DMB

Consumers Power Company

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0550

May 4, 1984

83-11 #3

Mr J G Keppler, Regional Administrator
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

MIDLAND ENERGY CENTER PROJECT
DOCKET NOS 50-329 AND 50-330
POTENTIAL DEFECTS IN MECHANICAL SHOCK ARRESTORS
FILE: 0.4.9.83 SERIAL: 30268

Reference: J W Cook letter to J G Keppler, same subject:

1) Serial 26651, dated January 6, 1984
2) Serial 28041, dated March 16, 1984

This letter, as were the referenced letters, is an interim 10CFR50.55(e) report concerning defective capstan springs in Pacific Scientific mechanical shock arrestors. The attachment to this letter describes the investigation of this concern and the corrective action taking place.

All suspected capstan springs are being inspected to determine whether cracks exist. A final decision on 10CFR50.55(e) reportability will be made when inspections have been completed.

Another report, either interim or final, will be sent on or before July 27, 1984.

James W. Cook

JWC/AHB/cd

Attachments: 1) MCAR 75, Interim Report 3, dated April 17, 1984

CC Document Control Desk, NRC
Washington, DC

RJCook, NRC Resident Inspector
Midland Nuclear Plant

DSHood, USNRC Office of NRR

INPO Records Center

OC0584-0002A-MP01

MAY 9 1984

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Bechtel Associates Professional Corporation

14821

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SUBJECT: MCAR 75

Potential Defects in Mechanical Shock Arrestor Models PSA-1 and PSA-3

INTERIM REPORT 3

DATE: April 17, 1984

PROJECT: Consumers Power Company
Midland Plant Units 1 and 2
Bechtel Job 7220

Introduction

This report addresses potentially defective capstan springs in Pacific Scientific Company (PSA) shock arrestors supplied to the Midland project. This has been identified as a 10 CFR 21 condition by Pacific Scientific.

Description of Concern

Attachment 1 identifies certain Pacific Scientific Company mechanical shock arrestor Models PSA-1 and PSA-3 furnished to the Midland project by ITT Grinnell Corporation that may have cracked capstan springs. The suspect capstan springs were supplied to Pacific Scientific by one of two spring manufacturers. ITT Grinnell has identified 283 shock arrestors furnished to Midland that contain suspect springs.

Summary of Investigation and Historical Background

Pacific Scientific Company has investigated the subject deficiency and concluded that springs with possible cracks are limited to those supplied by one spring manufacturer. ITT Grinnell has identified those snubbers furnished to the Midland project that contain the suspect springs. Subsequently, PSA and ITT Grinnell have recommended that additional inspection/testing of suspect snubbers be performed. This is further addressed under the Corrective Action section of this report.

Analysis of Safety Implication

The possibility exists that cracks in the capstan springs could result in spring failure during dynamic loading, thereby potentially affecting the ability of the component to perform its intended safety function.

Root Cause

As discussed in Attachment 2, the root cause of this problem has been traced to one of Pacific's subsuppliers and the manufacturing process the subsupplier used. The suspect process was as follows:

a. Cold draw round bar into rectangular form

b. Age harden the rectangular wire

c. Coil wire into a spring shape

d. Stress relieve

e. Nondestructive examination

f. Silver plate

A metallurgical evaluation concluded that the microcracks were caused by formation of spring tang after age hardening at 900F followed by silver plating.

Corrective Action

1. Field engineering has identified suspect piping shock arrestors on Nonconformance Report (NCR) C-00949 issued December 13, 1983. ITT Grinnell was the sole supplier for Midland of snubbers (for piping) containing suspect capstan springs. A review is being performed to determine that no other disciplines/areas on the Midland project have similar concerns. Any deficiencies found will be documented on a NCR. This review will be completed by June 25, 1984.

2. All suspect shock arrestor capstan springs will be inspected for cracks; all defective capstan springs will be replaced. This activity will be completed before fuel load, and will be tracked via NCR C-00949 (or any additional NCRs resulting from Item 1 above).

