

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Davis-Besse Unit 1

DOCKET NUMBER (2)

0 5 0 0 0 3 4 6

PAGE (3)

1 OF 06

TITLE (4)
VELAN CHECK VALVE ANTIROTATION BINDING

| 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 NAMES |
| 1 | 0 | 2 | 5 | 8 | 4 | 0 | 1 | 5 | |
| 1 | 1 | 2 | 3 | 8 | 4 | | | | |

DOCKET NUMBER(S)

0 5 0 0 0

0 5 0 0 0

OPERATING

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

| POWER LEVEL (10) | 20.402(b) | 20.405(c) | 50.73(a)(2)(iv) | 73.71(b) |
|------------------|-------------------|------------------|---------------------|--------------------------------------------------------------|
| 0.10.10 | 20.405(a)(1)(i) | 50.36(c)(1) | X 50.73(a)(2)(v) | 73.71(a) |
| | 20.405(a)(1)(ii) | 50.36(c)(2) | 50.73(a)(2)(vi) | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| | 20.405(a)(1)(iii) | 50.73(a)(2)(i) | 50.73(a)(2)(vii)(A) | |
| | 20.405(a)(1)(iv) | 50.73(a)(2)(ii) | 50.73(a)(2)(vii)(B) | |
| | 20.405(a)(1)(v) | 50.73(a)(2)(iii) | 50.73(a)(2)(viii) | |

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER |
|-----------------|-------------------------------|
| James W. Marley | AREA CODE 4 1 9 2 5 9 5 0 0 0 |

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPDOS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NPDOS |
|-------|--------|------------|--------------|---------------------|-------|--------|-----------|--------------|---------------------|
| B | B, Q | Ø, Ø, Ø, V | V, Ø, 8, 5 | Y | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

SUPPLEMENTAL REPORT EXPECTED (14)

| YES (If yes, complete EXPECTED SUBMISSION DATE) | NO | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|-------------------------------------------------|----|-------------------------------|-------|-----|------|
| X | | | | | |

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

On October 25, 1984, Davis-Besse Unit 1 was in a refueling outage with fuel removed from the reactor vessel to allow inspection of the reactor internals. High pressure injection valve HP 59 was disassembled and inspected in response to concerns issued in NRC IE Notice 83-06, INPO SER. 20-83 and correspondence with Velan, the valve manufacturer. During inspection of HP 59, it was discovered that the valve disc could be rotated with sufficient force by hand to cause the anti rotation stop on the disc to ride up on the hanger arm anti rotation stop. If the disc were to rotate into this position during normal operation, the valve could be unable to seat properly, allowing some back leakage to occur. The apparent cause of the failure is the design of the valve disc anti rotation stop. The anti rotation mechanism for each of the four HP swing check valves was modified to eliminate the binding concern. Toledo Edison is currently evaluating the status of other Velan Check Valves utilized in the plant to determine the need for additional corrective action. This report is a followup to the 10CFR Part 21 Report NP-43-84-01.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 9/31/85

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|---------------------------------------------|----------------------------------------------|----------------|----------------------|--------------------|----------|----|-----|
| FACILITY NAME (1) Davis-Besse Unit 1 | DOCKET NUMBER (2) 0 5 0 0 0 3 4 6 8 4 | LER NUMBER (6) | | | PAGE (3) | | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | | |
| | | 0 1 5 | — | — | 0 2 | OF | 0 6 |

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

Description of Occurrence: On October 25, 1984, Davis-Besse Unit 1 was in a refueling outage, with its fuel removed from the reactor vessel for inspection of reactor internals. Toledo Edison decided to inspect the high pressure injection swing check valves during the 1984 refueling outage based on concerns in NRC IE Notice 83-06, INPO SER 20-83, and correspondence from Velan, the valve manufacturer. The high pressure injection swing check valves are located off the RCS cold legs and serve as the first isolation boundary between the RCS and the HPI system piping.

On October 25, 1984, Valve HP 59 was disassembled and inspected. The disc in HP 59 was found to be seated properly. However, it was discovered that the disc could be rotated with sufficient force by hand to cause the anti rotation stop on the disc to ride up on the hanger arm stop (See Figure 1). If the disc was to rotate into this position during normal operation, the valve disc should be prevented from properly aligning with the valve seat and some back leakage could occur.

The valve identified with this deficiency is a Velan Model B9-3114B-13WS Serial No. 285, 2½" swing check valve.

