005, 85-030, 85-036, 85-039, 85-043, 85-045, 85-048, 86-003, 86-020, 86-022, 86-029, 87-015 and 87-022.

PLANT CONTACT

D.W. Vinci, Maintenance Superintendent, (504) 464-3138

Ref: 10CFR50.73(a)(2)(iv)

LOUISIANA POWER & LIGHT / WATERFORD 3 SES • P.O. BOX B • KILLONA, LA 70066-0751

MIDDLE SOUTH UTILITIES SYSTEM

June 16, 1988

W3A88-0061
A4.05
QA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Reporting of Licensee Event Report

Attached is Licensee Event Report Number LER-88-003-01 for Waterford Steam Electric Station Unit 3. This Licensee Event Report is submitted pursuant to 10CFR50.73(a)(2)(iv).

Very truly yours,

N.S. Carns
Plant Manager - Nuclear

NSC/WEM:rk

Attachment

cc: R.D. Martin, NRC Resident Inspectors Office, INPO Records Center (J.T. Wheelock), E.L. Blake, W.M. Stevenson, D.L. Wigginton

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