Hal Ornstein
AEOD

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Serving The Best Location in the Nation
PERRY NUCLEAR POWER PLANT

Murray R. Edelman
SR. VICE PRESIDENT
NUCLEAR

November 9, 1987
PY-CEI/OIE-0288 L

Mr. A. Bert Davis
Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Perry Nuclear Power Plant
Docket No. 50-440
Augmented Inspection Team (AIT)
Status and Commitments

Dear Mr. Davis:

This letter provides a preliminary description on the sequence of events, troubleshooting, and conclusions surrounding the MSIV slow closure problem. It also contains corrective actions and commitments made to the AIT on November 9, 1987. The formal report required by your Confirmatory Action letter dated November 4, 1987 will be submitted on or before December 4, 1987.

Based upon the information provided to date, we plan to restart the plant on November 10, 1987 with your concurrence. If you have any questions, please feel free to call.

Very truly yours,

A. Kaplan for
Murray R. Edelman
Senior Vice President
Nuclear Group

MRE:njc

Attachment

cc: K. Connaughton
T. Colburn
Document Control Desk

3/12

I. Executive Summary

On October 29, 1987 the Perry Nuclear Power Plant was completing the final stages of the Startup Test Program. One of these tests involved fast closing one Main Steam Isolation Valve (MSIV). During this test, the valve (1B21-F028D) failed to stroke closed within the required time. All other MSIVs (7) were cycled in order to verify adequate stroke times. Two of the other MSIVs failed to satisfy the required stroke time.

The three valves that initially failed were stroked satisfactorily upon subsequent demand. Based on industry experience involving MSIV control air, the problem was attributed to a one time deposit of debris in the respective solenoids which was exhausted as shown by the subsequent successful stroke. The debris was believed to have caused a delay in the solenoid responses. Based upon the satisfactory stroke, the valves were considered operable and startup testing resumed. Plant management decided to perform the MSIV stroke tests again prior to the last startup test, the full MSIV isolation scram. This approach was discussed with NRC Region III.

On November 3, in preparation for the final startup test, additional stroke timing tests of MSIVs were performed. During the first stroke attempt, two of the same MSIVs (1B21F022D, 1B21F028D) that previously stroked slowly, again failed to close within the required time. The valves were subsequently recycled satisfactorily within minutes of their first tests. However, because the valves again failed to meet the required closure time on the first attempt, the basis for an isolated failure was no longer considered valid. NRC Region III was informed of the problem. The decision was made to shutdown the plant and troubleshoot the problem.

On November 4, an NRC Augmented Inspection Team (AIT) arrived onsite. A troubleshooting plan was established and implemented. The air actuators of the three valves which had exhibited slow closing times were disassembled and the inspection results documented. The conclusion drawn is that the dual solenoids exhibited sluggish action after operating in localized high temperature conditions. It is felt that steam leaks caused a raised temperature environment in the vicinity of the solenoids. The raised temperatures degraded the Ethylene Propylene Diene Monomer (EPDM) material causing the solenoid to stick or to be sluggish. Corrective actions included disassembling all 8 MSIV's dual solenoids, and replacing or rebuilding the solenoids as applicable.

II. Chronology of Events

On October 29, 1987 at 1837 Startup Test Instruction (STI)-B21-025A, "Main Steam Isolation Valve (MSIV) Functional Test" was being performed on 1B21-F022D, the steam line D inboard MSIV. This valve closed in 22.14 seconds. Technical Specification 3.4.7 requires the MSIVs to close in 2.5 to 5.0 seconds. At 2103 and 2106 the D inboard MSIV was cycled with closure times of 3.24 and 2.94 seconds, respectively. All other MSIVs were then cycled to verify closure times. The B outboard MSIV closed in 11.9 seconds and the D outboard MSIV closed in 77 seconds. Each was cycled again with satisfactory results. Since initial conditions causing MSIV slow closure could not be repeated, all MSIVs were declared operable and plant startup testing continued.

On November 3 at 1150, MSIV fast closure timing was commenced in preparation for the MSIV fast closure scram test in accordance with agreements made with the NRC on October 30. At 1157 the D inboard MSIV closed in 18 seconds and was cycled again at 1159 with a closure time of 3.0 seconds. At 1208 the D outboard MSIV failed to close. A second attempt was satisfactory at 1213 with a closure time of 3.4 seconds. The D inboard and outboard MSIVs were declared inoperable and placed in the closed position in accordance with the requirements of Technical Specification 3.6.4.a. Based on repeat failures a plant shutdown commenced at 1330. The reactor was manually scrammed at 1819.

On November 4, the Nuclear Regulatory Commission (NRC) issued a Confirmatory Action Letter (CAL) detailing various steps Perry management was to take and not to take in preparation for an NRC Augmented Inspection Team (AIT). The team arrived onsite November 4.

III. Troubleshooting Activities

Prior to performing any work in the field, a troubleshooting plan was written. Based on the symptoms shown on October 29 and November 3, it was felt that the component with the highest probability of causing the slow closures was the ASCO model number NP-8323A20E dual solenoid found on each MSIV air actuator. Numerous possibilities existed which could have somehow affected these solenoids. The troubleshooting plan was set up to determine what the root cause was and whether any secondary problems had an impact.

On November 5 "As Found" conditions were documented and a more detailed troubleshooting plan was developed to establish the root cause of the MSIV failures and corrective actions necessary to restore the valves to operable condition. The troubleshooting plan was agreed to by the NRC AIT. On November 5 through November 8 various troubleshooting activities were carried out.

The first MSIV investigated was the 1B21-F022D valve (inboard MSIV on "D" line). Solenoid voltages and solenoid air exhaust port samples were taken as the valve was cycled all results were satisfactory. Next the field wiring and air lines were disconnected from the air actuator or air pack. All connections and pipe openings were inspected and any discrepancies noted. The air pack was then removed from the valve actuator and taken to the I&C hotshop for disassembly.

The above steps were repeated for the 1B21-F028B outboard valve and then the 1B21-F028D outboard valve. Any discrepancy no matter how small was documented for further evaluation. Whenever possible pictures were taken of what was found. The major discrepancies appear to be the following:

1. All dual solenoids disassembled have impact marks on the star shaped disk subassembly and a deep depression (dimple) on the disc holder seal (EPDM), with the solenoids of the B21-F028D indicating the most degradation.

2. Many of the EPDM Body Assembly O-Rings were hard, flattened, and adhering to metal surfaces.

3. In the 1B21-F022D valve rust was found inside the solenoid valve body, and the B solenoid coil was badly corroded.

In addition to the component disassembly three types of air analyses were performed to determine what contribution, if any, instrument air quality may have had in the failure of the MSIV valves. Filter samples were collected to determine particulate matter present in the instrument air system at the solenoid and actuator supply points. Various unknown substances observed in or collected from internal component surfaces were analyzed using infrared spectrophotometry to deduce origin of materials found. Grab samples of the air supply were analyzed by gas chromatography for hydrocarbon content and quantification of organic contaminants if present in significant quantities.

The samples collected on filter paper for particulate were analyzed under a microscope. Very small quantities of particles greater than 40 micron were identified which indicates acceptable air system quality. Therefore, it is a very low probability that the particles had an adverse effect upon the solenoid valve operation. Analyses of the substances collected during disassembly identified the presence of thread sealant and silicone lubricant, both of which are normally used during assembly of solenoid valves and air lines. Air supply grab samples indicated no hydrocarbons present in the instrument air supply.

Based on all the information it appears that the EPDM material used in various parts of the solenoid was interfering with solenoid valve movement. Thus, the decision was made to disassemble the dual solenoids on all 8 MSIVs, and refurbish as necessary.

IV. Root Cause

The cause of the MSIV delayed closures has been isolated to a failure of the ASCO dual solenoid valves. This failure is attributed to EPDM elastomer degradation due to elevated temperatures in the vicinity of the air packs resulting from steam leaks. The observed hardened dimples on the disc holder assembly and core assembly hardened elastomer seals is consistent with high temperature conditions. Other evidence of localized steam effects include degradation of the solenoid valve O-rings and observed rust/moisture discoloration of the 1P21-F022D solenoid coil.

Localized high temperature conditions existed during the plant cycle due to steam leakage and elevated area temperature indications. Steam leakage is known to have occurred in MSIV 1B21-F022B packing and the MSIV leakage control system isolation valves. This leakage was in the direct vicinity of those MSIV's which exhibited slow closure. Steam in excess of 300 degrees F is suspected of leaking in the direct location of the subject MSIV air packs based upon the degredation of the EPDM.

V. Corrective Actions

The following evaluations and actions have been or will be completed prior to plant startup:

1. For the dual (fast closure) solenoid the total air pack will be replaced for the 1B21-F028D valve, and the whole dual solenoid will be replaced on the 1B21-F022D valve. No other solenoids showed significant degradation or required replacement. All of the other MSIV dual solenoids have been rebuilt.

2. For the single (slow closure) solenoid the solenoid will be replaced on the 1B21-F028D, since the whole air pack is being replaced. Based on the inspection results above, no other replacements were necessary.

3. A evaluation has been performed of other ASCO solenoid Class 1E harsh environment applications in the plant, including those which may have been subject to the steam leak environment which affected the MSIV solenoids. The review identified two normally deenergized solenoids which do not serve an active safety function. Work history review of all other applications has shown no solenoid failures.

4. An evaluation will be made of other equipment in the vicinity of the 1B21-F022D, 1B21-F028D, and 1B21-F028B valves, to assess any impact that the steam leaks may have had on these components.

5. Additional temporary temperature monitoring will be installed in the steam tunnel on the preselected sample points in the MSIV area including the dual and test solenoid bodies. This monitoring will be used to evaluate the actual temperature profile of the complete MSIV actuator assembly and the surrounding area. Following completion of the Startup Test Program, temporary temperature indication will also be installed in the drywell for monitoring of the inboard MSIVs.

The following additional evaluations and actions will be performed:

1. Further evaluation will be performed on the exsisting industry experience and efforts on ASCO solenoid valve failure investigations. This evaluation will include such areas as using different metal, and non-metal materials, and the effect of hydrocarbons. Possible design improvements, including an exhaust port screen will be evaluated. Based on these evaluations a determination will be made on future actions including replacement frequencies.

2. A sampling plan for the solenoid elastomer components will be established. Analyses of these components are expected to confirm that hydrocarbons did not contribute to the EPDM degradation. Dew point and particulate sampling of the instrument air system will continue at the existing test frequency.

   A preventive maintenance requirement will be established for periodic replacement of the instrument air system prefilters. The maintenance frequency will be consistent with replacement of the instrument air system after filters. Additionally a generic precaution will be added into air system work orders regarding the use of thread lubricants and sealants.

   An evaluation will also be made of the relative physical location of the air compressors reduction gear vents, and the compressor air intake, to determine the need for modification, and/or periodic replacement of the intake filter.

3. Until the first refueling outage the full closure dual solenoids will be checked for proper operation during the monthly slow closure check. This will be performed by fully closing each MSIV individually utilizing the test solenoid, followed by taking the control switch to close, thus verifying the proper operation of the dual solenoid. Also during this time frame the MSIVs will be cycled individually on a quarterly basis regardless of plant operating conditions, and the fast closure time verified. On an interval not to exceed six months an inspection will be performed on a dual solenoid during an outage of opportunity. This inspection will verify no degradation of the solenoid valve internals.

AIT ACTION ITEMS

RESPONSIBLE SECTION	ITEM	DELIVERED	DESCRIPTION
OPS/LCS	1. SEQUENCE OF EVENTS A. CLOSURE TIMES B. OPERATOR ACTIONS TAKEN	X X X	o OPS CHRONOLOGY o UNIT LOGS o STA LOG o CONDITION REPORTS o SUMMARY o STI DATA
LCS	2. ADEQUACY OF REPORTING AND CATEGORIZATION OF EVENT	X	o SUMMARY WRITE UP
NED/LCS	3. IMMEDIATE SAFETY SIGNIFICANCE	X	o HISTORY OF EVENTS SUMMARY
OPS/LCS	4. ADDITIONAL TESTING ACTIVITIES IN PROGRESS	X	o SVI LIST o W.O. LISTS/VARIOUS UNITS
I&C/LCS	5. RPS ACTUATION SIGNALS DURING SURVEILLANCES	X	o SVIs o ISEG EVALUATION OF TRIP SIGNALS
LCS	6. MANAGEMENT DECISION MAKING PROCESS-INFORMATION AVAILABLE	X	o SUMMARY WRITE UP
LCS	7. PREVIOUS MSIV TIMING PROBLEMS	X	o SUMMARY WRITE UP o CANTLIN MEMO
TECH/LCS	8. MSIV MAINTENANCE HISTORY (OTHER THAN STI/SVI) A. RETESTING PERFORMED	X X	o WO LIST - WO's PROVIDED o SYSTEM AND COMPONENT DRAWINGS
TECH	9. AIR SYSTEMS MAINTENANCE HISTORY A. RETESTING PERFORMED B. VEDNORS MANUALS	X X X	o WO LIST - WOs NOT PROVIDED (NOT IN BOOK) o VARIOUS P51/P52 W.O.s/ CRs o 3 VENDOR MANUALS PROVIDED TO NRC o SYSTEM AND COMPONENT DRAWINGS o CONDITION REPORTS P51/P52

OPS	10. ADEQUACY OF PROCEDURES IN PLACE TO HANDLE EVENT A. OPERATOR TRAINING	X	o OPS SUMMARY
NED/LCS	11. SAFETY SIGNIFICANCE OF INCIDENT (ACCIDENT ANALYSIS)		o HISTORY OF EVENT SUMMARY o GE; MSIV CLOSURE TESTING o GE; MASS FLOW ESTIMATES o GAI SAFETY ANALYSIS
NED/LCS	12. ANALYSIS OF LOADING ON STEAMLINES (3 CLOSED, 1 OPEN)	X	o GE -EFFECTS OF ISOLATION o J. EPPICH MEMO DATED 11/6/87 o J. EPPICH MEMO DATED 11/6/87
LCS	13. PREVIOUS SIMILAR INDUSTRY EVENTS A. LER 86030	X	o NPRD PRINTOUT (NOT IN BOOK) o SERs 36-84, 57-85, o RELATED LER SUMMARIES o PERRY LER 86030
LCS	14. PREVIOUS NRC INFORMATION-BULLETINS, CIRCULARS, INFORMATION NOTICES	X	o IENs; 80-11,81-29,82-52, 83-57,84-23,84-68,85-08, 85-17,85-17-01,85-84, 86-57,78-14 o IEB; 78-14,79-01A
NED/LCS	15. OTHER APPLICATIONS OF ASCO VALVES	X	o EQ LIST o W.O. SEARCH o MODEL NUMBERS
TECH/I&C	16. TROUBLESHOOTING PLAN A. MATERIAL CONDITIONS AFFECT ON CLOSURE B. ANY FURTHER INVESTIGATIONS	X(REV. 0)	o TROUBLESHOOTING PLAN, AIR SY o POINTS SAMPLED o SEQUENCE OF TROUBLESHOOTING o PARTICLE COUNTS
	17. GENERIC IMPLICATIONS	X	o CORRECTIVE ACTION, INDUSTRY EVALUATION
TECH	18. ROOT CAUSE	X	o PRELIMINARY ANALYSIS
TECH	19. CORRECTIVE ACTIONS	X	o (DRAFT) 9 ITEMS
TECH	20. PLANS FOR STARTUP	X	o TUESDAY CONFERENCE @ REGION III

LCS	21. CLOSURE INFORMATION ON 1985 OPEN ITEM ON FSAR AIR QUALITY CHANGE (3 TO 40 MICRONS)	X	o CEI/NRR LTR 0306 o CEI/NRC LTR NOV. 9, 1984 o VIOLATION FROM 84-15 o IER 85-039 o IER 85-066 o IER 85-088 o SSER SUPP 7 - 9.3.1
TECH	22. MESH SIZE OF FLUSH CLOTHS USED ON AIR SYSTEMS TESTS	CLOSED PER DISCUSSIONS	
RPS	23. ANALYSIS OF AIR SYSTEM FLUSH CLOTHS TO VERIFY LESS THAN 40 MICRON PARTICLE SIZE (OIL, WATER)	CLOSED PER DISCUSSIONS X	o RESULTS ON CHEMISTRY ANALYSIS
NED-MDS	24. BRIEF SUMMARY DESCRIBING RELATIONSHIP BETWEEN COMPONENT SUPPLIERS AND MSIV CONTROL AIR PACK ASSEMBLERS (i.e. HILLER SHEFLER, NORGREN, ETC.)	X	o SUMMARY WRITE UP/LIST
OPLS	25. EQUIPMENT QUARANTINE LIST	X	o POD, NOV. 5
NED	26. MSIV EQUIPMENT	X	o SCEW SHEETS o DRAWINGS

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

NOV 4 1987

Docket No. 50-440
Docket No. 50-441

The Cleveland Electric Illuminating
Company
ATTN: Mr. Murray R. Edelman
Vice President
Nuclear Group
Post Office Box 5000
Cleveland, OH 44101

Gentlemen:

This letter confirms the telephone conversation on November 3, 1987, between Mr. Greenman and others of this office and Mr. A. Kaplan of your staff regarding the Main Steam Isolation Valve (MSIV) failures occurring at the Perry Nuclear Power Plant Unit 1 on November 3, 1987. With regard to the matters discussed, we understand that you will:

1. Take those actions necessary to ensure that complete documentary evidence of the "as found" condition of equipment being inspected is maintained.

2. Provide a step by step troubleshooting program to establish the root cause of the MSIVs failure to meet acceptance criteria.

3. Not disturb any components that offer a potential for being the root cause including power sources, switches, solenoids, and the air system directly feeding the MISVs until that action is approved by the NRC AIT team leader.

4. Except as dictated by plant safety, advise the NRC AIT Leader prior to conducting any troubleshooting activities. Such notification should be provided soon enough to allow time for the team leader to assign an inspector to observe activities.

5. Submit to NRC Region III a formal report of your findings and conclusions within 30 days of receipt of this letter.

None of these actions should be construed to take precedence over actions which you feel necessary to ensure plant and personnel safety.

We also understand that Perry Nuclear Power Plant Unit 1 will not be made critical without the concurrence of the Region III Regional Administrator or his designee.

CONFIRMATORY ACTION LETTER

Please let me know immediately if your understanding differs from that set out above.

Sincerely,

A. Bert Davis
Regional Administrator

cc: F. R. Stead, Manager, Perry Plant Technical Department
M. D. Lyster, Manager, Perry Plant Operations Department
Ms. E. M. Buzzelli, General Supervising Engineer, Licensing and Compliance Section
DCD/DCB (RIDS)
Licensing Fee Management Branch
Resident Inspector, RIII
Harold W. Kohn, Ohio EPA
Terry J. Lodge, Esq.
James W. Harris, State of Ohio
Robert M. Quillin, Ohio Department of Health
State of Ohio, Public Utilities Commission
J. M. Taylor, DEDO
T. E. Murley, NRR
J. Lieberman, OE
R. Cooper, EDO
W. Lanning, NRR
F. Miraglia, NRR
G. Holahan, NRR
M. Virgilio, NRR
J. Partlow, NRR
K. Connaughton, SRI
J. Strasma, RIII

AIT Meeting 11/4/87

Name	Tittle
Roger Lanksbury	AIT Team Leader
Al Kaplan	V.P. Nuclear Oper. Div.
M. D. Lyster	Mgr, PPOD
T.R. Stead	Mgr. PPTD
R.A. Stratman	Gen Sup Ops.
D.R. Green	Gen. Sup. Elect. Design
C. Riley	MGR NQAD
C. Shuster	MGR. Engineering
V. K. Higaki	GSE Outage Planning
W. R. Kanda	GSE, Inst. & Control
K F Russell	Shift Supervisor
M.W. Gmyrek	St. Ops Coordinator
[illegible] R Pech	GSE - Mech. Design
John P. Eppich	Sr Engr. Mech. Design
E. M. Buzzelli	GSE - Licensing & Compliance
R.A. Newkirk	GSE Technical
G. W. Heffner	Supv. Media Relations
G.A. Dunn	Supv Compliance Unit
K. A. Connaughton	NRC - S.R.I.
S. D. Eick	NRC - RIII Inspector
Hal Ornstein	NRC - AEOD
[illegible] Shaw	NRC/NRR/EMEB
John [illegible]	NRC/NRR/PD III-1
Vince Concel	PPTD/SE Unit/
Peter J Arthur	PPTD NSSS Lead

MSIV-Chronology of Events

October 29, 1987

1835 - Stroked INBD MSIV 1B21-F0022D for STI-B21-025A Section 8.3, per ERIS valve did not close for 18 seconds. Level 1 Test Exception Report written (STA Log)

1842 - Re-opened 1B21-F0022D (Plant Log)

1900 - Declared 1B21-F0022D Inop, closing time was 22.8 seconds from STI data (Plant Log) (LCO written, 87-2031)

2103 - Re-stroked 1B21-F0022D - time to close 3.2 seconds (Plant Log)

2106 - Stroked 1B21-F0022D again - time to close 2.9 seconds (Plant Log)

2144 - Stroked 1B21-F0028D - time to close 77 seconds (Plant Log)

2152 - 2220 stroked all MSIVs (Unit Log)

2221 - Decision (had been) made by Plant Management to stroke all MSIV's to check for common mode failure. Found 1B21-F0028B had an initial slow stroke time of 11.9 seconds, second stroke was 3.9 seconds (Plant Log)

2230 - 1B21-F0022D was re-stroked, valve closed in less than 3 seconds. Valve was stroked again and stroke time was less than 3 seconds (STA Log) 1B21-F0028D and F0028B also experienced long closing times (77 seconds and 12 seconds). When restroked valves had times of approx. [illegible] seconds each. In all cases the solenoid lights on 1H13-P622 and -P623 de-energized (STA-Log)
Isolated "D" Main Steam Line (STA Log)

2236-2250 - Isolated "D" MSL (Unit Log)

2240 - Isolated "D" MSL (Plant Log)

2310 - All MSIVs were verified to stroke within 3-5 seconds. Could not repeat the initial condition causing MSIV to slow close. Stroking the MSIV has freed up the Solenoid/Pneumatic valves, which control MSIV stroking, of any foreign matter or moisture. In 5 to 7 days MSIV Isolation Scram test is scheduled, if this is delayed we'll fast stroke the MSIV's again to see if event is repeatable. Declared 1B21-F0022D, F0028D and F0028B operable. (Plant Log)

2340 - Restored "D" MSL (Plant Log)

October 30, 1987

0010 - Made 4hr. report on slow closing MSIV's (Plant Log)

0300 - Test Exception Report (TER) 451-1 for MSIV closure was approved. All MSIV's restored. (STA Log)

B/84

October 30, 1987

0330 - TER 451-1 (MSIV Fast Closure) was resolved and closed. No restrictions to going back to TC-7 (Plant Log)

0355 - Increasing power (Plant Log)

November 2, 1987

1942 - Commenced SVI C71-T0039, MSL Isol Valve Closure Channel functional (Unit Log) (10% stroke - partial closure - RPS)

2142 - Completed SVI C71-T0039 - Sat

November 3, 1987

1145 - Decreased power to 80% to stroke MSIVs (Plant Log)

1154-1222 - stroked MSIVs (Unit Log)

1157 - 1B21-F022D took 18 seconds to close (Plant Log)

1158 - Unit Supervisor declared F022D Inop (Unit Log)

1159 - 1B21-F022D restroked in 3.0 seconds (Plant Log)

1200 - Unit Supervisor declared F022D operable (Unit Log)

1212 - 1B21-F028D did not close in the 2 minute 49 seconds that the control switch was in "close". Took switch back to "Auto", then to "close", valve shut in 3.4 seconds (Plant Log)

1212 - Unit Supervisor declared F028D Inop (Unit Log)

1230 - Declared MSL "D" Inop based on repeated failure of 1B21-F022D and F028D to stroke in required time. (see 10-29-87 20-24 shift entry) (Plant Log) (ALCO written, 87-2128)

1330 - Informed System Operation Center of intended plant shutdown (Unit Log)

1337 - Commenced PWR decrease (Unit Log)
Commenced a normal Rx shutdown (Plant Log)

1353 - Closed 1B21-F022D 3.4 seconds (Unit Log)

1354 - Closed 1B21-F028D 3.3 seconds (Unit Log)

1355 - Shut 1B21-F022D and F028D, out of T.S. 3.4.7 and 3.6.4. Made 4hr. report (Plant Log)

Attachments: Unit Log
Plant Log
STA Log
CR 87-503
CR 87-513

① Sequence of Events

- Copy of Unit Logs for 10/29/87 And 11/3/87

- Handwritten sequence - (Forthcoming)

10/27/87

1334- NOTIFIED SOC (HEALY) OF APPROX 100MWE LOAD DECREASE & SUBSEQ INCREASE DUE TO STI C85-022

1343- DECREASED LOAD SET TO OPEN 2.5 BYPASS VALVES INITIAL LOAD 803MWE, POWER 2453 MWTH.

1347- COMPLETED SVI-C51-T0028F-SAT

1350- DISABLED AUTO SHIFT OF C85 PRESSURE CONTROL

1400- Completed SVI 1331-T0081D-SAT

1407- RESTORED C85 SYSTEM TO DUAL CHANNEL OPERABILITY. SHIFTED C85 TO B CHANNEL, DISABLED AUTO ~~SHIFT~~ SHIFT OF C85 SYSTEM

1313- LATE ENTRY: RW PERFORMED DISCHG OF CUST A TO LAKE 33K

1426- RESTORED C85 SYSTEM TO DUAL CHANNEL OPERABILITY. NOTIFIED SOC (HEALY) OF POWER (LOAD) INCREASE TO 790-800 MWE

1433- RESTORED TURBINE LOAD SET TO 125 MWE → TURBINE LOAD, ALL BYP VALVES CLOSED - PEAK RPV POWER 3250G MWTH - NO CONTROL ROD MOTION [illegible] BYPASS [illegible]

[illegible] VERIFIED [illegible]

1437- Commenced [illegible] Radwaste [illegible]

1442- Commenced SVI B21-T0182R [illegible] HPCS [illegible] (E22-B[illegible])

1444- Completed [illegible] transferring water from SP to RW [illegible] 6500 gal transferred

1457- Doug Skelica (ET) ENTERED MAIN [illegible] FOR INSPECTION [illegible]

1500- Commenced SVI-E22-T1202 HPCS [illegible] FLOW FUNCT (E22-N056) [illegible]

1502- SECURED [illegible] MODE [illegible] COMMENCED [illegible]

1504- Doug Skelica exited main [illegible]

1527- COMPLETED SVI-B21-T0189K-SAT

1543- Completed SVI-E22-T1202-SAT

1557- SHIFTED B33 TO FLUX MANUAL

1602- COMPLETED PTI N32 P001 - UNSAT FOR ESOP DATA

1604- CORE FLOW > 45%

1705- COMMENCED SVI G50-T3266 - LRW RELEASE PERMIT FOR FDST B

1716- SHIFTED B33 TO FLUX AUTO

1721- RW SENDING 34K FROM FDST A TO CST

1725- SHIFTED B33 TO FLUX MANUAL

1732- Commenced SVI-N16-T2001 - SW VAC BKR / ISOL VLV OP TEST

1748- SHIFTED B33 TO FLUX AUTO

1813- SECURED ADDING H₂ to GENERATOR

1828- COMMENCED SVI B21 T0187R HPCS/ECCS L2/L8 RPV LEVEL FUNCTIONAL (B21-L6

1837- SHUT B21-F022D - FAST CLOSURE PER STI B21 C25A SECT 8.3

1842- OPENED B21 F022D - VALVE DIDN'T APPEAR TO CLOSE WITHIN 5 SEC CRITERIA - EVALUATING DATA

10/27 [illegible]

10/23/87

1930 Completed SVI-B21-T0187R - SAT
1900 - LATE ENTRY - B21-F022D DECLARED INOP, LIMITED TO 75% PWR, 55%
1940 - SHIFTED B33 to FLUX MANUAL
1955 - CORE FLOW REDUCED TO 53%, DROVE ROD IN TO 100% ROD LINE

1957 Assumed the Shift
2055 Started CRD pump A Secured CRD pump B
2103 CLOSED B21-F022D FOR STROKE TEST FOR SVI-B21 3.24 S Stopwatch
2105 OPENED B21-F022D
2106 CLOSED B21-F022D FOR STROKE TEST FOR SVI-B21 2.94 S Stopwatch
2107 OPENED B21-F022D
2127 Commenced SVI-M17-T2002
2144 Closed B21-F028D 1m 17 s Stopwatch L70 N302C
2145 Opened B21-F028D
2152 Closed B21-F028D Stopwatch L70-N302C
2153 Opened B21-F028D
2211 Closed B21-F022B 3.07 s L70-N302P
2211 Opened B21-F022B
2213 Closed B21-F022A 3.37 s L70 N302 P
2213 Opened B21-F022A
2215 Closed B21-F022C 3.45 s L70 N302 P
2215 Opened B21-F022C
2216 Closed B21-F028B L70 N302 P
2216 Opened B21-F028B
2218 Closed B21-F028B 3.96 s L70 N302 P
2218 Opened B21-F028B
2219 Closed B21-F028A 3.48 s L70-N302 P
2219 Opened B21-F028A
2220 Closed B21-F028C 4.12 s L70-N302 P
2221 Opened B21-F028C
2236 Closed B21-F028D and B21-F067D
2240 Deenergized 1E32-F001N in closed position and
1B21-F067D closed & deenergized
2250 Deenergized B21-F028D Solenoids in all the ...
2310 Relanded leads to B21-F028D. Declared B21-F022D
B21-F028D and B21-F028B operable
2322 ... ...
2333 Completed SVI-M17-T2002 & SVI-M17-T2002

11-2-87

1904 Commenced SVI-R10-T5217

1914 Completed SVI R10-T5217 partial - SAT.

1942 Commenced SVI-C71-T0039, MSL Isol Vlv Closure Chan Func

2015 Completed Xfer of WTT A to Cndr.

2029 Bypassed APRM C to allow bypassing LPRM 24-25-4B.

2030 Unbypassed APRM 'C'.

2050 - Resumed [illegible] MW

2121 Completed adding H2 to the generator.

2122 CVCW Chiller 'A' tripped Investigating

2127 Unable to determine why CV Chiller A tripped due to P50 A [illegible] being [illegible] on 1H13-P904.

2130 Attempted to start CV Chiller B. Chiller immediately

[illegible]

[illegible] Safety CKT [illegible]

2134 Started CV Chiller 'C' [illegible]

2144 Completed SVI-C71-T0039 - SAT

2154 Shifted steam [illegible] to Aux Boiler

2159 Shutdown SSE for training

2201 Bypassed APRM 'C' [illegible] LPRM 24-25-[illegible]

2214 Started SSE [illegible]

2240 [illegible]

2241 [illegible] declared [illegible] operable.