HP 58 was disassembled and inspected. The disc in HP 58 was found to be seated properly. Some wear due to contact was observed on the disc & hanger arm stops but not as much as what was observed on HP 59. The disc was rotated by hand and could NOT be forced to bind or "cock."

HP 51 and HP 50 were disassembled and inspected. The discs on HP 51 and HP 50 were found to be seated properly. Small amounts of wear were observed on the disc and hanger arm stops. The amount of wear was much less than observed on HP 58 & HP 59. Attempts to rotate the discs by hand could NOT force the discs to bind or "cock."

Designation of Apparent Cause of Occurrence: The apparent cause of the anti-rotation stop jamming is due to the design of the anti rotation stops. The four HP swing check valve discs were manufactured by casting. The anti rotation stops on the disc were also part of the casting. As a result, the stop tended to be short and rounded. The resulting dimensions of the disc stop allows the disc stop to slide under the hanger arm and to interfere with the hanger stop when flow through the valve causes the disc to rotate. This contact between the disc stop and hanger stop causes wearing of the stop surfaces. After significant wear of the stop surfaces has occurred, the disc stop can be jammed up onto the hanger stop and lock in this position, basically "cocking" the disc. The disc is then unable to seat properly, allowing reverse flow past the valve to occur.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31/85

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|---------------------------------------------|------------------------------------------|----------------|----------------------|--------------------|----------|-----|--------|
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Analysis of Occurrence: All of the four High Pressure Injection valve discs were inspected and found to be seated properly. If the binding which was caused during manipulation of the disc had occurred on the high pressure injection valves during operation, it would not have prevented the High Pressure Injection System from performing its intended function of supplying water to the reactor coolant system. The binding could prevent the disc from seating properly and allow some back leakage to occur. Since at Davis-Besse, a stop check valve and a closed motor operated valve are in series with each high pressure injection swing check valve, leakage through the swing check valve would not affect the operation of the system or result in any over pressurization of the piping.

Corrective Action: HP 59, HP 58, HP 51 & HP 50 were disassembled and a thorough examination of each valve disc internals was completed to evaluate possible disc jamming due to anti rotation stop binding. The examinations were completed under the direction of the valve manufacturer's representative. The decision was made by Toledo Edison to modify each HP swing check disc to improve the anti rotation mechanism. Each valve was modified under FCR 84-113 Rev. A as follows: Each valve disc was rotated 90° to relocate the anti rotation stops on the disc away from the arm stop to prevent any further potential interference. A hole (9/32" dia.) was then drilled into the hanger arm and disc shaft. A locking pin (1/4" dia x 11/16" long) was then inserted into the drilled hole to effectively "lock" the disc to the hanger, thus preventing rotation of the disc with respect to the hanger (see figures 2 and 3).

Each valve disc was lapped and cleaned with emery cloth as required. Each valve disc and hanger were reassembled. A 1/8" dia. cotter pin was used to lock the disc nut in place. The valves were then reassembled.

Toledo Edison is currently evaluating the status of other Velan Check valves utilized in the plant to determine the need for any additional corrective actions.

This report is a follow up to the 10CFR Part 21 Report NP-43-84-01 submitted by Toledo Edison on November 1, 1984 which identified the concern of a potentially generic manufacturing deficiency which could prevent the valve disc in certain Velan swing check valves from seating properly.

Failure Data: There have been no previous similar reported occurrences.