3. Corrective actions taken by Pacific to preclude recurrence were to revise the manufacturing process and add further inspection requirements. The process now followed is:

   a. Cold draw round bar into rectangular form

   b. Normalize the material

c. Coil wire into a spring shape

d. Age harden

e. Stress relieve

f. Nondestructive examination

g. Silver plate

h. Nondestructive examination

Reportability

Based on the safety implications, this deficiency was reported to the NRC as potentially reportable in accordance with Title 10 of the Code of Federal Regulations, Part 50.55(e) on December 7, 1983.

Submitted by: _____
E.B. Poser
Project Engineering Manager

Approved by: _____
B.R. Klein
Plant Design Chief Engineer

Approved by: _____
E.H. Smith
Engineering Manager

Concurrence by: _____
for M.A. Dietrich
Project Quality Assurance Engineer

RFT/MS/rar*(PD)

Attachments: 1. ITT Grinnell letter to Bechtel, 10/5/83 (Com 131017)
2. ITT Grinnell letter to Bechtel, 3/6/84 (Com 144941)

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ATTACHMENT 1

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ITT Grinnell Corporation
Executive Offices
260 West Exchange Street
Providence, Rhode Island 02901
(401) 831-7000

8003140031

October 5, '83

Bechtel Associates Professional Corp.
P.O. Box 100
Ann Arbor, MI 48106

Attn: Mr. E. M. Hughes - Project Engineer

Re: MIDLAND PLANT - UNITS 1 & 2
P.O. No. 7220-M-106-AC

Subject: Pacific Scientific Mechanical Shock Arrestors
Model PSA-1 and PSA-3
Capstan Spring Potential Quality Problem

Gentlemen:

Attached please find a copy of Pacific Scientific's letter to us dated 9-21-83 (Attachment I) which identifies a potential quality problem with Size 1 and 3 Mechanical Shock Arrestor Capstan Springs. The scope of the problem is identified on Page 4 of 5 of the attached report, and the arrestors supplied to ITT Grinnell are summarized on Page 5 of 5.

A review of our records indicates that the mechanical shock arrestors - as listed on Attachment II - have been supplied on the subject contract by ITT Grinnell. We are confident that Attachment II represents a complete listing of the arrestors supplied to your project, since of the (2,888) arrestors supplied to ITT Grinnell, all but (70) units (19 Size #1 and 51 Size #3) have been identified to a specific customer shipment. Any additional arrestors supplied to your project will be identified to your attention as soon as possible.

As a valued customer of ours, we are bringing this information to your attention for appropriate action. We recommend that you contact the following - directly - to resolve this problem:

Mr. Paul A. Hadnagy - Director Technical Operations
or
Mr. Peter M. Zatezalo - Director of Marketing

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Pacific Scientific Co.
1346 S. State College Blvd.
Anaheim, CA 92803
Tel. No. (714) 774-5217

It is our position that all charges for this effort are to Pacific Scientific's account.

Please let us know if you require any additional information.

Very truly yours,

ITT GRINNELL CORPORATION

N. A. DeCRISTOFARO
Project Manager

NAD/m (Att.)
cc's w/Att. R. Kon - Prov.
F. Shepard - Bechtel/Ann Arbor
D. Sewell - Warren
B. Kelly - Prov.
P. Zatezalo - P.S. Co.
P. Hadnagy - P.S. Co.

Kin-Tech Division

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PACIFIC SCIENTIFIC

21 September 1983

cc: D. CHARTRAU
D. SEWELL
B. KELLY

ITT Grinnell
621 Dana Street N.E.
Warren, Ohio 44481

Attention: Mr. T. Lauka

Subject: Pacific Scientific Mechanical Shock Arrestors
Model PSA-1 and PSA-3

Reference: Service Report No. SR83-01

Gentlemen:

The attached report discusses potential problems with certain serial number PSA-1 and PSA-3 snubbers. Our records indicate that the units shown on Attachment A are in the affected group and were delivered to you.

