

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS
LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED
BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN
ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-
6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC
20550-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104),
OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

Millstone Nuclear Power Station Unit 1

DOCKET NUMBER (2)

05000245

PAGE (3)

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TITLE (4)

High Range Stack Noble Gas Monitor Inoperable

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	30	96	96	054	01	12	16	96	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)							
POWER LEVEL (10)		000	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)	
			20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
			20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		<input checked="" type="checkbox"/> OTHER	
			20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A Special Report	
			20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

Robert W. Walpole, MP1 Nuclear Licensing Manager

TELEPHONE NUMBER (Include Area Code)

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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)

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

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 30, 1996 at 0525 hours, with the plant shutdown and the reactor in the COLD SHUTDOWN condition, the High Range Stack Noble Gas Monitor failed and was declared inoperable. Due to the intermittent nature of the failure, initial troubleshooting could not determine a definitive cause of the problem; therefore, the monitor remained inoperable with the alternate pre-planned method established in accordance with Technical Specification 3.8.D.7 to monitor stack effluent releases. An extensive troubleshooting effort was initiated with resources from Millstone Unit Nos. 1 and 3, as well as the services of the vendor to determine the cause of the intermittent failures and return the High Range Stack Noble Gas Monitor to service.

Installation design inadequacies associated with system grounding, electronic noise protection, and monitor susceptibility to power transients were identified and corrected. The monitor was successfully tested, and declared operable on November 26, 1996.

This event is reportable pursuant to Millstone Unit No. 1 Technical Specification 3.8.D.7, which requires the submission of a Special Report to NRC, within 14 days of the event, when the High Range Stack Noble Gas Monitor cannot be made operable within seven days. This report supplements the original report that was submitted on November 13, 1996.

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

I. Description of Event

On October 30, 1996 at 0525 hours, with the plant shutdown and the reactor in the COLD SHUTDOWN condition, the High Range Stack Noble Gas Monitor failed and was declared inoperable. Troubleshooting revealed that several circuit boards were suspect and replaced, which allowed the monitor to operate. Since it was not known whether the suspect boards failed on their own or due to another problem that still existed within the monitor, the monitor was left as inoperable. Additionally, recent intermittent problems with the monitor resulted in the conclusion that continued troubleshooting, which consisted of component replacement and subsequent monitoring for intermittent problems, was necessary to obtain reasonable assurance that the monitor would function properly when returned to service. Subsequently, the monitor failed again due to an unknown cause. At this point, it was determined that since a definitive problem could not be found, the monitor would not be returned to service in a timely manner. Due to the history of intermittent problems that have surfaced with this instrument over the past several months and the failure of troubleshooting efforts to identify the root cause, it was deemed necessary to develop a plan to conduct extensive troubleshooting and system walkdowns to validate proper grounding, noise protection, and compliance with recommended installation instructions. Alternate pre-planned actions were initiated in accordance with Technical Specification 3.8.D.7.

Design inadequacies and other monitor problems identified during walkdowns and troubleshooting were corrected. The monitor was successfully tested on November 23, 1996 with no problems identified and declared operable on November 26, 1996.

II. Cause of Event

The cause of the Stack High Range Noble Gas Monitor failure is inadequate design in that the system was installed with insufficient grounding and induced Electrical Magnetic Interference/Radio Frequency Interference (EMI/RFI) contributors. Additional causal factors include susceptibility of the monitor's microcomputer to power supply voltage transients and excessive electronic heat.

III. Analysis of Event

Per the Millstone Unit No. 1 Updated Final Safety Analysis Report (UFSAR), the process and effluent monitoring system provides a means for compliance with 10CFR20, 10CFR50 Appendix A GDC 60, 63, and 64, and Regulatory Guides 1.21, 1.97, 4.15, and 8.8. The High Range Stack Noble Gas Monitor measures the gross gamma activity of noble gases exiting the Millstone Unit No. 1 Main Stack to provide information to the operator for assessing plant conditions and classification of events, during and following an accident.

This event is reportable pursuant to Millstone Unit No. 1 Technical Specification 3.8.D.7, which requires the submission of a Special Report to NRC, within 14 days of the event, when the High Range Stack Noble Gas Monitor cannot be made operable within seven days.

The High Range Stack Noble Gas Monitor is required to be operable at all times. The bases of the Technical Specifications delineates that, since the Millstone Unit No. 1 stack represents the final release point for potential accident level releases from all three Millstone units, the applicability has been defined as at all times rather than relating it solely to Millstone Unit No. 1 operating modes. There are no safety

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consequences since the Millstone Unit No. 1 Main Stack Noble Gas Activity Monitor remains operable as the initial alternate, pre-planned method to monitor effluent releases. In the event of an accident involving a release through the Main Stack, additional monitoring methods are available as described in Emergency Plan Operating Procedures.

The High Range Stack Noble Gas Monitor is a microprocessor based instrument. Because it uses sensitive low level electronics, reliable operation of the monitor is, in part, dependent on proper voltage regulation, adequate heat dissipation, and immunity from EMI/RFI. Troubleshooting identified that several system failures occurred concurrent with testing of an automatic bus transfer (ABT) device feeding the panel which provides the monitor's AC power. The rapid loss and restoration of power generated electromagnetic noise within the electronics enclosure. Additionally, the power transient propagated through the monitor's unregulated power supply resulting in check source activation and detector high voltage spikes. Excessive electronic heat reduced the life expectancy of the monitor's circuit boards resulting in premature failure. Inadequate grounding and EMI/RFI protection increased the likelihood of electrical noise coupling into the microprocessor circuits and caused them to misoperate.

IV. Corrective Action

Walkdown and verification of system design were performed to identify installation inadequacies including grounding and EMI/RFI induced sources.

Upgraded system to standard grounding and wiring practices to reduce EMI/RFI contributors. Eliminated instrument ground loops.

Installed uninterruptable power supply for filtering and voltage regulation during power transients.

Installed upgraded circuit boards to minimize electronic heat generation and improve noise immunity.

Training on instrument grounding and reduction of EMI/RFI contributors will be conducted for all Millstone Unit No. 1 engineering personnel by July 1, 1997.

V. Additional Information

Similar Events

LER 96-044-01, dated: 7/29/96, "High Range Stack Noble Gas Monitor Inoperable Due to Inadequate Calibration"

LER 95-015-00, dated 8/21/95, "Stack High Range Noble Gas Radiation Monitor Inoperable"

Manufacturer Data

Kaman Radiation Monitor Model KMG-HRH