Report No: NP-33-84-16

DVR No(s): 84-167

FIG 1

LER No. 84-015

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ORIGINAL DESIGN

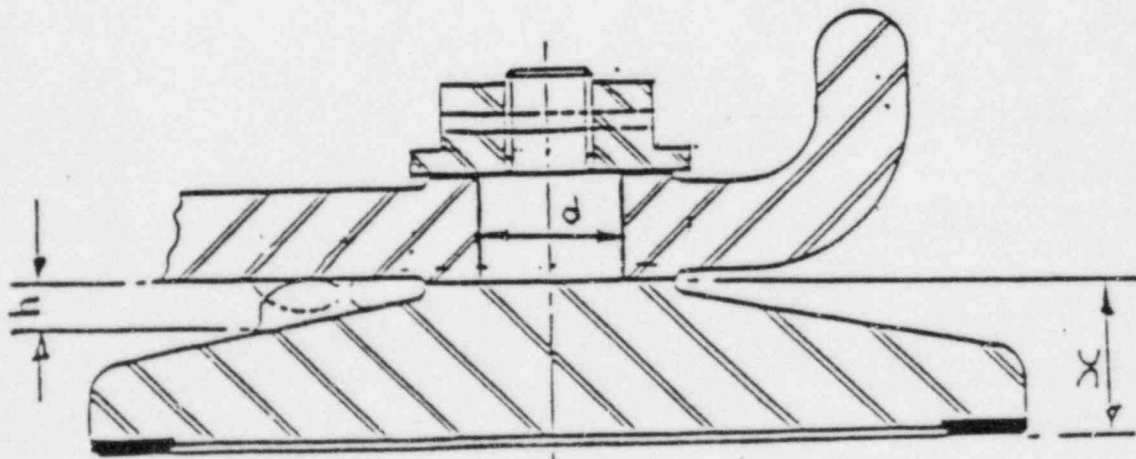
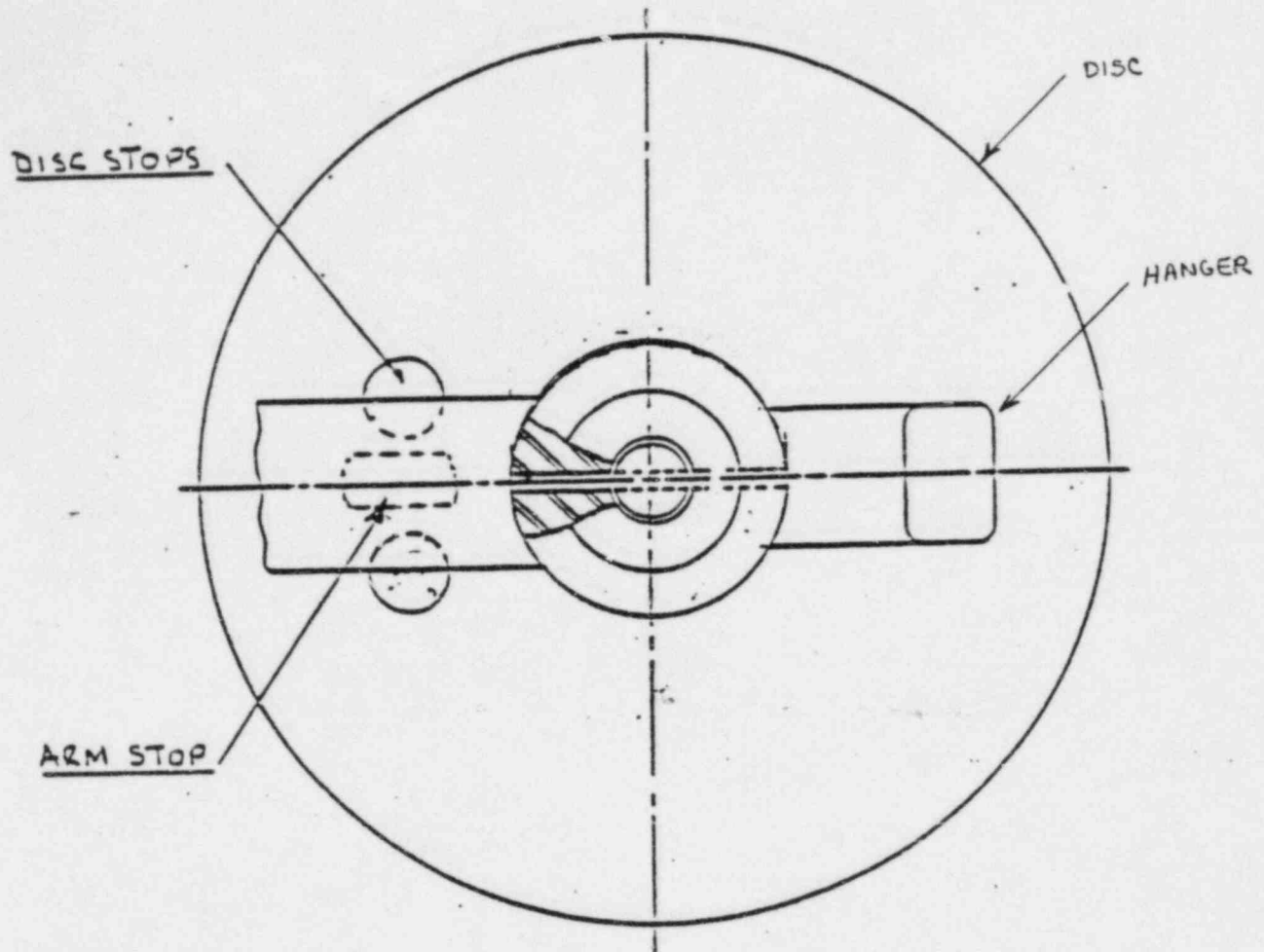