2242 Unbypassed APRM C.

2320 SSC requested Main [illegible] volts of 339.5

[illegible signature]

2351 ASSUMED THE SHIFT.

2400 NO FURTHER ENTRIES THIS DATE

[illegible signature]

11/3/87

0745 Assumed the shift

PNPP UNIT I

SS Henry Kelly
US Joe Harter
US Doug Gardner
SO Scott Davis
SO John Mikolaj
SO Al Steward

EXTRA LICENSED OPERATORS

STA Pat Curran

0807 Commenced SVI R42 ... weekly ... Battery test
0824 Commenced SVI B21-T0309A ... Rx ... Actuation ...
0847 Informed ... Operator ... of intended ... 50 MWe increase
0929 SVI B21 ... 3 ... Completed Sat
1004 ... Informed ... operator ... of intended ... increase
1018 Commenced BPV testing per ...
1025 Performed 24 hr Post ... Engineering ...
1041 Completed BPV testing, No rod motion verified by
1st Verif. [signature]
2nd Verif [signature]
1046 Commenced CIV testing per STI N31-0024
1105 Informed SOC operator ... of intended 15%
Pwr decrease
1107 Completed CIV testing, Commenced Pwr decrease
1127 Placed G36 A+B in hold
1150 Commenced stroke timing of MSIVS w/ stopwatch
L73-A833V Cal due 11-24-87
1151 Closed E21-F022B 3.2 sec
1156 Opened E21-F022B
1157 Closed E21-F022D 11 sec

1158 US Declared MSL D Inoperable (B21-F022D)
Opened B21-F022D
1159 Closed B21-F022D 3.0 sec
1200 Opened B21-F022D
US Declared MSL "D" operable
1201 Closed B21-F022A 3.1 sec
1202 Opened B21-F022A
1203 Closed B21-F022C 3.6 sec
1204 Opened B21-F022C
1206 Closed B21-F028B 4.0 sec
1207 Opened B21-F028B
1208 Closed B21-F028D., B21-F028D didn't
close 2 min 49 sec later placed B21-F028D C/S
in Auto at 1211
1212 US Declared MSL D Inop (B21-F028D)
1213 Closed B21-F028D 3.4 sec
1214 Opened B21-F028D
1217 Closed B21-F028D 3.8 sec
1218 Opened B21-F028D
1219 Closed B21-F028A 3.6 sec
1220 Opened B21-F028A
1221 Closed B21-F028C
1222 Opened B21-F028C
1226 Started ESC pump A
1227 Commenced C51-T0026 Power/Flow Verf
1233 RW commenced xfer of FOSTA to the CST
1235 Started RHR pump A in S.P. Cooling
1238 Opened E12-F024A at 1000 gpm
1245 Commenced xfer of S.P. water to RW
1255 Completed pumping the Suppression Pool. Xfered
5500 gallons to Radwaste
1327 SVI C51-T0026 Completed Sat
1330 Informed SOC operator Dervedo of Intended
plant S/D
1335 S/D RHR "A" Closed E12-F024A 3000 gpm
1337 Commenced Pwr Decrease, SM ECCA
1341 Commenced SVI C51-T526 Discharge Permit
1353 Closed B21-F022D 3.4 sec

1354 Closed B21-F028D 3.3 sec.
1357 Placed G36 "B" F/D in service
1418 Removed N23 "C&F" and N24 "A&B" from service
1431 Commenced SVI C11-T1022 RPC RWL
1430 SVI C11-T1022 Completed Sat
1447 S/D CBP "C"
1453 S/D RFBP "D"
1503 Rate Entry 1157 US declared MSL D Inop due to slow closing time on B21-F022D
1510 RW completed pumping FDSTA to the CST
1519 Commenced SVI C51-T0030C APRM C Cal for replacement of LPRM 4B-24-25
1537 Placed the MFP ? in Off & Placed RF Pump B on Man Flow Control

1515 [illegible]
1516 [illegible] RPM [illegible]
[illegible] CBP [illegible]
1605 Commenced [illegible] from [illegible] P24 [illegible]
1605 Informed SOC [illegible] of [illegible] Pump
[illegible] shift [illegible]
1630 Transferred [illegible] Reactor Recirc Pumps "A" [illegible] S/ow Speed
[illegible] Power [illegible]
PC Power Discharged
1640 Commenced discharge of FDST "B"
1701 Commenced SVI-C11-T1019, LOSP [illegible] Auto [illegible]
1711 Completed SVI-C11-T1019, Not SAT
1729 Shifted steam seals to the Aux Boiler, Shutdown the SSE
1732 Shifted In house Loads to Startup Xfmr
1735 Commenced raising Rx Press to 950# per US for SRE controls
1736 Informed SOC "Jeziorski" of impending plant scram
1746 Shut down RFPT "B" to Turning Gear Ops
1805 Commenced SVI-C11-T1006, CRD Aux Scram Instrumentation
1806 Started the MFP
1814 Shifted the MFP to the S/U level controller
1820 Manually scrammed the Rx entered UNI-C71-
1823 Started "C" HWP N21

PERRY NUCLEAR POWER PLANT

PLANT LOG Vol. 8 № 92

00-08 THUR 10-29-87

0125 STARTED 'B' - RFBP

0149 STARTED 'C' - CBP

0216 MSR - STARTED FW HTR DRAINS PUMP 'C' FORWARD, Chem. OK.

0449 Rx Pwr 78.9%, ROD LINE 114.6%, GMWT 2824

CORE FLOW 55.5%, ENTERED MEOD BOUNDARY OF TC-7.

PREP. to COMMENCED STI-C91-OR 8.1 - Thermal Pwr Determination and 8.2 - Thermal Limit Determination.

0452 C91- CRASHED - Holding this POWER LEVEL ≈ 79%

0529 C91- Returned to Service

0530 EXITED ANN- NGI, RPV COND. .220 umho (?)

0553 Commenced to Decrease Core flow to min- FCV setting in FAST SPEED Pumps.

0607 COMMENCED B/U H_2 PURGE

0635 CORE FLOW <45%, ENTERED T.S. 3.4.1.1, MUST Perform SVI-B33-T5433 once per 8 hrs and within 30 min after completion of Pwr increase of at least 5% of Rated Pwr.

R. Stoffle

08-20

0835 Started RHR A in the Suppression pool cooling mode.

1027 Authorized release of CWDT A.

1033 Placed A Press. Reg. in Control for STI-C85-022/8.1.

1110 Restored RHR A to standby readiness.

1136 Placed B Press. Reg in control for STI-C85-022/8.1

1230 Inop. RHR B in prep. for going into SPCU returning thru 1E12-F024B.

1305 Started SPCU pump in recirculation mode to improve Supp. Pool Chemistry.

1340 Opened 22 bypass valves as prereq. for STI-C85-22/8.3 Verified requirements of T.S. 3.1.4.1.

1431 All bypass closed, STI-C85-22/8.3 complete, min. feedwater temp. was 345°F (originally 360°F).

1837 Closed 1B21-F022D for STI B21-T0025A/8.3. Valve took an extremely long time to close.

1842 Reopened 1B21-F022D.

1900 Declared 1B21-F022D INOP - closure time from STI data was 22.8 secs. CR and TER initiated. Rx. power ~ 75%

PERRY NUCLEAR POWER PLANT

PLANT LOG Vol. 8

Nº 93

08-20 Thurs. 10/29/87

1900 cont. Core flow = 53% - limiting plant condition to these values until TER is resolved

DKH

20-24 ✓

1940 B33 → Flux MAN.

1955 Reduced core flow to 53%, Drove rods to <100% Rod Line, 66% PWR.

2055 STARTED A CRD PMP, SECURED B CRD PMP.

~~2144 STROKED B21-F028D closed (... ...)~~ Ra/ 10-29-87

2103 STROKED F022D, Fast close - 3.24 sec and Reopened

2106 STROKED F022D, Fast close 2.97 sec. and Reopened.

2144 STROKED F028D Fast close $\boxed{7.7 \text{ Sec.}}$ and Reopened.

2152 STROKED F028D Fast close 3.19 sec and Reopened.

2221 Decision made by plant management to stroke all MSIV. to check for Common mode fail. Found in Addition to $\boxed{\text{F022D}}$, $\boxed{\text{F028D}}$ having initial slow stroke times that $\boxed{\text{B21 F028 B}}$ (11.9 sec), initial took excessive time but later stroked at 3.9 sec.

2240 ISOLATED D MSL. FOR T.S. Action.

2310 ALL MSIV WERE VERIFIED TO STROKE WITHIN 3-5 SEC. Could not Repeat the initial condition causing MSIV to stroke close slow. Stroking the MSIV has freed up the sol/PNEUMATIC valves which control MSIV stroking of any foreign matter or moisture. In 5 to 7 Days MSIV 100. scram test is scheduled, if this is delayed will Fast stroke the MSIV again to see if condition is repeatable.

DECLARED F022D, F028D and F028B OPERABLE.

2340 Restored D MSL to SERVICE

R. McGaffee

RA/ 10/30/87

fj

00.08 FRI 10-30-87

0010 MADE 4 hr Report (50.72.b.2.iii.d) on Slow closing of MSIV initially.

0114 Secured B/U H_2 Purge, S/U AN in interim mode in prep. to TA/Bldg 676 A P/D.

0145 Authorized Release of FDST-B

0230 While changing light bulb in P47 B chiller - chiller tripped on loss of PNL PWR, → M25/26 B inop (Tech. Spec.)

0242 Isolated RCIC due to ~~E31-N~~ FAILED SU1, BAD Relay (4 hr. Report Required) (Relay order for replacement)

0245 Inserted TRIP Per T/S ~~for E31-N~~ Due to Relay 1E31A-K4B inop.

0324 P47B Restored, M25/26 B now OPERABLE.

0330 TCR 451-1 (SVI-B21-... /MSIV FAST CLOSURE) Resolved and closed. NO Restrictions to going back with TC-7.

0414 MADE 4 hr Report ON ISO. RCIC SYS. ALSO notified Resident inspector of THIS RPT. + 0010 Notification.

L.E. 0355: Comm. Raising PWR to CONTINUE TC-7 TESTING.

0442 PWR ↑ on HOLD - RAN OUT of Rod Pull Sheets, RE on way in to Generate Additional Rod Pull SHEETS to continue with TC-7 TESTING. (RX PWR at 75%) NEED to get to 85% for Next test.

0452 Restart of E31A-K4B (which was replaced) is set, waiting for closure prior to Restoring E31.

0533 RE-Commenced PWR INCREASE to 85%.

0554 Completed FDST-B Release

0555 AT 83% PWR, 5% Core Flow, in TC-7 window.

0600 PPA Reports EHC oil LEAK ON "D"-TSV. MAINT. ONSCENE. CHEM + RW informed. N37 ... OR SUMP (-45"), making PREPS to add OIL to ... (need ...)

0608 MAINT. has STOPPED LEAK ON D TSU INFORMED ... + PLANT HELPER SUPERVISOR TO COORDINATE CLEAN UP EFFORT.

0627 Completed SVI-N27-... A/B.5 ... + 6" - 6"

0649 N37 OIL has sprayed from wall on 620' TB E Down to 577' ... on 8' Puddle on 577 and oil has flowed into ... ... RW informed)

00-08 11/3/87
0032- Placed RHR 'A' in Supp Pool Cooling
0510- Secured Supp Pool Cooling, Placed RHR 'A' in Stby
Mike Wesley

08-16
1145 Decreased power to 80% to stroke MSIVs
1157 B21-F022D took 18 sec to stroke -.
1159 Restroked F022D time 3.0 sec
1212 B21-F028D did not close in the 2 min 49 sec that the valve control switch was in close. Took switch back to auto then back to close valve shut in 34 sec.
1230 Declared D MSL penetration INOP based on repeated failure of F022D and F028D to stroke in required time (SEE Entry 10-29-87 20-24 shift)
1337 Commenced a normal Rx shutdown
1355 Shut B21-F022D and F028D, out of T.S. 3.4.7 and 3.6.4 made 4 hour report on B21-F022D and 28D being INOP
1500 Authorized discharge of EDST 'B'
K. McKelley

16-24
1546 REMOVED RFPT "B" FROM THE MASTER LEVEL CONTROLLER AND IDLED IT AT 1100 RPM.
1600 COMMENCED POWER REDUCTION FROM 45% POWER.
1630 REACTOR POWER AT 35%. DOWNSHIFTED RECIRC PUMPS TO SLOW. RECEIVED BOTH WITHDRAW AND INSERT ROD BLOCKS WITH POWER LESS THAN THE LOW POWER SET POINT. VERIFIED PULL SHEET ROD SEQUENCE CORRECT.
1640 DISCUSSION WITH REACTOR ENGINEERING (STILES + DONOVAN) ROD PATTERN CONTROL BLOCKS DUE TO RODS BEING OUT OF SEQUENCE FOR THE RPCS THOUGH CORRECT BY THE PULL ~~SHEET~~ 11-3-87 SHEET. ROD PULL SHEET SPECIFIED THAT BEYOND A CERTAIN STEP, RODS WOULD BE OUT OF THE RPCS PATTERN CONSTRAINTS. RODS HAD NOT YET BEEN INSERTED BEYOND THIS STEP WHEN POWER WENT LESS THAN THE LPSP. CONDITION REPORT TO BE PRODUCED BY REACTOR (CONT)

UNIT 1
SHIFT TECHNICAL ADVISOR LOG

PERRY NUCLEAR POWER PLANT

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DATE	TIME	KEYWORD	REMARKS
10-29-87	~~1800~~ 1720 10-29-87	Continued	74% with 45% loop flow. Left Loose Parts Monitor in alarm.
	1835	MSIV's	Fast stroked valve F022D for startup. Per ERIS the valve did not start to move for 18 seconds and then took 2 seconds to close. Level 1 ~~Fcoco~~ TER written limits 75% power 53% flow.
			OFF GOING [signature] DATE 10-29-87 TIME 2007
			OC 1 PRESS 960 PSIG BPV POS POWER 66 % CORE FLOW 55 MLB HR
			GEN 771 MWE RCIC S/R HPCS S/R DIV 3 DG S/R
			LPCI A S/R LPCS S/R SLC A S/R ADS A S/R DIV 1 DG S/R
			LPCI B INOP LPCI C S/R SLC B S/R ADS B S/R DIV 2 DG S/R
			REMARKS RHR B IN SPCU ON COMING [signature]
10-29-87	2230	MSIV's	1B21-F022D was restroked in less than 3 seconds twice. 1B21-F028D and 1B21-F023B experienced long stroke times of 1 min 17 sec. and 11.9 seconds when tested. These were stroked again with stroke times of approx. 3 sec. The 1H13-P672 and P623 solenoid lights de-energized in all cases, indicating the slow stroke times occurred most probably from slow

UNIT 1
SHIFT TECHNICAL ADVISOR LOG

PAGE 1113

ERRY NUCLEAR POWER PLANT

DATE	TIME	KEYWORD	REMARKS
10-29-87	2230	MSIV's	movement of one of the air solenoid control valves. MSL D was isolated per T.S actions and a 4 hr report was generated.
10-30-87	0015	4 hr notif.	4 hour notification completed.
	0120	E31	During E31 SVI, Relay K4D failed. RCIC was declared INOP due to exceeding 2 hr time limit.
	0300	MSIV's	TER 451-1 for MSIV closure too slow has been approved. All MSIV's are restored.
	0400	Plant	Raising power to 85%.

[illegible] DJ Phillips [illegible] 10-30-87 [illegible] 0745
[illegible] 1 [illegible] 957 [illegible] POWER 86 % CORE FLOW 60 [illegible]
[illegible] 1000 [illegible] inop [illegible] SR [illegible] SR
SR [illegible] SR [illegible] SR [illegible] SR [illegible] SR
inop [illegible] SR [illegible] SR [illegible] SR [illegible] SR
[illegible] in SPCU [illegible] [illegible]

DATE	TIME	KEYWORD	REMARKS
10-30-87	0820	Chemistry	Reactor Water Conductivity is greater than .3 entered ORI.
10-30-87	1315	G36	Both G36 filters are now back inservice.
10-30-87	1545	Plant	Completed TC 7 testing. reduced rod line from 115% to 100% and increasing power to 100% until entry into TC-8 is approved.

UNIT 1

SHIFT TECHNICAL ADVISOR LOG

PERRY NUCLEAR POWER PLANT

DATE	TIME	KEYWORD	REMARKS
11-2-87	OFF GOING R. Stech		DATE 11-2-87 TIME 2342
	OC 1 PRESS 987	PSIG RPV POS/POWER 92 % CORE FLOW 73 MLB/HR	
	GEN 1106 MWE RCIC	S/R HPCS S/R DIV 3 DG S/R	
	LPCI A S/R LPCS	S/R SLC A S/R ADS A S/R DIV 1 DG S/R	
	LPCI B S/R LPCI C	S/R SLC B S/R ADS B S/R DIV 2 DG S/R	
	REMARKS Reviewed Unit Log		ON COMING [signature]
11-3-87	OFF GOING [signature]		DATE 11-3-87 TIME 0800
	OC 1 PRESS 1,000	PSIG RPV POS/POWER 90 % CORE FLOW 70 MLB/HR	
	GEN 1066 MWE RCIC	S/R HPCS S/R DIV 3 DG S/R	
	LPCI A S/R LPCS	S/R SLC A S/R ADS A S/R DIV 1 DG S/R	
	LPCI B S/R LPCI C	S/R SLC B S/R ADS B S/R DIV 2 DG S/R	
	REMARKS		ON COMING [signature]
11-3-87	1230 ~~1130~~	MSIV's	Fast stroked each MSIV. the F022D took 18 seconds and the F028D ~~took~~ did not close after 2 minutes and 48 seconds. On the second stroke the F022D took 3.0 seconds and the F028D took 3.4 seconds. Recommended to the Shift Supervisor & OSO. A. the valves not be called operable. B. the STI Reactor Full Isolation not be performed. We do not want to challenge the MSIV's with a known problem.

DATE	TIME	KEYWORD	REMARKS
-3-87	1520	MSIV's	Both F022D and F028D have been declared inoperable and isolated and de-energized. Current plans are to shutdown and investigate.

[illegible] GOING Afurman DATE 11-3-87 TIME 1540

[illegible] 1 PRESS 950 PSIG BPV POS/POWER 45 % CORE FLOW 53 MLB/HR

[illegible] 488 [illegible] RCIC S/R [illegible] S/R DIV 3 DG S/R

[illegible] S/R [illegible] S/R SLC A S/R ADS A S/R DIV 1 DG S/R

[illegible] S/R [illegible] S/R SLC B S/R ADS B S/R DIV 2 DG S/R

REMARKS ON COMING R. Street

DATE	TIME	KEYWORD	REMARKS
-3-87	1543	Status	Normal plant shutdown in progress. RFP A is on the MLC, RFP B is idling and the MFP control switch is in OFF. Recirc control is Flux Manual.
	1626	B33	Transferred Recirc pumps to slow
	1741	Status	Preparing to manually scram the reactor. After Recirc pumps were transferred and FCV's opened power was below LPSP. Unknown to the Operators when the LPAP was reached was that the control rod sequence steps had the rods out sequence by the RPC. So now that the plant is below LPSP RCIS has insert inhibits. (This crew did not realize that the rod sequence sheets deviate from RPC sequence

PNPP No. 6440
Rev. 3/87

CONDITION REPORT

(Use back of form for additional space.)

1	CR - 87 - 563	Page 1 of ___

EVENT DATE/TIME	DISCOVERY DATE/TIME	METHOD OF DISCOVERY
10-29-87/ 1877	10-29-87/ 1877	1H13-P601 INDICATIONS

EVENT DESCRIPTION

DURING PERFORMANCE OF STI-B21-025A WHILE FAST CLOSING 1B21-F022D, OPERATORS OBSERVED AN APPROX. 1½ SEC TIME DELAY BEFORE THE VALVE BEGAN TO STROKE ONCE THE CONTROL SWITCH WAS PLACED IN THE "CLOSE" POSITION. THE VALVE THEN STROKED CLOSE IN LESS THAN 5 SEC. AT 2103 THE VALVE WAS STROKED SUCCESSFULLY 2 TIMES, USING SOI-B21. (EVENT DESCRIPTION CONTINUED ON ATTACHED SHEET)

IMMEDIATE CORRECTIVE ACTION (INCLUDE SVI'S)

REDUCED POWER TO ≈75% AND FLOW≈53%

TER 451-1 (LEVEL 1 FAILURE)

SYSTEM/COMPONENTS AFFECTED (INCLUDE MPL)	REDUNDANT EQUIPMENT IN SAME SYSTEM AVAILABLE
1B21-F022D, 1B21-F023D, 1B21-F023B	1B21-F022 A, B, C 1B21-F028 A, C

ACTIVITIES AND CONDITIONS PRIOR TO EVENT

PERFORMING STI-B21-025A, 3.5 IN TC 7

OPERATIONAL CONDITION: (1) 2 3 4 5
REACTOR POWER (MWTH): 76%
REACTOR PRESSURE: 947 PSIG
RX WATER TEMP (IF NONSATURATED):

INITIATION CRITERIA	ORIGINATOR	DATE	SECTION
1, 4	D.G. Phelps	10-29-87	PPTO-TECHNICAL

TECH SPEC INVOLVED	LCO INITIATED (ATTACH COPY)	WORK INITIATED? (INCLUDE NO.)
3.6.4 3.4.7	☒ ACTUAL ☐ POTENTIAL	☐ WR ☒ WO 87-9231

US REVIEW	DATE	STA REVIEW	DATE
[signature]	10/30/87	D.A. Phelps	10-30-87

NOTIFICATION (INCLUDE REPORTING REQUIREMENT) (ATTACH ENF)
☐ IMMEDIATE
☐ ONE HOUR
☒ FOUR HOUR 50.72 [illegible]
☐ 24 HOUR

REPORTS
☒ POTENTIAL LER (PAP-0603)
☐ POTENTIAL RSF (PAP-1604)
RSF. ______
☐ MANAGEMENT PRELIMINARY REPORT (GS-OPERATIONS NOTIFIED)

TECH SPEC VIOLATION? ☐ YES ☒ NO

REMARKS
SEE PLANT AND UNIT LOGS FOR 2 STROKE TIMES.

REVIEWED, REQUIRED ACTIONS TAKEN SS	DATE
[signature]	10-30-87

COMPLIANCE REVIEW	DATE	LER NO.	ASSIGNED SECTION

REVIEW	DATE	PORC	REVIEW/APPROVED	DATE
		☐ YES ☐ NO		

PORC REVIEW MEETING NO.	APPROVED	DATE	APPROVED	DATE

CR CLOSED	DATE	REMARKS	CAUSE CODE
			P

EVENT DESCRIPTION (continued)

PER THE SOI AND USS DIRECTION (WITH SS OPERATIONS CONCURRENCE) THE REMAINING MSIV'S WERE FAST CLOSED. ALL MSIV'S STROKED SATISFACTORILY EXCEPT 1B21-F028B AND 1B21-F028D. AT 2134 1B21-F028D FAST STROKED CLOSE UNSATISFACTORILY IN 1 MINUTE, 17 SECONDS. AT 2152 THE VALVE WAS RESTROKED WITH A CLOSURE TIME OF APPROX. 3 SEC.

AT 2216 1B21-F028B FAST STROKED CLOSE UNSATISFACTORILY IN 11.9 SECONDS. AT 2218 THE VALVE WAS RESTROKED WITH A CLOSURE TIME OF APPROX. 3 SEC.

DURING ALL MSIV CLOSURES THE SOLENOID LIGHTS ON 1H13-P622 AND 1H13-P623 WERE OBSERVED TO EXTINGUISH IMMEDIATELY, INDICATING THAT POWER WAS DEENERGIZED TO THE SOLENOIDS AT THE AFFECTED VALVE.

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Page 1

EVENT NOTIFICATION

Perry Nuclear Power Plant
Unit 1

Caller's Name: Roger M Stiffler Title: SS

Event Time: 2144 Zone: [X] EST [ ] EDT Event Date: 10-29-87

	EVENT CLASSIFICATION
	GENERAL EMERGENCY
	SITE AREA EMERGENCY
	ALERT
	UNUSUAL EVENT
X	50.72 NON-EMERGENCY
	SECURITY/SAFEGUARDS
	TRANSPORTATION EVENT
	OTHER:

Y	N	EVENT CATEGORY	INITIATION SIGNAL
		REACTOR TRIP/SCRAM	F022 D, F028D and F028D Fast stroked close too slow >5 sec
		ESF ACTUATION	
		ECCS ACTUATION	
		SAFETY INJECTION FLOW	
		LCO ACTION STATEMENT	
X		OTHER:	

SYSTEM: B21

COMPONENT: F022 D F028D F028B

	CAUSE OF FAILURE
X	MECHANICAL
	ELECTRICAL
	PERSONNEL ERROR
	PROCEDURE INADEQUACY
	OTHER:

EVENT DESCRIPTION
(Use CR if completed) ([X] see CR)

POWER PRIOR TO EVENT(S): 64 %

CURRENT POWER OR MODE: (1) 64%

DID ALL SYSTEMS FUNCTION AS REQUIRED? [X] YES [ ] NO IF "NO", EXPLAIN ABOVE

ANYTHING "UNUSUAL" OR NOT UNDERSTOOD? [ ] YES [X] NO IF "YES", EXPLAIN ABOVE

OUTSIDE AGENCY OR PERSONNEL NOTIFIED			
STATE(S): NO			
LOCAL: NO			
RESIDENT	YES	NO	WILL BE
OTHER: NO			
PRESS RELEASE NO			

CORRECTIVE ACTION(S)

① Restroked all vlvs - SAT -, Freed up sol./Pneumatic vlv which control MSIV stroking.

② Looking at possibility of incorporating sol. freeing stroking MSIV's.

