

**AUTOMATIC VALVE**41144 Vincent Court
Telephone 810-474-6700Novi MI USA 48375-1924
Facsimile 810-474-6732**World Class Air Valves and Controls**

OCTOBER 28, 1996

SUBJECT: 10CFR21 NOTIFICATION OF POTENTIAL DEFECT

On 09-02-96 Jim Wethington, of Commonwealth Edison-Quad Cities NPS, notified Automatic Valve that a Main Steam Isolation Valve (MSIV) EPN 1-0203-1D had failed to close in the 3-5 seconds required by their technical specifications. The solenoid valves associated with the MSIV had recently been replaced by Quad Cities personnel. Following replacement, the MSIV stroked properly under cold conditions (reactor shutdown and solenoid valves de-energized prior to testing). The concern was identified while re-timing the MSIV during plant start-up. After the solenoids had remained energized for several hours the MSIV would not close within the required 3-5 seconds.

On 09-03-96 Todd Hutchins of Automatic Valve inspected the solenoid at the Quad Cities facility and determined that the 6910-0x0 solenoid plunger was 1.322-1.327" in length. The correct specified length is 1.287-1.295". The probable cause of the incorrect length appeared to be a missed machining operation at time of manufacture.

A solenoid plunger of this length restricts the exhaust port in the plunger stem. This potentially can prevent any equipment operated by the solenoid from operating within its intended time requirement.

On 09-04-96 Todd Hutchins and Jim Wethington discussed the non-conformance and initial corrective action with Keith Walton and Laura Collins of the Nuclear Regulatory Commission located at the Quad Cities facility.

Automatic Valve verified that all of the 6910-0x0 solenoid plungers currently in their stock were the correct length and added a specific inspection requirement for all future plungers.

To prevent any additional valves from being rebuilt with potentially long plungers Automatic Valve requested all customers who had received kits containing the 6910-0x0 solenoid plunger in the last two years to verify the plunger length. It had been Automatic Valve's experience that kits supplied previous to the two year cutoff were already installed in operating valves and could not immediately be measured.

The defective solenoid from Quad Cities was returned on 09-27-96 to Automatic Valve for additional testing and root cause determination. Frank Lentin of Commonwealth

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Subject: 10CFR21 Notification of Potential Defect

Edison notified Automatic Valve that a 10CFR21 review had been initiated and that a decision on potential reportability was required by 11-04-96.

On 10-17-96 preliminary test data indicated that field detection of the non-conforming plunger was possible with a dimensional inspection (requiring the solenoid to be disassembled) or time testing the product after the solenoid had reached it's stabilized temperature (but not during its initial cold state).

Since the missed machining operation on the plunger was an omission in the machining process, the problem is not lot specific. Potentially all solenoid valves manufactured since 02-03-70 (utilizing the 10 watt #6910-0x0 solenoid) with the model numbers prefixed A, B, C, K, or U are affected. If you are unsure as to whether this affects you, please submit questionable part numbers to Automatic Valve for verification.

There have been no reported non-conforming plungers shipped in the previous 26 years.

All known customers (list attached) were verbally notified of the potential problem, verbally notified of the recommended corrective action, given an assurance that a formal 10CFR21 decision would be made by 11-04-96 and that they would receive a copy.

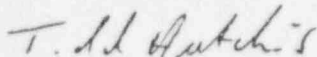
The formal corrective action report (attached) was completed on 10-28-96 and outlines the problem, root cause, corrective action, implementation, and preventative action.

This letter intends to fulfill Automatic Valve's obligation under 10CFR21 and is being sent with all attachments to all known customers who have purchased products containing the potentially long plunger and who have imposed 10CFR21 in their purchase order.

Should you have any additional questions, please feel free to contact me.