At your convenience, please return these snubbers to us for inspection and repair as necessary. If the snubbers are still in warranty (one year warranty if shipped prior to 1 April 1983 and five year warranty if shipped on or after 1 April 1983), this will be done at no charge to you--excluding freight. Should the units be beyond the warranty period, there will be a $100.00 per unit charge, also excluding freight.

All affected snubbers will be returned to you within 30 days after we receive them.

The foregoing will apply to snubbers returned to us through 31 December 1984.

We apologize for any inconvenience this may cause you.

Very truly yours,

P. A. Hadnagy
Director Technical Operations

PAH:sf

Enclosure

ATTACHMENT I

1346 S. State College Boulevard, Anaheim, California 92803 (714) 774-5217, TELEX 65-5421

PG 1 OF 5

0003106

SHOCK ARRESTOR CAPSTAN SPRING SERVICE REPORT

During testing of Pacific Scientific Company's PSA-1 Shock Arrestors, part number 1801102-05, at Union Electric Callaway Station by Daniel International personnel, 4 of 7 snubbers tested revealed a broken capstan spring tang.

Pacific Scientific Company requested failed springs for independent metallurgical examination. Failed components were returned to Pacific Scientific Company who forwarded broken springs to "Mettek", 1805 E. Carnegie, Santa Ana, CA 92705, (714) 549-1083, for metallurgical and fracture analysis.

One spring exhibiting a visual crack in one tang (removed from snubber S/N 21524 which was returned by Union Electric) was installed by Pacific Scientific Co. into a snubber and subjected to a full load (1500 lbs.) acceleration test. This test was repeated 5 times (10 full load cycles) with no failures. The cracked spring was then subjected to a dynamic load cycling test. This test cycles the snubber at 3 Hertz intervals from 3 to 33 Hertz for 10 seconds at each interval at 100%, 75% and 50% rated loads, a total of 5940 cycles. The cracked spring satisfactorily passed this test.

0 0 0 0 3 1 0 7

Springs from the identical lot as those that failed were traced to snubbers located at Kansas Gas & Electric Co. Wolf Creek Station. These were returned to Pacific Scientific for testing and evaluation.

Eleven (11) each 1801102-05 PSA-1 Shock Arrestors returned to Pacific Scientific Co. by Kansas Gas & Electric Co. Wolf Creek Station were visually and functionally tested by Pacific Scientific Co. personnel in the presence of KG&E and Union Electric Co. personnel.

All eleven PSA-1 Shock Arrestors (S/Ns 21511 thru 21521) were disassembled to a level permitting verification that the capstan spring was properly installed and whole. The Shock Arrestors were reassembled and subjected to a successful acceleration test at full rated load (1500 lbs.).

Following successful acceleration test, all eleven Shock Arrestors were disassembled to facilitate visual and non-destructive examination of the capstan springs:

S/N 21511 - No apparent visual defects. Magnetic particle non-destructive examination revealed indications in both spring tangs with one tang exhibiting three separate indications. Indications were suspected to be micro cracks.

SHOCK ARRESTOR CAPSTAN SPRING SERVICE REPORT - (Cont'd.)

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S/N 21512 - No apparent visual defects. Magnetic particle examination exhibited an indication of one micro crack on one tang.

S/N 21513 - No apparent visual defects. No magnetic particle examination indications.

S/N 21514 - No apparent visual defects. No magnetic particle examination indications.

S/N 21515 - No apparent visual defects. Both tangs exhibited a magnetic particle micro crack indication.

S/N 21516 - No apparent visual defects. No magnetic particle examination indications.

S/N 21517 - No apparent visual defects. No magnetic particle examination indications.

S/N 21518 - No apparent visual defects. Both tangs exhibited a magnetic particle micro crack indication.

S/N 21519 - No apparent visual defects. Both tangs exhibited a magnetic particle micro crack indication.

S/N 21520 - No apparent visual defects. One tang exhibited a magnetic particle micro crack indication.