MODE OF OPERATION UNTIL CORRECTION: (1)

ESTIMATE TIME TO RESTART: NA

OTHER INFORMATION REQUESTED BY NRC:

① What was cause of slow stroke? ① Possibly sol/pneumatic vlv hung up but on subsequent strokes freed up. Couldn't repeat above condition on subsequent stroking

TIME/DATE OF CALL: 0010 10-30-87	CR NO.: CR- 87 - 503 pg 5 of
NAME OF INDIVIDUAL CONTACTED: MARKSBERRY	CALLER'S SIGNATURE: R M Stiffler

F028B

CLOT SCS
pg 4 of

TIME

22:11:05	C	B21-F22B	CLOSURE TIME	3:07 sec
22:11:40	O			
22:13:20	C	B21 F022A		3:37
22:13:30	C			
22:15:45	C	B21 F022C		3:45
22:15:55	O			
22:16:45	C	B21 F022B		11.9
22:18	O	F028D		
22:18:10	C	F028D		3.96
22:18:40	O	F028D		
22:19:07	C	B21 F022A		3.48
22:19:55	O			
22:20:37	C	B21 F022C		4.12
22:21:40	C			

IMAGE EVALUATION
TEST TARGET (MT-3)

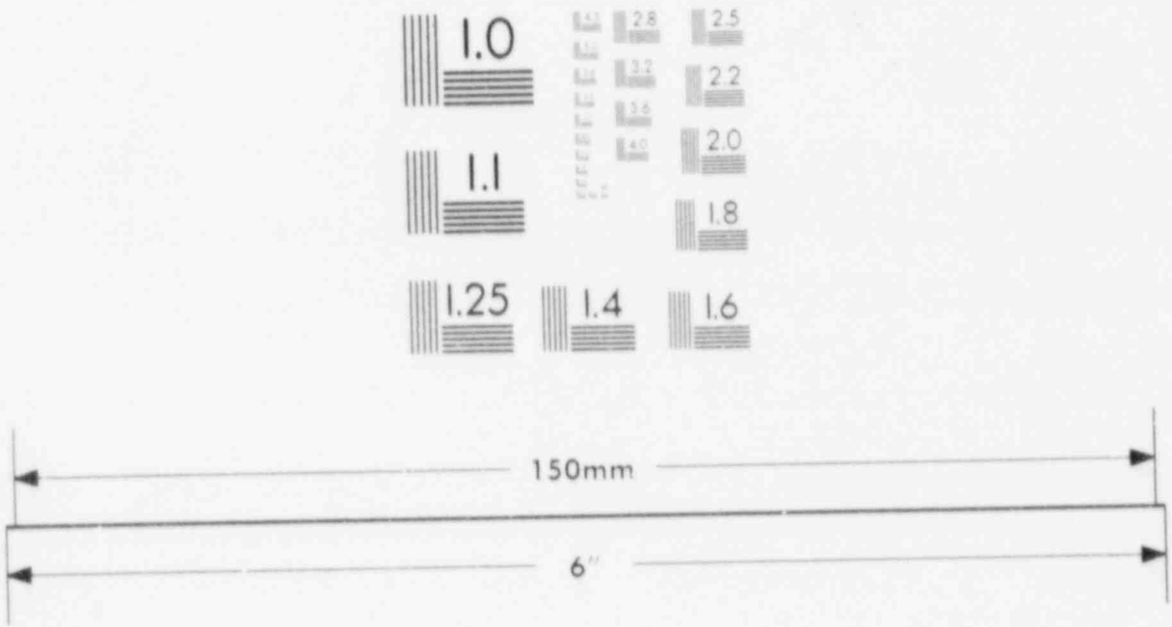


IMAGE EVALUATION
TEST TARGET (MT-3)

150mm

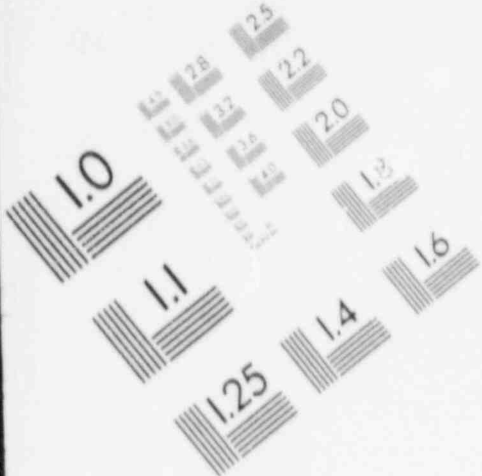
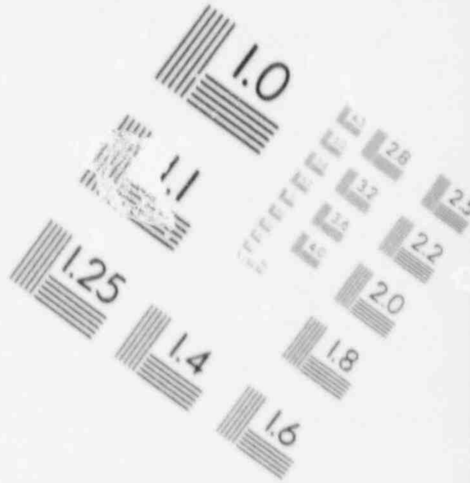
6"

IMAGE EVALUATION
TEST TARGET (MT-3)

150mm

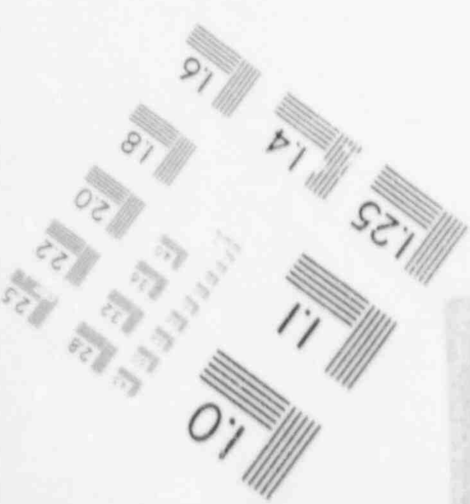
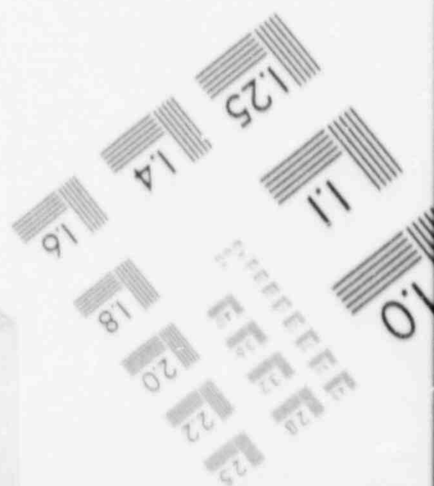
6"

IMAGE EVALUATION TEST TARGET (MT-3)


150mm

6"

FORM NO. 7137
Rev 1/87

ACTIVE LCO TRACKING SHEET 8720031

OP-LCO-1

T.S. SECTION	MPL(S)	OPERATIONAL CONDITION
3.6.4 ; 3.4.7	B21	1

ENTRY TIME/DATE 1900 10/29/87

IMPACT TIME/DATE 2300 10/29/87

TECH SPEC 3.0.3 ☑ YES ☐ NO

TECH SPEC 3.0.4 ☐ YES ☑ NO

OCP WORK RELATED ☐ YES ☑ NO

PROBLEM DESCRIPTION

1B21-F022D while closing during the performance of ST-B21-025A/B,S valve closure was slow. (22.xx sec by ST calculation) (Also it appears the valve was too fast when it started moving ≈ 7.38 s by ERIS.

ACTION REQUIREMENT

3.4.7 with one or more MSIV's inop
i. maintain at least one MSIV operable in each affected main steam line that is open and within 8 hrs, either:
a) Restore the inop valve to operable status, or
b) Isolate the affected main steam line by use of a deactivated MSIV in the closed position

3.6.4 maintain at least one isolation valve operable in each affected penetration that is open and within 4 hrs either
i Restore to operable
ii Isolate each affected penetration by use of at least one deactivated auto valve secured in the isolated position.

REFERENCE FORMS

CR87-503 pg 3 of

ADDITIONAL INFORMATION		STROKED SAT
B21 F0028D	FAILED 2144 10/29/87	2152 10/29/87
B21 F028B	FAILED 2216 10/29/87	2218 10/29/87

ENTRY REVIEW

DR Gardner
US

[signature]
SS

GSO

CLEARANCE

2310 10/29/87 [initials]
TIME DATE US

R. [signature]
SS

GSO

Rev. 5/87 (Use back of form for additional space.) | 1 | CR - 87 - 515 | Page 1 of ___

EVENT DATE/TIME: 11-3-87 / 1230 ~~1130A~~
DISCOVERY DATE/TIME: 11-3-87 / 1230 ~~1130A~~
METHOD OF DISCOVERY: Observation

EVENT DESCRIPTION
Fast stroked MSIV F022D closed the valve took 18 seconds to close.
Fast stroked MSIV F028D closed the valve did not move after 2 minutes and 49 seconds.

IMMEDIATE CORRECTIVE ACTION (INCLUDE SVI'S)
Restroked each valve
F022D closed in 3.0 seconds.
F028D closed in 3.4 seconds.

SYSTEM/COMPONENTS AFFECTED (INCLUDE MPL)
MSIV's F022D
F028D

REDUNDANT EQUIPMENT IN SAME SYSTEM AVAILABLE

ACTIVITIES AND CONDITIONS PRIOR TO EVENT
TC-8 Testing
Power 80%
Preparations for Full Reactor Isolation Test.

OPERATIONAL CONDITION: (1) 2 3 4 5
REACTOR POWER (MWTH): 80
REACTOR PRESSURE: 960
RX WATER TEMP (IF NONSATURATED): NA

INITIATION CRITERIA	ORIGINATOR	DATE	SECTION
3	[signature]	11-3-87	Tech

TECH SPEC INVOLVED: 3.6.4 / 3.4.7
LCO INITIATED (ATTACH COPY): ☒ ACTUAL ☐ POTENTIAL
WORK INITIATED? (INCLUDE NO.): ☐ WR ☒ NO

US REVIEW	DATE	STA REVIEW	DATE
[signature]	11/3/87	[signature]	11-3-87

NOTIFICATION (INCLUDE REPORTING REQUIREMENT) (ATTACH ENF)
☐ IMMEDIATE
☐ ONE HOUR
☒ FOUR HOUR 10CFR50.72 b 2 iii i
☐ 24 HOUR

REPORTS
☒ POTENTIAL LER (PAP-0603)
☐ POTENTIAL RSF (PAP-1604)
RSF- ___
☐ MANAGEMENT PRELIMINARY REPORT (GS-OPERATIONS NOTIFIED)

TECH SPEC VIOLATION? ☐ YES ☒ NO

REMARKS

REVIEWED, REQUIRED ACTIONS TAKEN (SS): [signature] DATE: 11-3-87

COMPLIANCE REVIEW	DATE	LER NO.	ASSIGNED SECTION
	/		

REVIEW	DATE	PORC	REVIEW/APPROVED	DATE
		☐ YES ☐ NO		

PORC REVIEW MEETING NO.	APPROVED	DATE	APPROVED	DATE

CR CLOSED	DATE	REMARKS	CAUSE CODE
			P

PNPP No. 6912
Rev. 4/86

Page 1

EVENT NOTIFICATION

Perry Nuclear Power Plant
Unit 1

Caller's Name: Henry Kelly Title: Sh. Ft. Supv

Event Time: 1157 Zone: ☒ EST ☐ EDT Event Date: 11-3-87

EVENT CLASSIFICATION	
	GENERAL EMERGENCY
	SITE AREA EMERGENCY
	ALERT
	UNUSUAL EVENT
X	50.72 NON-EMERGENCY
	SECURITY/SAFEGUARDS
	TRANSPORTATION EVENT
	OTHER:

Y	N	EVENT CATEGORY	INITIATION SIGNAL
		REACTOR TRIP/SCRAM	
		ESF ACTUATION	
		ECCS ACTUATION	
		SAFETY INJECTION FLOW	
		LCO ACTION STATEMENT	
		OTHER:	

CAUSE OF FAILURE	
	MECHANICAL
	ELECTRICAL
	PERSONNEL ERROR
	PROCEDURE INADEQUACY
X	OTHER: unknown

SYSTEM: B21 (MSIVs) F028D

COMPONENT: B21-F022D AND ~~F028~~

EVENT DESCRIPTION
(Use CR if completed) (☒ see CR)

POWER PRIOR TO EVENT(S):	80%
CURRENT POWER OR MODE:	83%

DID ALL SYSTEMS FUNCTION AS REQUIRED?	☐ YES ☒ NO	IF "NO", EXPLAIN ABOVE
ANYTHING "UNUSUAL" OR NOT UNDERSTOOD?	☐ YES ☒ NO	IF "YES", EXPLAIN ABOVE

OUTSIDE AGENCY OR PERSONNEL NOTIFIED

STATE(S):	NA		
LOCAL:	NA		
RESIDENT	YES	NO	WILL BE
OTHER:	NONE		
	PRESS RELEASE		

CORRECTIVE ACTION(S)

commencing Rx shutdown
Ix shut both MSIVs (F022D & F028D) at 75%
valves shut at 1355

MODE OF OPERATION UNTIL CORRECTION: 4

ESTIMATE TIME TO RESTART: unknown

OTHER INFORMATION REQUESTED BY NRC:
stroke Time of valves
history - was ops center informed of problem Fri? - No, in discussions with Region on Fri valves were not considered INOP - 1970 review of log showed that at the call was made - I informed the NRC ops center

TIME/DATE OF CALL:	1355 11-3-87	CR NO.:	CR-87 - 513.
NAME OF INDIVIDUAL CONTACTED:	Ron Young	CALLER'S SIGNATURE:	Henry Kelly

PNPP No. 7157
Rev 1/87

ACTIVE LCO TRACKING SHEET

8712120

OAP-1701-1

T.S. SECTION	MPL(S)	OPERATIONAL CONDITION
3.6.4, 3.4.7	B21	1

ENTRY TIME/DATE 1157 11/3/87	TECH SPEC 3.0.3 ☒ YES ☐ NO
IMPACT TIME/DATE 1557 11/3/87	TECH SPEC 3.0.4 ☒ YES ☐ NO
	OCP WORK RELATED ☐ YES ☒ NO

PROBLEM DESCRIPTION

B21-F028D FAILED TO STROKE ONCE, BUT STROKED SUCCESSFULLY THE SECOND & THIRD TIME

B21-F022D STROKED @ 18 SECONDS 1ST & THEN STROKED SAT

ACTION REQUIREMENT

ISOLATE PENETRATION OR
HOT S/D IN 12 HRS &
COLD S/D IN 24 HRS

REFERENCE FORMS

WO 87-9285
87-9293
T/O 1-87-4207

ADDITIONAL INFORMATION

B21-F022D & F028D DISABLED 1530 11/3/87
Transferred to ASO @ 0050 11-4-87 [illegible]

ENTRY REVIEW	CLEARANCE
[signature] US	00.50 TIME 11-4-87 DATE [signature] US
[signature] SS	Mike Wesley SS
[signature] GSO	[signature] GSO

Partial Sequence of Events

October 29, 1987

1837 Shut 1B21-F022D per STI-B21-025A 22.14 sec

1900 1B21-F022D declared inoperable

2103 1B21-F022D closed 3.24 seconds

2106 1B21-F022D closed 2.94 seconds

2144 1B21-F028D closed 1 minute 17 seconds

2152 1B21-F028D closed 3.19 seconds

2216 1B21-F028B closed 11.9 seconds

2218 1B21-F028B closed 3.96 seconds

2310 1B21-F022D, F028D, F028B declared Operable

October 30, 1987

0010 Notified NRC of slow closure of MSIV's

November 3, 1987

1150 Commensed stroke timing MSIVs

1157 Closed 1B21-F022D 18 seconds

1158 Declared 1B21-F022D Inoperable

1159 Closed 1B21-F022D 3.0 seconds

1200 1B21-F022D declared Operable

1208 Attempted to close 1B21-F028D, control switch held in shut position for 2 minutes 49 seconds

1212 1B21-F028D declared Inoperable

1213 1B21-F028D closed 3.4 seconds

1217 1B21-F028D closed 3.4 seconds

1330 Commensed plant shutdown

1353 Shut 1B21-F022D

1354 Shut 1B21-F028D

November 3, 1987

1358 Notified NRC of slow closure of MSIV's

1630 Shifted Reactor Recirculation Pumps to slow speed
Recieved withdraw and insert Rod Blocks from
Rod Pattern Control System

1919 Manually Scrammed the reactor - Reactor
Power 23 percent of rated.

2130 Notified NRC of reactor scram

POWER PLANT Unit 1 — Vol. No. 57

10/27/87

1334- NOTIFIED SOC (HEALY) OF APPROX 100MWE LOAD DECREASE & SUBSEQ. INCREASE DUE TO STI C85-022

1343- DECREASED LOAD SET TO OPEN 2.5 BYPASS VALVES INITIAL LOAD 803MWE, POWER 2453 MWTH.

1347- COMPLETED SVI- C51- T0028F- SAT

1350- DISABLED AUTO SHIFT OF C85 PRESSURE CONTROL

1408- completed SVI 1831- T0081D- SAT

1409- RESTORED C85 SYSTEM TO DUAL CHANNEL OPERABILITY, SHIFTED C85 TO B CHANNEL, DISABLED AUTO ~~SETUP~~ SHIFT OF C85 SYSTEM

1313- LATE ENTRY. RW PERFORMED DISCHG OF CUST A TO LAKE- 33K

1426- RESTORED C85 SYSTEM TO DUAL CHANNEL OPERABILITY- NOTIFIED SOC (HEALY) of POWER (LOAD) INCREASE TO 790-800 MWE

1433- RESTORED TURBINE LOAD SET TO 125% = TURBINE LOAD, ALL BYPASS VALVES CLOSED - PEAK RPV POWER 2506 MWTH - NO CONTROL ROD MOTION WITH BYPASS VALVES OPEN [illegible] VERIFIED [illegible]

1437- COMMENCED PUMPING [illegible] RADWASTE VIA ... RECU [illegible]

1447- COMMENCED SVI- B21- T0189R- ECCS HPCS HIGH RV PRESSURE FUNCT. (B21-N672)

1449- Completed ~~[illegible]~~ transferring water from SP to RW - 2600 gal transferred [illegible]

1457- DOUG Sheligo (ST) ENTERED MAIN (THE HD/UT) FOR INSPECTION [illegible]

1500- COMMENCED SVI- E22- T1202- HPCS LOW FLOW FUNCT (E22-N656)

1510- SECURED MIH INTERMITTENT MODE OPS - COMMENCED SVI H2 PURGE [illegible]

1509- Doug Sheligo exited main [illegible] yard [illegible]

1527- COMPLETED SVI- B21- T0189R- SAT

1543- Completed SVI- E22- T1202- SAT

1557- SHIFTED B33 TO FLUX MANUAL

1602- COMPLETED PTI N32 P001 - UNSAT FOR EBOP DATA

1604- CORE FLOW > 45%

1705- COMMENCED SOI G50- T3266- LRW RELEASE PERMIT FOR FDST B

1716- SHIFTED B33 TO FLUX AUTO

1721- RW SENDING 34K FROM FDST A TO CST

1725- SHIFTED B33 TO FLUX MANUAL

1737- COMMENCED SVI- M16- T2001- DW VAC BKR ISOL VLV OP TEST

1748- SHIFTED B33 TO FLUX AUTO

1813- SECURED ADDING H_2 to GENERATOR

1828- COMMENCED SVI B21 T0187R HPCS/ECCS L2/L8 RPV LEVEL FUNCTIONAL (B21- L6...

1837- SHUT. B21- F022D - FAST CLOSURE PER STI B21 025A SECT 8.3

1842- OPENED B21 F022D - VALVE DIDNT APPEAR TO CLOSE WITHIN 5.5 SEC CRITERIA - EVALUATING DATA

MN 10-29-87 [illegible]

10/29/87

1930 Completed SVI-B21-T0187R - SAT
A100- LATE ENTRY - B21-F022D DECLARED INOP, LIMITED TO 75% PWR, 55%
1940- SHIFTED B33 to FLUX MANUAL
1955- CORE FLOW REDUCED to 53%, DROVE 2008 IN to 100% ROD LINE

1957 Assumed the Shift
2055 Started CRD pump A Secured CRD pump B
2103 CLOSED B21-F022D FOR STROKE TEST PER SO1-B21 3.24 S Stopwatch L70 N...
2105 OPENED B21-F022D
2106 CLOSED B21-F022D FOR STROKE TEST PER SO1-B21 2.94 S Stopwatch L70 N...
2107 OPENED B21-F022D
2127 Commenced SVI-M17-T2002
2144 Closed B21-F028D In 17 S Stopwatch L70 N302C
2145 Opened B21-F028D
2152 Closed B21-F028D ... S Stopwatch B70 N302C
2153 Opened B21-F028D
2211 Closed B21-F022B 3.07 S L70 N302P
2211 Opened B21-F022B
2213 Closed B21-F022A 3.37 S L70 N302P
2212 Opened B21-F022A
2215 Closed B21-F022C 3.45 S L70 N302P
2215 Opened B21-F022C
2216 Closed B21-F028B ...9 S L70 N302P
2218 Opened B21-F028B
2218 Closed B21-F028B 3.96 S L70 N302P
2218 Opened B21-F028B
2219 Closed B21-F028A 3.48 S L70-N302P
2219 Opened B21-F028A
2220 Closed B21-F028C 4.12 S L70-N302P
2221 Opened B21-F028C
2236 Closed B21-F028D and B21-F067D
2240 Deenergized 1E32-F001N in closed position and
B21-F067D Closed & deenergized
2250 Deenergized B21-F028D Solenoids by lifting leads
2310 Relanded leads to B21-F028D, Declared B21-F022D
B21-F028D and B21-F028B operable
2322 Rx ... Fault 22.59 ... 48
2323 Completed SVI-M17-T2001 & SVI-M17-T2002

2340 Opened 1821-F028D
2343 Accumulator Fault Rod 22-59 Clear pressure was good. Inst block had small amount of moisture.
2400 Continued the Shift No Further entries this date

11/3/87

0745 Assumed the shift

PNPP UNIT I

SS Henry Kelly
US Joe Hanker
US Doug Gardner
SO Scott Davis
SO John Mikolaj
SO Jeff Steward

EXTRA LICENSED OPERATORS

STA Pat Curran

0807 Commenced PTI-P54-P0024 Diesel fire pump. Battery test
0829 Commenced SVI-B21-T0369A SRV Pressure Activation channel funct.
0841 Informed SOC operator Jereeko of intended 50 MWe increase
0929 SVI B21-T369A Completed Sat
1014 Inf. SOC operator Jordan of intended power decrease for BPV testing
1018 Commenced BPV testing for STI N31-0024
1025 Performed 24 hr Post S/D Engine roll on DIV II D.G
1041 Completed BPV testing, No rod motion Verified by.
1st Verif. [illegible]
2nd Verif [illegible]
1046 Commenced CIV testing for STI N31-0024
1105 Informed SOC operator Jereeko of intended 15% power decrease
1107 Completed CIV testing, Commenced pwr decrease
1127 Placed G36 A+B in hold
1150 Commenced stroke timing of MSIVS w/ Stopwatch L73-R833V Cal due 11-24-87
1154 Closed B21-F022B 3.3 sec
1156 Opened B21-F022B
1157 Closed B21-F022D 1[illegible] sec

1158 US Declared MSL D Inoperable (B21-F022D)
Opened B21-F022D
1159 Closed ~~AO~~ B21-F022D 3.0 sec
1200 Opened B21-F022D
US Declared MSL 'D' operable
1201 Closed B21-F022A 3.1 sec
1202 Opened B21-F022A
1203 Closed B21-F022C 3.6 sec
1204 Opened B21-F022C
1206 Closed B21-F028B 4.0 sec
1207 Opened B21-F028B
1208 Closed B21-F028D, B21-F32 D drain
Clear 2 min 44 sec later placed B21-F0?? D
in Auto at 1211
~~1215~~ 1212 US Declared MSL D Inop (B21-F028D)
1213 Closed B21-F028D 3.4 sec
1214 Opened B21-F028D
1217 Closed B21-F028D 3.4 sec
1218 Opened B21-F028D
1219 Closed B21-F028A 3.6 sec
1220 Opened B21-F028A
1221 Closed B21-F028C
1222 Opened B21-F028C
1226 Started ECC pump "A"
1227 Commenced C51-T0026 Power/Flow Verif
1233 RW commenced xfer of FDST A to the CST
1235 Started RHR pump A in S.P. Cooling
1238 Opened E12-F024A at 1000 gpm
1245 Commenced xfer of S.P. water to RW
1255 Completed pumping the Suppression Pool. Xfered
5500 gallons to Radwaste
1327 SVI C51-T0026 Completed Sat
1330 Informed SOC operator Dereaks of Intended
plant S/D
1335 S/D RHR 'A' Closed E12-F024A 3000 gpm
1337 Commenced Pwr Decrease, Sm ECCA
1341 Commenced SVI GSU-T526 Discharge Permit
1353 Closed B21-F022D 3.4 sec
1354 Closed B21-F028D

Reportable Event number 10515 .

Facility : [illegible]
Unit : 1
Region : 3
Vendor : GE,GE
Operations Officer : Don Markeberry
NRC Notified By : ROGER STIFFLER
Rad Release : No
Cause : Unknown
Component :

Date Notified : 10/31/87
Time Notified : 00:10
Date of Event : 10/30/87
Time of Event : 21:44
Classification : 10 CFR 50.72
Category 1 : LCO Action Statement
Category 2 :
Category 3 :
Category 4 :

EVENT DESCRIPTION :

WITH THE REACTOR AT 62%, FULL CLOSURE TESTS ON MSIVs FOUND THREE VALVES WITH CLOSURE TIMES EXCEEDING THE 5 SECOND LIMIT. THE FIRST MSIV, FO22-D [illegible] CLOSED 22 SECONDS. AFTER FURTHER TESTS THE CLOSURE TIMES WERE WITHIN 3-5 SECONDS. AS THE RESULT OF THE TEST, THE OUTBOARD MSIV, FO-28-D, WAS TESTED WITH A CLOSURE TIME OF 77 SECONDS. THE VALVE WAS CYCLED SEVERAL TIMES WITH STROKE TIMES WITHIN 3-5 SECONDS. ALL OTHER MSIVs WERE TESTED WITH ONLY ONE OTHER VALVE, FO-26-B, CLOSING AT 12 SECONDS AND FURTHER TESTS REVEALED CLOSURE TIMES WITHIN 3-5 SECONDS. AFTER THE FIRST TEST ON THE THREE VALVES SLOW CLOSURE TIMES COULD NOT BE REPEATED. SUSPECT WATER IN AIR SUPPLY AFFECTING THE PNEUMATIC SOLENOIDS WHERE THE CYCLING FREED THE SOLENOIDS. CONSIDERING SHORTENING THE SURVEILLANCE FREQUENCY FOR FULL CLOSURE TESTS [illegible] 92 DAYS - NOTIFIED-RDO(SPESSARD)

[illegible]

(2) Closure Times

- STI Package for Tests on 10/29/87

Valve	Time/Date		Closure Time
1B21-F022A	2213	10/29	3.37 seconds
	1201	11/3	3.1 seconds
1B21-F022B	2211	10/29	3.07 seconds
	1154	11/3	3.2 seconds
1B21-F022C	2215	10/29	3.45 seconds
	1203	11/3	3.6 seconds
1B21-F022D	1837	10/29	22.14 seconds per STI-B21-D25A
	2103	10/29	3.24 seconds
	2106	10/29	2.94 seconds
	1157	11/3	18 seconds
	1159	11/3	3.0 seconds
	1353	11/3	3.4 seconds
1B21-F028A	2219	10/29	3.48 seconds
	1219	11/3	3.6 seconds
1B21-F028B	2216	10/29	11.9 seconds
	2218	10/29	3.96 seconds
	1206	11/3	4.0 seconds
1B21-F028C	2220	10/29	4.12 seconds
	1221	11/3	Not recorded

Valve	Time / Date		Closure Time
1B21-F028D	2144	10/29	1 minute 17 seconds
	2152	10/29	3.19 seconds
	2236	10/29	Not recorded
	1208	11/3	Did not close
	1213	11/3	3.4 seconds
	1354	11/3	Not recorded

Startup Test Results Package Cover Sheet
Perry Unit 1 Startup Test Program

Rev.: 4
Form: PAP-1101-7

S.I. No./Rev.	STI Title	STI Section No./Title	TSN	Date
B21-025A/3	MSIV FUNCTION TEST	8.3/Full Cl. of Fstst MSIV @70%	451	10/30/87

Reason for Test:

[X] Scheduled Test [] Retest per TER ________ [] Other ________

Initial Conditions
Test Plateau: [] OV [] HU [] Low Pwr [] Mid Pwr [X] Hi Pwr
Test Condition: [] OV [] HU [] 1 [] 2 [] 3 [] 4 [] 5 [] 6 [X] 7 [] 8

Core Pwr 75 % Plant MWe 885 Other: ________
Core Flow 53 % Rx Press 962 psig ________

TER'S (list) Attach all open and closed TER's: 451-01, 02 (TSN) [] cont
STCN'S (list) Attach all applicable STCN'S: 025A - 3 - 1, 2, 3 (STI#)(Rev) [] cont

Acceptance Criteria Results
Level 1: [] Sat. [X] Exceptions [] N/A
Level 2: [X] Sat. [X] Exceptions [] N/A
Level 3: [] Sat. [] Exceptions [X] N/A
Other Analysis [] Sat [] Exceptions [X] N/A

Resp. Vendor: [X] GE [] GAI [] Other ________

[X] Results Package Index Compl
[X] Proc/Inst Sat or None Used
M & TE USED:
[] Yes, M&TE Report submitted
[X] None Used

Summary of Test and Test Results (inc. results of any unsat plant proc./inst.eval)

This test closed the fastest MSIV as determined from previous testing at approximately 75% power. The valve, 1B21 F022D was slow to start closing (time from solenoid deenergization to valve movement indicated by limit switch) however closing time (time from 90% to 10% limit switch actuation extrapolated to 100%) was within specification. TER 451-01 was generated to addrers this. This TER was resolved before testing was secured. All other analysis was satisfactory.