Very truly yours,

AUTOMATIC VALVE CORPORATION



Todd Hutchins
President

TJH/cb
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AUTOMATIC VALVE

CORRECTIVE ACTION
9622A

10/28/96

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1. Team: Jim Wethington, Quad Cities NPS, tel:309.654.2241x2190
Todd Hutchins, Automatic Valve, tel:810.474.6700
2. Problem: On 09-02-96 MSIV #1-0203-1D would not fast close within the 3-5 second technical specification when the solenoids had been energized for a minimum of two hours at a minimum of 90°F ambient.
3. Containment: Air pack ser# D53325 was removed from MSIV #1-0203-1D for inspection by Automatic Valve personnel at Quad Cities. Air pack ser# D53332 was rebuilt for installation on MSIV #1-0203-1D on 09-04-96.
4. Cause: One plunger from solenoid 6910-0x0 missed the machining operation after the viton insert was pressed in.
5. Corrective action:
 - 5.1 For products in the field:
Verify the plunger length to be 1.287-1.295" or verify when de-energized that the application speed meets technical specifications after the solenoid has been energized for a minimum of two hours at a minimum of 90°F ambient.
 - 5.2 For products at Automatic Valve:
Verify flow/response time and/or verify plunger length.
6. Verification:
 - 6.1 Verified that the non-conforming plunger was fully assembled but had missed the machining operation (based on x-rays and photos).
 - 6.2 Verified that the non-conforming plunger when energized for minimum of two hours at a minimum of 90°F ambient would cause significant delay in de-energize flow time (test report PV-UTL-46 attached).
 - 6.3 Verified that the non-conforming plunger could be identified by a flow/response time test.
7. Implementation:
 - 7.1 Plants should verify that the plunger length is 1.287-1.295" or verify when de-energized that the application speed meets technical specifications after the solenoid has been energized for a minimum of two hours at a minimum of 90°F ambient.
 - 7.2 Automatic Valve added plunger length as a critical 'to be inspected' dimension on the inspection print (print #6910-0X0 attached). Current stock at Automatic Valve was re-inspected and found all to be within tolerance. Service kits sold to customers in 1995 and 1996 still in stock were re-inspected and found all to be within tolerance (contacts attached).

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7.3 Automatic Valve verified flow/response time and/or plunger length on all shipments since 09-04-96.

7.4 On 10-28-96 Automatic Valve notified in writing all known customers who had purchased products containing the potentially long plunger and who had imposed 10CFR21 in their purchase order.

8. Prevention:

8.1 Plants should add plunger dimensions to field rebuild instructions (example attached).

8.2 Automatic Valve added critical solenoid dimensions to engineering 'critical characteristics' procedure.

8.3 Automatic Valve added flow/response time requirements to final test procedure.

9. Verification: Monitor testing and field feedback data.

AUTOMATIC VALVE

LOCN: I:\DSS\DOCUMENT\PVUTL46

DATE: 10-26-1996 6/11

TEST NUMBER: PV-UTL-46

PURPOSE:

- To determine the effects of ambient temperatures on the energize and de-energize times of solenoid 6910-0X0, with:
- Non-conforming 6910-001 solenoid plunger - length of 1.322 - 1.327 - as returned from Commonwealth Edison.
 - Conforming 6910-001 solenoid plunger - length of 1.287 - 1.295

TEST PROCEDURE:

1. Run all tests at 80 psig using filtered non-lubricated air.
 2. Attach solenoid manifold with non-conforming plunger to test plate AX-402.
 3. With the manifold at ambient temperature, record the following temperatures - also refer to figure 1.
 - 3.1. Ta - Ambient temperature
 - 3.2. T1 - Temperature of solenoid adapter nut.
 - 3.3. T2 - Temperature of solenoid coil housing.
 - 3.4. T3 - Temperature of solenoid manifold block.
- (Note: Physically mark the locations where temperature readings are taken and take all subsequent temperature readings at the same locations.)
4. Determine flow and exhaust response times taking 3 to 5 readings waiting a minimum of 10 minutes between readings to allow system to stabilize.
 - 4.1 During each reading record temperatures at locations designated in paragraph 3.
 5. With the manifold at ambient temperature, energize the solenoid for a minimum of 2 hours.
 - 5.1. Record temperatures T1 through T3 per paragraph 3.
 - 5.2 Determine flow and exhaust response times and record temperatures per paragraphs 4 through 4.1.
 6. Disconnect air inlet line, remove the pressure transducer and place the manifold, test plate, and load chamber in an oven and heat to 90°F for a minimum of 1/2 hour with the solenoid energized.
 - 6.1. Measure temperatures T1 through T3 per paragraph 3 prior to running response tests.
 - 6.2 Determine flow and exhaust times and record temperatures per paragraphs 4 through 4.1.
 - 6.2.1 During the wait between readings, reinsert the manifold in the oven to re-establish temperatures.
 7. Repeat paragraph 6 through 6.2 at oven temperatures of 90°F, 100°F, 125°F, and 150°F.
 8. Repeat paragraphs 2 through 7 with conforming solenoid plunger.

