



November 5, 1996

Attn: Document Control Desk

U.S. Nuclear Regulatory Commission
Washington, DC 20555

Reference: **Event # 31089 10/3/96**

In accordance with 10CFR 21 - Reporting of Defects and Noncompliance the following report is submitted by:

Pacific Scientific
HTL / Kin-Tech Division
22715 Savi Ranch Parkway
Yorba Linda, CA 92887-4609

Steve Kahm
Director of Quality Control

The defective part is an Inner Thrust Bearing 1801461-01 used in a PSA 35 Mechanical Shock Arrestor 1801112-** manufactured by Pacific Scientific. The Mechanical Shock Arrestor (snubber) is used as a restraint on piping systems for a Nuclear Generating Plant.

The defective Inner Thrust Bearing was supplied by :

Markall
3207 W. Pendleton Ave
Santa Ana, CA 92704

PSA 35, Cracked Inner Thrust Bearings - P/N 1801461-01 :
Cracks were found in a PSA 35 Snubber Inner Thrust Bearings - 1801461-01. This indicated a breakdown in the NDT check in manufacturing this part.

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A snubber acts like a rigid strut when activated and limits the piping movement to $\pm .060$ inches between 3 to 33Hz at full rated load. The worst case failure mode is for the cracked Inner Thrust Bearing to disintegrate or distort under load during a seismic event and cause the snubber to become a rigid strut. The failed snubber would protect the piping system. But the piping system would be under stress when the plant returned to a shut down condition. The snubber would not be able to telescope and allow the pipe to return to the cold set position but remain in the hot set position.

The following are the dates for this event:

10/1/96 Trouble and Failure Report (TFR) was written up on the defective 1801461-01 Thrust Bearing.
10/3/96 Called NRC OPERATION CENTER 301 816-5100
Mr. Doug Weaver assigned an **Event # 31089**.

The defective Inner Thrust bearings has been isolated to three nuclear plants. Attached is a location of the plants to which PSA 35 snubbers were supplied with potential defective thrust bearings. The USA plants are returning their snubbers for inspection, thrust bearing replacement and test. We are still working out the return of the snubbers shipped to Wolsong 3 in Korea.

The NDT acceptance after heat treat should have rejected the cracked parts. This necessitated a review of the approved vendors NDT procedures and personnel. On 10/8/96 Pacific Scientific surveyed the NDT vendor and reviewed their NDT program and tested their present NDT personnel and found their program acceptable. The individual who accepted the bad lot of parts had been fired before our visit.

Internal Purchasing and Assembly Outline Procedures will be changed to requiring an additional in-house NDT for parts in question. In addition an assembly visual check of the thrust bearings inspection point for the PSA 35 and PSA 100 mechanical shock arrestor assemblies will be added. Expect this procedural changes to be completed 11/14/96.

Assembled a PSA 35 with a defective thrust bearing and was successfully tested at different frequencies for a total of 5000 full rated load life cycle. Under these extreme conditions the test unit demonstrated that the snubber still met Design Specification requirements even with a defective thrust bearing. Most snubbers when removed during an outage should normally not see at most 5-10 full rated load cycles. A PSA 35 snubber with a defective thrust bearing is considered operable for a single outage. Recommend that units with a potential defective thrust bearing be returned for examination. But if the unit was installed we recommend that it be removed at the next outage and sent back to the factory for examination.

The lot of defective parts have been located and isolated to only three customers. The two USA plants snubbers were not installed and the units are being returned to Pacific Scientific. For the Korean Wolsong 3 plant we are still working out a replacement schedule.

A final report will be completed by November 30, 1996 for submittal.

Regards,



Steve Kahm
Quality Assurance Director
HTL / Kin-Tech Division

**LISTING OF UTILITIES WHO HAVE BEEN SHIPPED UNITS
WITH SUSPECT 1801461-01 THRUST BEARINGS**

C of C	DATE	P/N	CUSTOMER	ANC	QTY	PSA 35 S/N	COMMENTS
3396	12/21/95	1801126-05	GEORGIA POWER Vogtle Nuclear Generating St	443981	2	533 35L	Faxed letter of Notification UNITS BEING RETURNED TO PSCO
3397	1/11/96					534 35L	
3401	1/25/96	1801112-13	CLEVELAND ELECTRIC Perry Nuclear Power Plant	444738	2	13171-13172	Faxed letter of Notification UNITS BEING RETURNED TO PSCO
3413	3/19/96	1801112-	KOREA ELECTRIC COMPA Wolsong 3	443362	9	13173-13181	Faxed letter of Notification WAREHOUSED / NOT INSTALLED WORKING WITH UTILITY ON REPLACEMENT SCHEDULE