TEST Status: [] Complete [X] Complete/TER's (Ck if any TER's) [] Cancelled

Prepared By/Date	Reviewed By TD/Date	S/U Ele Supr/Date	Sup. SU Pr Dr/Date/Time
[signature] 10/30/87	[signature] 10-30-87	John [signature] 10-30	[signature] 10/30/87

Approval Status: [X] Approved [] Approved with comments
Open TER's: [] yes [X] no

PCRC Meeting No: 87-238
GE SCM: Date [signature]
Plant Tech Mgr/Date: [signature] 10-30-87
Plant Ops. Mgr/Date: [signature] 10/30/87

TEST COPY

CCCCC3

STARTUP TEST CHANGE NOTICE

Sheet 1 of 1

Rev.: 4
Form: PAP-1104-3a

STI No./Title	Rev.	STCN No.	Date
B21-025A / MSIV Function Test	3	025A-3-3	10/29/87

Reason for change

To utilize most recent data on stroke time and limit switch positions.

Affected steps, sections, or paragraphs

6.6.3, 8.3.2.1.c

Change

Change 6.6.3 to

From the ~~[illegible]~~ LATEST (LG 10/29/87) SVI-B21-T2001, record the MSIV with the fastest stroke time. Then record the actual valve positions AP_{10} and AP_{90} associated with the fastest MSIV, from the instrument file folder (filed by MSIV number). Obtain the maximum isolation instrumentation delay time from the completed Attachment 1 of Section 8.1, completed during TC 3. Attach copies of the SVI and file folder data.

Does STCN change intent of the STI [] Yes [X] No

(if yes is checked, conditional approval is not allowed)

Originator/Date: [signature] 10/29/87

Conditional Approval	Test Director/Date	Shift or Unit Supervisor/Date
	[signature] 10-29-87	[signature] 10/29/87

50.59 Applicability Ck Completed per PAP-0305 (Attach Applicability Ck Form) Yes [] No [X]

STCN Log [X] Updated

	S/U Test Ele Supr/Date	S/U Prog. Director/Date	GE SOM:
		OQS:	

Final Approval:	PORC Meeting No.	Plant Tech. Manager/Date:
[] Approved	NA BL 10-29-87	Plant Ops Manager/Date:
[] Disapproved		

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STARTUP TEST CHANGE NOTICE

Sheet 1 of 1

Rev.: 4
Form: EAP-1104-3a

STI No./Title	Rev.	STCN No.	Date
B21-025A / MSIV Function Test	3	025A-3-2	5-17-87

Reason for change: Delete the requirement to evacuate containment. The unit supervisor feels this is unnecessary.

Affected steps, sections, or paragraphs: 6.3.3, 6.5.3, 8.1.2.2.c, 8.2.2.2c

Change: Delete the above steps. Mark "Deleted" adjacent to the steps and in signoffs of 8.1.2.2c and 8.2.2.2c.

Does STCN change intent of the STI [] Yes [X] No
(if yes is checked, conditional approval is not allowed)

Originator/Date: W.E. Long / 5-17-87

Conditional Approval	Test Director/Date	Shift or Unit Supervisor/Date
	[signature] / 5-17-87	[signature] 5/17/87

50.59 Applicability Ck Completed per EAP-0305 (Attach Applicability Ck Form)
Yes [] No [X]
STCN Log [X] Updated

S/U Test Ele Supr/Date	S/U Prog. Director/Date	GE SCM:
John Cantlin / 5-20-87	[signature] LEAS / 5-20-87	[signature] 5-22-87
	QCS: [signature] 5/21/87	

Final Approval:	PORC Meeting No.	Plant Tech. Manager/Date:
[X] Approved	87-114	[signature] 5/21/87
[] Disapproved		Plant Ops Manager/Date: [signature] 5/21/87

TSN 451

STARTUP TEST CHANGE NOTICE

Sheet 1 of 1

Rev.: 4
Form: PAP-1104-3a

STI No./Title	Rev.	STCN No.	Date
STI-B21-025A/MSIV Function Test	3	025A-3-1	5/14/87

Reason for change
To transfer testing per Sections 8.1 and 8.2 from TC-2 to TC-3. This change previously approved by PCRC via STCN-203-2-5 and S.E. #87-260.

Affected steps, sections, or paragraphs
2.0, 6.1, 6.1 note 2, 6.3.1, 6.4.2, 6.5.1, 6.6.3, 6.8.2, 8.1.2.2.a, 8.1.39.4.a.2, 8.2 (note), 8.2.2.1.b, 8.2.2.2.a, 8.2.3.1, 8.3.2.1.c, 8.4.2.1.b, Attachment 7 - No. 1.

Change

For the above steps change Test Condition 2 to Test Condition 3.

Does STCN change intent of the STI [ ] Yes [X] No
(if yes is checked, conditional approval is not allowed)

Originator/Date: H. E. Longe [signature] 5-15-87

Conditional Approval
Test Director/Date: [signature] 5-15-87
Shift or Unit Supervisor/Date: [signature] 5/15/87

50.59 Applicability Ck Completed per PAP-0305 (Attach Applicability Ck Form)
Yes [ ] No [X]

STCN Log [X] Updated

S/U Test Ele Supr/Date: John G. Centini 5-21-87
S/U Prog. Director/Date: [signature] 5-21-87
GE SOM: [signature] 5-22-87
OPS: [signature] 5/21/87

Final Approval:
[X] Approved
[ ] Disapproved

PCRC Meeting No.: 87-114

Plant Tech. Manager/Date: Steven [signature] for AAS 5/21/87
Plant Ops Manager/Date: [signature] 5/21/87

TSN 451

8.3 Full Closure of the Fastest MSIV at 70% Power

8.3.1 Precautions Applicable to All Sections

1. Reviewed (5.1) — RLB 10/29/87 Init/Date

8.3.2 Prerequisites and Initial Condition

1. Prerequisites

a. ERIS sample plan (6.6.1) — RLB 10/29/87 Init/Date

b. Scram and isolation margins verified. (6.6.2) — RLB 10/29/87 Init/Date

c. Record (6.6.3):

Fastest MSIV F022D, t_d .28 sec.

AP_{10} 9.8 %, AP_{90} ~~88.0~~ 91 %. — RLB 10/29/87 Init/Date

Verified By/Date 10/29/87

2. Initial Conditions

a. Test Condition 7, reactor power 70-75% (6.7.1) — RLB 10/29/87 Init/Date/Time

b. Recirculation system in Master Manual Mode (6.7.2) — RLB 10/29/87 Init/Date/Time

c. Evacuate Containment (6.7.3) — RLB 10/29/87 1831 Init/Date/Time

8.3.3 Authorization to test

1. Test Condition 7 and Test Plateau HP are approved per STI- HP - 204 , High Power Plateau. — RLB 10/29/87 Init/Date

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2. Test included in TPOD

or

Test not in TPOD, approved to test (and QA notified)

NA

Startup Test Program Director — Date

Init/Date

3. Approved

Unit Supervisor — Date — Time

NOTE: All controls and indicators used in this section are located on panel 1H13-P601, unless specified otherwise.

8.3.4 Record the following:

P680 Instrument	Parameter	Data		Alternate Inst./Units
APRM A	Core Power	75	%	NA
1N41-R018	Plant MWe	885	MWe	
1C34-R609	Reactor Press	[illegible]	psig	
1B33-R613	Core Flow	55	Mlb/hr= 53 %	
1C34-R608	NR Rx Level A/B (Circle Channel Used)	[illegible]	inches	

Init/Date

NOTE: Starting and stopping of ERIS and archiving of ERIS data is at the discretion of the Test Director.

8.3.5 Start ERIS recording at least 10 seconds prior to the MSIV closure.

Init/Date

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8.3.6 Manually close the fastest MSIV (recorded in step 8.3.2-1c) by turning its control switch to the "CLOSE" position.

RLB 10/29/82
Init/Date

8.3.7 When the reactor pressure and power transient has stabilized, stop ERIS. Archive the ERIS data and record the information necessary for data retrieval.

Tape No. LABEL 4S121 449

RLB 10/29/82
Init/Date

8.3.8 Plant Restoration

1. Open the tripped MSIV by returning its control switch to the "AUTO" position.

RLB 10/29/82
Init/Date

2. Plant operations may continue as directed by the Unit Supervisor.

RLB 10/29/82
Init/Date

8.3.9 Level 1 Analysis

1. Times t'_o, t_{10}, and t_{90} equal the time the MSIV pilot valve solenoid is de-energized and actuation of the 10% and 90% closed limit switches, respectively.

From the ERIS data (ERIS signals B21EC069 through B21EC081), record values for t'_o, t_{90}, and t_{10}.

t'_o = 53.315 sec.

t_{90} = 20.310 sec. t_{10} = 17.424 sec.

Init/Date

2. Calculate the valve stroke time t_s.

$$t_s = \frac{(t_{90} - t_{10})}{(\Delta P_{90} - \Delta P_{10})} \times 100\%$$

$$t_s = \frac{(20.310\ \text{sec} - 17.424\ \text{sec})}{(91\ \% - 9.8\ \%)} \times 100\%$$

t_s = 3.55 sec.

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<u>NOTE</u>: Values for AP_{10} and AP_{90} are from step 8.3.2-1.

G.A. 10/29/87
Init/Date

3. Verify the MSIV stroke time (t_s) is greater than or equal to 2.5 seconds and less than or equal to 5.0 seconds: Acceptance Criteria 3.1.1.

G.A. 10/29/87
Init/Date

4. Calculate closure time t_{sol} from the following:

$$t_{sol} = (t_{90} - t_o') + \frac{(t_{90} - t_{10})}{(AP_{90} - AP_{10})} (100\% - AP_{90})$$

$$t_{sol} = (\underline{\text{[illegible]}}\ \text{sec} - \underline{52.576}\ \text{sec}) + \frac{(\underline{20.520}\ \text{sec} - \underline{17.424}\ \text{sec})}{(\underline{91}\ \% - \underline{9.8}\ \%)} (100\% - \underline{91}\ \%)$$

t_{sol} = <u>21.76</u> sec.

G.A. 10/29/87
Init/Date

5. The total effective MSIV closure time equals t_{sol} plus the maximum instrumentation delay time (i.e., $t_{sol} + t_d$). Calculate the total effective closure time.

Total Effective Closure Time = $t_{sol} + t_d$

Total Effective Closure Time = <u>21.86</u> sec. + <u>.28</u> sec.

Total Effective Closure Time = <u>22.14</u> sec.

<u>NOTE</u>: The value for t_d is from Step 8.3.2-1.

G.A. 10/29/87
Init/Date

6. Verify the total effective closure time, is not greater than 5.5 seconds. Acceptance Criteria 3.1.1.

$t_{sol} + t_d$ is less than or equal to 5.5 sec.

TCR 451.1 G.A. 10/29/87
Init/Date

[signature] 10/29/87
Level I Analysis Verified By/Date

Serial No. <u>451</u>

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8.3.10 Secure from Test

1. Approved

Tom Oh... / 10/13/87

Test Director / Date

2. Approved

Mike Nemcik / 10/16/87 / 0328

Unit Supervisor / Date / Time

8.3.11 Level 2 Analysis

1. Verify the reactor did not scram or isolate during the MSIV closure: Acceptance Criteria 3.2.1.

   G.A. 10/13/87

   Init/Date

2. Scram Avoidance - Flow Biased Scram

   a. Determine the Peak transient value for simulated thermal power (STP). The Peak Transient STP is the value at point of closest approach of ERIS Heat Flux channels C51EA019 or 20 to either of ERIS channels C71A0003 or C71A0004, respectively.

      Peak Transient STP = ~~77.408~~ 78.209

      Using: C51EA019/C51EA020 (Circle)

      dSTP = Peak Transient STP - Initial STP

      dSTP = ~~77.408~~ 78.209 - 76.292

      dSTP = ~~1.116~~ 1.917

      10/31/87

      Init/Date

   b. Determine APRM Upscale Simulated Thermal Power Trip Setpoint. The Setpoint is the value of ERIS Channels C71A0003 or C71A0004 at the point of the Peak Transient STP.

      Setpoint = ~~93.312~~ 92.929

      10/30/87

      Init/Date

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c. Compute the Simulated Thermal Power margin to scram:

Margin to Scram = Setpoint - Peak Transient STP

Margin to Scram = 92.929 % - 78.209 %

Margin to Scram = 14.72 %

Init/Date 10/30/87

d. Verify the simulated thermal power (STP) margin to scram for each channel is greater than or equal to 5.0%. Acceptance Criteria 3.2.2.

Init/Date 10/30/87

3. Scram Avoidance - Reactor Pressure

a. Calculate the transient reactor pressure margin to scram.

Initial Pressure = 964.00 psig (ERIS C34EA028)

Margin to Scram = Scram Setpoint - Peak transient pressure (ERIS signal C34EA028 or C34EA030 as appropriate)

Margin to Scram = 1064.7 psig - ~~984.84~~ 981 psig

Margin to Scram = ~~80.86~~ 89 psi

Init/Date 10/30/87

b. Verify the reactor pressure margin to scram is greater than or equal to 10 psi: Acceptance Criteria 3.2.2.

Init/Date 10/30/87

4. Scram Avoidance - Neutron Flux

a. Calculate the transient neutron flux margin to scram:

1) From the ERIS data, determine the peak transient neutron flux. Use highest of ERIS signals C51EA003 thru C51EA010 and record the channel used.

Using APRM B :

Peak Flux = 84.08 %

Init/Date 10/30/87

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2) Compute the margin to Scram as follows:

Margin to scram = Setpoint - Peak Flux

Margin to scram = 118% - 84.08 %

Margin to Scram = 33.92 %

10/30/87
Init/Date

b. Verify the neutron flux margin to scram is greater than or equal to 7.5% Acceptance Criteria 3.2.2.

10/30/87
Init/Date

5. Main Steam Line Isolation Avoidance

a. Calculate the transient individual MSL flow margin to isolation:

$$\text{Margin to Isolation} = \text{Isolation Setpoint} - \frac{\text{Peak Individual MSL Flow}}{\text{Rated MSL Flow}} \times 100\%$$

NOTE: The Peak Individual MSL flow in the above equation is the maximum steam flow observed in all unisolated steam lines.

$$\text{Margin to Isolation} = 137\% - \frac{3.\text{[illegible]} \times 10^6 \text{ lbm/hr}}{3.85 \times 10^6 \text{ lbm/hr}} \times 100\%$$

Margin to Isolation = 38.149%

Where: Peak transient individual MSL Flow is determined from ERIS signals C34EA014, C34EA015, C34EA016 and C34EA017.

3.85×10^6 lbm/hr is one fourth of rated steam flow,

15.4×10^6 lbm/hr.

10/30/87
Init/Date

b. Verify the margin to isolation to greater than or equal to 10%: Acceptance Criteria 3.2.2.

10/30/87
Init/Date

C D McClin 10/30/87
Level 2 Analysis Verified By/Date

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8.3.12 Verify that any ERIS printouts, other computer or recorder printouts, and any other plant data required is available for inclusion in the Test Results Package.

PDM 10/30/87
Init/Date

**************************** END OF SECTION 8.3 ****************************

(INTENTIONALLY BLANK)

Serial No. 451

Attachment 6

ERIS Sample Plan

Function ID	Function Description	Scan Interval (msec)
B21EA001	Rx Wide Range Level C	8
B21EA002	Rx Wide Range Level A	8
B21EA003	Rx Wide Range Level L	8
B21EA004	Rx Wide Range Level B	8
B21EC013	RPS Isolation Status Channel A	5
B21EC014	RPS Isolation Status Channel B	5
B21EC015	RPS Isolation Status Channel C	5
B21EC016	RPS Isolation Status Channel D	5
*B21EC021	SRV Initiation Status	4
*B21EC022	SRV Initiation Status	4
*B21EC023	SRV Initiation Status	4
*B21EC024	SRV Initiation Status	4
*B21EC025	SRV Initiation Status	4
*B21EC026	SRV Initiation Status	4
*B21EC027	SRV Initiation Status	4
*B21EC028	SRV Initiation Status	4
*B21EC029	SRV Initiation Status	4
*B21EC030	SRV Initiation Status	4
*B21EC031	SRV Initiation Status	4
*B21EC032	SRV Initiation Status	4
*B21EC033	SRV Initiation Status	4
*B21EC034	SRV Initiation Status	4
*B21EC035	SRV Initiation Status	4
*B21EC036	SRV Initiation Status	4
*B21EC037	SRV Initiation Status	4
*B21EC038	SRV Initiation Status	4
*B21EC039	SRV Initiation Status	4
B21EC042	SRV Position	10
B21EC043	SRV Position	10
B21EC044	SRV Position	10
B21EC045	SRV Position	10
B21EC046	SRV Position	10
B21EC047	SRV Position	10
B21EC048	SRV Position	10
B21EC049	SRV Position	10
B21EC050	SRV Position	10
B21EC051	SRV Position	10
B21EC052	SRV Position	10
B21EC053	SRV Position	10

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Attachment 6 (Cont.)

ERIS Sample Plan

Function ID	Function Description	Scan Interval (msec)
B21EC054	SRV Position	10
B21EC055	SRV Position	10
B21EC056	SRV Position	10
B21EC057	SRV Position	10
B21EC058	SRV Position	10
B21EC059	SRV Position	10
B21EC060	SRV Position	10
*B21EC069+	INBD MSIV Solenoid Status (22A)	4
*B21EC070+	INBD MSIV Position (22A)	4
*B21EC071+	INBD MSIV Position (22A)	4
*B21EC072+	INBD MSIV Solenoid Status (22B)	4
*B21EC073+	INBD MSIV Position (22B)	4
*B21EC074+	INBD MSIV Position (22B)	4
*B21EC075+	INBD MSIV Solenoid Status (22C)	4
*B21EC076+	INBD MSIV Position (22C)	4
*B21EC077+	INBD MSIV Position (22C)	4
*B21EC078+	INBD MSIV Solenoid Status (22D)	4
*B21EC079+	INBD MSIV Position (22D)	4
*B21EC080+	INBD MSIV Position (22D)	4
*B21EC081+	OUTBD MSIV Solenoid Status (28A)	4
*B21EC082+	OUTBD MSIV Position (28A)	4
*B21EC083+	OUTBD MSIV Position (28A)	4
*B21EC084+	OUTBD MSIV Solenoid Status (28B)	4
*B21EC085+	OUTBD MSIV Position (28B)	4
*B21EC086+	OUTBD MSIV Position (28B)	4
*B21EC087+	OUTBD MSIV Solenoid Status (28C)	4
*B21EC088+	OUTBD MSIV Position (28C)	4
*B21EC089+	OUTBD MSIV Position (28C)	4
*B21EC090+	OUTBD MSIV Solenoid Status (28D)	4
*B21EC091+	OUTBD MSIV Position (28D)	4
*B21EC092+	OUTBD MSIV Position (28D)	4
*B33EA021+	Reactor Core Flow	8
*B33EA028	Recirc Pump Elbow Tap 14A DP	4
*B33EA029	Recirc Pump Elbow Tap 14C DP	4
*B33EA030	Recirc Pump Elbow Tap 24A DP	4
*B33EA031	Recirc Pump Elbow Tap 24C DP	4
B33EC003	LFMG Set Gen CB 2A Status	5
B33EC004	LFMG Set Gen CB 2B Status	5
B33EC009	LFMG Set Gen CB 5A Status	4
B33EC010	LFMG Set Gen CB 5B Status	4

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ERIS Sample Plan

Function ID	Function Description	Scan Interval (msec)
*C34EA013+ ✓	Total Reactor Steam Flow	8
*C34EA014+ ✓	Steam Line A Flow	8
*C34EA015+ ✓	Steam Line B Flow	8
*C34EA016+ ✓	Steam Line C Flow	8
*C34EA017+ ✓	Steam Line D Flow	8
*C34EA019	Feedwater Flow A	8
*C34EA020	Feedwater Flow B	8
*C34EA024	Rx Narrow Range Level A	8
*C34EA025	Rx Narrow Range Level B	8
*C34EA026	Rx Narrow Range Level C	8
*C34EA028+ ✓	Narrow Range Rx Dome Pressure	8
*C34EA030+ ✓	Wide Range Rx Dome Pressure	8
C34EA031	Turbine Steam Flow	8
C34EC001	TDFP A Trip Status	5
C34EC002	TDFP B Trip Status	5
*C34EC003	MDFP C Trip Status	5
*C51EA003+ ✓	APRM A Flux	8
*C51EA004+ ✓	APRM B Flux	8
*C51EA005+ ✓	APRM C Flux	8
*C51EA006+ ✓	APRM D Flux	8
*C51EA007+ ✓	APRM E Flux	8
*C51EA008+ ✓	APRM F Flux	8
*C51EA009+ ✓	APRM G Flux	8
*C51EA010+ ✓	APRM H Flux	8
*C51EA019+ ✓	Heat Flux A	4
*C51EA020+ ✓	Heat Flux B	4
*C71EC001	Channel Scram A Status	2
*C71EC002	Channel Scram B Status	2
*C71EC003	Channel Scram C Status	2
*C71EC004	Channel Scram D Status	2
C71EC009	RPT Logic A Status	4
C71EC010	RPT Logic B Status	4
C85EA011	Main Turbine Total BVP Valve Position	4
E22EA001	HPCS Flow	8
E22EC001	HPCS System Initiation Status	5
E51EA004	RCIC Pump Flow	8
E51EA014	RCIC Turbine Speed	8
E51EC001	RCIC System Initiation Status	10
N21EA019	Condenser Pressure A	100
N21EA020	Condenser Pressure B	100
N21EA021	Condenser Pressure C	100

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Attachment 6 (Cont.)

ERIS Sample Plan

Function ID	Function Description	Scan Interval (msec)
*N31EA002	Main Turbine Total CV Position	4
*N32EA005	Main Turbine Cont Valve A Position	4
*N32EA006	Main Turbine Cont Valve B Position	4
*N32EA007	Main Turbine Cont Valve C Position	4
*N32EA008	Main Turbine Cont Valve D Position	4
*C71A0003+ ✓	Flow Bias Simulated Thermal Power Trip Setpoint A	8
*C71A0004+ ✓	Flow Bias Simulated Thermal Power Trip Setpoint B	8

*Required point for test.
+Printout required in Test Results Package.

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Attachment 7
Form: STI-B21-025A-6a
Sheets a-b

TC-7 Margin Verification

1. From the completed level 2 analysis of section 8.2 performed at TC-~~7~~ 3, record the following:

   a) From 8.2.11.2a (Simulated Thermal Power) record the largest transient change in simulated thermal power (STP).

      dSTP = .55 %

   b) Verify the following:

      10% - dSTP ≥ 5%

      10% - .55 % ≥ 5%

      9.45 % ≥ 5%

   c) From 8.2.11.3 (Reactor Pressure) record the following:

      1. Initial Pressure = 939 psig

      2. Peak Transient Pressure = 948 psig

      ΔP = Initial Pressure - Peak Transient Pressure = 9 psig

   d) Verify the following:

      55 psig - ΔP ≥ 10 psig

      55 psig - 9 psig ≥ 10 psig

      46 psig ≥ 10 psig

   e) From 8.2.11.4 (Neutron Flux) record the following:

      dAPRM = 2 %

   f) Verify the following:

      38% - dAPRM ≥ 7.5%

      38% - 2 % ≥ 7.5%

      36 % ≥ 7.5%

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TC-7 Margin Verification

g) From 8.2.11.5 (MSL Isolation Avoidance) record the following:

Initial MSL flow = 1.44×10^6 lbm/hr
Peak Individual MSL flow = 1.98×10^6 lbm/hr

$$\Delta MSL\ Flow = \frac{\text{Peak Individual MSL Flow} - \text{Initial MSL flow}}{3.85 \times 10^6\ \text{lbm/hr}}$$

h) Verify the following:

52% - ΔMSL Flow ≥ 10%

52% - 14 % ≥ 10%

38 % ≥ 10%

Robert L. Burch 10/29/87
Completed By/Date

[illegible] 10/29/87
Verified By/Date

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INFORMATION ONLY

Attachment 65
Form: PAP-1102-39

Log Continuation Sheet

Log Sheet Continued: Form: PAP-1102- 44 Date: 11/6/87

Sample I.D.		Parameter	Time	Limit	Results		Inst MPL	Init
SEC NOTE (1)	Run II	Particle Count	0550	NONE >1.5 μ	>3.0	390	670-Y091A	KAS
(1)	Run II		0550		>5.0	070	670-Y091A	KAS
(1)	Run II		0550		>8.0	28	670-Y091A	KAS
(1)	Run II		0550		>10.0	21	670-Y091A	KAS
(1)	Run II		0550		>12.0	16	670-Y091A	KAS
(1)	Run II		0550		>15.0	0	670-Y091A	KAS
N/A								

Remarks: None KAS

Reviewed By: [signature] 11/6/87

REV 4 11/08/87
0700
SEQUENCE OF TROUBLESHOOTING PLAN

Component	Description of Work	Document	NRC Approval	Date Complete
1) Inboard MSIV's	Field - Inspect all 4 MSIV's	WO 87-9323	Yes	11/05/87
2) B21-F022D	Field - Stroke B21-F022D Open	WO 87-9323	Yes	11/05/87
3) B21-F022D	Field	WO 87-9323	Yes	11/05/87
	- Remove junction box box cover			"
	- Verify tightness of terminal screws			"
	- Record voltage at term 1 & 2			"
	- Record voltage at term 3 & 4			"
	- Install pressure gauge at B21-F083D (Accumulator drain			"
4) B21-F022D	Field	WO 87-9323	Yes	11/05/87
	- Ops slow stroke B21-F022D app. 50% then finish with fast stroke			"
	- Obtain "Pillow Case" air samples of exhaust ports			"
	- Monitor for lowest pressure			"
5) B21-F022D	Field			
	- Open B21-F083D (Accumulator Drain) and blow down for app. 1 min. into pillow case	WO 87-9323	Yes	11/05/87
6) B21-F022D	Field	WO 87-9293	Yes	11/05/87
	- Disconnect 3/8" and 1 5/8" air supply to air pack			"
	- Unbolt and remove air pack			"
	- Transport air pact to shop			"

Component	Description of Work	Document	NRC Approval	Date Complete
7) B21-F022D	Field - Perform blowdown of 1 5/8" air supply - Obtain a "pillow case" air sample - Perform a dewpoint reading - Perform a particle count	WO 87-9405 (to be repeated)	Yes	11/06/87
8) B21-F022D	Shop - Perform shop testing by cycling valve with N_2 supply and temp. power supply and document results	WO 87-9372	Yes	11/06/87
9) B21-F022D	Shop - Perform a detailed disassembly of each component as follows:			
	1) Inspect air pack bolts for tightness	WO 87-9372	Yes	11/05/87
	- Inspect air ports for cleanliness			"
	- Look for signs of foreign material			"
	- Photograph air pack			"
	2) Disassemble ASCO 3-way (Part #4) Model #8323	WO 87-9372	Yes	11/06/87
	- Remove solenoid			"
	- Examine actuator and solenoid valve			"
	- Examine pilot air lines			"
	- Disassemble solenoid 'A'			"
	- Examine for free movement - Examine for excessive wear - Examine condition of parts - Document findings			