TEST EQUIPMENT:

Number	Description	Calibration Date
APG-2	0 to 60 160 PSIG pressure gage	10-02-1996
NIC-3091	Oscilloscope	06-10-1996
7199	Thermocouple thermometer	10-04-1996
TTT-I100-550	Thermometer	11-07-1995
SPT-667388	Pressure transducer	06-24-1996

AUTOMATIC VALVE

LOCN: I:\DSS\DOCUMENT\PVUTL46

DATE: 10-26-1996 7/11

TEST RESULTS (AVERAGES)

Solenoid Energize Time	Conforming Plunger Length 1.287-1.296				Non-conforming plunger Length 1.322-1.327			
	Temperatures Degrees F		Solenoid energized to 72 psig (seconds)	Solenoid de-energized to 8 psig (seconds)	Temperature Degrees F		Solenoid energized to 72 psig (seconds)	Solenoid de-energized to 8 psig (seconds)
	Oven	Body			Oven	Body		
0 (COLD)	None - 71 ambient	71.4	0.182	0.142	None - 72 ambient	72.5	0.200	0.234
2 hrs	None - 71 ambient	91.2	0.181	0.145	None - 72 ambient	93.5	0.214	67.3
2 hrs	*NR	*NR	*NR	*NR	90	108	0.210	146.1
2 hrs	*NR	*NR	*NR	*NR	100	112	*NR	157.2
2 hrs	125	121	0.174	0.241	125	115	*NR	180.4
2 hrs	154	152	0.167	0.244	150	127	0.215	249.0

*NR - NO READING

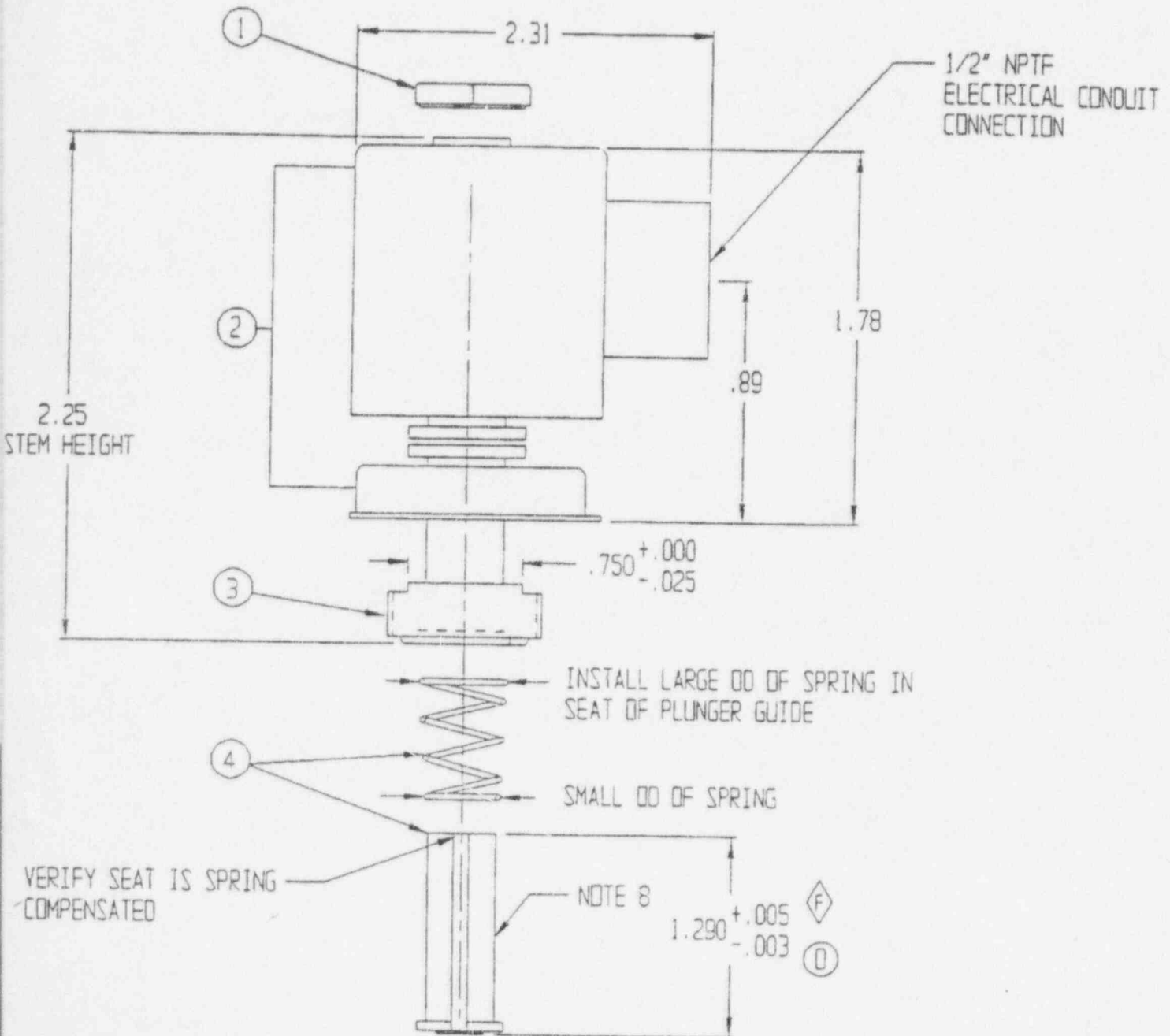
ANALYSIS/CONCLUSIONS:

1. Ambient temperature fluctuations have little effect on either the energized or de-energized times with the conforming plunger installed.
2. Ambient temperature fluctuations have only a slight effect on the energized times with the non-conforming plunger installed.
3. Ambient temperature fluctuations have a significant effect on de-energized times with the non-conforming plunger. As the data shows, at an ambient temperature of 90 degrees F the unit became, for practical purposes, non functional. The "quickest" exhaust time with the surface of the body at 93.4 degrees F was 54 seconds compared to 0.145 for the manifold with the conforming plunger.
4. At a minimum ambient temperature of 90 degrees F and with the solenoid coil energized for a minimum of 2 hours, the delay in the de-energized time would be easily detectable. As the ambient temperature increases, the delay becomes more and more noticeable.

Conducted by: Brian Bielat Title: Engineer Date: 10-25-1996Analyzed by: David S. Swanton Title: VP Eng/Mfg Date: 10-26-1996Approved by: David S. Swanton Title: VP Eng/Mfg Date: 10-28-1996

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AUTOMATIC VALVE SOLENOID #6910-0X0 10/28/96



AUTOMATIC VALVE

SHIPPEDKITSWITH6510-0X0

10/25/96

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CUSTOMER	PO#	SHIPPED	QTY	PART#	COMMENTS	
IOWA ELEC	T02883	5/2/95	2	K-C5450-5-110	N/A SINCE FUNCTION IS FAIL ENERGIZED	
PECO	BW603502	12/4/95	2	K-C6930-010	INSPECTED 10-04-96 BY NEPCO	
COMED	356396	2/12/96	10	K-C6930-010	INSPECTED 09-30-96 BY COMED	
PECO	LS604405	2/12/96	1	K-C6930-010	INSPECTED 09-25-96 BY NEPCO	
PECO	BW606621	4/18/96	19	K-C6930-010	INSPECTED 10-04-96 BY NEPCO	
PECO	LS607873	7/26/96	9	K-C6930-010	INSPECTED 09-25-96 BY NEPCO	
IOWA ELEC	T13195	9/27/96	6	K-C5450-5-110	INSPECTED 09-17-96 BY AV	
DETROIT ED	NR315280	10/21/96	3	K-C6930-010	INSPECTED 10-18-96 BY AV	

