

NON-PUBLIC?: N
ACCESSION #: 9107290270
LICENSEE EVENT REPORT (LER)

FACILITY NAME: THREE MILE ISLAND UNIT 2 PAGE: 1 OF 04

DOCKET NUMBER: 05000320

TITLE: PROCESSED WATER DISPOSAL SYSTEM SAMPLE VALVE
MISALIGNMENT
EVENT DATE: 06/26/91 LER #: 91-005-00 REPORT DATE: 07/24/91

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(i)

LICENSEE CONTACT FOR THIS LER:
NAME: E. D. Schrull - TMI Licensing TELEPHONE: (717) 948-8832
Engineer

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

SUPPLEMENTAL REPORT EXPECTED:

ABSTRACT:

On June 26, 1991, the TMI-2 Processed Water Disposal System (PWDS) was operating in the "coupled mode" (i.e., evaporator coupled to the vaporizer) when a vaporizer exhaust sample valve was found closed. A sample of the vaporizer exhaust is routinely analyzed to calculate the system decontamination factor (DF); it is not used to determine radio-nuclide release.

This event was a result of either personnel error in that the evaporator operator did not follow the operating procedure or a design deficiency in that the valve must be "cracked" open to provide the required drip flow. Various contributing factors make the root cause of this event indeterminate. Upon discovery of the mispositioned valve, the immediate corrective actions taken were to open the valve and initiate an investigation into the cause of the mispositioning. The PWDS was

subsequently shut down. Longer term corrective actions include a revision to the PWDS operating procedure and an engineering review of the sampling system.

TMI-2 Tech. Spec. 3.9.13 states, "ACCIDENT GENERATED WATER shall be disposed of in accordance with NRC-approved procedures." Per the NRC-approved PWDS operating procedure, the vaporizer exhaust sample valve was required to be open during coupled mode operations. Therefore, PWDS operation in this manner, although inadvertent, was prohibited by the plant's Tech. Specs. and the event is reportable per 10 CFR 50.73(a)(2)(i)(B).

This event is similar in nature to LERs 91-02, 91-03, and 91-04.

END OF ABSTRACT

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I. PLANT OPERATING CONDITIONS BEFORE THE EVENT

The TMI-2 facility was in Mode 3. The TMI-2 PWDS was operating in the "coupled mode" using domestic water as the feed to the evaporator. Normally, in the coupled mode of operation, accident generated water (AGW) is pumped to the evaporator where it is processed into two forms: a concentrated liquid waste and a purified liquid distillate. The concentrated waste is then dried to a solid waste form and packaged for transport and burial. The liquid distillate is pumped to the vaporizer where it is discharged to the atmosphere as steam. The process operates in a continuous flow mode with the evaporator and vaporizer coupled. When domestic water is used as the evaporator feed, the process is basically the same except that no radionuclides exist in the concentrated liquid waste or the purified liquid distillate. However, in this case, there was AGW remaining in the various pipes and tanks of the PWDS.

II. STATUS OF STRUCTURES, COMPONENTS OR SYSTEMS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT

N/A

III. EVENT DESCRIPTION

On June 25, 1991 at 7:30 p.m., the TMI-2 PWDS was operating in the coupled mode when an evaporator shutdown was initiated to support an attempt to retrieve a loose section of pipe in the Blender/Dryer.

During the shutdown, vaporizer exhaust stack sample valve WD/SMV! V-86 was closed. Evaporator operations were resumed in accordance with the applicable cold restart portion of the operating procedure at 5:50 a.m. on June 26, 1991 using domestic water. Vaporization of domestic water, which started at approximately 6:00 a.m., also vaporized residual AGW that was in the various pipes and tanks of the PWDS. The startup was performed using a "clean" copy of the controlled procedure. The procedure was properly signed-off indicating that the step which requires the opening of valve V-86 had been accomplished. However, a TMI-2 engineer performing a morning inspection tour of the Evaporator Building noticed that there was no flow into the sample collection bottle. He asked a NUPAC operator to verify the valve position. Valve V-86 was found closed.