Component	Description of Work	Document	NRC Approval	Date Complete
	2) Disassemble ASCO 3-way (Part #4) Model #8323 (continued)	WO 87-9372	Yes	11/06/87
	- Disassemble Solenoid 'B'			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine condition of parts			"
	- Document findings			"
10) Outboard MSIV's	Field - Inspect all 4 MSIV's			
11) B21-F028B	Field	WO 87-9439	Yes	11/07/87
	- Perform blowdown of 1 5/8" air supply			"
	- Obtain pillowcase sample			"
12) B21-F028D	Field	WO 87-9440	Yes	11/07/87
	- Perform dewpoint			"
	- Perform partcal count			"
13) B21-F028D	Field			
	- Ops to slow stroke B21-F028D close then finish with fast stroke	SOI	Yes	11/05/87
14) B21-F028D	Shop	WO 87-9456	Yes	11/07/87
	- Perform a detailed disassembly of each component as follows:			
	1) Inspect air pack bolts for tightness		Yes	11/07/87
	- Inspect air ports for cleanliness			"
	- Look for signs of foreign material			"
	- Photograph air pack			"

Component	Description of Work	Document	NRC Approval	Date Complete
	2) Disassemble ASCO 3-way (Part #4) Model #8323	WO 87-9444	Yes	11/07/87
	- Remove solenoid			"
	- Examine actuator and solenoid valve			"
	- Examine pilot air lines			"
	- Disassemble solenoid 'A'			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine condition of parts			"
	- Document findings			"
	- Disassemble Solenoid 'B'			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine condition of parts			"
	- Document findings			"
	3) Disassemble ASCO 3-way (Part #5) Model 8320		Yes	11/07/87
	- Remove solenoid			"
	- Examine actuator and solenoid valve			"
	- Examine pilot air lines			"
	- Disassemble solenoid			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine for condition of parts			"
	- Document findings			"
	4) Disassemble Norgren 4-way valve (Part #1)			11/07/87
	- Remove 4-way valve			"
	- Examine 4-way valve			"
	- Disassemble 4-way valve			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine for condition of parts			"
	- Document findings			"

Component	Description of Work	Document	NRC Approval	Date Complete
	5) Disassembly of Norgren 2-way valve (Part #2)			11/07/87
	- Remove 3-way valve			"
	- Examine 3-way valve			"
	- Disassemble 3-way valve			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine for condition of parts			"
	- Document findings			"
	6) Disassembly of Norgren 2-way valve (Part #3)			11/07/87
	- Remove 2-way valve			"
	- Examine 2-way valve			"
	- Disassemble 2-way			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine for condition of parts			"
	- Document findings			"
15) B21-F028B	Field - Disconnect 3/8" and 1 5/8" air supply too air pack - Unbolt and remove air pack - Transport air pact to shop	WO 87-9324	Yes	11/06/87
16) B21-F028B	Shop - Perform a detailed disassembly of each component as follows:	WO 87-9433	No	11/07/87
	1) Inspect air pack bolts for tightness			11/07/87
	- Inspect air ports for cleanliness			"
	- Look for signs of foreign material			"
	- Photograph air pack			"

Component	Description of Work	Document	NRC Approval	Date Complete
	2) Disassemble ASCO 3-way (Part #4) Model #8323			11/07/87
	- Remove solenoid			"
	- Examine actuator and solenoid valve			"
	- Examine pilot air lines			"
	- Disassemble solenoid 'A'			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine condition of parts			"
	- Document findings			"
	- Disassemble Solenoid 'B'			"
	- Examine for free movement			"
	- Examine for excessive wear			"
	- Examine condition of parts			"
	- Document findings			"

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B21-F0022D

11/03/87	1157	Closed in 18 Sec. (Unit Log)
	1158	Opened and MSL D declared INOP (Unit Log)
	1159	Closed in 3.0 Sec. (Unit Log)
	1200	Opened and MSL D declared Operable (Unit Log)
	1353	Closed in 3.4 Sec. (Unit Log)
	1503	MSL D declared INOP as of 1158 (Unit Log)
11/05/87	1005	Opened (Unit Log)
	1023	Slow close for 30 Sec. then fast close to full close position. (Unit Log) I&C Techs recorded solenoid voltages during stroke. All exhaust ports were covered with pillow cases to trap any debris. Black powdery substances were found when the pillow cases were removed. Accumulator pressure was monitored during stroking. Minimum pressure was 81 psi. The accumulator was blown down into a pillow case. (WO 87-9330, QA Inspection Report 87-I-728)
	2000 (approx.)	Determinated the field wiring and airline. Found metal filings on the valve port internal threads. It is believed they are pipe thread filings, possibly from disassembly of the fitting. A sample was taken. The internal of the electrical conduit was found sealed with a BISCO type material. No evidence of it was found in any air pack internals. The air pack was bagged and taken to the I&C hot shop. (WO 87-9293. QA Inspection Report 87-I-679)
11/06/87	0000 to 0600	Instrument air sample was taken at the MSIV. Particles were observed at the mouth of the blow down line. They probably are lubricant and filings from disassembly. (WO 87-9405 and QA Inspection Report 87-I-725) A dew point reading of instrument air at the MSIV was taken. (WO 87-9405 and QA Inspection Report 87-I-375)
11/07/87	0225 to 0600	Commenced the disassembly of the air pack. Slight galling was found at the ferrule area in the stainless "T" fitting for the dual solenoid assembly. A small amount of dirt/grease was found in the exhaust port internals. A sample was taken. Galling was observed at the supply port internals. A sample was taken. Galling damage to the supply port and its fitting/adaptor was observed. Swipes of the exhaust port internals revealed a small amount of dirt/grease with a few unidentified particles present. A sample was kept. A "substantial" amount of blackish grease was found in the upper and lower cylinder connection ports. Nothing was found in any of the solenoid exhaust

ports. Drawings D-209-013-5 R/M, B-208-013--06 R/3, the vendor manual and the solenoid wiring do not agree with each other. A FCR was written. Nitrogen was connected to the air pack and 3 test actuations were performed. The solenoids functioned properly. An O-ring in the slow close shuttle blew on the 5th test. Cotton gloves were attached to the exhaust ports during the tests. Nothing was found. The vendor Rep's Manual showed a part #18 (inlet strainer) that was not on Dwg. SA-A068 Sht. 4 in the WO package or found in the "A" solenoid. The NRC inquired if the part was present on the "B" solenoid. The I&C Tech began to remove the "B" solenoid. Then the NRC observed the step in the WO to work only on the "A" solenoid and questioned why the WO was deviated from. The LOCA seals had "flowed". <u>The vendor Rep speculated this</u> was due to solenoid or ambient temperature. (WO 87-9372, QA Inspection Report 87-I-686)

0900 to 1600 The "A" solenoid was removed from the valve assembly and disassembled. The body gasket stuck to its seat. Particles remained in the seat when the gasket was removed. The same condition was found on disassembly of the "B" solenoid. Samples of both were taken. Also on the "B" solenoid impact marks were found on the star shaped disc subassembly and a deep depression noted on the disc seal. One lead to the "B" coil had a nick in the insulation. A continuity check and megger was performed. (WO 87-9372 and QA Inspection Report 87-I-694)

1830 to 2400 The plug nut assembly was removed. A grease type substance was found around the bottom of the solenoid base assembly. The retainer ring had dirt and grease in it. I&C feels a more detailed vendor drawing of subassemblies is needed. (WO 87-9372 and QA Inspection Report 87-I-726)

Disassembly complete.

WO 87-9372 is being revised to replace the dual solenoid 3 way valve assembly and to replace 3 "O"-rings on the 3 to 4 way viave coupling.

B21-F0028B

11/03/87	1206	Closed in 4.0 Sec. (Unit Log)
	1208	Opened (Unit Log)
11/06/87	0405	Closed (Unit Log)
	0900 to 1400	The field wiring was determined and the airline removed. Metal shavings were found at the fitting threads. A sample was taken. Extensive grooved or gouged scratches were observed on the outside of the airline fitting. This fitting was sent to the hot shop for evaluation. The air pack was removed to the hot shop. The lower liquid side of the actuator was wiped with a cotton glove. A rust colored oily substance was found and a sample sent for analysis. (WO 87-9324 and QA Inspection Report 87-I-729)
11/07/87	0700	Instrument air dew point sample at MSIV was taken. (WO 87-9439 and QA Inspection Report 87-I-618)
	2040 to 2240	Fragments of BISCO material were found in the bottom of the junction box along with metal shavings that appear to be from the junction box housing. The insulation was found cut on wire #3 to solenoid "A". Thread lubricant was found on the strainer in the port between the solenoids. The body gaskets for both solenoids left residue on their seats, were hard and brittle, and showed evidence of exposure to excessive heat. The rubber gasket to the disc holder was slightly brittle and the disc holder showed signs of wear. The NRC voiced concern about the grade of mounting bolts for the air pack to MSIV. One bolt did not have a grade stamp on its head. Both solenoid internals were examined with nothing found. (WO 87-9433 and QA Inspection Report 87-I-761)
11/08/87	1700	NR PPDS-2963 written to document that the woven insulation on lead to the "A" solenoid coil has been damaged. The insulation beneath it is not. Dispositioned use-as-is and closed after solenoids were re-installed.
	2144	O-ring gaskets were removed from the valve body. The area was cleaned with Acetone.
	2235	Reassembled the dual solenoid 3 way valve using the ASCO re-build kit. This consisted of the valve body gaskets, core assembly, and disc spring.

2323 Performed functional check, joint cycles of solenoids and each one independantly. Checked pressure integrity by pressurizing with nitrogen and checking with snoop. Sat.

2329 Reinstalled the dual solenoid 3 way valve assembly on the air-pack. All connections were restored and documented. Not air-pack is in the I&C hot shop awaiting to be installed on to the actuator.

B21-F0028D

11/03/87	1208	Would not close in 2 Min. 49 Sec. (Unit Log)
	1211	Placed control switch in auto (Unit Log)
	1212	MSL D declared INOP (Unit Log)
	1213	Closed in 3.4 Sec. (Unit Log)
	1214	Opened (Unit Log)
	1217	Closed in 3.4 Sec. (Unit Log)
	1218	Opened (Unit Log)
	1354	Closed in 3.4 Sec. (Unit Log)
11/04/87	1817	Opened (Unit Log)
11/06/87	0358	Stroked per SOI (Unit Log)
	0402	Closed (Unit Log)
	1800 to 2400	The field wiring was determinated and the airline removed. NRC (Stefano) voiced concern over the method of supporting the flexible airhose. Tape was found covering the exhaust port of the dual solenoid valve assembly. Metal filings and material were found on the inside of the main air connection. A sample was taken. The air pack was taken to the hot shop. (WO 87-9283 and QA Inspection Report 87-I-738)
11/07/87	0700	Dew point sample of instrument air at MSIV in progress.
	0800 to 1600	Set up the air pack in the test rig and proved that the tape over the exhaust port is not a problem solenoid "A" had frayed insulation on one lead. Per NRC the solenoids were energized for a minimum of one hour. Temperature readings were 137 F on solenoid "A" cover, 128 F on solenoid "B", and 131.5 F on the 3 way valve. Pipe thread sealant was found at the 3 way valve filter screen. No indication of LOCA seal migration was observed. The solenoid "A" core appeared blue from possible heat damage and the inside of the base assembly is discolored. The body gasket was stuck to its seat and seemed to be decomposing. (WO 87-9443, 87-9438, QA Inspection Report 87-I-730)
	1600 to 2400	The "B" solenoid was disassembled. The body gasket was shiny, pressed, brittle, and left residue in its seat. The solenoid coil was badly corroded. The plug nut gasket on the "B" solenoid was smashed. The 4 way air control valve was disassembled. The allen head bolts from the cover were rusty. Nothing unusual was found internal. (WO 87-9443 and QA Inspection Report 87-I-687)

11/08/87	0000 to 0330	There was no evidence of lubrication on the O-Rings. Small pieces of what appears to be cotton were found on top of the piston. The bottom piston seal appears dirty. The vendor Rep. recommended replacement. The push rod did not appear to be lubricated. The 3 way air valve was disassembled. Dirt was observed in every port. Small particles were observed internal to the exhaust muffler. The valve stroke seemed slow to the vendor Rep. A large amount of hardened grease was found on the upper piston. A sample was taken. The two way air valve was disassembled. The stroke was fine. Some dirt was found in the bottom. (WC 87-9443, QA Inspection Report 87-I-739)
		Disassembly Complete.

B21-INBOARD

F022A — Dual solenoid 3 way valve assembly removed from air-pack. (WO 87-9458)

The removal showed a wire going to the coil which has lost its insulation. Work package revised to replace the entire assembly.

F022B — Dual solenoid 3 way valve assembly removed from its air-pack. The assembly was rebuilt, functional check performed and re-installed on the air pack. (WO 87-9464) Awaiting Re-Test. NR [illegible]DB-2954 was written for a frayed woven insulation cloth dispositioned use-as-is and closed.

F022C — Dual solenoid 3 way valve assembly removed from its air-pack. Then the assembly was rebuilt, functional checked, and reinstalled on to the air-pack. (WO 87-9463) Awaiting Re-Test.

F022D — Air-pack was removed from the valve per WO 87-9353. The dual solenoid 3 way valve assembly was disassembled per WO 87-9372. Work Order 87-9372 is being revised to replace the dual solenoid 3 way valve assembly and 3 o-rings for the coupling between the 3 way and 4 way valve.

B21-OUTBOARD

F0028A	The dual solenoid 3 way valve assembly was removed from the air-pack, re-built, functionaly checked and re-installed on the air-pack. (WO 87-9466) Awaiting Re-Test.
F0028B	The air-pack was removed from the valve. The dual solenoid 3 way valve assembly was rebuilt, functionally checked and re-installed on the air-pack. Note the air-pack is in the I&C shop. NR PPDS-2965 was written for frayed woven cloth, dispositioned and closed. (WO 87-9433)
F0028C	The dual solenoid 3 way valve assembly was removed from the air-pack, re-built, functionally checked and re-installed on the air-pack. (WO 87-9467) Awaiting Re-Test.
F0028D	Air-pack was removed per work order (87-9385). Dual solenoid 3 way valve was disassembled. (WO 87-9443) This work order is being revised to put a new air-pack on the actuator.

E32-F0001N

11/08/87	2200	Per DCP 87-0688 Rev. 1, we are manufacturing a clamp ring to provide for a secondary seal on the valve. Work is directed per WO 87-8685.
11/09/87	0550	All parts have been manufactured by PPCD Maintenance. They are in the process of assembling the clamp. The pieces have been trial fit on a valve in the maintenance shop and they fit. This mock fit-up was minus the packing. MMGS inspectors are ensuring all dimension's are per the DCP prior to assembly. MMGS will witness the installation of the clamp ring on to the valve per a hold point in the work order.

B21-F0022B

11/08/87	1715	Removed dual solenoid 3 way valve assembly from air-pack.
	1722	Disassembled dual solenoid 3 way valve assembly. Acetone or Alcohol were used to clean various parts as directed by the R.S.E. and ASCO Vendor Rep. Dual solenoid 3 way valve assembly was rebuilt using repair kit which includes valve body gaskets, core assembly, and disc spring.
	1745	Completed rebuild, performed functional check. After functional check solenoid "B" was removed from the valve due to chattering. Replaced the "O"-ring and re-assembled. Functional check sat.
	1800	NR PPDS-2964 was written to document that the woven insulation on the lead to solenoid "A" coil has been damaged. The insulation beneath it has not. Dispositioned use-as-is. Dual solenoid 3 way valve assembly was reinstalled on air-pack. All connections were restored and documented on the instrument restoration checklist. And after the installation NR PPDS-2964 was closed. (WO 87-9464 and QA Inspection Reports 87-I-0731 and 87-I-0688) Awaiting Re-Test.

B21-F0022C

11/08/87	1545	Removed the dual solenoid 3 way valve assembly from the air-pack. Acetone or Alcohol were used to clean various parts as directed by the R.S.E. and ASCO Vendor Rep. As found condition "O"-rings, fairly flexible and lubed no evidence of degradation.
	1550	Dissassembled the dual solenoid 3 way valve assembly was rebuilt using the repair kit which includes, valve body gaskets, core assembly, and disc spring.
	1634	Completed rebuild, perform dual solenoid valve functional checks, joint cycles of solenoids and each one independantly. Verifyed pressure integrity by pressurizing to 90-100 psi with nitrogen and snooped joints. Sat.
	1933	Re-installed the dual solenoid 3 way valve on the air-pack. All connections were restored and documented on the instrument restoration checklist. (WO 87-9465 and QA Inspection Report 87-I-0731) Awaiting Re-Test.

B21-F0028A

11/08/87 1220 Removed the dual solenoid 3 way valve assembly from the air-pack. Acetone or Alcohol were used to clean various parts as directed by the R.S.E. and ASCO Vendor Rep. "O"-ring seat surface has discoloration, the Vendor Rep. and S.E., Q.C. feel this discoloration is acceptable. The solenoid 3 way valve was rebuilt using a rebuild kit, which contains the following: valve body gaskets, core assembly, and disc spring.

1320 Completed the rebuild, performed dual solenoid valve functional check, joint cycles of solenoids and each one independently. Verifyed pressure integrity by pressurizing to 90-100 psi with nitrogen and snooped joints. Sat.

1755 Re-installed the dual solenoid 3 way valve assembly on the air-pack. All connections were restored and documented on the instrument restoration checklist. (WO 87-9466 and QA Inspection Report 87-I-0731) Awaiting Re-Test.

B21-F0022A

11/08/87	Removed the dual solenoid 3 way valve assembly from the air-pack. (WO 87-9436 and QA Inspection Report 87-I-0731) Package being revised to replace the dual solenoid 3 way valve assembly due to a frayed wire.

E21-F0028C

11/08/87	1410	Removed dual solenoid 3 way valve assembly from air-pack.
	1424	Disassembled the dual solenoid 3 way valve assembly. Acetone or Alcohol were used to clean various parts as directed by the R.S.E. and the ASCO Vendor Rep. As found conditions of this assembly was that the o-ring seats were clean and free of residue. The assembly was then rebuilt with the dual solenoid valve repair kit consisting of valve body gaskets, core assembly, and disc spring.
	1500	Completed rebuild, performed functional check, joint cycles of solenoids and each one independently. Checked pressure integrity by pressurizing with nitrogen and checking with snoop. Sat.
	1800	Re-installed the dual solenoid 3 way valve assembly on the air-pack. All connections were restored and documented on the instrument restoration checklist. (WO 87-9467 and QA Inspection Report 87-1-0731)

PRELIMINARY RESULTS SUMMARY: INSTRUMENT AIR AT MSIV'S

PREPARED BY: John J. Grimm 11/8/87
John J. Grimm

I. INTRODUCTION

Three types of analyses were performed to determine what contribution, if any, instrument air quality may have had in the failure of the MSIV valves. Samples were collected to determine and characterize particulate matter present in the instrument air system at the solenoid and actuator supply points. Various unknown substances observed in or collected from component surfaces were analyzed using Infrared Spectrophotometry to deduce origin of materials found. Grab samples were analyzed by Gas Chromatography for hydrocarbon content and quantification of organic contaminants, if present in significant quantities. Preliminary results of these analyses are presented in the following report.

II. SAMPLES TAKEN AND ANALYSES PERFORMED

Samples collected, analyses performed on samples and brief annotations are in the following list. Codes for analysis type are as follows:

IR: Infrared Spectroscopy, for identification of unknown organic compounds.

PSC: Particulate sizing, and characterization.

GC: Gas Chromatography, for Identification and quantification of condensable hydrocarbons.

SAMPLE	DATE/TIME	DESCRIPTION	ANALYSIS
MSIV-1	11/6/87:1115	B21-F028B Deposits from 1 5/8" air hose.	IR
MSIV-2	11/6/87:1545	B21-F028B exhaust port (unknown fluid)	IR
MSIV-3	11/6/87:1115	Fitting from B21-F028B w/foreign mat'l inside (black solids and oily fluid)	IR
MSIV-4	11/6/87:2101	B21-F022D: ≈ 0.1 $ft.^3$ solenoid supply collected on 0.45μ filter paper.	PSC
MSIV-5	11/6/87:2108	B21-F022D: ≈ 0.1 $ft.^3$ solenoid supply collected on 0.45μ filter paper	PSC

SAMPLE	DATE/TIME	DESCRIPTION	ANALYSIS
MSIV-6	11/6/87:2125	B21-F022D: ≈ 0.1 $ft.^3$ actuator supply collected on 0.45μ filter paper.	PSC
MSIV-7	11/6/87:2135	B21-F022D: ≈ 0.1 $ft.^3$ actuator supply collected on 0.45μ filter paper.	PSC
MSIV-8	11/7/87:0800	Rectorseal™ Thread sealant sample.	IR
MSIV-9	11/7/87:0800	Neverseeze™ Thread lubricant sample	IR
MSIV-10	11/7/87:0730	P52-F556: Instr. air at Containment penetration (outside). 10 min. blowdown, 5 min. purge of sampler.	GC
MSIV-11	11/7/87:0745	P52-F556: Instr. air at Containment penetration (outside). 10 min. blowdown, 15 min. purge of sampler.	GC
MSIV-12	11/7/87:1151	B21-F028B: Solenoid supply, ≈0.1$ft.^3$ on 0.45μ particulate filter.	PSC
MSIV-13	11/7/87:1202	B21-F028B: Solenoid supply, ≈0.1$ft.^3$ on 0.45μ particulate filter.	PSC
MSIV-14	11/7/87:1214	B21-F028B: Actuator supply, ≈0.1$ft.^3$ on 0.45μ particulate filter.	PSC
MSIV-15	11/7/87:1220	B21-F028B: Actuator supply, ≈0.1$ft.^3$ on 0.45μ particulate filter.	PSC
MSIV-16	11/7/87:1503	B21-F028B: Solenoid supply, ≈0.1$ft.^3$ on 0.45μ particulate filter.	PSC
MSIV-17	11/7/87:1521	B21-F028B: Solenoid supply, ≈0.5$ft.^3$ on 0.45μ particulate filter.	PSC
MSIV-18	11/7/87:1537	B21-F028B: Actuator supply, ≈0.1$ft.^3$ on 0.45μ particulate filter.	PSC
MSIV-19	11/7/87:1553	B21-F028B: Actuator supply, ≈0.5$ft.^3$ on 0.45μ particulate filter.	PSC

III. ANALYSIS RESULTS

A. Infrared Spectroscopy

Samples MSIV-1, 2, 3, 8, 9 were analyzed using Infrared Spectroscopy, a measurement which "fingerprints" organic compounds based on deflection of light in the infrared spectral region and the correlation of this deflection to covalent bond angles. Samples 8 and 9 were control samples of suspected contaminants Rectorseal tm and Neverseeze tm, respectively. When spectra from samples 1 and 3 were compared to the control spectra, neither matched the spectrum for Neverseeze tm, and the spectrum from sample 3 was similar to that of Rectorseal tm. This indicates the presence of thread sealant which has partially degraded, with no Neverseeze tm present.

Sample MSIV-3, a clear unknown oily substance, was found to be silicone lubricant.

B. Particle Size Measurement and Characterization

Samples MSIV-4, 5, 6, 7, 16, 17 were analyzed by Microscopy. After being collected on 0.45μ filter paper on which a grid is superimposed, the samples were analyzed under a microscope. Particles were measured using a graticule. Particles in the 20-40μ range and >40μ range were totalled and reported. The results indicated the presence of particles >40μ in each of the samples analyzed. The total number of particles >40μ ranged from 6 to 14. On Samples MSIV-4 through 7, some fibrous material was present. This was determined to be contamination of the sample due to adverse sampling conditions in the drywell in the area of the MSIV's. This was confirmed when backup samples taken with improved sampling technique revealed no fibrous material. The particulate material was characterized by the Microscopist into three types: white translucent, rust in color, and black metallic.

A tabulation of particles in the 20-40μ and >40μ ranges follows.

SAMPLE DESIGNATION	PARTICLES 20-40μ	PARTICLES >40μ
MSIV-4	10	6
MSIV-5	3	5
MSIV-6	10	11
MSIV-7	1	7
MSIV-16	40	6
MSIV-17	47	14

C. Total Hydrocarbon by Gas Chromtography

Two grab samples from the instrument air supply to containment were analyzed for hydrocarbons using Gas Chromatography, a separation and detection/quantification technique based on the molecular weight of the substances analyzed. All hydrocarbons detected were reported as a weighted quantity of Methane, CH_4. Neither sample analyzed revealed detectable condensable Hydrocarbons greater than 0.1 PPM, with one result having no detectable hydrocarbons and the other 0.1 PPM Methane equivalent.

In the case of both sample results however, there is a high probability of false detection at the 0.1 PPM level, which is close to the threshold of detectability. Further, contamination by hydrocarbons from sampling apparatus was a distinct possibility since sampler fittings were not thoroughly cleaned and "baked out" prior to sampling. It is probable then, that the 0.1 PPM result of the single sample is in fact false-detection by reason of sample contamination or errant instrument signals close to the baseline response level.

