

Docket No. 50-346

License No. NPF-3

Serial No. 1-295

September 14, 1982



James G. Keppler
Regional Director, Region III
Office of Inspection and Enforcement
United States Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

This letter is in response to IE Bulletin No. 81-01, dated January 27, 1981, and applicable to the Davis-Besse Nuclear Power Station Unit 1. This letter is also a continuation of the initial response in letter Serial No. 1-189, dated March 6, 1981.

As stated in the March 6 letter, items 1 and 2 under "Actions to be Taken by Licensees of Operating Reactors" are not applicable since there are no International Nuclear Safeguards Corporation (INC) snubbers installed at Davis-Besse 1. In response to item 3 and in accordance with the March 6 letter, the inspection of mechanical snubbers was performed during the recently completed refueling outage.

Inspection and Results

A total of 78 mechanical snubbers, manufactured by Pacific Scientific Co., were inspected under Davis-Besse Test Procedure TP520.40. This total included all installed snubbers on safety related systems.

The inspection procedure covered the visual examination and manual actuation test as described in item 1A of the bulletin. The visual examination identified any defects in the snubbers or hardware (loose bolting, cotter pins, etc.) and also recorded the cold piston setting of all snubbers. To verify proper operation, one end of each snubber was disconnected and stroked by hand over its full range of movement (in both tension and compression). A checklist, attached to the procedure, recorded all the above information plus the snubber location and identification number.

Of the 78 snubbers tested, 9 were identified as nonconforming with respect to test guidelines and required modifications (performed during outage). These 9 cases are described below. Another 9 snubbers required minor maintenance which was also completed during the outage. Of these 9, 7 required replacement of bushings and 2 required cotter pin replacement.

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Nonconforming Installations:

- 1) Snubber ID: M1113/H56
Location: Containment - Reactor Coolant Flow Sensing
Model/Size: Pacific Scientific PSA-1/4 (350#).
Mode of Failure: Snubber locked in "as-found" position.
Cause of Failure: Internal guide rods twisted. This is caused by the rotation of the snubber base relative to the opposite end (installation error).
Corrective Action: Snubber replaced
Effect on Plant/System Safety: This support and adjacent supports were analyzed and found to be within allowable stress values. The piping, however, was found to be overstressed and, therefore, was inspected to detect any plastic deformation of the lines. The inspection included an examination (dye-penetrant test) of the joints of the adjacent fittings, measurements to check the ovality of the piping and a test to verify the straightness of the piping (insure buckling did not occur). Since no defects were found during the inspection, the piping and fittings were found to be acceptable as is.
Operability: Pursuant to the above, the operability of the snubber/support and, likewise, the reactor coolant flow sensing system was unaffected by this failure during normal plant operation.

In the remote event of a seismic occurrence, the snubber, being in the locked position, would have performed its intended design function.
- 2) Snubber ID: M-1113/H61
Location: Containment - Reactor Coolant Flow Sensing
Model/Size: Pacific Scientific PSA-1/4 (350#).
Mode of Failure: Snubber locked in "as-found" position.
Cause of Failure: Rust/corrosion on internal parts prevented rotation and, therefore, linear motion of the snubber. After snubber was broken free, proper movement of the snubber piston was restored.
Corrective Action: Snubber replaced
Effect on Plant/System Safety: Analysis has shown that the piping and piping supports were not overstressed by the rigid condition of the snubber.
Operability: The operability of the reactor coolant flow system was unaffected with this snubber acting as a rigid support. This holds true during both normal operation or during a seismic event.
- 3) Snubber ID: I/F-PSH-RC02B4-H1
Location: Containment - Reactor Coolant Loop Hot Leg/Reactor Protection System
Model/Size: Pacific Scientific PSA-1/4 (350#).
Mode of Failure: Snubber locked in "as-found" position.
Cause of Failure: Internal guide rods twisted. This is caused by the rotation of the snubber base relative to the opposite end (installation error).

Corrective Action: Snubber replaced.

Effect on Plant/System Safety: The evaluation performed on this system revealed no overstressing in any support members but did show one point on the piping from the reactor coolant hot leg to the second isolation valve to be overstressed. An inspection, identical to that for item 1, was performed and resulted in the acceptance of the piping and fittings "as is".