The NUPAC operator reset the flow to be within the specified range and notified the appropriate TMI-2 personnel. The PWDS was subsequently shutdown at approximately 7:30 a.m. on June 26, 1991.

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IV. ROOT CAUSE

The root cause of this event is either personnel error or a design deficiency. This event could be attributable to personnel error in that the operator, while preparing to perform the procedural step to open the valve, could have become distracted by other process adjustments and inadvertently signed-off the step as complete. A contributing factor to the potential personnel error was that a startup was taking place in conjunction with shift turnover. Further, the operators could have been fatigued after spending most of their shift performing system maintenance.

Conversely, this event could have resulted from a design deficiency. Valve V-86 is a needle valve and to achieve the necessary flowrate, it must be just "cracked" open. This valve may have been cracked open initially to establish the required flow, but closed due to thermal expansion during system startup. Thus, it is indeterminate whether the root cause of the event was personnel error or a design deficiency. A further contributor to this event is the use of a sample collection container which is opaque, making it difficult to visually verify a steady sample drip rate.

V. CORRECTIVE ACTIONS

Upon discovery of the mispositioned valve, the immediate corrective actions taken were to open the valve and initiate an investigation into the cause of the mispositioning. The PWDS was subsequently shut down. Longer term corrective actions include the following:

1. The collection bottle at the V-86 sample location has been provided with clear tubing to facilitate flow verification.
2. The PWDS operating procedure has been revised to require the independent verification and sign-off by a second operator indicating that a steady rapid drip is being collected in the sample bottle downstream of V-86 during vaporizer startup.
3. NUPAC is evaluating the use of a different type of valve at V-86 or the use of an orifice, which would allow V-86 to be fully open during use. While this analysis is being performed, hourly checks of V-86 have been instituted to ensure proper sample flow.

Finally, this event is the subject of a Human Performance Enhancement System (HPES) review.

VI. COMPONENT FAILURE DATA

N/A

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VII. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

No safety function is performed by valve V-86. A sample of the vaporizer exhaust is routinely analyzed to calculate the system DF; it is not used to determine radionuclide release. During vaporizer operations, the release of radioactivity from the PWDS is determined by the vaporizer feed compositor sample and monitored by the vaporizer influent radiation monitor (PWD-RML-1) WD/MON!. Release calculations are based on the vaporizer feed compositor sample and, thus, no credit is taken for decontamination by the vaporizer. Thus, there were no unmonitored releases of radioactivity from the PWDS during this period and this event did not pose a potential public health and safety concern.

VIII. PREVIOUS EVENTS OF A SIMILAR NATURE

LERs 91-02, 91-03, and 91-04.

* The Energy Industry Identification System (EIIS), System Identification (SI) and Component Function Identification (CFI) Codes are included in brackets, "SI/CFI!", where applicable, as required by 10 CFR 50.73(b)(2)(ii)(F).

ATTACHMENT 1 TO 9107290270 PAGE 1 OF 1

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July 24, 1991
C312-91-2062
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US Nuclear Regulatory Commission
Washington, DC 20555

Attn: Document Control Desk

Dear Sir:

Three Mile Island Station Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Licensee Event Report 91-05

Attached is Licensee Event Report 91-05 concerning a sample valve in the TMI-2 Processed Water Disposal System that was found to be in a position not in accordance with an NRC-approved procedure.

This event is reportable pursuant to Title 10 of the Code of Federal Regulations, Section 50.73(a)(2)(i)(B).

Sincerely,

R. L. Long
Director, Corporate Services/TMI-2

EDS/dlb

Attachment

cc: T. T. Martin - Regional Administrator, Region I
M. T. Masnik - Project Manager, PDNP Directorate
L. H. Thonus - Project Manager, TMI Site
F. I. Young - Senior Resident Inspector, TMI

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