Other Activities in progress at time of MSIV testing

All Surveillance Instructions

SVI#	Mode Cklist	Title	RespGp	Last Start Date	Due Date	Late Date	Freq	RqdModes
~~A10-T0000~~	~~N/A~~	~~SVI Computer Algorythim Test~~	~~CM~~	~~Oct 29, 1987~~	~~Dec 25, 2001~~	~~Dec 25, 2001~~	~~R/O~~	~~1 2 3 4 5~~
[redacted]	1	ECCS Rx Wtr Level Chan Func Start: 1828 Stop: 1942	I & C	Oct 29, 1987	Nov 27, 1987	Dec 5, 1987	M	1 2 3 4* 5*
B21-T0189-R	3	ECCS Drywell Press Hi Chan Func	I & C	Oct 29, 1987	Nov 27, 1987	Dec 5, 1987	M	1#2#3#
B33-T5433	S/R	APRM/LPRM Noise Baseline	Ops	Oct 29, 1987	Dec 25, 2001	Dec 25, 2001	S/R	1 2
C11-T1022	4	Rod Pattern Control System (Above HPSP)	Ops	Oct 29, 1987	Dec 25, 2001	Dec 25, 2001	S/R	1 2 #*
C51-T0028-F	5	APRM Flow Biased Signal Chan Cal	I & C	Oct 29, 1987	Nov 5, 1987	Nov 6, 1987	W	1
E12-T0358-C	3	Containment Press Hi 1E12-N062C Chan Cal	I & C	Oct 29, 1987	Dec 18, 1988	May 4, 1989	R*	1 2 3
[redacted]	1	ECCS Sp Wtr Lvl High Chan C Func Start: 2212 Stop: 2312	I & C	Oct 29, 1987	Nov 27, 1987	Dec 5, 1987	M	1 2 3 4*5*
E22-T0195-G	1	ECCS Sp Wtr Lvl High Chan G Func	I & C	Oct 29, 1987	Nov 27, 1987	Dec 5, 1987	M	1 2 3 4*5*
E22-T1200	1	HPCS Pump Disch Press High Chan Func	I & C	Oct 29, 1987	Nov 25, 1987	Dec 5, 1987	M	1 2 3 4*5*
[redacted]	1	HPCS Pump Disch Flow Low Chan Func Start: 1500 Stop: 1555	I & C	Oct 29, 1987	Nov 27, 1987	Dec 5, 1987	M	1 2 3 4*5*
E31-T0087-A	3	RWCU Area 1 Amb Temp Hi-Chan Func	I & C	Oct 29, 1987	Nov 25, 1987	Dec 3, 1987	M	1 2 3
E31-T0087-B	3	RWCU Area 1 Amb Temp Hi-Chan Func	I & C	Oct 29, 1987	Nov 25, 1987	Dec 3, 1987	M	1 2 3
E31-T0087-C	3	RWCU Area 1 Amb Temp Hi-Chan Func	I & C	Oct 29, 1987	Nov 27, 1987	Dec 5, 1987	M	1 2 3
E31-T0087-D	3	RWCU Area 1 Amb Temp Hi-Chan Func	I & C	Oct 29, 1987	Nov 27, 1987	Dec 5, 1987	M	1 2 3
G42-T2001	3	Supp Pool Cleanup Valve Operability Test (2YR-4.0.2 NA)	Ops	Oct 29, 1987	Apr 30, 1989	Oct 30, 1989	2A	1 2 3
	3	Supp Pool Cleanup Valve Operability Test	Ops	Oct 29, 1987	Jan 29, 1988	Feb 21, 1988	Q	1 2 3
G43-T1306	3	Supp Pool M/U Timer Chan A Func/Cal for 1G43-K1	I & C	Oct 29, 1987	Nov 25, 1987	Dec 3, 1987	M	1 2 3
M16-T0416-A	3	DW Vac Bkr D/P Chan A Func	I & C	Oct 29, 1987	Nov 27, 1987	Dec 6, 1987	M	1 2 3
[redacted]	3	DW Vac Bkr Isol Valve Oper Test Start: 1739 Stop: 2013	Ops	Oct 29, 1987	Nov 22, 1987	Nov 29, 1987	M	1 2 3
[redacted]	1	Cont Vac Relief Valve Operability Test Start: 2127 Stop: 2209	Ops	Oct 29, 1987	Nov 29, 1987	Dec 6, 1987	M	1 2 3 4*5*
M40-T8328	1 9	RHB Vent Exh Operability Test	Ops	Oct 29, 1987	Nov 29, 1987	Dec 6, 1987	M	1 2 3 4 5

Count:
21

13/85

All Surveil e Instructions

SVI#	Mode Ckllist	Title	RespGp	Last Start Date	Due Date	Late Date	Freq	RqdModes
[redacted]	3	SRV Press Actuation Chan Fund Start: 0829 Stop: 1006	I & C	Nov 3, 1987	Dec 3, 1987	Dec 11, 1987	M	1 2 3
B33-T1160	S/R	Jet Pump Operability	Ops	Nov 3, 1987	Dec 25, 2001	Dec 25, 2001	D	1*
C:1-T1008	1 9	CR Scram Accumulator Operability Ck	Ops	Nov 3, 1987	Nov 10, 1987	Nov 11, 1987	W	1 2 5*
[redacted]	S/R	APRM Flow Biased PWR/Flow Verification Start: 1227 Stop: 1327	Ops	Nov 3, 1987	Dec 25, 2001	Dec 25, 2001	D	1
E12-T0357-A	3	Containment Press HI Chan A Fund	I & C	Nov 3, 1987	Dec 3, 1987	Dec 11, 1987	M	1 2 3
E32-T5401-A	3	MSIVLCS Inbd Press Chan Fund	I & C	Nov 3, 1987	Dec 3, 1987	Dec 11, 1987	M	1 2 3
M17-T0410-A	1	Cont Vac Bkr D/P Iso Chan A Fund	I & C	Nov 3, 1987	Dec 1, 1987	Dec 10, 1987	M	1 2 3 4 5
N64-T8021-A	3	Main Condenser Offgas H2 Mon A Fund Test	I & C	Nov 3, 1987	Dec 3, 1987	Dec 11, 1987	M	1 2 3
P35-T3011	S/R	Iodine Analysis	Chem	Nov 3, 1987	Dec 25, 2001	Dec 25, 2001	S/R	1 2 3 4
P45-T0371-A	1	ESW to Diesel HX Flow Chan Fund/Cal	I & C	Nov 3, 1987	Jan 20, 1988	Feb 12, 1988	Q	1 2 3 4 5
R42-T5202	1	125V Batteries Voltage Cal A Limits-Div III	M	Nov 3, 1987	Nov 10, 1987	Nov 11, 1987	W	1 2 3 4 5
	1	125V Batteries Voltage Cal A Limits-Div I	M	Nov 3, 1987	Nov 10, 1987	Nov 11, 1987	W	1 2 3 4 5
	1	125V Batteries Voltage Cal A Limits-Div II	M	Nov 3, 1987	Nov 10, 1987	Nov 11, 1987	W	1 2 3 4 5

Count:

11

INSTALLATION OF SCAFFOLDING

11-3-87 2nd	87-1345	RJF	AX #2	599	
	86-12307	RJF	IB	574	L-2
	87-6725	RJF	DG-06		
	87-2382	RJF	RW	620	
11-4-87 1st + 2nd					
	87-2136	PPOD	IB	599	G-7
	87-2200	PPOD	IB	599	G-7
	87-9234	PPOD	TB	577	B-13
	87-8734	PPOD	HB	560	B PUMP
	87-9249	PPOD	HB	560	C PUMP
	87-9259	PPOD	HB	560	D PUMP
	87-8972	PPOD	TB	647	A-13
	87-8973	PPOD	TB	647	A-11
	87-8295	RJF	AX ROOF		
	624 AIRLOCK PROTECTION				
	87-9315		RB	599	WET WELL
	87-9316		RB	599	WET WELL

I&C Work Orders / Repetitive Task
working between 11/2 1530 → 11/3 2330

R86-8241 - G50
R85-7770 - P21
87-9273 - C51
R84-2211
R85-7173
R84-2210 -P52
R84-2212
R-85 7174
87-9286 - D-17
87-8047 - M24
87-9117

2nd shift 11/2
1530 - 2330

87-2647 - N64
R84 2229
R84 2057
R84 2209 -P52
R85 9981
R85 7182 -P52
R84 2208
R85 8551

3rd shift 11/3
2330 -0730

85-13447 - G50
87-357 - G50
87-9168 - G36
87-9169 - G36
87-4593 - G41
87-7593 - N24

Day shift 11/3
0730 - 1600

87-7086 - N64
87-9085 - R61
87-9787 G33
87-9117 C-51
87-9017 R-61
87-6465 P-52
R84 2299
R84 2207
86 3108
R84 2206 P52
R84 2208
R84 2300
R85 2828
R86 277
R85 7195
R85 7180
R85 9995
R84-2057
87-9149 R61
R84 3303
R84 3304
R84 3307 P84
R84 3308
R84 3309
87-9117 C-51

DAY SHIFT 11/3
0730 - 1600

87 - 9117 - C-51
R85 2328 - P-52
87 - 7062 - C71
R84 - 2300 - P-52
R85 15993 - M46
87 - 8285 - D17
87 - 9301 - G33
87 - 8347 - C11

2nd Shif 11/3
1530 - 2330

↓ 29.	87-1228 FU/RC	G50 T/S - Need Maint. - WO# 87-[illegible] completed [illegible] RW operator
✱ 30.	87-8707 DB/AK	F52 retest Completed SAT
↓ 31.	87-8347 MF/DB	C11 T/S - U.S. said do while S/D
32	87-2672 EY/OP	Of21FC340 - NEED [illegible] [illegible] do [illegible]
✱ 33	B21-T0032A FU/RC	Completed SAT
✓ 34	87-9803 [illegible]	G50 ~~Closed out~~
→ 35	R86-[illegible] [illegible]	G50 T/S
✱ 36	87-6452 OC	B33 Closed out
✱ 37	R85-878 [illegible]	P61 Complete-SAT
		START
		1530-0000 11/2/87
✱ 1)	RC-7741 [illegible]	G50 completed SAT
✓ 2)	[illegible] CC/EE	[illegible] CK/NR because [illegible] was closed & wires [illegible]
✱ 3)	R85-7770	P31 completed SAT

* 4)	[illegible] SH/OC/BE	Completed SKT
* 5)	STE-B33-[illegible] BE	Complete SKT
* 6)	Set Point Change for Chemistry BM/RE	- Complete SKT
* 7)	C21TOC39 SH/OC/BE	Completed SKT
→ 8)	87-[illegible] BE/BE	CSI M&TE Installed
* 9)	[illegible] BE/[illegible]	Completed SKT [illegible] [illegible]-[illegible]
* 10)	87-9286 BM/RE	OT completed SKT
* 11)	87-2647 [illegible]	[illegible] - all [illegible] set per chem [illegible]
↓ 12)	G36 Setup Programming BE/BE	- don't work - NO "Ready" or programming lines on SCREEN
↓ 13)	87-9117 BE/[illegible]H	CSI - Need [illegible] card - still spiking downscale
		Tues. 11-3-87 2330-0800
— 1)	87-2647 TP/CD	1N64Z002C Need to have O.D. [illegible] to [illegible]

	↓ 2)	B21-T034A RW/RP	cannot perform with TC & Testing
	✱ 3)	NEC-T8[illegible]21A SH/TG	Start 0000 Done 0115
SAT	✱ 4)	P52 RT RB/KH JM/AD	R84-2229 done SAT R84-2057 turned over R84-2209 Done SAT R85-9971 Done SAT
	✱ 5)	E3[illegible]-T5[illegible] RW/RP	[illegible] Done 0215
	✱ 6)	1N17-T0110A TG/SH	Start 0230 Done 0300
[illegible]	✱ 7)	[illegible] CD/AD	Start [illegible] Done 0330
	↓ 8)	R85-7[illegible]2 TG/SH	1P52N014C Vis [illegible] permit ↑ [illegible]
[illegible]	↓ 9)	R84-2208 JM/TP	I/P 1P52N702 need circuit support
"Rev [illegible]"	— 10)	P45-T0371A RW/CD/AD	START 0530 needs TC w/ pre-req
[illegible]	✱ 11)	R85-8551 RP/TG	P52[illegible] Done SAT
	— 12)	D17-T040A RW/AD	Start 0615 - [illegible] turned over
		[illegible]	[illegible]

0730-1300 11-3-87

1.	85-12447	C50 Fire Complete - SRT
	87-357	Fire Complete - SRT
	AW/NG	
→ 2.	87-9168	C36 T/O
→	87-9167	
	FR/SP	
3.	87-[illegible]	C41 Fire Complete - SRT
	[illegible]	
→ 4	87-[illegible]	N24 No Keys until Thurs or Friday
	CM/SM	
- 5	87-7016	N24 Complete - SRT
	T/MR	
	6. Shift Tech	
	JMcK	
7	C51	working with F. Duich
	FR/DF	check out of LPRM [illegible]
		T/O
→ 8	87-9085	R61] R61 GND problem
	87-9787	G33]
	JMcF/SMC	Part ON order (P/S #900316)
→ 9	87-9[illegible]	C51 - LPRM card
	RY/OR	C/R sent. ND
10	87-9017	R61 T/S
	JM[illegible]/[illegible]	Sent
11	87-6465	R6 T/K - Clean up paper work
		[illegible]

12.	Chart R... FU/F...	Poe
13.	D23-T1313D JP/EO/EW	Can't meet prereq 4.0.4
14.	B21-T0369A MF/RC	Completed SAT
15.	R84-2299	PS2 RT's Completed SAT
	R84-2307	Completed SAT
	DE/...	
16.	R86-3108	PS2 RT's RT being deleted Closed out
	R84-2206	Complete - SAT
	R84-2208	Complete - SAT
	R84-2300	Did not get done, No Turn over
	R85-2328	T/O
	R86-277	Complete - SAT
	CM/JM	
17.	R85-7185	PS2 RT's Completed SAT
	R85 7180	Completed SAT
	JW/JP	
18.	R85-9995	PS2 RT Complete - SAT
	MF/RC	
19.	R84 7057	1PS2N0073 Sent
	RY IDR	1PS2N0072
20	87-9149	R61
	JMcE...	To planners - xfer to maint
21.	R84-3303, 3304	P84 RT's Field Complete - ...
	R84 - 3307	
	R84 3308, 3309	

...
otkin
31E)
...
95-0338

22	87-9117 MF/RC	APRM i/c 1/0 LPRM cold replacement	? 12)
		1530- 0000 11/3	* 13)
* 1)	87-9117 BE/SH	completed SAT	14)
* 2)	R[illegible]-23[illegible] EE/RE	P52 completed SA	
↓ 3)	[illegible] JS/[illegible]	→ [illegible]	11)
* 4)	87-7062 [illegible]	[illegible]	*
✓ 5)	P[illegible]-A [illegible]/BE	Completed SAT	3)
* 6)	R[illegible]-2[illegible] BC/BE	[illegible] completed SAT	4)
* 7)	RCS-15993 RB/RE	M46 completed SAT	5)
* 8)	TXI-033 SH/BB	completed SAT	↓ 6)
* 9)	TXI-035 RB/RE	completed SAT	7)
↓ 10)	87-8285 [illegible]	[illegible]	8)
* 11)	87-9301 87-8347	633 MTA completed [illegible]	9)

→ 12)	87-8347 C/RE	C11 T/O
✱ 13)	TXI-34 RR/SL	[illegible]
→ 14)	TXI-3[illegible] RR/RE	T/O
		2330-0800 11-4-87 WEDNESDAY
✱ 1)	TXI-036 AD/LH	continued done SH
✱ 2)	[illegible] AD/LH	[illegible] 0111 [illegible] 0210
✱ 3)	87-9302 SH/RP	C11 TRANSPONDER CARD done SH
- 4)	87-8971 RB/RW	N22 F270 - switch N22N273 is baked jumpered FCR - need to temp wire switch etc, & FCR ANSWER
- 5)	87-9150 TP/CD	N22 [illegible] Binding, sent to maint VIA [illegible] FOR REPAIR - I&C to [illegible] CK. LOOP [illegible]
↓ 6)	87-8285 TG/JM	D17 install new relays - need new hold-down straps [illegible]
- 7)	87-9305 ~~SH/RP~~ TG/JC	E12R601 Tshoot recorder [illegible] (parts on order)
- 8)	87-2129 TG/JM	install test [illegible] - [illegible] [illegible] - [illegible]

FAP No. 7260

PLANT DAILY MAINTENANCE REPORT

DATE: 11/3/87

CREW: 1

WO NUMBER	JOB / MPL	PERSONNEL ASSIGNED	RESTRAINTS	STATUS / REMARKS
87-9119		SAMPSON, BAKER		PLUG FOR DRESSER VALVE
				TURNED OVER TO EGM @ 1500 HRS.
W.R. M-660		MARUSCHAK, QUEENER		U.T. CALIB. BLOCKS
R85-000306		WEST, CRAIG		
TRAINING		ANDERSON, M. MARUSCHAK,		
87-8626		OROSZ		
R86-013105	0641C0007			

VACATION:

SICK:

OTHER:

FNFP No. 7260

PLANT DAILY MAINTENANCE REPORT

DATE: 11·3·87

CREW: II

WO NUMBER	JOB / MPL	PERSONNEL ASSIGNED	RESTRAINTS	STATUS / ..EMARKS
762000091	Training Bld	Vertholz Soden Przeracki		
87-8992	PAA Hx	Pae W. Ranson Haldi Propst		

VACATION:

SICK: Schroeder

OTHER: Training Vance

W.O.	DESCRIPTION
87-499	Service Air - add 2 oz Dow Corning Anti-Foam Agent.
87-5281	Service Air - add 2 oz Dow Corning 200 Anti-Foam.
85-12839	Instrument Air - Repair Dryer Desiccant Towers (Void).
85-7537	Instrument Air - Change Filter Cartridge.
85-7541	Instrument Air - Change Filter Cartridge.
85-12800	Instrument Air - Replace After Filter Elements.
85-12626	Instrument Air - Clean or Replace Filter Elements.
85-2790	Instrument Air - Drain Valve Plugged.
86-2492	Instrument Air - Repair/unclog Filter.
85-1522	Instrument Air - Hi Suct Filter D/P Clean or Replace.
85-3643	Instrument Air - I.A. Dryer 2P52D003B Dewpoint - 28.

REPETITIVE TASK PRINTED ON: 5/12/87
AT 3:30:46

REPET TASK NO.	REV#	REV DATE	MPL #	COMP CAT	TASK CAT	TASK TYPE
R85-007932	6	10/17/86	2P52D0005B	FLT	MEPM	INSPECTION

EQUIPMENT NAME
FILTER AFTER 5MCRN

RESP SECT MAINT

ASSEMBLY DESCRIPTION: INSTRUMENT AIR FILTER 2P52A

TASK SUMMARY: INSPECT INSTRUMENT AIR AFTER FILTER

LOCATION	SAFETY M/E	EQ LIST	RWP	ALARA REV	TAGOUT	REQD	WORK ORDER NUMBER
CCB/05-574	5 - 5	NO	NO	NO	YES	NO	

ROC	POC	FREQUENCY	DUE DATE	EARLY DATE	LATE DATE	GRACE
	12345	1 SEMIANNUAL	6/07/87	5/11/87	7/04/87	15%

TASK DESCRIPTION:
INSPECT FILTER CARTRIDGE FOR EVIDENCE OF DESSICANT OR OTHER PARTICULATE CLOGGING THE FILTER.
IF NECESSARY REPLACE THE CARTRIDGE (STK CODE 9054016).
IF THE FILTER HAS BEEN BLOCKED OR BLOWN THROUGH , A CONDITION REPORT SHALL BE INITIATED.*****NOTE:IT IS NORMAL TO FIND SOME MATERIAL ON THE INSIDE OF THE FILTER ELEMENT.(CST B00059)*****

COMMENTS FROM LAST PERFORMANCE:
WORK COMPLETE PER WO# 86-15004 (FILTERS REPLACED)

SEF
OCT 21 1987
ENTERED IN PPMIS

INSTRUCTIONS REQUIRED:
NA

PARTS: STOCK # DESCRIPTION AMT REQ'D
NA

M & TE CODE DESCRIPTION
NA NOT APPLICABLE

COMPLETION SECTION..

COMPLETED X -OR- RESCHEDULE _ TO _ / _ / _ -OR- DELETE _ CODE _

PERSONNEL: BADGE#	HOURS	M & TE: MPL #	DESCRIPTION
1255	2		
1329	2		

COMMENTS:

COMPLETED BY: BADGE# 1255 NAME Robert E. Krueger DATE 10/19/87

SYSTEM CANNOT BE ISOLATED FROM AIR SUPPLY DUE TO VALVES LEAKING BY. CARTRIDGE INDICATOR READING IS IN GREEN & DRAIN VALVE IN BOTTOM OF FILTER HOUSING WAS BLED WITH NO EVIDENCE OF ANY DESSICANT OR PARTICULATE CLOGGING FILTER

INFORMATION ONLY

REPETITIVE TASK PRINTED ON: 5/12/87
AT 3:30:46

REPET TASK NO.	REV#	REV DATE	MPL #	COMP CAT	TASK CAT	TASK TYPE
R85-007931	6	10/17/86	2P52D0005A	FLT	MEPM	INSPECTION

EQUIPMENT NAME
FILTER AFTER 5MCRN

ASSEMBLY DESCRIPTION: INSTRUMENT AIR FILTER 2P52A
TASK SUMMARY: INSPECT INSTRUMENT AIR AFTER FILTER
RESP SECT: MAINT

LOCATION	SAFETY M/E	EQ LIST	RWP	ALARA REV	[redacted] TAGOUT	WORK ORDER REQD NUMBER
CCB/05-574	5 - 5	NO	NO	NO	YES	NO

ROC	POC	FREQUENCY	DUE DATE	EARLY DATE	LATE DATE	GRACE
	12345	1 SEMIANNUAL	6/07/87	5/11/87	7/04/87	15%

TASK DESCRIPTION:
INSPECT FILTER CARTRIDGE FOR EVIDENCE OF DESSICANT OR OTHER PARTICULATE CLOGGING THE FILTER.
IF NECESSARY REPLACE THE CARTRIDGE (STK CODE 9054016).
IF THE FILTER HAS BEEN BLOCKED OR IS BLOWN THROUGH A CONDITION REPORT SHALL BE INITIATED.****NOTE:IT IS NORMAL TO HAVE SOME MATERIAL ON THE INSIDE OF THE FILTER ELEMENT.(CST B00059)*****

COMMENTS FROM LAST PERFORMANCE:
WORK COMPLETE PER WO# 86-15004 (FILTERS REPLACED)

INSTRUCTIONS REQUIRED:
NA

PARTS: STOCK # DESCRIPTION AMT REQ'D
NA

M & TE CODE DESCRIPTION
NA NOT APPLICABLE

COMPLETION SECTION..

COMPLETED ✓ -OR- RESCHEDULE _ TO __ / __ / __ -OR- DELETE _ CODE __

PERSONNEL: BADGE#	HOURS	M & TE: MPL #	DESCRIPTION
770	.5		
1562	.5		

COMMENTS: Filter cartridge checked okay

COMPLETED BY: BADGE# 770 NAME Murray Bay DATE 10 / 2 / 87

LAD
OCT 08 1987
ENTERED IN PPMIS

INFORMATION ONLY

LAD
OCT 08 1987
ENTERED IN PPMIS

REPETITIVE TASK PRINTED ON: 5/12/87
AT 3:30:46

REPET TASK NO.	REV#	REV DATE	MPL #	COMP CAT	TASK CAT	TASK TYPE
R85-007929	6	10/09/86	1P52D0005A	FLT	MEPM	INSPECTION

EQUIPMENT NAME
FILTER AFTER 5MCRN

ASSEMBLY DESCRIPTION		TASK SUMMARY	RESP SECT
INSTR AIR AFTER FILTER	1P52A	INSPECT INSTRUMENT AIR AFTER FILTER	MAINT

LOCATION	SAFETY M/E	EQ LIST	RWP	ALARA REV	TAGOUT	WORK ORDER REQD	NUMBER
CCB/04-574	5 -	NO	NO	NO	YES	NO	

ROC	POC	FREQUENCY	DUE DATE	EARLY DATE	LATE DATE	GRACE
	12345	1 SEMIANNUAL	6/07/87	5/11/87	7/04/87	15%

TASK DESCRIPTION:
INSPECT FILTER CARTRIDGE FOR EVIDENCE OF DESSICANT OR OTHER PARTICULATE CLOGGING THE FILTER.
IF NECESSARY REPLACE THE CARTRIDGE (STK CODE 9054016).
IF THE FILTER HAS BEEN BLOCKED OR BLOWN THROUGH , A CONDITION REPORT SHALL BE INITIATED.**** NOTE: IT IS NORMAL TO FIND SOME MATERIAL ON THE INSIDE OF THE FILTER ELEMENT.(CTS B00059)*****

COMMENTS FROM LAST PERFORMANCE:
WORK COMPLETE PER WO# 86-15004 (FILTERS REPLACED)

INSTRUCTIONS REQUIRED:
NA

PARTS: STOCK # DESCRIPTION AMT REQ'D
NA

M & TE CODE DESCRIPTION
NA NOT APPLICABLE

COMPLETION SECTION...

COMPLETED ✓ -OR- RESCHEDULE _ TO __ / __ / __ -OR- DELETE _ CODE __

PERSONNEL: BADGE#	HOURS	M & TE: MPL #	DESCRIPTION
770	.5		
1562	.5		

COMMENTS: Filter cartridge checked okay

COMPLETED BY: BADGE# 770 NAME Murray Bay DATE 10/2/87

INFORMATION ONLY

LAC
OCT 08 1987
ENTERED IN PPMIS

8/6/E

Tom Schrenk

pg 2

NOV 3 1987 2ND Shift

(1) WO 87-6725 Finished R57 strobe lighting job Completed terms in term box and demobed the area.

(2) WR 87-100706 Installing power to the 3 new guard houses located in the yard area on the north end of the plant

NOV 4 1987 1st Shift

(1) WO 87-8138 Installing R34 grounding in control complex 626, tying into existing grounds

(2) WO 86-10336 working in the hot tool room installing R71 lighting pulling wire in new conduits

(3) SHE #87-91-0015 running new conduit and cable to telephone and battery room in warehouse #1.

(4) SAE #76-10-00098 changing out heater elements in warehouse #2

(5) WR 87-100706 Installing power cables to the 3 new guard houses located in the yard area on the north end of the plant

(6) WO 87-7885 removing box and fitting covers to support insulators and QC for inspection of penetration seals.

p 292

1) worked temporary light and power on unit 2.

NOV 4 1987 2ND SHIFT

1) WR 87-100706 finished final connections for 3 new guard houses on north side of plant.

1) determined temporary air-conditioner outside of Diesel Generator room 7.

FORM No. 7320

PLANT DAILY MAINTENANCE REPORT

DATE: 11-5-87

CREW: 3

WO NUMBER	JOB / MPL	PERSONNEL ASSIGNED	RESTRAINTS	STATUS / REMARKS
87-8583		Mihalic / Fenner		
87-6015				
87-5671		Sturm / Bartheny		
	GB	Swatosky / Kipper / Burkey		

VACATION:

SICK:

OTHER:

13/88

MW 16. 11D

PLANT DAILY MAINTENANCE REPORT

DATE: 11-3-87

CREW: 4

WO NUMBER	JOB / MPL	PERSONNEL ASSIGNED	RESTRAINTS	STATUS / REMARKS
2 87-8728	1N64B0112C	Pietrzak Riedel Zoller		
1 87-7453	1P52000034	Pietrzak-Riedel-Zoller		
R86 14295	1E22D50008	Vest - Hommel Bliss		Waiting on Tag Clearing

VACATION: Burns

SICK:

OTHER:

NPF No.

PLANT DAILY MAINTENANCE REPORT

DATE: 11-3-87

CREW: #5

WO NUMBER	JOB / MPL	PERSONNEL ASSIGNED	RESTRAINTS	STATUS / REMARKS
87-505	OP21F0441A	Armstrong, Kruger	F/C	
~~[illegible]~~	~~[illegible]~~			
PTI 34P0024		Schwarz, Acierno, ~~[illegible]~~	F/C	13 Hours Makeup
	Electrical work Weld World	" "		
	Weld World 98003	Bay McHugh		Pyloric Needs some work done
	Ware House 98003	Hawes		Working with Harwood Setting up Mezzanine lights
		Spangler		Work with Church crew C ~~[illegible]~~

VACATION:

SICK:

OTHER: Stevens, Sietz - Brazing Quals. Ervine / Tomasik - Blue Print

Form No. 7260

PLANT DAILY MAINTENANCE REPORT

DATE: 11-3-87

CREW: (6)

WO NUMBER	JOB / MPL	PERSONNEL ASSIGNED	RESTRAINTS	STATUS / REMARKS
87-6999 87-8293	1R54F0345 1R23S0002	CHURCH, SPANGLER		
SRV		SURBLICA, WORKMAN		
CRD		HUDDLESTON, GUGGENBILLER		
TRAINING		LIMBERT, SHREVE, DEHLMER		

[...]Y NUCLEAR [...]ER PLANT

MAINTENANCE SHIFT TURNOVER LOG Vol. 5

Nº 82

turnover 11-2-87 thru 11-3-87 m Johnson

P44 87-8992 assigned "Pri 2"
Paper work - assigned (on my own)
Pm assigned (on my own)

attempted to prep outage package on T/over sheet 87-9163 to PWC have parts

N71 87-8585 no packing nothing issued to PWC
N71 87-8586 have packing to PWC
N71 87-8587 " " " "
scaffold is up

N25 87-8936 saw a new T/O in package, signed it, to PWC

87-9163 } in HB, informed carpenters we needed scaffold, no
87-8936 } ...... at this time "High Rad", will install (if not installed already) after scram

turnover 11-3-87 thru 11-4-87 from Roberti

87-7634 P53 assigned PLCO
87-8992 P44 assigned Pri 2
87-9274 N27 assigned FC ?pri 2 pump not running, agitated cooling lines, added oil - low, couldn't ~~and~~ monitor temp C/R could not start & run pump due to tagging, sent up for retest.