FIG 2
MODIFIED DESIGN

LER NO. 84-015

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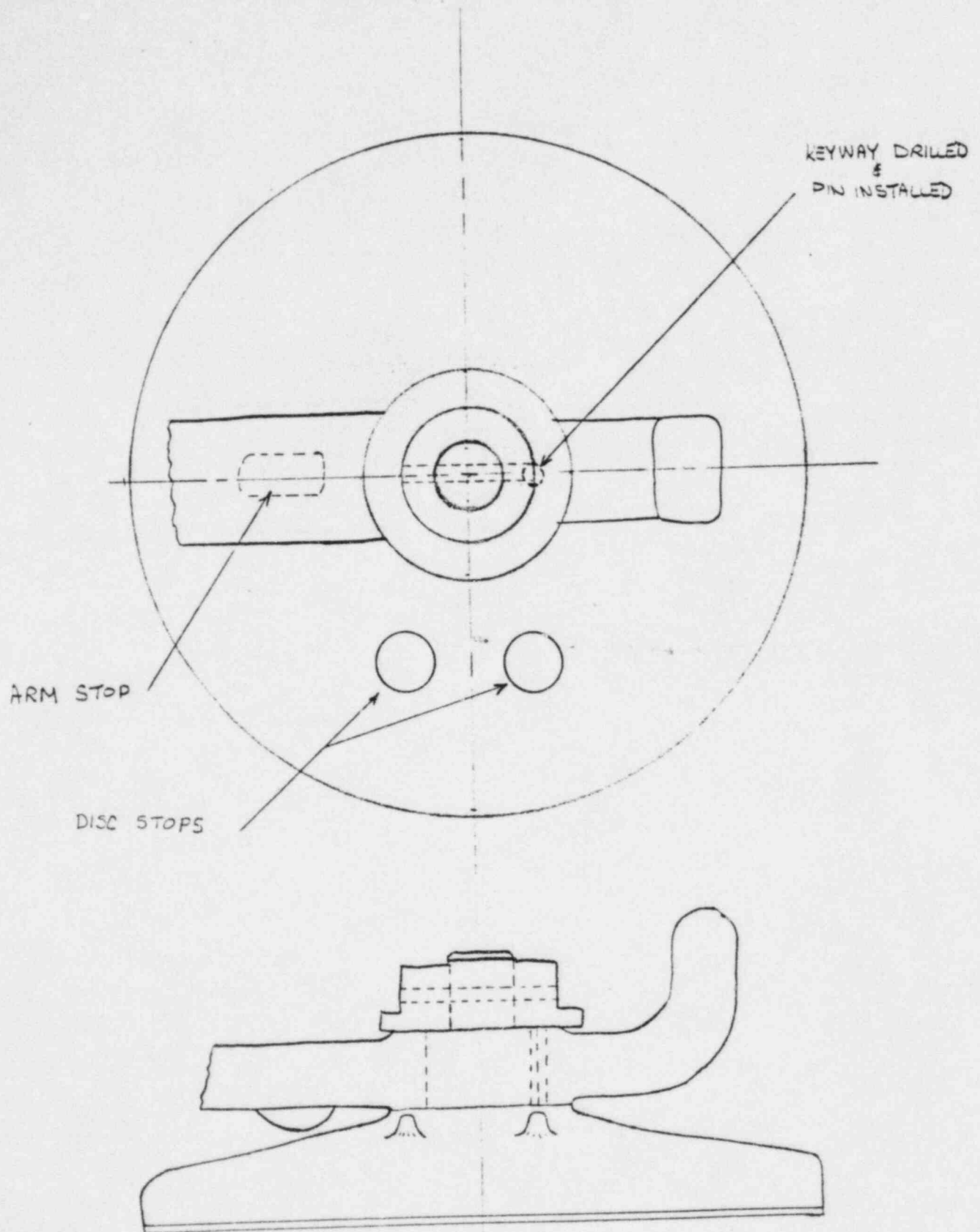
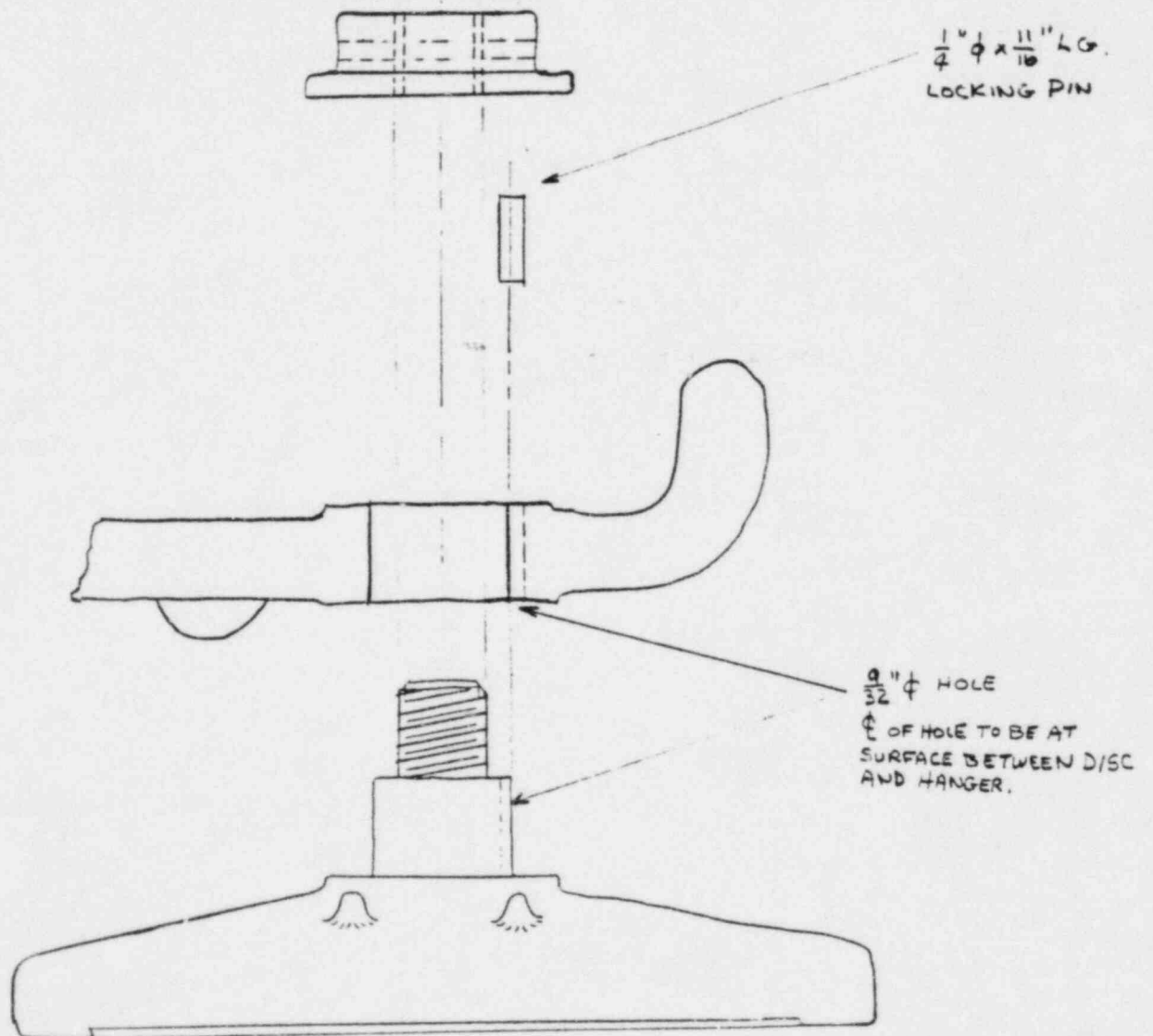


FIG 3
MODIFIED DESIGN

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November 23, 1984

Log No. K84-1368
File: RR 2 (NP-33-84-16)

Docket No. 50-346
License No. NPF-3

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

Gentlemen:

LER No. 84-015
Davis-Besse Nuclear Power Station Unit 1
Date of Occurrence: October 25, 1984

Enclosed is Licensee Event Report LER-015 which is being submitted in accordance with 10CFR50.73, to provide 30 day written notification of the subject occurrence.

Yours truly,

Stephen M. Quennoz
Plant Manager
Davis-Besse Nuclear Power Station

SMQ/bec

Enclosure

cc: Mr. James G. Keppler,
Regional Administrator,
USNRC Region III

Mr. Walt Rogers
DB-1 NRC Resident Inspector

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