

LICENSEE EVENT REPORT

Updated report. Date of
original report 5/10/83.CONTROL BLOCK: ①

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

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| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | | | | | | | | | | | |
| LICENSEE CODE | | | | | | | | | | | | | | | LICENSE NUMBER | | | | | | | | | | LICENSE TYPE | | | | | | | | | | CAT 58 | | | | |

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| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | | | | | | | | | | | |
| REPORT SOURCE | | | | | | | | | | | | | | | DOCKET NUMBER | | | | | | | | | | EVENT DATE | | | | | | | | | | REPORT DATE | | | | |

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES ⑩

⑩ ② During the Unit 2 refueling outage, snubber 52 was replaced with an instrumented
③ mechanical snubber to investigate previous five snubber failures. Snubber 52 (S/N
④ 6991) which had previously passed its functional test, failed during a test required
⑤ to return a snubber to the Storeroom. Four additional snubbers were satisfactorily
⑥ tested to verify that this was an isolated incident. Safety significance is minimal
⑦ because NDE performed on "D" main steam line revealed no abnormalities in the high
⑧ stress weld areas. Similar event reported by R.O. 83-12/01T on Docket 50-237.

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|----------------------|---|--------------|----|---------------|----|-----------------|----|-----------------|----|-------|----|----------------------|----|------------------|----|----------------------|----|------------------------|----|------------|----|-----------------------|----|-----------------|----|-------------|----|--------------|----|----|----|
| 0 | 9 | C | C | 11 | E | 12 | B | 13 | S | U | P | O | R | T | 14 | D | 15 | Z | 16 | 8 | 3 | — | 0 | 2 | 6 | — | 0 | 3 | L | — | 0 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| SYSTEM CODE | | CAUSE CODE | | CAUSE SUBCODE | | COMPONENT CODE | | | | | | | | | | COMP. SUBCODE | | VALVE SUBCODE | | EVENT YEAR | | SEQUENTIAL REPORT NO. | | OCCURRENCE CODE | | REPORT TYPE | | REVISION NO. | | | |
| LER/RO REPORT NUMBER | | ACTION TAKEN | | FUTURE ACTION | | EFFECT ON PLANT | | SHUTDOWN METHOD | | HOURS | | ATTACHMENT SUBMITTED | | NPRD-4 FORM SUB. | | PRIME COMP. SUPPLIER | | COMPONENT MANUFACTURER | | | | | | | | | | | | | |
| ① | | ② | | ③ | | ④ | | ⑤ | | ⑥ | | ⑦ | | ⑧ | | ⑨ | | ⑩ | | | | | | | | | | | | | |

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS ⑳

⑳ ① The cause of snubber failure is not known even though a thorough investigation was
② conducted. However, it was concluded that continued operation is justified. The
③ defective snubbers have been replaced. Surveillances will continue per DTS 020-1
④ and Technical Specification 4.6.I.

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|-------------------------------|---|---------------------------|----|--------------------|----|---------------------|----|-----------------------|----|----|-------------------|----|
| 1 | 5 | H | 28 | 0 | 0 | 0 | 29 | N/A | B | 31 | Surveillance Test | 32 |
| 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| FACILITY STATUS | | % POWER | | OTHER STATUS | | METHOD OF DISCOVERY | | DISCOVERY DESCRIPTION | | | | |
| ACTIVITY CONTENT | | RELEASED OF RELEASE | | AMOUNT OF ACTIVITY | | LOCATION OF RELEASE | | | | | | |
| PERSONNEL EXPOSURES | | NUMBER | | TYPE | | DESCRIPTION | | | | | | |
| PERSONNEL INJURIES | | NUMBER | | DESCRIPTION | | | | | | | | |
| LOSS OF OR DAMAGE TO FACILITY | | TYPE | | DESCRIPTION | | | | | | | | |
| PUBLICATION | | ISSUED | | DESCRIPTION | | | | | | | | |
| NAME OF PREPARER | | Ben Schroeder/R. Mirochna | | PHONE | | (815) 942-2920 x422 | | | | | | |

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ATTACHMENT TO LICENSEE EVENT REPORT 83-26/03X-1
COMMONWEALTH EDISON COMPANY (CWE)
DRESDEN UNIT (ILDRS2)
DOCKET #050-237

This supplemental report concerns the inoperable snubber found during the routine mechanical snubber functional test during the previous Unit 2 refueling outage (January 1983). Main Steam Line (MSL) snubber #52 was identified as being inoperable and/or in questionable condition. Please refer to the initial DVR/LER submittal. (Also refer to supplemental submittal for LER 83-12 for Docket 050-237.)