S/N 21521 - No apparent visual defects. One tang exhibited a magnetic particle micro crack indication.

Five (5) capstan springs exhibiting non-destructive magnetic particle examination indications were assembled into a test snubber and subjected to a dynamic load of 1500 lbs. at frequencies of 3 to 33 Hertz intervals for 10 seconds each at 100%, 75% and 50% of rated load.

The springs tested represented the "worst case" as determined by the non-destructive magnetic particle inspection. They were S/Ns 21511, 21515, 21518, 21519 and 21520.

Springs, S/Ns 21515 and 21518, survived the entire test (5940 cycles). Spring, S/N 21511, survived 533 full load cycles before both tangs failed. S/N 21518 survived 1800 full load cycles before one tang failed, and S/N 21520 survived 1850 full load cycles before one tang failed.

Metallurgical report by Mettek Material Engineering Technology Laboratories indicates spring cracking occurred because of stresses induced during spring forming which caused hydrogen cracking during subsequent silver plating.

SHOCK ARRESTOR CAPSTAN SPRING SERVICE REPORT - (Cont'd.)

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Metallurgical report also explains that, although the spring fracture face exhibited brittleness at the crack onset, the core of the spring was ductile and spring fracture was simple dimple (ductile) rupture. This accounts for the ability of the springs to withstand the full load functional and dynamic load testing conducted and suggests that the useful life of springs which contain cracks remains to be substantial.

The capstan springs are manufactured for Pacific Scientific Co. by a spring manufacturer. These springs are supplied formed, stress relieved and 100% magnetic particle inspected to Pacific Scientific Co., who then subcontracts the springs for silver plating. Pacific Scientific Co. part numbers for the capstan springs are as follows:

PSA-1 (1801613)

PSA-3 (1801614)

Pacific Scientific is effecting corrective action with the spring manufacturer, the nature of which is not yet fully established.

Recommendations

At your earliest convenience, return the affected snubbers to Pacific Scientific for inspection.

Inspection will include removal of spring to facilitate examination for tang cracks by use of magnetic particle or liquid penetrant non-destructive examination.

Urgency of inspection is to be assessed by individual owners based on snubber system application and analysis of results of tests conducted on failed snubbers and reported herein.

Affected Serial Numbers

PSA-1 Pacific Scientific Part No. 1801102-05

S/Ns 15672 thru 16921
16526 " 16662
18211 thru 21160
21411 thru 22060
22311 thru 22710
22711 " 22860

PSA-3 Pacific Scientific Part No. 1801106-05

S/Ns 21311 thru 21610
24311 thru 25310
25361 thru 25960
27194 thru 28543
20302 " 20395
20551 " 20636
20398 " 20400
20637
20700

20851 THRU 20869
20870 " 20955

LONG STROKES -07

506 THRU 510
486 " 487

ATTACHMENT A

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1) **Model Number PSA-1**
Part Number 1801102-05 and -07

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Serial Numbers

16526 thru 16662
16667 thru 16733
16754 thru 16920
18346 thru 18445
18709 thru 18724
18725 thru 18735
18736 thru 18765
18766 thru 18908
19482 thru 19551
19552 thru 19576
19982 thru 20081
20418 thru 20547
20691 thru 20736
20961 thru 21060
21061 thru 21084
22443 thru 22542
22711 thru 22860

0003110

2) **Model Number PSA-3**
Part Number 1801106-05 and -07

Serial Numbers

28144 thru 28232
27623 thru 27693
27906 thru 27937
27696 thru 27738
27739 thru 27905
25826 thru 25916
25444 thru 25498
25532 thru 25642
25646 thru 25759
25036
25393 thru 25443
24711 thru 24910
21565 thru 21610
506 thru 510 (-07)
486 thru 487 (-07)
24311 thru 24410
21461 thru 21495
20302 thru 20395
20551 thru 20636
20398 thru 20400
20637
20700
20851 thru 20869
20870 thru 20955

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CONTRACT: MD SIZE #1 PAGE: 1