Operability: The operability of the reactor coolant loop hot leg-reactor protection system was unaffected with this snubber acting as a rigid support. This holds true during both normal operation or during a seismic event.

4) Snubber ID: M1113/H58

Location: Containment - Reactor Coolant Flow Sensing

Model/Size: Pacific Scientific PSA-1/4 (350#).

Mode of Failure: The "as-found" cold piston setting of 2 5/8" was out of the specified tolerance of 3 5/16" min. to 3 1/2" max.

Cause of Failure: The piston setting for this snubber was not in accordance with the specified setting tolerance due, apparently, to the following:

- 1) Modifications. When minor system modifications (add valve, change support member) were performed prior to and after startup, a complete reanalysis of the system piping was not always performed. The modification could easily change the required snubber setting, but the snubber was never modified. Since the issue of the piston setting tolerance drawing (issued in 1980), the control of the snubber settings is enhanced. Also, now modifications to the system are followed up by a reanalysis to insure snubber piston settings are correct.
- 2) Design/Installation. During the initial design of the snubber systems (snubber, transition kits, etc.), the pin-to-pin dimensions were specified and the snubbers installed in the field accordingly. Since there was no way to verify the installed piston setting (until drawing was issued in 1980), the snubbers remained set "as installed". Any miscalculations in pin-to-pin dimensions, discrepancies in the various transition parts, or small alignment errors on the installation of the structural support members could affect the snubber setting.

Corrective Action: A 3/4" thick plate was added to the hanger to lengthen the pin-to-pin dimension on the snubber assembly placing the cold piston setting within the specified range.

Effect on Plant/System Safety: The piping and piping supports were analyzed and found to be within allowable stress levels. The safety of the reactor coolant flow sensing system and the balance of the plant was not degraded by this nonconforming snubber setting.

Operability: The operability of the piping and piping supports on the reactor coolant flow sensing line was unaffected by this nonconformance.

- 5) Snubber ID: EBB-5-19-H10
Location: Containment - Steam Generator Sample Line
Model/Size: Pacific Scientific PSA-1/4 (350#).
Mode of Failure: The "as-found" cold piston setting of 3 1/2" was out of the specified tolerance of 1/2" min. to 3 3/16" max.
Cause of Failure: The piston setting for this snubber was not in accordance with the specified setting tolerance. Reference discussion under item 4.
Corrective Action: A 3/4" thick plate was added between the snubber rear bracket and the structural support to shorten the pin-to-pin dimension on the snubber assembly placing the cold piston setting within the specified range.
Effect on Plant/System Safety: The piping and piping supports were analyzed and found to be within allowable stress levels. The safety of the steam generator sample system and the balance of the plant was not degraded by this nonconforming snubber setting.
Operability: The operability of the piping and piping supports on the steam generator sample line was unaffected by this non-conformance.
- 6) Snubber ID: I/F-PT-RC2A1-H2
Location: Containment - Reactor Coolant Loop Hot Leg/Reactor Protection System
Model/Size: Pacific Scientific PSA-1/4 (350#).
Mode of Failure: The "as found" cold piston setting of 0" was out of the specified tolerance of 1/2" min. to 3 5/16" max.
Cause of Failure: The piston setting for this snubber was not in accordance with the specified setting tolerance. Reference discussion under item 4.
Corrective Action: The extension pipe of the snubber transition assembly was removed, shortened by 2" and reinstalled. This modification placed the cold piston setting within the specified range.
Effect on Plant/System Safety: The piping and piping supports were analyzed and found to be within allowable stress levels. The safety of reactor coolant loop hot leg-reactor protection system and the balance of the plant was not degraded by this nonconforming snubber setting.
Operability: The operability of the piping and piping supports on the reactor coolant loop hot leg-reactor protection system line was unaffected by this nonconformance.
- 7) Snubber ID: I/F-FP-RC01A-R4
Location: Containment - Reactor Coolant Loop Hot Leg Flow/Reactor Protection System
Model/Size: Pacific Scientific PSA-1/4 (350#).
Mode of Failure: The "as-found" cold piston setting of 0" was out of the specified tolerance of 1/2" min. to 1 1/4" max.
Cause of Failure: The piston setting for this snubber was not in accordance with the specified setting tolerance. Reference discussion under item 4.

Corrective Action: The extension pipe of the snubber transition assembly was removed, shortened by 7/8" and reinstalled. This modification placed the cold piston setting within the specified range.

