

363

update on failed RHR spray line snubbers
LICENSEE EVENT REPORT

NOV 05 1984 B&W

CONTROL BLOCK 1191541221

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 PATMI 2 2 000-0000000-000 3411111 4 5

CON'T REPORT SOURCE L 6 05000320 7 062883 8 100484 9

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES 10

02 On June 28, 1983, two (mechanical) seismic restraint snubbers on the Decay Heat
03 Auxiliary Spray Line would not respond to inplace exercising. Subsequent to removal
04 and disassembly, these snubbers were found to have failed in a bound-up rigid
05 condition. Since the Reactor Coolant System was in a low pressure, low temperature,
06 this event had no significant effect on the plant or the public. Due to the nature
07 of this event, this is a special report.

08
09 SYSTEM CODE C I 11 CAUSE CODE E 12 CAUSE SUBCODE B 13 COMPONENT CODE SUPPORT 14 COMP SUBCODE D 15 VALVE SUBCODE Z 16

17 LER/RO REPORT NUMBER 833 21 22 SEQUENTIAL REPORT NO. 0513 24 26 OCCURRENCE CODE 919 28 29 REPORT TYPE X 30 31 REVISION NO. 1 32
ACTION TAKEN C 18 FUTURE ACTION X 19 EFFECT ON PLANT Z 20 SHUTDOWN METHOD Z 21 HOURS 0000 22 24 ATTACHMENT SUBMITTED Y 23 24 NRPD-4 FORM SUB. N 24 PRIME COMP. SUPPLIER L 25 COMPONENT MANUFACTURER P 029 26

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS 27

10 The root cause of this snubber failure is most likely due to a water hammer event.
11 The source of the water hammer cannot be determined. *Insert see pg 3* The two failed snubbers were
12 replaced in like kind. No further studies of this event are being considered at
13 this time.

14
15 FACILITY STATUS x 28 % POWER 000 29 OTHER STATUS Recovery Mode 30 METHOD OF DISCOVERY C 31 DISCOVERY DESCRIPTION Inspector observation 32

16 ACTIVITY CONTENT Z 33 RELEASED OF RELEASE Z 34 AMOUNT OF ACTIVITY NA 35 LOCATION OF RELEASE NA 36

17 PERSONNEL EXPOSURES NUMBER 000 37 TYPE Z 38 DESCRIPTION NA 39

18 PERSONNEL INJURIES NUMBER 000 40 DESCRIPTION NA 41

19 LOSS OF OR DAMAGE TO FACILITY TYPE Z 42 DESCRIPTION NA 43 8410170307 841004 PDR ADDCK 05000320 S PDR IE22 1/1

20 PUBLICITY ISSUED N 44 DESCRIPTION NA 45 NRC USE ONLY

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I. EXPLANATION OF THE OCCURRENCE

On November 11, 1983, in a meeting held with the NRC Site Inspector, it was decided to report the following pipe snubber failures as a Special Event Report.

→ In 1982, Electrical Power Research Institute (EPRI) initiated the first phase of the TMI-2 Mechanical Component Information and Examination Program. Four (4) mechanical snubbers removed from the Decay Heat Auxiliary spray line were inoperative and had severely damaged internals. Although these snubbers failed, their failure mode was in a bound-up or rigid condition and would most likely have performed their safety function of seismic restraint; however, they would not have responded as designed to allow thermal movements. Examination showed that these snubbers had experienced severe overloads in both extension and retraction, presumably as a result of a water hammer event or due to accident-related forces originating in the Reactor Coolant System (due to either cavitating reactor coolant pumps or from dynamic forces created in the pressurizer). Further details of the initial phase of the examination of the TMI-2 mechanical snubbers are documented in EPRI NP-2966 dated March 1983.

d
a. Since the exact cause of failure was not determined during the initial investigation, Phase II examinations were undertaken in 1983 to inspect pipe supports and additional snubbers. Subsequently, on May 4, 1983, Decay Heat Auxiliary Spray Line Piping Restraint Snubbers DHH-284-S and DHH-289-S were visually examined. At DHH-284-S, two PSA-1/4 (manufacturer's designation for a rated load of 350 pounds) snubbers were found as expected. The snubber housings were moderately corroded and there were no exterior indications of physical damage. At DHH-289-S, only a single PSA-1/2 (rated load of 500 pounds) snubber was found rather than a double snubber arrangement as expected. The snubber was attached horizontally to a stanchion which is welded to the pipe. The snubber housing was very heavily corroded externally. The safety wire had completely rusted away but there was no indication of external physical damage.

Following the snubber visual inspections, a second entry was made on June 28, 1983, to perform in-place functional tests on the above mentioned snubbers. This was accomplished by supporting the snubber in the horizontal position and attaching a push/pull spring scale device. Neither snubber would move using the push/pull spring scale; therefore, they failed the breakaway force test and were assumed to be "locked-up". The snubbers were replaced with like kind and given a full travel test.

On July 21, 1983, on-site disassembly and inspection found extensive internal damage and twisted and broken components in the

former snubbers. Since the Reactor Coolant System was in a low pressure, low temperature condition, this event had no effect on the plant or the health and safety of the public. Further details of the Phase II Examination of the TMI-2 Mechanical Snubbers are documented in EPRI NP-3593 dated July 1984.

II. CAUSE OF THE OCCURRENCE

Detailed system analysis concluded that the most likely cause of the snubber failures was a water hammer event rather than a vibratory motion originating from the Reactor Coolant System. [It is not clear from the data, however, whether the source of the water hammer was from the Decay Heat Removal System, the pressurizer, or the cold leg of Reactor Coolant Pump RC-P-2A which experienced deep cavitation during the accident.]



III. CIRCUMSTANCES SURROUNDING THE OCCURRENCE

The circumstances which most probably resulted in the snubber failures are described above.

IV. CORRECTIVE ACTIONS PLANNED

Immediate - The inoperative snubbers were replaced with like kind.

Long-Term - No further actions by GPU Nuclear are planned at this time. Licensees may desire to review the content of this event in terms of the potential for applicability at their units.

V. COMPONENT FAILURE DATA

These snubbers were manufactured by Pacific Scientific Company; DHH-284-S - Size PSA1/4; DHH-289-S - Size PSA1/2.



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US Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 2 (TMI-2)
Operating License No. DPR-73
Docket No. 50-320
Licensee Event Report 83-053/099X-1

Attached is updated Licensee Event Report 83-053/099X-1 concerning the failure of seismic snubbers on the decay heat auxiliary spray line. This report was originally submitted on December 22, 1983.

If you have any questions concerning this information, please call Mr. J. J. Byrne of my staff.

Sincerely,

F. R. Standerfer
Vice President/Director, TMI-2

FRS/RDW/jep

Attachments

cc: Regional Administrator - Office of I & E, Dr. T. E. Murley
Program Director - TMI Program Office, Dr. B. J. Snyder
Deputy Program Director - TMI Program Office, Dr. W. D. Travers