143930

0460	MD-A21	MIDLND	2-617-5-123
0462	MD-A21	MIDLND	1-603-3-505
0474	MD-A21	MIDLND	1-616-4-526
1062	MD-A21	MIDLND	1-616-4-526
0476	MD-A21	MIDLND	2-617-5-122
0967	MD-A21	MIDLND	1-616-4-527
0472	MD-A21	MIDLND	1-616-4-539
9549	MD-A21	MIDLND	1-616-2-509
1084	MD-A21	MIDLND	1-616-2-509
1086	MD-A21	MIDLND	1-616-3-500
1071	MD-A21	MIDLND	1-616-3-508
1063	MD-A21	MIDLND	1-601-2-512
0530	MD-A21	MIDLND	1-616-3-501
0479	MD-A21	MIDLND	1-616-3-509
0434	MD-A21	MIDLND	1-616-3-509
1074	MD-A21	MIDLND	1-616-2-533
0993	MD-A21	MIDLND	1-616-3-525
0529	MD-A21	MIDLND	1-616-4-542
0519	MD-A21	MIDLND	1-616-4-530
0520	MD-A21	MIDLND	1-616-4-530
0996	MD-A21	MIDLND	1-616-4-529
1070	MD-A21	MIDLND	1-616-4-529
0992	MD-A21	MIDLND	1-616-4-530
1007	MD-A21	MIDLND	1-616-3-503
1072	MD-A21	MIDLND	1-616-3-507
0473	MD-A21	MIDLND	1-616-4-523
0991	MD-A21	MIDLND	1-616-4-536
1073	MD-A21	MIDLND	1-616-4-537
0483	MD-A21	MIDLND	1-616-4-541
0439	MD-A21	MIDLND	1-616-4-541
0990	MD-A21	MIDLND	1-616-2-502
1000	MD-A21	MIDLND	1-616-2-502
8863	MD-A55	MIDLND	2-617-5-131
8842	MD-A55	MIDLND	1-616-2-534
8726	MD-A90	MIDLND	1-652-1-522
8789	MD-A90	MIDLND	1-652-1-523
0846	MD-A46	MIDLND	1-EBB-2-3-H4
8785	MD-A90	MIDLND	2-652-1-519
8824	MD-A90	MIDLND	2-652-1-520
8730	MD-A90	MIDLND	2-652-1-521
8721	MD-A56	MIDLND	1-638-14-501
8729	MD-A56	MIDLND	1-638-14-501
8711	MD-A56	MIDLND	1-638-14-503
8720	MD-A89	MIDLND	1-603-1-500
8712	MD-A89	MIDLND	2-639-14-500
8732	MD-A89	MIDLND	1-603-2-38
8731	MD-A89	MIDLND	1-616-2-535
8716	MD-A89	MIDLND	2-652-1-504
8724	MD-A89	MIDLND	2-652-1-505
8715	MD-A89	MIDLND	2-652-1-506
8723	MD-A89	MIDLND	2-652-1-507
8719	MD-A89	MIDLND	2-652-1-509
8722	MD-A89	MIDLND	1-652-1-510
8713	MD-A89	MIDLND	1-652-1-511
8727	MD-A89	MIDLND	1-652-1-512