QCEMS 0250-16
UNIT 1(2)
REVISION 7

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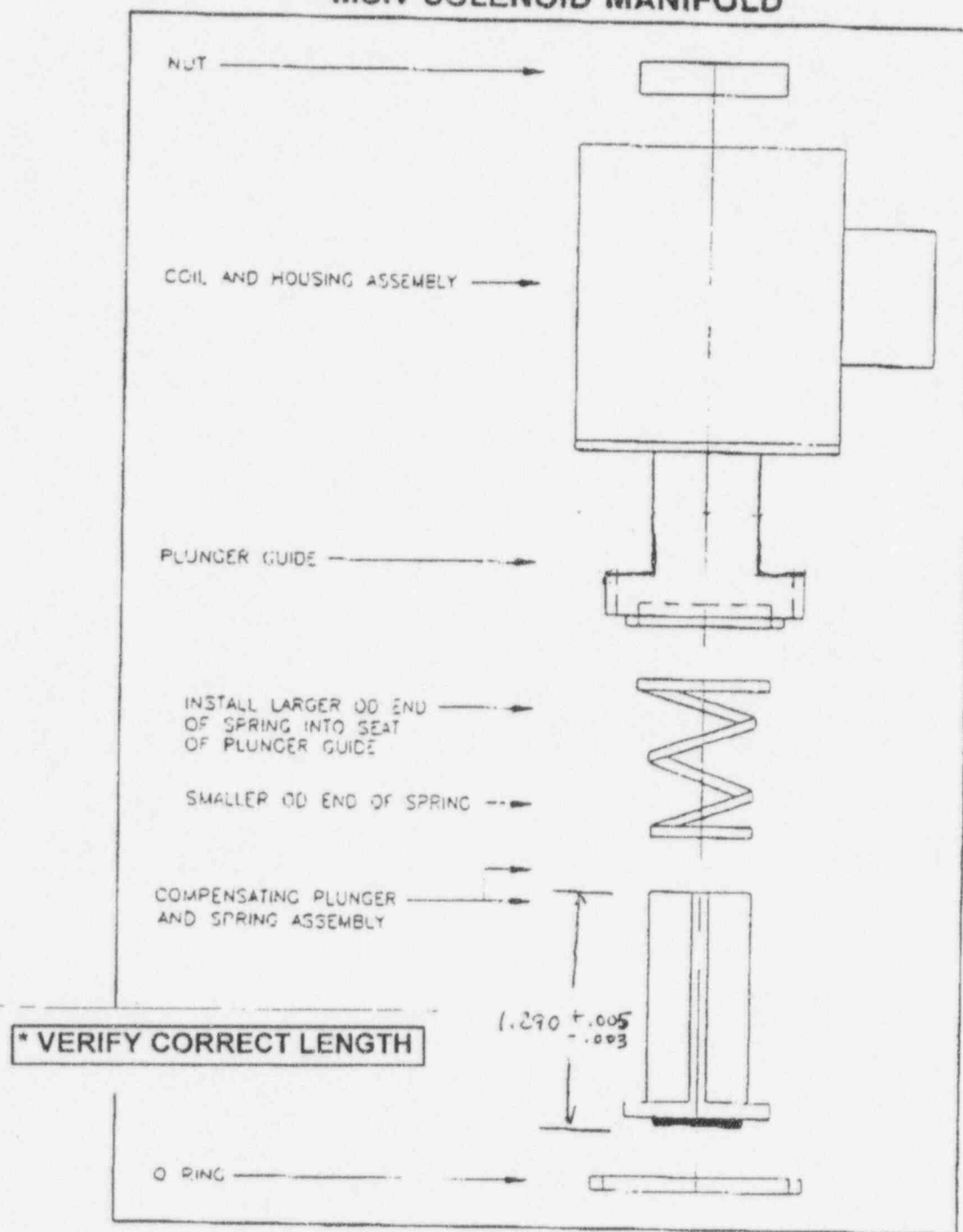
RECOMMENDED FIELD REBUILD INSTRUCTIONS**MSIV SOLENOID MANIFOLD**

Figure 4

Ref: GE SIL 505

GENERAL INFORMATION or OTHER

EVENT NUMBER: 31229

LICENSEE: AUTOMATIC VALVE

REGION: 3

CITY: NOVI

STATE: MI

COUNTY:

AGREEMENT: N

LICENSE#:

DOCKET:

NOTIFICATION DATE: 10/28/96
NOTIFICATION TIME: 12:13 [ET]
EVENT DATE: 10/28/96
EVENT TIME: 00:00 [EST]
LAST UPDATE DATE: 10/28/96

NOTIFICATIONS

WRC NOTIFIED BY: HUTCHINS
HQ OPS OFFICER: CHAUNCEY GOULD

VERN HODGE

EMERGENCY CLASS: NOT APPLICABLE

10 CFR SECTION:

NINF

CCCC 21.21

INFORMATION ONLY
UNSPECIFIED PARAGRAPH

EVENT TEXT

AUTOMATIC VALVE WAS NOTIFIED BY COMMONWEALTH EDISON-QUAD CITIES THAT A MAIN STEAM ISOLATION VALVED FAILED TO CLOSE WITHIN THE 3-5 SECONDS REQUIRED BY THEIR TS. FURTHER INSPECTION BY AUTOMATIC VALVE PERSONNEL DETERMINED THAT THE "6910-0X0" SOLENOID PLUNGER WAS TOO LONG. THE PROBABLE CAUSE FOR THE INCORRECT LENGTH APPEARED TO BE A MISSED MACHINING OPERATION AT TIME OF MANUFACTURE.