The Station Nuclear Engineering Department (SNED) performed a comprehensive investigation (assisted by Sargent & Lundy, Pacific Scientific, and Dresden Station) to determine the mode and cause of snubber inoperability. The conclusion of this investigation forms the remainder of this supplemental report.

Conclusion of SNED's report is as follows:

As a result of the Main Steam Line snubber failures on Dresden 2, an intensive effort was initiated to assess the safety significance and to identify the cause of snubber failure. The results of the safety significance assessment would determine whether the safe operation of Dresden Unit 2 had been in jeopardy while operating with the failed snubbers. It would also provide assurance that continued operation of D-3, QC-1, and QC-2 as well as D-2 would not jeopardize plant safety.

Several actions were taken to verify safe plant operation. To begin with additional inspections were performed on Dresden 2 to quantify the extent of damage. Snubbers surveillances were also conducted on D-3, QC-1 and QC-2. No other damage was found on D-2 and no snubber failures were found on the other units.

A variety of operability assessments assuming differing failure configurations and a different SRV opening time were performed. First, these indicated that D-2 was operable while operating with the failed snubbers. Second, considering the results of the different postulated failure conditions analyzed, these operability assessments indicated that the D-2, D-3, QC-1 and QC-2 Main Steam Lines will remain operable even in the event of similar snubber failures. Since no snubber failures were found on the other units, additional D-2 pipe and steel inspections showed no failures, and the results of the operability analyses indicated that the piping was operable; safe operation of the plants was ensured.

This conclusion is reinforced by the existence of the Technical Specification surveillance which originally identified the failures. These requirements delineate an augmented snubber inspection to be performed in the event of snubber failures. The safety significance of operating without knowing the cause of a snubber failure was assessed when these requirements were instituted. Therefore, the Technical Specification escalating surveillance requirements ensure safe operation.

ATTACHMENT TO LICENSEE EVENT REPORT 83-26/03L-0 (Continued)

Concurrent with the above actions a comprehensive investigation was being pursued to determine the cause of snubber failure. All possible evidence concerning the D-2 failures was gathered. As previously stated additional inspections were performed to quantify the extent of the D-2 damage. Snubber autopsies were performed to determine the nature of the snubber failures. Finally, an action plan was pursued which concentrated on items which seemed most likely to have contributed to snubber failures. The areas investigated were:

- 1) Adequacy of snubbers materials
- 2) Vibration
- 3) Overload
- 4) Installation
- 5) Design

The original autopsies indicated that the snubbers had been subjected to an overload condition. The investigation, however, to identify a possible overload condition proved negative. A load high enough to fail the snubbers could not be identified by either in-plant testing or by analysis. The conclusion drawn from the D-2 steel inspection also indicated that a high load did not exist.

The in-plant tests which were performed monitored snubber loads for the highest known load producing transient (the SRV actuation) having occurred while the snubbers were installed. In fact the SRV actuation was determined to be the highest load producing transient of those which could occur to the subject lines. Also the plant startup was monitored to seek out unanticipated transients. As a follow-up, provisions have been made to continuously monitor the remainder of the D-2 operating cycle. (Note: This is already installed and operating.) This will aid in detecting unknown transients causing snubber failure.

A detailed review of the snubber as-built configurations was also done to determine if an installation problem existed. Binding of snubber components had been identified early on as a possible mode contributing to snubber failure. The as-built configuration was modeled with the actual (as determined by field test data) pipe movements input to simulate the field conditions. In no case did binding occur. Therefore, binding was ruled out as a cause of these specific failures.

One of the PSCo (Pacific Scientific Company) field trips revealed that there could be a field installation technique which degrades the snubber. This places the snubber in a condition in which it may lock up. This installation problem has been determined not to be the cause of the extensive snubber damage occurring on D-2. This conclusion is based on two supporting facts.