Attachment II

1 of 6

Midland 148178 148321

CONTRACT: MD 131017 SIZE #1 PAGE: 2

143930

18725	MD-A89	MIDLND	1-652-1-513
18733	MD-A89	MIDLND	1-652-1-514
18728	MD-A89	MIDLND	1-652-1-515
16625	MD-935	MIDLND	BULK
16550	MD-935		"
16863	MD-935		"
16702	MD-935		"
16667	MD-935		"
18407	MD-957	MIDLND	NONE LISTED
19519	MD-996	MIDLND	"
19532	MD-996		"
19512	MD-996		"
19548	MD-996		"
19547	MD-996		"
19550	MD-996		"
19488	MD-996		"
19530	MD-996		"
16536	MD-996		"
19495	MD-996		"
19496	MD-996		"
19499	MD-996		"
19497	MD-996		"
19498	MD-996		"
16593	MD-996		"
16540	MD-996		"
16532	MD-996		"
16547	MD-996		"
16542	MD-996		"
16599	MD-996		"
16549	MD-996		"
16548	MD-996		"
16588	MD-996		"
16562	MD-881	MIDLND	2-619-6-109
16641	MD-881	MIDLND	2-619-6-109
18369	MD-797	MIDLND	NOT LISTED
18371	MD-979	"	"
18379	MD-979	"	"
18401	MD-979	MIDLND	BULK
18406	MD-979	"	"
22447	MD-D02	MIDLND	NOT LISTED
22449	MD-D02	MIDLND	"
22451	MD-D02	"	"
22452	MD-D02	"	"
22455	MD-D02	"	"
22456	MD-C02	MIDLND	BULK
22458	MD-C02	MIDLND	"
22460	MD-D02	"	"
22461	MD-C02	"	"
22462	MD-C02	"	"
2464	MD-C02	MIDLND	BULK
2466	MD-D02	"	"
2468	MD-D02	"	"
2469	MD-C02	"	"
2470	MD-C02	"	"
2472	MD-C02	"	"

Att. II
Page 20f6

131017 Midland 148178 14832i

CONTRACT: MD SIZE #1 PAGE: 3

143930

22473	MD-C02	"	"
22474	MD-D02	"	"
22476	MD-C02	"	"
22478	MD-C02	"	"
22479	MD-C02	"	"
22480	MD-D02	"	"
22481	MD-C02	"	"
22482	MD-C02	"	"
22483	MD-D02	"	"
22484	MD-D02	"	"
22486	MD-C02	MIDLND	BULK
22490	MD-C02	"	"
22491	MD-C02	"	"
22495	MD-C02	"	"
22496	MD-D02	"	"
22505	MD-D02	"	"
22506	MD-C02	"	"
22522	MD-B38	MIDLND	2-617-5-43
22536	MD-D02	"	BULK
22717	MD-D01	"	"
22720	MD-D02	"	"
22722	MD-D01	"	"
22723	MD-D02	"	"
22730	MD-D01	"	"
22741	MD-D01	"	"
22742	MD-D01	"	"
22745	MD-D01	"	"
22747	MD-D01	"	"
22749	MD-D01	"	"
22752	MD-D01	"	"
22753	MD-D01	"	"
22763	MD-D01	"	"
22771	MD-D01	"	"
22776	MD-D01	"	"
22781	MD-D02	"	"
22783	MD-D02	"	"
22786	MD-D01	"	"
22789	MD-D02	"	"
22790	MD-D02	"	"
22791	MD-D02	"	"
22792	MD-D02	"	"
22793	MD-D02	"	"
22794	MD-D02	"	"
22795	MD-D02	"	"
22796	MD-D02	"	"
22800	MD-D01	"	"
2801	MD-D01	"	"
2802	MD-D02	"	"
2803	MD-D02	"	"
2805	MD-D01	"	"
2806	MD-D01	"	"
2807	MD-D01	"	"
2808	MD-D01	"	"
2810	MD-D01	"	"
2811	MD-D02	"	"

Att. II
Page 3 of 6

Midland 148178 148321

CONTRACT: MD 131017 SIZE #1 PAGE: 4

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22813	MD-D01	•	•
22815	MD-D02	•	•
22816	MD-D01	•	•
22817	MD-D01	•	•
22818	MD-D01	•	•
22819	MD-D02	•	•
22820	MD-D02	•	•
22821	MD-D01	•	•
22822	MD-D01	•	•
22823	MD-D02	•	•
22824	MD-D01	•	•
22825	MD-D01	•	•
22827	MD-D01	•	•
22828	MD-D01	•	•
22829	MD-D01	•	•
22831	MD-D01	•	•
22833	MD-D01	•	•
22834	MD-D01	•	•
22835	MD-D02	•	•
22838	MD-D01	•	•
22839	MD-D01	•	•
22850	MD-D01	•	•
22851	MD-D01	•	•
22856	MD-D01	•	•