Effect on Plant/System Safety: The piping and piping supports were analyzed with the snubber in the "as-found" condition and were verified to be within allowable stress levels. The safety of the reactor coolant loop hot leg flow-reactor protection system and the balance of the plant was not degraded by this nonconforming snubber setting.

Operability: The operability of the piping and piping supports on the reactor coolant loop hot leg flow-reactor protection system line was unaffected by this nonconformance.

8) Snubber ID: I/F-FP-RC01A-R5

Location: Containment - Reactor Coolant Loop Hot Leg Flow/Reactor Protection System

Model/Size: Pacific Scientific PSA-1/4 (350#).

Mode of Failure: The "as-found" cold piston setting of .1" was out of the specified tolerance of 3/4" min. to 3 1/2" max.

Cause of Failure: The piston setting for this snubber was not in accordance with the specified setting tolerance. Reference discussion under item 4.

Corrective Action: The extension pipe of the snubber transition assembly was removed and replaced with a pipe 7/8" longer which placed the cold piston setting within the specified range.

Effect on Plant/System Safety: The piping and supports were analyzed and found to be within allowable stress levels. The safety of the reactor coolant loop hot leg flow-reactor protection system and the balance of the plant was not degraded by this nonconforming snubber setting.

Operability: The operability of the piping and piping supports on the reactor coolant loop hot leg flow-reactor protection system line was unaffected by this nonconformance.

9) Snubber ID: I/F-LT-SP9A1-A5-H6

Location: Containment - Steam Generator 2 Level Indication

Model/Size: Pacific Scientific PSA-1/4 (350#).

Mode of Failure: The "as-found" cold piston setting of 5/8" was out of the specified tolerance of 2 1/4" min. to 3 1/2" max.

Cause of Failure: The piston setting for this snubber was not in accordance with the specified setting tolerance. Reference discussion under item 4.

Corrective Action: The snubber transition tube assembly (pipe and adapters) was removed completely and replaced with a forward bracket. The rear bracket was detached and shimmed with steel channel. This modification placed the cold piston setting within the specified range.

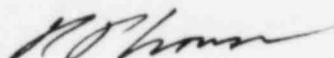
Effect on Plant/System Safety: The piping and supports were analyzed and found to be within allowable stress levels. The safety of the steam generator 2 level indication system and the balance of the plant was not degraded by this nonconforming snubber setting.

Operability: The operability of the piping and piping supports on the steam generator two-level indication line was unaffected by this nonconformance.

Summary/Conclusion

The inspection performed for IE Bulletin No. 81-01, Surveillance of Mechanical Snubbers, revealed nine (9) nonconformances out of the 78 snubbers installed at Davis-Besse 1. Modifications to the nonconforming snubbers were engineered and implemented prior to the completion of the 1982 refueling outage. The associated piping and piping supports were analyzed with the snubbers in the "As-found" condition and were found to have no adverse affect on the safety or operability of the specific systems or any other nuclear safety related system.

Very truly yours,

A handwritten signature in cursive script, appearing to read "M. J. ...".

RPC/JKW/SJO

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The following list specifies the sizes for the mechanical snubbers installed at Davis-Besse 1. These snubbers were all manufactured by Pacific Scientific Co.

