

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 (76-F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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|---|--|-------------------------------|--------------------|
| FACILITY NAME (1) Millstone Nuclear Power Station Unit 2 | | DOCKET NUMBER (2) 05000336 | PAGE (3) 1 OF 3 |
|---|--|-------------------------------|--------------------|

TITLE (4)
Service Water Piping Liner Material Peeled Off and Lodged in the Strainer for the Emergency Diesel Generator Heat Exchangers Causing Reduced Flow to the Heat Exchangers

| 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 NAME | DOCKET NUMBER |
| 11 | 26 | 97 | 97 | -- 037 -- | 00 | 12 | 22 | 97 | FACILITY NAME | DOCKET NUMBER |

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|-------------------------|---|--|---------------|-------------------|--|------------------|------------------|---|-------------------|--|
| OPERATING MODE (9) N | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) | | | | | | | | | |
| | 20.2201(b) | | | 20.2203(a)(2)(v) | | | 50.73(a)(2)(i) | | 50.73(a)(2)(viii) | |
| POWER LEVEL (10) 000 | 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) | | OTHER | | |
| 20.2203(a)(2)(iii) | | | 50.36(c)(1) | | | X 50.73(a)(2)(v) | | Specify in Abstract below in NRC Form 366-A | | |
| 20.2203(a)(2)(iv) | | | 50.36(c)(2) | | | 50.73(a)(2)(vii) | | | | |

LICENSEE CONTACT FOR THIS LER (12)

| | |
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| NAME R. G. Joshi, MP2 Regulatory Compliance Manager | TELEPHONE NUMBER (include Area Code) (860) 440-2080 |
|--|--|

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 |
|-------|--------|-----------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
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|---|----|--|--|-------------------------------|-------|-----|------|
| SUPPLEMENTAL REPORT EXPECTED (14) | | | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
| X YES (If yes, complete EXPECTED SUBMISSION DATE). | NO | | | | 04 | 03 | 98 |

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

On November 26, 1997, at 0830 hours, while performing a routine strainer maintenance procedure, a piece of debris was discovered in one side of the duplex inlet strainer for the service water system cooling supply to the "B" emergency diesel generator heat exchangers. The debris consisted of one approximately 6 inch by 12 inch piece of plasticized Polyvinyl Chloride (PVC) piping liner material, and was found in the strainer basket that had been in service. The strainer provides for the removal of debris from the inlet piping to the diesel engine heat exchangers. The liner material is a PVC coating used in various portions of the service water system for corrosion protection of carbon steel piping internals from exposure to seawater.

The cause of the PVC liner failure is not known at this time.

Service water piping internal inspections will be performed to locate the source of the piece of PVC liner material and to identify any additional areas of damaged liner. An engineering evaluation is being performed to determine the cause of the PVC liner failure. Piping liner repairs will be performed as indicated by the piping inspection. At least one service water train will be completed prior to entering Mode 6 from the current outage. Both trains will be completed prior to entering Mode 4 from the current outage.

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

I. Description of Event

On November 26, 1997, at 0830 hours, while performing a routine strainer maintenance procedure, a piece of debris was discovered in one side of the duplex inlet strainer [STR] for the service water system [BI] cooling supply to the "B" emergency diesel generator [DG] heat exchangers [HX]. At the time of discovery, the plant was defueled.

Upon discovery of this condition, a prompt report was issued on November 26, 1997, in accordance with the requirements of 10 CFR 50.72(b)(2)(i). The report would have been more properly made pursuant to 10 CFR 50.72(b)(2)(iii).

The debris consisted of one approximately 6 inch by 12 inch piece of plasticized Polyvinyl Chloride (PVC) piping liner [LNR] material, and was found in the strainer basket that had been in service. The strainer provides for the removal of debris from the inlet piping to the diesel engine heat exchangers. This strainer supplements the combination of intake structure traveling screens and service water pump discharge strainers in prevention of heat exchanger debris fouling. The liner material is a PVC coating used in various portions of the service water system for corrosion protection of carbon steel piping internals from exposure to seawater. Since application of this liner is common to both service water trains, both trains were declared inoperable pending inspection.

The location of the source of the PVC material is unknown, but inspections of the two service water trains are being performed. Once the source of the failure is determined, the cause and corrective action will be determined.

This event is reported in accordance with 10 CFR 50.73(a)(2)(v), any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to remove residual heat or mitigate the consequences of an accident.

II. Cause of Event

The cause of the PVC liner failure is not known at this time.

III. Analysis of Event

The function of the service water system is to supply a dependable continuous flow of cooling water to the diesel engine heat exchangers, the reactor building closed cooling water heat exchangers, and various other safety related and non-safety related heat loads. Two independent cross-connected supply headers with isolation valves are provided to all heat exchangers. The water source for the service water system is sea water. To protect carbon steel piping from seawater induced corrosion, internal PVC coating is applied as a liner material in various sections of the system.

The PVC liner material is manufactured by the Arbonite Company and carries the trade name "Arbosol". This liner material was applied as an internal coating to replacement piping spools prior to assembly in the plant. Typically, the replacement piping spools were sent to the Arbonite Company for the liner application. This system improvement, to replace epoxy lined piping with the Arbosol lined piping, was implemented over five phases during the period between 1988 to 1995. This is the first instance of a piece of PVC liner being found in either a strainer or a heat exchanger tube sheet.

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For the diesel engine heat exchangers supply, the measured strainer basket surface area is a minimum of 275 square inches and the approximate area of the PVC liner piece is 70 square inches. This means that only 25 percent of the strainer area could have been blocked to service water flow, and at least 75 percent of flow was available. The measured available service water flow through the strainer is typically 1180 gallons per minute (gpm). The required indicated flow for a fully loaded diesel generator is 559 gpm. Therefore, service water flow available to the heat exchangers was more than 50 percent greater than the flow requirement.

The diesel generator remained operable with the as-found condition. However, this event is considered to be potentially safety significant.

IV. Corrective Action

As a result of this event, the following actions have been, or will be, performed.

1. Service water piping internal inspections will be performed to locate the source of the piece of PVC liner material and to identify any additional areas of damaged liner. An engineering evaluation is being performed to determine the cause of the PVC liner failure.
2. Piping liner repairs will be performed as required, based upon inspection results. At least one service water train will be completed prior to entering Mode 6 from the current outage. Both trains will be completed prior to entering Mode 4 from the current outage.

V. Additional Information

The strainer is made by the Andale Company of Lansdale, PA, and is a six inch duplex type 101C which requires manual shifting between the two strainer baskets.

Similar Events

No previous similar event involving failure of piping liner material was identified.

Energy Industry Identification System (EIIIS) codes are identified in the text as [XX].