NUMBER OF RECORDS FOUND: 189

Att. II
Page 4 of 6

PSA105-R01 I T T GRINNELL CORPORATION PAGE 1
10/03/83 PIPE HANGER DIVISION - WARREN
06:09:08 PSA LOG BY CONTRACT

CONTRACT MD - MIDLAND

SERIAL NO	ORDER NO	MARK/SKETCH NUMBER	SIZE
24318	E-MD-A21-00	2-632-2-23	3
24322	E-MD-A21-00	1-610-1-504	3
24329	E-MD-A21-00	1-616-2-505	3
24353	E-MD-A21-00	1-610-1-507	3
24354	E-MD-A21-00	1-610-1-503	3
24357	E-MD-A21-00	1-619-2-503	3
24358	E-MD-A21-00	2-617-3-121	3
25400	E-MD-A55-00	1-638-13-503	3
25408	E-MD-A55-00	2-611-2-501	3
25428	E-MD-A55-00	1-601-1-503	3
25437	E-MD-A55-00	1-601-2-508	3
25438	E-MD-A55-00	1-601-1-503	3
25182	E-MD-A56-00	2-632-2-34	3
25209	E-MD-A56-00	1-638-13-501	3
25214	E-MD-A56-00	1-631-2-133	3
25215	E-MD-A56-00	2-631-2- 33	3
24806	E-MD-A89-00	2-602-1-21	3
24814	E-MD-A89-00	1-610-1-517	3
24845	E-MD-A89-00	2-602-1-21	3
25148	E-MD-A89-00	2-639-13-504	3
25216	E-MD-A89-00	2-602-1-21	3
25228	E-MD-A89-00	2-602-1-21	3
25233	E-MD-A89-00	2-639-13-501	3
25238	E-MD-A89-00	1-638-13-504	3
25240	E-MD-A89-00	2-639-13-505	3
25244	E-MD-A89-00	2-602-1-2	3
25247	E-MD-A89-00	2-602-1-2	3
25613	E-MD-A89-01	2-639-13-505	3
25149	E-MD-A90-00	1-601-1-501	3
25155	E-MD-A90-00	1-638-13-505	3
25549	E-MD-A98-00		
25451	E-MD-A98-00		3
25602	E-MD-A98-00	2-618-3-512	3
25609	E-MD-A98-00		
25612	E-MD-A98-00		
25618	E-MD-A98-00	1-618-3-520	3
25619	E-MD-A98-00		
25620	E-MD-A98-00	1-618-3-512	3
25914	E-MD-B10-00		
25834	E-MD-B10-00		3
25839	E-MD-B10-00		3
25653	E-MD-B10-00		
25733	E-MD-B18-00		
25741	E-MD-B18-00		
25565	E-MD-B42-00	2-639-3-512	3
25566	E-MD-C01-00		
25569	E-MD-C01-00		
25570	E-MD-C01-00		
25572	E-MD-C01-00		

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PSA105-R01
10/03/83
06:09:04