First, the investigation into the magnitude of thermal loads created due to snubber lock-up have resulted in loads which have been determined not to be severe enough to have caused the additional snubber damage. Second, only

ATTACHMENT TO LICENSEE EVENT REPORT 83-26/03L-0
CONTINUED

four of the five failed snubbers exhibited this installation prompted condition. This area will be pursued further, but considering the above, the results of this action are not significant to this failure investigation.

Since overload was not the cause of failure, a snubber testing program was initiated to delineate the PSA-10 snubber capabilities. It was determined that the snubber performed adequately when subject to a cyclic high magnitude dynamic load. The results did indicate that the snubber performance would be drastically degraded with the snubber subjected to a bending moment. As previously stated, though, binding did not occur on the Dresden 2 snubbers. Therefore, this information is not applicable to this failure investigation.

The failure investigation also included a review of the Main Steam support system design. This included a review of the analyses performed and the assumptions used in performing the analysis. Comparisons of other support system designs for similar piping systems were also performed. The results of these reviews indicated there was no item which would result in the analyses producing loads near the snubber failure point.

Finally, investigations were performed to verify snubber material adequacy and to determine if vibration was degrading the snubber performance. The material investigations were performed considering the extent of snubber damage. The vibration concern was raised because of prior knowledge of Main Steam Line vibration. The results of these efforts indicated that the materials were adequate and that the vibration was not severe enough to affect snubber operation.

In summary, the data is contradictory and, therefore, inconclusive. The snubber autopsies indicate that the snubbers were overloaded. The review of the possible transients and of the analyses, and the results of the inplant testing program and the pipe and steel inspections all indicate that an overload condition did not exist. This would lead to the conclusion that other factors such as component binding must be degrading snubber performance. But, again, the investigations performed have indicated that binding did not occur even with the mismatched components.

No conclusion delineating the cause of snubber failure can be drawn; however continued operation of the plants has been shown to be justified even considering the lack of a definitive cause of snubber failure.



Commonwealth Edison
Dresden Nuclear Power Station
R.R. #1
Morris, Illinois 60450
Telephone 815/942-2920

October 3, 1984

DJS Ltr #84-998

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

Updated Reportable Occurrence Report 83-26/03X-1, Docket #050-237 is being submitted to your office in accordance with Dresden Nuclear Power Station Technical Specification 6.6.B.1.(i), performance of structures, systems, or components that requires remedial action or corrective measures to prevent operation in a manner less conservative than assumed in the accident analyses in the safety analysis report or technical specifications bases; or discovery during plant life of conditions not specifically considered in the safety analysis report or technical specifications that require remedial action or corrective measures to prevent the existence or development of an unsafe condition. This updated report is provided in order to report further investigation regarding the cause of the event and the corrective actions taken.

D.J. Scott
Station Superintendent
Dresden Nuclear Power Station

DJS/kjl

Enclosure

cc: J.G. Keppler, Regional Administrator, Region III
File/NRC
File/Numerical

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SUPPLEMENT TO DVR

| | | | | |
|---------|-----|------|------|------|
| DVR NO. | STA | UNIT | YEAR | NO. |
| D - 12 | - | 2 | - 83 | - 58 |

PART 1 TITLE OF EVENT

OCCURRED

Mechanical Snubber #52 Failed Stroke Test
REASON FOR SUPPLEMENTAL REPORT

| | |
|---------|------|
| 4/12/83 | 1000 |
| DATE | TIME |

To report on the results of an investigation into reasons for the failure of the MSL snubber (#52) detected during the Spring 1983 refuel outage.

PART 2

ACCEPTANCE BY STATION REVIEW

DATE

SUPPLEMENTAL REPORT APPROVED
AND AUTHORIZED FOR DISTRIBUTION

| | | |
|------------------------|-----------------------|---------|
| <i>J. Brunner</i> | <i>John M. Alcorn</i> | |
| 10/4/84 | 10/5/84 | |
| <i>Douglas J. Ivot</i> | | 10/5/84 |
| STATION SUPERINTENDENT | | DATE |

EE 22
1/21