AUTOMATIC VALVE VERIFIED THAT ALL SOLENOID PLUNGERS OF THIS TYPE IN THEIR STOCK WERE THE CORRECT LENGTH AND ADDED A SPECIFIC INSPECTION REQUIREMENT FOR ALL FUTURE PLUNGERS. AUTOMATIC VALVE REQUESTED THAT ALL CUSTOMERS WHO RECEIVED KITS WITHIN THE LAST 2 YEARS CONTAINING THIS TYPE PLUNGER TO VERIFY THE PLUNGER LENGTH.

PART 21

AUTOMATIC VALVE

10CFR21NOTIFICATION

10/25/96

PLANT OR CO.	CONTACTED	CONTACT	TEL	FAX	FAXED	COMMENTS
ATWOOD ✓	10/23/96	BRIAN SULLIVAN	508.744.5690X131	741.3626	10/28/96	RESELL
PILGRIM ✓	10/22/96	BILL CARROLL	508.830.8386	8920	10/28/96	YES-Q
DRESDEN ✓	10/18/96	BILL POPPE	815.942.2920X3878	0579	10/28/96	YES-Q
QUAD x	10/18/96	JIM WETHINGTON	309.654.2241X2190	2265	10/28/96	YES-Q
CECO ✓	MSG 10-22-96	FRANK LENTIN	630.663.7450	2099	10/28/96	10CFR21
DEFENSE x	10/25/96	RICHARD BUSH	313.741.2195	2022	NOT REQ	NO 21
FERMI ✓	10/18/96	ALEX KLEMPNER	313.586.1805	4911	10/28/96	NO-Q
DRESSER x	10/22/96	LAURIE LUCKHARDT	905.335.3529	5315	NOT REQ	NO 21
BEAVER VALLEY x	10/24/96	ROY BROSI	412.393.5210	643.4671	10/28/96	NO SOL
HATCH x	10/24/96	KEITH CUMBIE	912.367.7781X2214	2666	10/28/96	NO-Q
GENERAL ELEC ✓	10/23/96	CLYDE NIEH	408.925.1849	2790	10/28/96	RESELL
OYSTER CREEK ✓	10/24/96	JAY ANVARI	609.971.4801	4651	10/28/96	NO SOL
HILLER ✓	10/23/96	DAVE BORCIK	412.325.1200	1589	10/28/96	DIFF SOL
CLINTON ✓	10/24/96	STEVE LAKEBRINK	217.935.8881X3768	6014	10/28/96	DIFF SOL
DUANE ARNOLD ✓	MSG 10-24-96	TODD ANDERSON	319.851.7730	7364	10/28/96	DIFF APP
FITZPATRICK x	10/22/96	GERRY OTTMAN	315.349.6548	342.6374	10/28/96	DIFF SOL
MONTICELLO ✓	10/22/96	DAVE PENNINGTON	612.295.1354	1017	10/28/96	YES-Q
NRC ✓	MSG 10-24-96	HAL ORNSTEIN	301.415.7574	5151	10/28/96	10CFR21
NRC →	10/24/96	BOB STRANSKY	301.816.5100	5151	10/28/96	10CFR21
LIMERICK	10/18/96	GINNY ANGUS	610.718.1200X3521	3599	10/28/96	NO-Q
PEACH	10/18/96	ED GUARINO	717.456.7014X3484	4845	10/28/96	YES-Q
SUSQUEHANNA	10/18/96	JERRY MAERTZ	717.542.3019	3177	10/28/96	YES-Q
HOPE	10/22/96	JOE ONDISH	609.339.3105	5250	10/28/96	NO-Q
GINNA	10/24/96	DAVE LOVGREN	716.771.3872	3903	10/28/96	NO SALES
TARGET ROCK	10/24/96	RICH MARTIN	516.293.3800X663	3714	10/28/96	NO SALES
BROWNS	10/18/96	DAVID CURTHS	205.729.7955	7952	10/28/96	NO-Q
VERMONT YANK	10/22/96	BOB CURRENT	802.258.5457	5544	10/28/96	YES-Q
WYLE	10/24/96	CLAUDE THIBAUT	205.837.4411X255	721.0144	10/28/96	RESELL