MECHANICAL SNUBBER LIST

<u>SNUBBER ID</u>	<u>SIZE</u>	<u>SNUBBER ID</u>	<u>SIZE</u>
FSK-M-CCA-2-1-H1	-- PSA-1/4	FSK-M-EBB-5-13-H2	-- PSA-1/4
FSK-M-CCA-2-1-H4	-- PSA-1/4	FSK-M-EBB-5-14-H1	-- PSA-1/4
FSK-M-CCA-6-2-H1	-- PSA-1/4	FSK-M-EBB-5-14-H2	-- PSA-1/4
FSK-M-CCA-18-1-H2	-- PSA-1/4	FSK-M-EBB-5-15-H6	-- PSA-1/4
FSK-M-CCA-20-1-H1	-- PSA-1	FSK-M-EBB-5-15-H9	-- PSA-1/4
FSK-M-CCA-20-1-H3	-- PSA-1	FSK-M-EBB-5-15-H10	-- PSA-1/4
FSK-M-CCA-20-1-H5	-- PSA-1	FSK-M-EBB-5-16-H9	-- PSA-1/4
FSK-M-CCA-20-2-H1	-- PSA-1	FSK-M-EBB-5-17-H1	-- PSA-1/4
FSK-M-CCA-20-2-H4	-- PSA-1	FSK-M-EBB-5-17-H9	-- PSA-1/4
FSK-M-CCA-20-2-H6	-- PSA-1	FSK-M-EBB-5-17-H11	-- PSA-1/4
		FSK-M-EBB-5-19-H1	-- PSA-1/4
FSK-M-CCA(28ID)-3-H1	-- PSA-1/4	FSK-M-EBB-5-19-H4	-- PSA-1/2
FSK-M-CCA(28ID)-3-H3	-- PSA-1/4	FSK-M-EBB-5-19-H5	-- PSA-1/2
FSK-M-CCA(28ID)-4-H1	-- PSA-1/4	FSK-M-EBB-5-19-H10	-- PSA-1/4
FSK-M-CCA(28ID)-4-H3	-- PSA-1/4		
		FSK-M-RCB-38-4-H4	-- PSA-1/4
FSK-M-CCA(36ID)-2-H1	-- PSA-1/4	I/F-FP-RC01A-R4	-- PSA-1/4
FSK-M-CCA(36ID)-3-H1	-- PSA-1/4	I/F-FP-RC01A-R5	-- PSA-1/4
		I/F-FP-RC01B-R1	-- PSA-1/4
FSK-M-CCB-8-8-H1	-- PSA-1/4	I/F-FP-RC01A-H3	-- PSA-1/4
FSK-M-CCB-8-8-H2	-- PSA-1/4		
FSK-M-CCB-8-12-H18	-- PSA-1/4	I/F-LT-SP9A1-A5-H4	-- PSA-1/4
FSK-M-CCB-8-12-H20	-- PSA-1/4		
FSK-M-CCB-8-15-H1	-- PSA-1/4	I/F-LT-SP9A1-A5-H6	-- PSA-1/4
FSK-M-CCB-8-15-H2	-- PSA-1/4		
FSK-M-CCB-8-22-H3	-- PSA-1/4	I/F-PSH-RC02B4-F1	-- PSA-1/4
FSK-M-EBB-5-1-H1	-- PSA-1		
FSK-M-EBB-5-2-H3	-- PSA-1	I/F-PT-RC2A1-H2	-- PSA-1/4
FSK-M-EBB-5-3-H2	-- PSA-1/4	I/F-PT-RC2B1-H2	-- PSA-1/4
FSK-M-EBB-5-4-H2	-- PSA-1/2	I/F-PT-RC2AS-H1	-- PSA-1/4
FSK-M-EBB-5-5-H1	-- PSA-1/4		
FSK-M-EBB-5-5-H2	-- PSA-1/4	I/F-SB-SP9A3-A4-H3	-- PSA-1/4
FSK-M-EBB-5-5-H4	-- PSA-1/4		
FSK-M-EBB-5-5-H5	-- PSA-1/4		
FSK-M-EBB-5-6-H1	-- PSA-1/4		
FSK-M-EBB-5-6-H2	-- PSA-1/4	3A-EBD-19-H58	-- PSA-1/4
FSK-M-EBB-5-7-H3	-- PSA-1/4		
FSK-M-EBB-5-7-H4	-- PSA-1/2		
FSK-M-EBB-5-8-H11	-- PSA-1/4		
FSK-M-EBB-5-8-H12	-- PSA-1/4	M-1113/H54	-- PSA-1/4
FSK-M-EBB-5-9-H1	-- PSA-1	M-1113/H55	-- PSA-1/4
FSK-M-EBB-5-10-H2	-- PSA-1/4	M-1113/H56	-- PSA-1/4
FSK-M-EBB-5-11-H1	-- PSA-3	M-1113/H58	-- PSA-1/4
FSK-M-EBB-5-11-H2	-- PSA-3	M-1113/H59	-- PSA-1/4
FSK-M-EBB-5-12-H2	-- PSA-1/4	M-1113/H60	-- PSA-1/4
FSK-M-EBB-5-12-H4	-- PSA-1/4	M-1113/H61	-- PSA-1/4
FSK-M-EBB-5-13-H1	-- PSA-1/4		