I T T GRINNELL CORPORATION
PIPE HANGER DIVISION - HARKEN
PSA LOG BY CONTRACT

CONTRACT MD - MIDLAND

SERIAL NO	ORDER NO	MARK/SKETCH NUMBER	SIZE
25581	E-MD-C01-00		
25583	E-MD-C01-00		
25586	E-MD-C01-00		
25605	E-MD-C01-00		
25614	E-MD-C01-00		
25615	E-MD-C01-00		
25616	E-MD-C01-00		
25617	E-MD-C01-00		
25660	E-MD-C02-00		
25661	E-MD-C02-00		
25662	E-MD-C02-00		
25663	E-MD-C02-00		
25664	E-MD-C02-00		
25665	E-MD-C02-00		
25667	E-MD-C02-00		
25668	E-MD-C02-00		
25672	E-MD-C02-00		
25673	E-MD-C02-00		
25677	E-MD-C02-00		
25679	E-MD-C02-00		
25444	E-MD-D01-00	BULK	3
25445	E-MD-D01-00	BULK	3
25449	E-MD-D01-00	BULK	3
25450	E-MD-D01-00	BULK	3
25459	E-MD-D01-00	BULK	3
25463	E-MD-D01-00	BULK	3
25464	E-MD-D01-00	BULK	3
25469	E-MD-D01-00	BULK	3
25474	E-MD-D01-00	BULK	3
25608	E-MD-D01-00	BULK	3
25623	E-MD-D01-00	BULK	3
25624	E-MD-D01-00	BULK	3
25625	E-MD-D01-00	BULK	3
25626	E-MD-D01-00	BULK	3
25627	E-MD-D01-00	BULK	3
25628	E-MD-D01-00	BULK	3
25629	E-MD-D01-00	BULK	3
25630	E-MD-D01-00	BULK	3
25639	E-MD-D01-00	BULK	3
25640	E-MD-D01-00	BULK	3
25641	E-MD-D01-00	BULK	3
25538	E-MD-D02-00		3
25636	E-MD-D02-00		
25642	E-MD-D02-00		
20630	E-MD-457-00		3

94 PSA LISTED FOR THIS CONTRACT

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ATTACHMENT 2

148321

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ITT Grinnell Corporation
Pipe Hanger Division
260 West Exchange Street
Providence, Rhode Island 02901
Telephone (401) 831-7000

March 6, '84

Bechtel Power Corporation
P.O. Box 1000
Ann Arbor, MI 48106

Attn: Mr. E. Poser

Subject: MIDLAND - UNITS 1 & 2
P.O. No. 7220-M-106-AC

Gentlemen:

In response to your Telex BGH 1813 dated February 21, '84, we would like to provide the following clarifications:

Reference A concerns potential interference problems with clamps/rear brackets for ITT Grinnell Fig. 306/307 mechanical snubbers. The root cause of this problem is a tolerance stack-up problem that was not anticipated in the initial design of the attachments for these products. If the tolerances are fully evaluated in a worst case condition, a potential exists that the pivot mount or end cap of the snubber may interfere with its mating attachment. If this were to happen, there would be a reduction in the included cone of action that is provided to accommodate anticipated thermal movements. Also, this interference would result in a slightly higher drag force on the piping system - but would not cause the snubber to malfunction.

The corrective actions taken were to -

1) reduce the edge distances (the distance from the centerline of the load stud to the edge of the clamp stock) to slightly over the code minimums,

2) we redesigned the rear brackets to configurations that would be less sensitive to the large tolerances we had encountered in the past, and

3) we drew all combinations to scale with all tolerances considered and allowed for plus or minus 7 degrees of swing even though we only recommend that plus or minus 5 degrees be used.

Reference B addresses the capstan springs in Pacific Scientific mechanicals with potential microcracks which could affect service life. The root cause of this problem has been traced to one of Pacific's subsuppliers and the manufacturing process they used. The suspect process was to cold draw round bar into a rectangular shape, age harden the rectangular wire, coil into a spring

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To: Bechtel Pwr. Corp.
Attn: Mr. E. Poser

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shape, stress relieve, inspect, and then silver plate. A metallurgical evaluation concluded that the microcracks were caused in the plating process. The corrective actions taken by Pacific to preclude recurrence were to revise the manufacturing process and add further inspection requirements. The process now followed is - cold draw round bar into rectangular form, normalize the material, coil into spring, age harden, stress relieve, inspect, silver plate, inspect again. This process should eliminate the problem, however, if it does not, the additional inspection will identify if a problem exists.

Should you have any further comments or questions, please feel free to contact us.

Very truly yours,

ITT GRINNELL CORPORATION

N. A. DeCRISTOFARO
Project Manager

NAD/m (0329h)
cc: P. Straube-Bechtel
T. Smith-Prov.
D. Powers-Prov.
P. Stanish-Prov.