87-9274 to PWC M40
87-2726 NE4 attempted to tighten fittings could not tighten one elbow that was leaking, submitted T/O. RL Harvey was QC on job, he's ~~writing~~ writing WR to work skid many leaks

prepped outage packages

no carpenters on 3rd shift SOD made call to not call them in to start erecting scaffolding, they will start in morning

mill Pros did not work, but ordered filters, they will be here if needed

CIVIL
ELECTRICAL
MECH.
OFFICE SERVICE
PMA
SUPPORT
OTHERS (IDENT.) ____________

R. J. FRAZIER

DAILY SCHEDULE

DATE 11-3 87

SHIFT 1ST

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAB.	M.W.	O.E.	PA.	P.F.	PLUMBE	S.M.	TEAM	STATUS
87-6068		DAW STR STEEL	RO! 623	0730 / 1600						3									ON-GOING NEED ANSWER TO FCR
87-8138		DRILL HOLE IN FIRE WALL (DRYWALL) FOR GROUND CABLE	[illegible]	1300 / 1400			1				1								F.C.
86-9355		BUSH PAD FOR PLENUM	[illegible]	1400 / 1600							2								DNF
87-6152		FABRICATE REMOVABLE INSULATION CANS FOR N27 FEEDWATER FLANGES	[illegible]	0730 / 1600					2										2-TO COMPLETE
87-7685		REMOVE PENT SEALS TO SUPPORT 87-8138	[illegible]	0730 / 1600					2										2-TO REMOVE
87-799		REPAIR & REPLACE DAMAGED INSULATION	[illegible]	0730 / 1600					1										ON-GOING
86-6349		COMPLETE UNFINISHED P44 INSULATION	[illegible]	0730 / 1600					2										ON-GOING

CIVIL
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MECH.
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PMA
SUPPORT
☒ OTHERS (IDENT.) SCAFFOLD

R. J. FRAZIER
DAILY SCHEDULE

DATE 11-3-87
SHIFT 1ST

JOB NO.	RPV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAB.	M.W.	O.E.	PA.	P.F.	PLUMBE	S.M.	TEAM.	STATUS
87-1345		BUILD SCAFFOLD & CUT TABLES	RY 551 / 2	1230 / 1600			2				1								TURN TO 2ND
87-7885		BUILD SCAFFOLD	CB	0630 / 1600			2				1								FC
62-1		BUILD SCAFFOLD SUPPORT PPUD WASHDOWN	CC	0730 / 1600															ON-GOING
68		MODIFY TC 2	YARD	0730 / 1600															DNF

CIVIL
ELECTRICAL
MECH.
OFFICE SERVICE
PMA
SUPPORT
OTHERS (IDENT.) ______

R. J. FRAZIER

DAILY SCHEDULE

DATE 11-3-87

SHIFT First

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAR.	M.W.	O.E.	PA.	P.F.	PLUMBR	S.M.	TEAM	STATUS
87-7883		SWO Paint Shop	Var	730 / 400	1								*	4 3					On Going
87-7989		Touch-Up Floor Coating Track Bay	1B 620	730 / 930	9							*	*	3 3					"
86-9889		Decon-Hot Tool Rm Capital Expend.	1A 514	730 / 1200								**	*	2 2					"
607		Paint Sheds & Buildings in South Yd	62 V.1	730 / 400								*	* ** **	3 3 2					"

CIVIL
ELECTRICAL
MECH.
OFFICE SERVICE
~~PMA~~
✓ SUPPORT
OTHERS (IDENT.) ____

R. J. F[illegible] IER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1st

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAR.	M.W.	O.E.	PA.	P.F.	PLUMBR	S.M.	TEAM	STATUS
87-10-30-4 pmA		Hyd pump & engine						1				1	1						PMA
87-7883		paint Shop & Broderson											1						WO's
87-8243		#4100 Valve in Warehouse											2						WO's
86-9353		Hoist (Capital F&P)											1						WO's
87-40 0000 7		Warehouse 22T											1						AF
606		W/S Construction yard Cleanup											1						
WR87 092916		Backhoe PACP											1						WO's
618		Move Trailers											1						

IVIL
ELECTRICAL
MECH.
OFFICE SERVICE
X PMA
SUPPORT
OTHERS (IDENT.) ____________

R. J. FRAZIER

DAILY SCHEDULE

DATE ... -87

SHEET 1

JOB NO.	REV. / SYS.	WORK DESCRIPTION				STATUS
87- -27-2		UNIT # 2 HOPP NEW HEATERS				
87- 24-1		CLEAN-UP				
PHYS		10 TOTAL				
87- -19-2 -19-3		Valve PACKING				
87- -19-1 -19-6		Valve PACKING				
87- -30-1 -30-2		W.O. TICKETS				
-29-2 -27-4						

- CIVIL
ELECTRICAL
MECH.
OFFICE SERVICE
PMA
X SUPPORT
OTHERS (IDENT.) ____

[illegible]

DAILY [illegible]

DATE -8[illegible]

SHEET 1

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC.	STOP	[illegible]	STATUS
509		OIL-Tool-CH. [illegible] WHS.				
		REP. TASKS UNIT #1				

- [ ] CIVIL
- [ ] ELECTRICAL
- [ ] MECH.
- [ ] OFFICE SERVICE
- [ ] PMA
- [x] SUPPORT
- [ ] OTHERS (IDENT.) ______

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1 1st

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAB.	M.W.	O.R.	PA.	P.F.	PLUMBR	S.M.	TEAM	STATUS
609		UNIT #1 SWITCH TRUCK																1	ongoing
609		UNIT #2 SWITCH TRUCK																1	"
618		FURNITURE & SUPPLIES																1	"
619		TOW MOTOR IN WAREHOUSE																1	EST. complete 11/13/87
609		OUT SIDE RUNS AND MISC. JOB TRUCK																1	ongoing
WR 87-042916		DIRT & Asphalt hauling to the dump from inside Unit 1																1	Am only

☐ CIVIL	
☐ ELECTRICAL	
☐ MECH.	
☒ OFFICE SERVICE	
☐ PMA	
☐ SUPPORT	
☐ OTHERS (IDENT.) ______	

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1st

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAB.	M.W.	O.R.	PA.	P.F.	PLUMBE	S.M.	TEAM.	STATUS
PPSD 608		2-CARPS MAIN GATE 1-LABOR BADGE BOOTH	MAIN GATE	0730 / 1200	3		B 2				B 1								COMPLETED
PPSD 608		3-CARPS DEMOBE and 2-LABOR MOVE TA-24 TA-10-9-8	[illegible]	0730 / 1600	5		G 3	1-CARP			2								TA-10-9-8 TA-24 MOVED to 80% SOUTH GATE
PPSD 618		1-CARP MOVE TP-21 3-LABORS to E-230 9-PEOPLE	TP-21 E-335	0730 / 1230	4		E 1				E 3								COMPLETED
		1-GF Jim Rockefeller			1		1												
PPSD 608		1-CARP BACK TO DEMOBE D	TA	1400 / 1600	1		1												TA-10-9-8 TA-24 MOVED TO 80% SOUTH GATE
PPSD		1-CARP - PPSD 608 Misc wk 3-LABORS - PPSD 618 Misc wk E	VAR	1200 / 1600	4		1				3								ON GOING

☐ CIVIL
☐ ELECTRICAL
☐ MECH.
☐ OFFICE SERVICE
☐ PMA
☐ SUPPORT
☐ OTHERS (IDENT.) ______________

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1st

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAR.	M.W.	O.E.	PA.	P.F.	PLUMBR	S.M.	TEAM.	STATUS
RT 86-13308		2-CARPS RT DOORS ON GOING	VAR	0730 / 1600	2		2												ON GOING
WO 87-8138		1-CARP CUT 1" HOLE IN DRYWALL FOR ELECT C	CC 630	1230 / 1400	1		D 1												COMPLETED

- [ ] CIVIL
- [ ] LECTRICAL
- [ ] MECH.
- [ ] OFFICE SERVICE
- [x] PMA
- [ ] SUPPORT
- [ ] OTHERS (IDENT.) ____________

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1st

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.U.	I.W.	LAB.	M.W.	O.E.	PA.	P.F.	PLUMBE	S.M.	TEAM.	STATUS
PMA 87-10-27-1		2-CARPS 1-LABOR SCOFFOLD FOR PROPANE LINES AUX 2 + HB 2	AUX	0730 / 1600	3		2				1								50% COMPLETED

☐	CIVIL
☐	ELECTRICAL
☐	MECH.
☐	OFFICE SERVICE
☐	PMA
☒	SUPPORT
☐	OTHERS (IDENT.) ______

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/81

SHIFT 1st

JOB NO.	RRV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAB.	M.W.	O.F.	PA.	P.F.	PLUMBE	S.M.	TEAM.	STATUS
SAE 87-40-00014		3-CARPS 1-LABOR FORMS FOR GAS BOTTLE STORAGE	WHSE YD	0730 / 1600	4		(A) 1 CARP (B) 1-CARP 3				1								PADS COMPLETED 50%
SAE 87-40-00015		1-CARP SIGNS FOR SECURITY 2-on STANDS	SHOP	0730 / 1600	1		(F) 1												COMPLETED
PROD 607		1-LABOR SITE CLEAN-UP	SHOP	0730 / 1600	1						1								ON GOING
PROD 607		1-CARP SITE CLEAN-UP (A)	SHOP	0930 / 1600	1		1												ONGOING
PROD 607		2-CARPS 1-LABOR T-111 on TEMP POWER (B)	TEMP PWHSE	1230 / 1600	3		2				1								5% COMPLETED
PROD 607		1-CARP T 111 on TEMP POWER (D)	TEMP PWHSE	1230 / 1600	1		1												5% COMPLETED
PROD 607		1-CARP SITE CLEAN-UP (E)	SHOP	1230 / 1600	1		1												ONGOING

- [ ] CIVIL
- [ ] ELECTRICAL
- [ ] MECH.
- [ ] OFFICE SERVICE
- [ ] PMA
- [ ] SUPPORT
- [ ] OTHERS (IDENT.) ______

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1st

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M.R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAR.	V.W.	O.E.	PA.	P.F.	PLUMBR	S.M.	TEAM	STATUS
WO 87 6068		RW Mezz (Capital Exp)		7.30 / 4.00						4									
WO 87 8715				7.30 / 4.00						2									
SAE 87 40-00014		Fire Training Burn Bldg. (Air-Gas Storage Bldg.) Warehouse Rebar - Prod		7.30 / 4.30					*1	4									
622 PROD		Code (451) Diesel Gen. Machine Frame		7.30 / 4:00 / 12:30 / 4.00					*1	4									
608 PPSD		Whole body counter Lifting Frame - welding		7.30 / 12.00					*1										
87-40 0007		PROD - YARD		7.30 / 4.00						~~8~~ 1									

- [X] E... ..RICAL
- [ ] MECH.
- [ ] OFFICE SERVICE
- [ ] PMA
- [ ] SUPPORT
- [ ] OTHERS (IDENT.) ____________

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1 Shift

..B NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	T.W.	LAB.	M.W.	O.E.	PA.	P.F.	PLUMBER	S.M.	TEAM	STATUS
PPOD		Support PPOD CleAN up 620 TB		7:30							10								
WO		Support PF ON WO-work CLEAN up		7:30							2								
WO		Support INS ON WO-work CleAN up		7:30							1								
WO		Support CArp ON WO work scaffold		7:30							10								
WO		Support Printer ON 87-7989 TB 620		7:30							3								
PPSD		Support PPSD CleANup restroom lunchroom		7:30							1								

- [x] EL. [ELEC]TRICAL
- [ ] MECH.
- [ ] OFFICE SERVICE
- [ ] PMA
- [ ] SUPPORT
- [ ] OTHERS (IDENT.) ____________

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 2 Shift

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAB.	M.W.	O.F.	PA.	P.F.	PLUMBE	S.M.	TEAM.	STATUS
WO		Support Carp on Scaffold									4								
WO		Support PF in WO-work									1								

- [ ] CIVIL
- [ ] ELECTRICAL
- [x] MECH.
- [ ] OFFICE SERVICE
- [ ] PMA
- [ ] SUPPORT
- [ ] OTHERS (IDENT.) ______

R. J. FRAZIER

DAILY SCHEDULE

DATE 11-3-87

SHIFT 1st BAUER

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M.R.	B.M.	CARP.	ELEC.	A.W.	L.W.	LAR.	V.N.	O.E.	PA.	P.F.	PLUMBE	S.M.	TEAM	STATUS
87-4658	0 / M53	INSTALL REFRIGERENT LINE'S	TECH CENTER	07:30 / 16:00	2										✓				WoRKing
WR COMINS		SUPPORT PROD TRAINING CENTER		07:30 / 16:00	3							✓							Welding Jack Bolts on Motor Base Complete Drilling holes on Base on going
623		INSTALL SAFETY BELT'N AB WAGON	FAB Shop	07:30 / 16:00	2	✓													installing Sign on Hay Wagon on going
869353	M53	TRANSPORT PLENUM TO 62A IB.	577	07:30 / 16:00	3												✓		Transporting of Plenum Completed
878715		Support Bill Sackett WORKING WITH I.W.		07:30 / 16:00	2												✓		on going
		Parking Road																	Q.C. inspecting Parking Road
87 40 [illegible] 9		COMPOSIT YARD Composit Yard		07:30		✓									✓				on going

- [ ] CIVIL
- [x] ELECTRICAL
- [ ] MECH.
- [ ] OFFICE SERVICE
- [ ] PMA
- [ ] SUPPORT
- [ ] OTHERS (IDENT.) ____________

R. J. FRAZIER

DAILY SCHEDULE

DATE 11-3-87

SHIFT 1

Tom Schenk

JOB NO.	REV./SYS.	WORK DESCRIPTION	LOC./PRT.	START/STOP	MAT./M.R.	B.M.	CARP.	ELEC.	A.W.	I.W.	LAR.	M.W.	O.E.	PA.	P.F.	PLUMBR	S.M.	TEAM.	STATUS
87-8739		Relocate Conduit Supports	[illegible]	7:30 * —				2	Conduit Start P.C. #?										Will work the ... than ... Hot Tool Room
86-10336		(capital EXP) Hot Tool Room	[illegible]	7:30 * 4:00															
87-8138		INSTALL GROUNDING	C/C 620	7:30 4:00				2											Will work the entire shift
SAE #7610-00098		REPLACING HEATERS IN WHSE #2	WD 620	7:30 4:00				2											Will work the entire shift
SAE #8791-0018		RELOCATING LIGHTING & HEATING IN WHSE #6	WD 620	7:30 4:00				2											Will work the entire shift
SAE #8791-0018		INSTALLING NEW SERVICE TO TELEPHONE ROOM IN WHSE #1	WD 620	7:30 4:00				2											Will work the entire shift
TEMP 611		- DISCONNECT WIRING SANDY'S OLD Shop - HOOK UP NEW BADGE BOOTH - INSTALL COAX CABLE FOR TOM CARLSON - REMOVE ... FROM CABLE YARD	[illegible]	7:30 4:00				2											Will work the entire shift

- [ ] CIVIL
- [ ] ELECTRICAL
- [ ] MECH.
- [ ] OFFICE SERVICE
- [ ] PMA
- [x] SUPPORT
- [ ] OTHERS (IDENT.) ____________

R. J. FRAZIER

DAILY SCHEDULE

DATE 11/3/87

SHIFT 1st A

JOB NO.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M. R.	B.M.	CARP.	REC.	A.W.	I.W.	LAB.	M.W.	O.E.	PA.	P.F.	PLUMBE	S.M.	TEAM.	STATUS
87-092916		PREPARE SUB BASE FOR ASPHALT			2						2								FINISHED
87-9066		REWORK SLIP FOR TRUCKS			2						2								1/2 DONE
607		CLEAN SITE FROM COMSTOCK SOUTH			4						4								ON-GOING
617		HAZ. WASTE			2						2								ON-GOING
87-7883		PAINTER SUPPORT			1						1								ON-GOING
607		CLEAN LUNCHROOMS, FAB SHOPS & WHS'S,			1						1								ON-GOING

MECH. DAILY SCHEDULE (?)-FOREMAN 13-CRAFT. SHIFT PARSONS

W.O.	REV. / SYS.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M.R.	STATUS
86-12301	1 / P54	INSTALL PIPE Fw #32 + Fw. 325 PETRAGLIA	I.B. 574' / 3D	1600 / 2400	* / 4	Completed [illegible] & 325 Need [illegible] final
86-10458	1 / P54	INSTALL HGR'S PETRAGLIA	I.B. 574' / 3D		*	DNW
87-1304	0 / P54	PRE-FAB PIPE ADAMS	R.W. 623' / 3D	2030 / 2400	* / *	LATE START FABRICATING NOT MUCH PROGRESS - [illegible] [illegible]
86-11051	2 / G50	REWORK VALVE G50 F098 CARSON	R.W. 602' / 4B	1600	2	DRAINING *** [illegible] [illegible] ALREADY [illegible]
87-8935	0 / P54	REPLACING THREADED NIPPLE ADAMS.	T.B. 697' / 4D	1830 / 2000	* / 2	COMPLETE IN FILE PACKAGE WILL BE R[illegible] TO M.E.'S. M.E.'S [illegible] TO GET TAGS [illegible]
87-9285	0 / B21	Manifold in shop MOB TOOLS IN HOT TOOL RM. REMOVE/REINSTALL AIR PACK OUTBOARD LOOP F022D	S.M. 628 / [illegible]	1600	2	[illegible] ENTRANCE [illegible]
87-9293	0 / B21	Need everything duplicate as above MOB SAME AS ABOVE INBOARD LOOP F022D	D.W. [illegible] / [illegible]	1600	2	[illegible] ENTRANCE [illegible]
						*** [illegible] WAITING [illegible] (86 11051)

MECH. DAILY SCHEDULE

DATE 11-3-87 1st

SHIFT Ivey

W.O.	SYS. / REV.	WORK DESCRIPTION	LOC. / PRI.	START / STOP	MAT. / M.R.	STATUS
87-6108	LS9 / 0	INSTALL LIQUID ABRASIVE CLEANER	I.B. 574		PIPE FITTER 4	
86-9353	LS9 / 0	INSTALL PLENUM	I.B 574'		SHEETMETAL	
86-12307	P54 / 1	INSTALL PIPE	I.B. 574'		PIPEFITTERS 4	
87-9052	N27 / 0	PRE-FAB ONLY PIPE (SHOP) (87 OUTAGE)	H.B. 613		PIPE FITTER 2	
87-1304	P59 / 0	PRE-FAB ONLY PIPE (SHOP)			PIPE FITTERS	
86-10458	P54 / 1	INSTALL HGRS.	I.B. 574 3D		PIPEFITTERS	
87-9285	B21 / 0	REMOVE + REINSTALL FOR PRE F0230.	S.T. 629 H.T.		PIPE FITTER	
87-4076	N23 / 0	INSTALL TUBING	T.P.C 568 9D.		PIPEFITTERS 2	
81-4058	M33	TEST CENTER RUN TUBING	H.T. [illegible]		2	

Reportability Review

Date/Time	Event
10-29-87/2144	Both MSL D Isolation Valves Failed.
10-30-87/0010	4 hour ENS call made to NRC regarding slow MSIVs. *Call made within the Requirements of 10 CFR 50.72 (b)(2)(iii) - Loss of a safety function.
11-03-87/1212	Both MSL D Isolation Valves Failed.
11-03-87/1337	Commenced Plant Shutdown.
11-03-87/1355	ENS call made on Plant shutdown and slow MSIVs. *Call satisfied 4 hour requirements of 10 CFR 50.72 (6)(2)(iii) and 1 hour requirement of 50.72 (b)(1)(i)A - Plant shutdown required by Technical Specification.
11-3-87/1819	Plant scrammed to shutdown.
11-03-87/2130	ENS call made on RPS/ESF Actuation. *2130 call was unnecessary since the plant scram was planned, not unexpected. Never-the-less, call was within 4 hour requirement per 10 CFR 50.72 (b)(2)(ii) - RPS/ESF Actuations.
Conclusion:	Three calls were made. All immediate Notification Requirements were satisfied. One call was made unnecessarily. A 30 day written report, in accordance with 10 CFR 50.73, was initiated and is forthcoming.

13/89

1. History

On October 29, 1987 at 1900, Main Steam Isolation Valve (MSIV) 1B21-F022D exceeded it's allowable stroke time during performance of a startup test and was declared inoperable. Technical Specification 3.6.4 Action (a) then became applicable and the penetration was to be isolated within 4 hours unless the valve could be returned to Operable status. At 2103 and 2106, 1B21-F022D was cycled and stroked closed within the 5 second isolation time required by 3.6.4.

Subsequent to the 1B21-F022D valve testing, all MSIVs were cycled in order to verify adequate stroke times. At 2144, the 1B21-F028D failed it's stroke time test and was considered inoperable. At this point, Technical Specifications required the plant to be shutdown in 12 hours. (One other MSIV, 1B21-F028B, also failed it's first stroke time test at 2216).

By 2310, all MSIVs that failed their initial stroke times had successfully completed subsequent tests and an evaluation of the results was complete. The valves were now considered operable. The bases for this decision was that the cause of the slow closures was a one time deposit of debris in the respective solenoids causing a delay in their response. Once the valves were cycled and the stroke times passed, the debris was assumed to be blown away. This conclusion was consistent with known industry problems regarding air systems and MSIV solenoid valves. These previous experiences were considered heavily in the final decision. No further actions per Technical Specifications were required. None of the Technical Specification Limiting Conditions for Operation (LCO) were violated.

On November 3, 1987 another series of stroke timing tests were performed on the MSIVs. At 1157, the 1B21-F022D failed it's stroke time and was declared inoperable. At 1208 the 1B21-F028D failed to close. Both valves were subsequently recycled satisfactorily within minutes of their first tests. However, because the valves again failed to properly actuate on the first attempt, the original hypotheses for the isolated failures was no longer considered valid. The plant commenced a shutdown at 1330 and the D and B lines were isolated by 1354. At 1819, in order to complete the shutdown the reactor was manually scrammed. The plant was shutdown within the 12 hours required by Technical Specification 3.6.4 Action (a).

Since no LCO was violated during either event, the plant remained within the constraints of the analytical bases contained in the operating license. Consequently, the incidents resulted in no immediate safety significance.

C EQUIPMENT D NUMBER S	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV DIV LOCATION SUPPORT ZONE M/H	SP NO 1 GE PURCH DWG MANUFACTURER MODEL EC-FT-CAT-ACC-RT		-ENVIRONMENTAL- 1-2 SUM-ENV/ENV QFD 3-4 M-LF-MI/OPD-SEAL 5 ART DEMO
*1B21 F 0460	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3)	1B21H010 R D2 C I/00-630 1B21 F 0022A DW-1 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A	 N/A	1 E301-S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES
*1B21 F 0461	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3)	1B21H010 R D2 C I/00-630 1B21 F 0022B DW-1 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A	 N/A	1 E301-S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES
*1B21 F 0462	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3)	1B21H010 R D2 C I/00-630 1B21 F 0022C DW-1 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A	 N/A	1 E301-S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES
*1B21 F 0463	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3)	1B21H010 R D2 C I/00-630 1B21 F 0022D DW-1 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A	 N/A	1 E301-S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES
*1B21 F 0480	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3)	1B21H011 S D1 AXC/05-620 1B21 F 0028A AB-7 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A	 N/A	1 E301-S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES
*1B21 F 0481	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3)	1B21H011 S D1 AXC/05-620 1B21 F 0028B AB-7 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A	 N/A	1 E301-S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES

B/90

C D S	EQUIPMENT NUMBER	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV DIV / LOCATION / SUPPORT / ZONE M/H	SP NO 1 GE PURCH DWG / MANUFACTURER / MODEL / EC-FT-CAT-ACC-RT	-ENVIRONMENTAL- 1-2 SUM-ENV/ENV QFD / 3-4 M-LF-MT/OPD-SEAL / 5 ARI DEMO
*	1B21 F 0482	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3)	1B21H011 S D1 AXC/05-620 1B2, F 0028C AB 7 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A N/A	1 E301 S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES
*	1B21 F 0483	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3)	1B21H011 S D1 AXC/05-620 1B21 F 0028D AB 7 HARSH	301 105D4935 ASCO NP-8320/8323 A1 C N/A N/A	1 E301-S05-01 * 2 A 3 T 40Y 05Y 4 YES 5 YES

ASCO E Harsh

ASCO m.l.17	C O S EQUIPMENT NUMBER	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV C LOCATION SUPPORT ZONE M/H
NP-8320-A185E NP-8323-A20E	*1B21 F 0460	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3) NO WORK HISTORY	1B21H010 R D C 1/00-630 1B21 F 0022A DW-1 HARSH
NP-8320-A185E NP-8323 A20E	*1B21 F 0461	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3) NO WORK HISTORY	1B21H010 R C C 1/00-630 1B21 F 0022B DW-1 HARSH
NP-8320 A185E NP-8323 A20E	*1B21 F 0462	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3) NO WORK HISTORY	1B21H010 R C C 1/00-630 1B21 F 0022C DW-1 HARSH
NP-8320 A185E NP-8323 A20E	*1B21 F 0463	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-INBOARD TEST/PILOT SOLENOIDS (3) NO WORK HISTORY	1B21H010 R C C 1/00-630 1B21 F 0022D DW-1 HARSH
NP-8320 A185E NP-8323 A20E	*1B21 F 0480	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3) NO WORK HISTORY	1B21H011 S AXC/05-620 1B21 F 0028A AB-7 HARSH
NP-8320 A185E NP-8323 A20E	*1B21 F 0481	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3) NO WORK HISTORY	1B21H011 S C AXC/05-620 1B21 F 0028B AB-7 HARSH

B/91

Asco Mod. 1 A

NP-8320-A185E ~~1-8323~~
NP-8323 A20E

NP-8320-A185E
NP-8323-A20E

C EQUIPMENT D NUMBER S	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV DIV LOCATION SUPPORT ZONE M/H
*1B21 F 0482	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3) No WORK HISTORY	1B21H011 S D1 AXC/05-620 1B21 F 0028C AB-7 HARSH
*1B21 F 0493	NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM ISOLATION VALVE-OUTBOARD TEST/PILOT SOLENOIDS (3) NO WORK HISTORY	1B21H011 S D1 AXC/05-620 1B21 F 0028D AB-7 HARSH

Asco Model #

Handwritten model	Equipment	Description	Zone M/H
NP8316A75E	*1M14 F 0043	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F040 SOLENOID NO WORK HISTORY	1M14 008 G D' C 0/12-689 1M14 F 0040 CT-0 HARSH
NP8316A75E	*1M14 F 0048	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F045 SOLENOID WO 8G-1648 Repair Air [illegible]	1M14 008 G D: C 0/12-689 1M14 F 0045 CT-1 HARSH
NP8316A75E	*1M14 F 0058A	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F055A SOLENOID NO WORK HISTORY	1M14 009 K D' C I/07-630 1M14 F 0055A DW-1 HARSH
NP8316A75E	*1M14 F 0058B	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F055B SOLENOID NO WORK HISTORY	1M14 010 J D: C 0/07-630 1M14 F 0055B CT-3 HARSH
NP8316A75E	*1M14 F 0063A	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F060A SOLENOID NO WORK HISTORY	1M14 009 K D' C I/16-630 1M14 F 0060A DW-1 HARSH
NP8316A75E	*1M14 F 0063B	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F060B SOLENOID NO WORK HISTORY	1M14 010 J D: C 0/16-630 1M14 F 0060B CT-3 HARSH

ASCO m.l.1 H

. . . . [illegible]

	C EQUIPMENT D NUMBER S	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV LOCATION SUPPORT ZONE M/H
NP8316A75E	*1M14 F 0068	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F065 SOLENOID	1M14 011 H C 0/12-652 1M14 F 0065 CT-7 HARSH
		NO WORK HISTORY	
NP8316A75E	*1M14 F 0073	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F070 SOLENOID	1M14 012 G C 0/12-652 1M14 F 0070 CT-7 HARSH
		NO WORK HISTORY	
NP8316A75E	*1M14 F 0088	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F085 SOLENOID	1M14 011 H C 0/12-664 1M14 F 0085 CT-7 HARSH
		NO WORK HISTORY	
NP8316A75E	*1M14 F 0093	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F090 SOLENOID	1M14 012 G C 0/12-664 1M14 F 0090 CT-0 HARSH
		NO WORK HISTORY	
NP8316A75E	*1M14 F 0192	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F190 SOLENOID NO WORK HISTORY	1M14 013 F C 0/12-685 1M14 F 0190 CT-1 HARSH
NP8316A74E	1M14 F0197	NO WORK HISTORY	
NP8316A75E	*1M14 F 0202	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F200 SOLENOID OPEN W.O. 86-3552 Tubing Air Leak	1M14 013 F C 0/12-664 1M14 F 0200 CT-7 HARSH
NP8316A74E	1M14 F 0207	W.O. 86-3553 Tubing Air Leak [illegible]	

ASCO m.1.1 A

[illegible] EQUIPMENT LIST

	C EQUIPMENT D NUMBER S	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV D LOCATION SUPPORT ZONE M/H
NP8316A74E	*1M14 F 0197	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F195 SOLENOID	1M14 016 D D C 0/12-689 1M14 F 0195 CT-1 HARSH
		NO WORK HISTORY	
NP8316A74E	*1M14 F 0207	CONTAINMENT VESSEL AND DRYWELL PURGE OP AIR TO F205 SOLENOID	1M14 016 D C C 0/12-664 1M14 F 0205 CT-7 HARSH
		[illegible]	

ASCO Mod. I A

SELECT :
SORT : 01
TITLE : EQPL/SP 607-000

AS OF 0076:

C EQUIPMENT D NUMBER S	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV D LOCATION SUPPORT ZONE M/H
*1B21 F 0451	NUCLEAR BOILER SYSTEM SOLENOID FOR VALVE F069 SOLENOID	1B21A004 U C AXB/04-620 1B21 F 0069 AB-7 HARSH
*1B33 F 0419	REACTOR RECIRCULATION SYSTEM CONTROLS OPERATING AIR TO F019 SOLENOID VALVE	1B21H009 U C C D/02-620 1B33 F 0019 CT-3 HARSH
*1B33 F 0420	REACTOR RECIRCULATION SYSTEM CONTROLS OPERATING AIR TO F020 SOLENOID	1B21H009 U C C D/02-620 1B33 F 0020 CT-3 HARSH
*1E12 F 0451A	RESIDUAL HEAT REMOVAL SYSTEM CONTROLS OPERATING AIR TO F051A SOLENOID VALVE	1E12A041 F C AXB/06-620 1E12 F 0051A AB-4 HARSH
*1E12 F 0451B	RESIDUAL HEAT REMOVAL SYSTEM CONTROLS OPERATING AIR TO F051B SOLENOID VALVE	1E12A042 H C AXB/04-620 1E12 F 0051B AB-4 HARSH
*1E12 F 0465A	RESIDUAL HEAT REMOVAL SYSTEM CONTROLS OPERATING AIR TO F065A SOLENOID VALVE	1E12A041 F C AXB/06-574 1E12 F 0065A AB-4 HARSH

NP8320A185E — *1B21 F 0451 — W.O. 85-1654 [illegible] copper tubing

NP832C94E — *1B33 F 0419 — W.O. 86-3554 [illegible]

NP832094E — *1B33 F 0420 — NO WORK HISTORY

NP8320A185E — *1E12 F 0451A — NO WORK HISTORY

NP8320A185E — *1E12 F 0451B

NP8320A185E — *1E12 F 0465A — NO WORK HISTORY

DSC m.1.1 A

TITLE : EQPL/SP 607-000

	C D S	EQUIPMENT NUMBER	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV LOCATION SUPPORT ZONE M/H
NP8320A155E	*	1E12 F 0465B	RESIDUAL HEAT REMOVAL SYSTEM CONTROLS OPERATING AIR TO F065B SOLENOID VALVE NO WORK HISTORY	1E1 42 F AXC/04-574 1E12 F 0065B AB-4 HARSH
NP8320A155E	*	1E51 F 0404	REACTOR CORE ISOLATION COOLING CONTROLS OPERATING AIR TO F004 SOLENOID VALVE NO WORK HISTORY	1E51A007 P AXB/05-574 1E51 F 0004 AB-3 HARSH
NP8320A155E	*	1E51 F 0405	REACTOR CORE ISOLATION COOLING CONTROLS OPERATING AIR TO F005 SOLENOID VALVE NO WORK HISTORY	1E51A007 P AXB/05-574 1E51 F 0005 AB-3 HARSH
NP8320A155E	*	1E51 F 0425	REACTOR CORE ISOLATION COOLING CONTROLS OPERATING AIR TO F025 SOLENOID VALVE NO WORK HISTORY	1E51A007 P AXC/05-574 1E51 F 0025 AB-3 HARSH
NP8320A155E	*	1E51 F 0426	REACTOR CORE ISOLATION COOLING CONTROLS OPERATING AIR TO F026 SOLENOID VALVE NO WORK HISTORY	1E51A007 P AXC/05-574 1E51 F 0026 AB-3 HARSH
NP8320A155E	*	1E51 F 0454	REACTOR CORE ISOLATION COOLING CONTROLS OPERATING AIR TO F054 SOLENOID VALVE NO WORK HISTORY	1E51A007 P AXC/05-574 1E51 F 0054 AB-3 HARSH

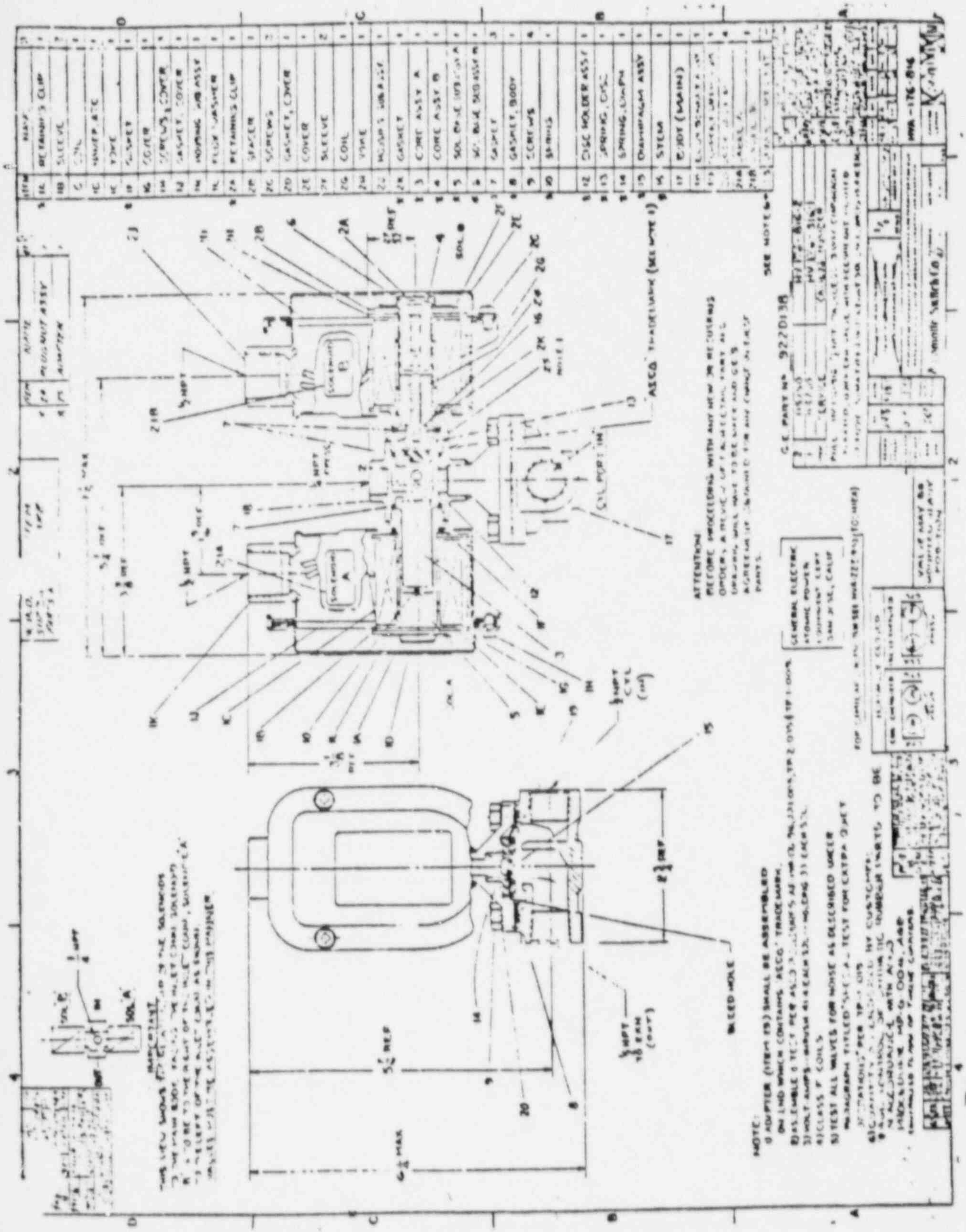
TITLE : EQML/SUM-ENV

C EQUIPMENT D NUMBER S	DESCRIPTIONS SERVICE (2) EQUIPMENT (2)	DIAGRAM REV DI LOCATION SUPPORT ZONE M/H
*1C11 D 0001	REACTOR PROTECTION SYSTEM CRD-HCV/SCRAM SOLENOID PILOT VALVE SOLENOID(TYPICAL-177 CRDS-2 SSPV PER CRD)	1C71A010 H VA C 0/14-620 LOCAL-CF CT-3 HARSH

[illegible]

ASCO MODEL# HVA-176-816-1

Computer search results for [illegible] Solenoid work



NOTICE

THIS INFORMATION IS SUPPLIED IN ACCORDANCE WITH ARTICLE [illegible] OF THE NUCLEAR STEAM SUPPLY SYSTEM CONTRACT BETWEEN GENERAL ELECTRIC COMPANY AND CLEVELAND ELECTRIC ILLUMINATING COMPANY DATED JUNE 2, 1972. THE USE OF THIS INFORMATION BY ANYONE OTHER THAN AGENTS OR EMPLOYEES OF CLEVELAND ELECTRIC ILLUMINATING COMPANY FOR ANY PURPOSE OTHER THAN THE DESIGN, CONSTRUCTION, LICENSING OR OPERATION OF THE PERRY NUCLEAR POWER PLANT IS NOT AUTHORIZED BY THE GENERAL ELECTRIC COMPANY.

Automatic Switch Co. FLORHAM PARK, NEW JERSEY Printed in U.S.A.	PRODUCTION SPECIFICATION BILL OF MATERIAL		FVP– 176-816 PAGE 1 OF 4 PAGE

CATA. NO	HV176-816-1 & HV176-816-2	SHOP ORDER NO	
BULL. NO	HV176-816, 1/2 NPT, PACKLESS, 3 WAY DIAPHRAGM OPERATED, QUICK EXH. VALVE WITH REDUNDANT PILOTED SOLENOID, NEMA TYPE 4 WATERTIGHT SOL. ENCL. WATTS: 15.4 AC (FT) EACH.	NO OF PARTS LIST PER ASS'Y: 1 ASSEMBLY REF: HVA-176-816	

ER NO	CHG LTR	ER NO	CHG LTR
[illegible]	K	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	N
73932	H	[illegible]	[illegible]
71[illegible]	G	[illegible]	P
70577	F		
69[illegible]	E		
69132	D		
68347	C		
67826	B		

FVP – 176-816

ITEM	PART NUMBER	CHG LTR	NOTE	MATERIAL	PART NAME	QUANTITY UNIT	REQ'D	DEL'D
1	HVA-17[illegible]	F	1		SOL. ASS'Y A (M-12)	1		
1A	GV-176-593-1	H		ST. STEEL	RETAINING CLIP	1		
1B	FV-99-033-1	H		STEEL	SLEEVE	2		
1D	GV-172-739-1	E		ALUM.	NAMEPLATE	1		
1E	HV-96-815-1	N		STEEL	YOKE	1		
1F	GV-39-619-5-HT	CV		ETHYLENE PROPYLENE	GASKET, HOUSING	1		
1G	FV-168-808-1	F		STEEL	COVER	1		
1H	FV-172-788-1	C		STEEL	SCREW, COVER	3		
1J	FV-172-759-1	D		BUNA-N	GASKET, COVER	1		
1K	FV 93-233-1 ~~[illegible]~~	B		STEEL	FLUX WASHER	1		
2	HVA-176-730	A	2		SOL. ASS'Y. B (M-12)	1		
2A	GV-176-593-1	H		ST. STEEL	RETAINING CLIP	1		
2B	FV-176-337-1	C		STEEL	SPACER	1		
2C	FV-172-788-1	C		STEEL	SCREW, COVER	3		
2D	FV-172-759-1	D		BUNA-N	GASKET, COVER	1		
2E	FV-168-808-1	F		STEEL	COVER	1		
2F	FV-99-033-1	H		STEEL	SLEEVE	2		
2H	HV-96-815-1	N		STEEL	YOKE	1		
2K	FV-180-769-3	B		ETHYLENE PROPYLENE	GASKET, HOUSING	1		
7	GV-39-619-6-VI	DU		VITON-A	GASKET	3		
0	GH-70-022-9C1	P		ST. STEEL	WASHER	4		
9	GH-73-102-3C1	N		ST. STEEL	SCREW	4		
8	GH-88-224-133A	Y		BUNA-N	GASKET	4		

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CATA. NO. HV176-816-1 & HV176-816-2

BULL. NO. HV 176-816

SHOP ORDER NO

NO. OF PARTS LIST PER ASS'Y: 1

ASSEMBLY REF: HVA-176-816

ER NO	CHG LTR	ER NO	CHG LTR
[illegible]	K	[illegible]	L
[illegible]	J	[illegible]	N
73537	H	[illegible]	M
71833	G	[illegible]	[illegible]
70577	F	[illegible]	E
69192	E		
69132	D		
68347	C		
67826	B		

FVP – 176-816

ITEM	PART NUMBER	CHG LTR	NOTE	MATERIAL	PART NAME	QUANTITY UNIT	QUANTITY REQ'D	QUANTITY DEL'D
3	GV-89-653-5	EA			CORE ASS'Y. SOL. A	1		
	FV-91-084-1	G		ST. STEEL	CORE	1		
	GV-60-452-9 ~~[illegible]~~	EM		VITON-A ~~[illegible]~~	DISC	1		
~~11~~	~~[illegible]~~	~~F~~			~~ADAPTER/PLUGNUT ASSY.~~	~~1~~		
	~~[illegible]~~	~~D~~		~~BRASS~~	~~ADAPTER~~	~~1~~		
	~~[illegible]~~	~~F~~			~~[illegible] ASS'Y.~~	~~1~~		
	~~[illegible]~~			~~ST. STEEL~~	~~PLUGNUT~~	~~1~~		
	~~[illegible]~~	~~F~~		~~COPPER~~	~~SHADING COIL~~	~~1~~		
12	FV-101-749-4 K	Z			DISC HOLDER ASS'Y	1		
	GV100-830-4	R		VITON A	DISC	1		
	GV-174-682-1	C		ST. STEEL	DISC. HOLDER	1		
19	FV-160-219-2	C		ST. STEEL	SUPPORT	1		
13	FV-162-939	-		ST. STEEL	SPRING, DISC	1		
6	FV-96-678-4	H			SOL. BASE SUB-ASS'Y. B	1		
	FV-172-472-1	A		ST. STEEL	DISC, FORMING	1		
	FV-166-960-2	F		ST. STEEL	CORE TUBE	1		
	FV-96-677-3	H		ST. STEEL	BONNET	1		
14	FV-178-088	-		ST. STEEL	SPRING, DIAPH.	1		
23	FV-186-495	A	3	——	SPARE PARTS KIT	—		
25	GV-200-153-1	J		BRASS	ADAPTER	1		
	FV-206-048-1	F			PLUGNUT ASSY	1		
	FV-158-248-1	E		COPPER	SHADING COIL	1		
	GV-200-152-1	J		ST. ST.	PLU[illegible]			

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CATA. NO. HV176-816-1 & HV176-816-2

SHOP ORDER NO

BULL. NO. HV176-816

NO. OF PARTS LIST PER ASS'Y 1

ASSEMBLY REF HVA-176-816

ER NO	CHG LTR	ER NO	CHG LTR
74[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	J	[illegible]	[illegible]
7[illegible]2	H	[illegible]	[illegible]
71[illegible]	G	[illegible]	[illegible]
70577	F	[illegible]	R
[illegible]	E		
69132	D		
60347	C		
67826	B		

FVP - 176-816

ITEM	PART NUMBER	CHG LTR	NOTE	MATERIAL	PART NAME	QUANTITY UNIT	REQ'D	DELVD
15	FV-178-091-1	A			DIAPHRAGM/DISC SUB-ASS'Y.	1		
	FV-178-092-1	A		ST. STEEL	RIVET	1		
	FV-103-889-1	L			DISC, SUB-ASS'Y.	2		
	FV-103-888-2	B		ST. STEEL	INSERT	2		
	GV-164-054-34	S		BUNA-N	DIAPHRAGM	1		
1[illegible]	FV-178-114-1	B		ST. STEEL	STEM	1		
	GV-178-122-1	A		BRASS	BODY, MAIN	1		
	FV-178-247-1	C			BODY & BONNET SUB-ASS'Y.	1		
	FV-178-110-1	B		BRASS	BODY	1		
	GV-178-089-1	C		BRASS	BONNET	1		
10	FV-178-547	B		17-7PH	SPRING	1		
5	GV-180-817-31	F			SOL. BASE SUB-ASS'Y. A	1		
	FV 80-630-14 ~~[illegible]~~	W			PLUGNUT SUB-ASS'Y.	1		
	FV 186-422-1 ~~[illegible]~~	-		ST. STEEL	PLUGNUT	1		
	FV-158-247-1	F		COPPER	SHADING COIL	1		
	FV-180-536-4	A		BRASS	BONNET	1		
	FV-164-996-1	E		ST. ST.	CORETUBE	1		
4	FV-182-125-1	-			CORE ASS'Y. SOL. B	1		
	FV-162-970-1	B		ST. ST.	CORE	1		
	FV-162-968-2	A		BRASS	GUIDE, SPRING	1		
	FV-180-347	A		ST. ST.	SPRING, CORE	1		
	FV-162-969-1	C		BRASS	PLUG, CORE	1		
[illegible]	FV-166-647-1	A		PLASTIC	LABELS A & B			
[illegible]	~~FV-166-643-2~~			~~PLASTIC~~	~~[illegible]~~			

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CATA. NO.	HV 176-816-1 HV 176-816-2	SHOP ORDER NO	
BULL. NO.	HV 176-816	NO. OF PARTS LIST PER ASS'Y	1
		ASSEMBLY REF	HVA-176-816

ER NO	CHG LTR	ER NO	CHG LTR
[illegible]	K	[illegible]	L
[illegible]	J	[illegible]	M
73032	H	[illegible]	N
71[illegible]	G	[illegible]	P
70577	F	[illegible]	R
69[illegible]	E		
69132	D		
68347	C		
67826	B		

FVP-176-816

ITEM	PART NUMBER	CHG LTR	NOTE	MATERIAL	PART NAME	QUANTITY UNIT	REQ'D	DELV'D
	NOTES:							
	1. IN SOLENOID ASSEMBLY A, OMIT GROUND SCREW AND SUBSTITUTE THE FOLLOWING:							
1C	GV-99-257-1G 115/60	AB			CATA HV 176-816-1 COIL - REMARK TO 115/60	1		
1C	GV-99-257-25G 115/50	AB			CATA HV 176-816-2 COIL -	1		
1N	FV-172-444-6	C			HOUSING/CONDUIT ASSEMBLY	1		
	GV-168-736-6	H		STEEL	HOUSING	1		
	FV-33-103-1	X		ALUMINUM	CONDUIT CONNECTION	1		
	2. IN SOLENOID ASSEMBLY B, OMIT GROUND SCREW AND NAMEPLATE AND SUBSTITUTE THE FOLLOWING:							
2G	GV-99-257-1G 115/60	AB			CATA HV 176-816-1 COIL - REMARK TO 115/60	1		
2G	GV-99-257-25G 115/50	AB			CATA HV 176-816-2 COIL -	1		
2J	FV-172-444-6	C			HOUSING/CONDUIT ASSEMBLY	1		
	GV-168-736-6	H		STEEL	HOUSING	1		
	FV-33-103-1	X		ALUMINUM	CONDUIT CONNECTION	1		
-	3. QUANTITY AS ORDERED BY CUSTOMER.							

ATTENTION:

BEFORE PROCEEDING WITH ANY NEW OR RECURRING ORDERS A REVIEW OF EACH DETAIL PART AND DRAWING WILL HAVE TO BE MADE AND G.E.'S AGREEMENT OBTAINED FOR ANY CHANGE IN THESE PARTS.

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

MEMORANDUM

☐ I no longer wish to receive this material.

K. R. Pech ROOM E110 FROM J. P. Eppich DATE November 5, 1987
PHONE 5225 ROOM E110
SUBJECT RELATIONSHIP OF MSIV AIR PACK VENDORS

Attached is a responsibility definition for parts which make up the MSIV Air Packs. Note that Hiller is the supplier to General Electric and all others are direct suppliers to Hiller. In addition to supplying the Tandem Cylinder to Hiller, Sheffer also performs all assembly and testing activities for Hiller.

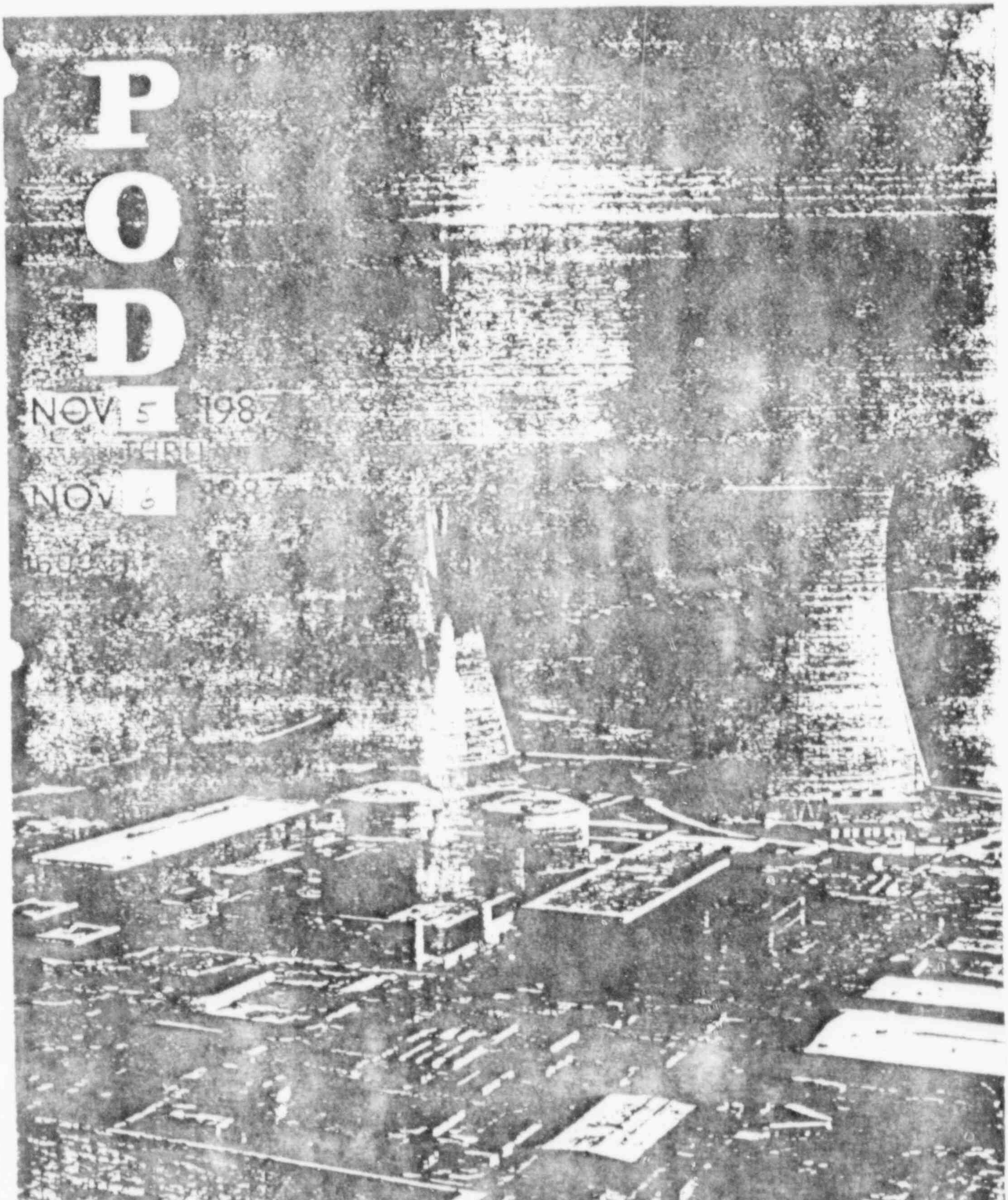
JPE/amc

CC: R. Newkirk
B. Stetson
V. Concel

B/92

COMPANY'S REPSONSIBLE FOR PARTS IN AIR PAC

		GENERAL ELECTIRC
	SA-A068 - AIR PAC	RALPH A. HILLER
ITEM:	1) TANDEM CYLINDER	SHEFFER
	2) CHECK VALVE	RALPH A. HILLER
	3) FLOW CONTROL VALVE	PARKER HANNIFIN
	4) HYD. FILL VALVE	RALPH A. HILLER
	5) GAS CHARGING VALVE	SCHRADER
	6) FLOW CONTROL VALVE	PAKER HANNIFIN
	7) 4 WAY AIR CONTROL VALVE	NORGREN
	8) 3 WAY AIR CONTROL VALVE	NORGREN
	9) 2 WAY AIR CONTROL VALVE	NORGREN
	10) 3 WAY AIR PILOT CONTROL VALVE	ASCO
	11) 3 WAY AIR PILOT CONTROL VALVE	ASCO
	12) MUFFLER CONTROL VALVE	MOSIER COMPANY



B/93

PLAN OF THE DAY

1600 Thursday Nov. 5 thru 1600 Friday Nov. 6

PROJECT OBJECTIVES

1. Release and work those work activities identified in the forced outage fragnet.

2. Complete work associated with "Week 05" of the Ops Quarterly Schedule.

Work Priorities are as follows:

A. Priority 1 and 2
B. Restraint "08" WO's
C. "Week 05" WO's for OPS quarterly schedule
D. Priority 3, no restraint code work orders
E. Priority 4, no restraint code work orders

NOTE: 1) PRIORITY 1 AND 2 WORK ORDERS SHOULD BE BROUGHT DIRECTLY TO THE PWC FOR IMMEDIATE PROCESSING THROUGH THE CONTROL ROOM AND OUT TO THE WORK GROUP.

2) ADDITIONAL WORK SHALL BE RELEASED BY THE CONTROL ROOM THRU THE NORMAL POD. SHOULD ANY OF THESE ITEMS RESTRAIN THE PLANT FROM TESTING OR POWER ASCENSION, THE UNIT SUPERVISOR SHOULD CONTACT THE SOD OF THE RESTRAINING ACTIVITY.

PREPARED: ______________________
TECH REVIEW SUPERVISOR

APPROVED: ______________________
PWC/SRO

PHONE NUMBERS TO CALL FOR SPECIFIC INFORMATION

POD/OPERATIONS QUARTERLY SCHEDULE

D. DERVAY	6028	275-4361
K. CIMORELLI	6029	

SHIFT OUTAGE DIRECTORS

PHONE	6248
BEEPER	275-0536

SHIFT MATERIAL DIRECTORS

PHONE NUMBERS	6487 OR 6135
BEEPER	275-0501

WAREHOUSE

ISSUE	6117
RECEIPT ISSUE	275-4188

NCSS COVERAGE

MECH.	1ST SHIFT - DAVE KACKLEY	275-0304
	2ND SHIFT - FRED FOSTER	275-0308
ELECT.	1ST SHIFT - GUY CAD	275-0339
CIVIL	1ST SHIFT - LARRY YOUNG	275-4227
SCAFFOLDING	1ST SHIFT - KEVIN CAMERSON	275-0440

MECH QUALITY ENGINEER

1ST SHIFT	275-4118
2ND SHIFT	275-4382

I&C QUALITY ENGINEER

1ST SHIFT	275-4104
2ND SHIFT	275-4383
IF NO RESPONSE	275-4124

ELECTRICAL QUALITY ENGINEER

1ST SHIFT	275-4110
2ND SHIFT	275-4112/275-4058
IF NO RESPONSE	275-0432

SHIFT I&C ENGINEER

PHONE	6891 OR 6894
BEEPER	275-4264

PHONE NUMBERS TO CALL FOR SPECIFIC INFORMATION

BACK SHIFT PPTD SUPPORT

PHONE	6786
BEEPER	275-4347

DIESEL TASK FORCE

1ST SHIFT	5724
TONY PUSATERI	275-4216/255-0365
BOB BOYLES	275-0586
BACKSHIFT/WEEKENDS	
DANA SMITH	428-6855

NED/NCSS ENGINEER

NCSS SYSTEMS	275-4054
BOP SYSTEMS	275-4135
HVAC SYSTEMS	275-4131
DIESEL SYSTEMS	275-4216
STRUCTURAL DESIGN	275-4130
PIPING SUPPORTS	275-0593
VALVES	275-4054

MISC

NR TRACKING	6271 275-4188
PPMIS (KEEP AVAILABLE)	8681-77-3279
DCP CLOSURE	6084 275-4178
PCR CLERK	6489
DCP COPIES	275-4200
ICU/DOC CENTER	6148 275-4153

MAIN STEAM ISOLATION VALVES

DUE TO THE RECENT PROBLEMS ASSOCIATED WITH THE MSIV'S, NO WORK ASSOCIATED WITH THE B21, P51 OR P52 SYSTEMS WILL BE APPROVED WITHOUT PRIOR APPROVAL OF THE MSIV TASK FORCE. THE TASK FORCE LEADERS WHO CAN AUTHORIZE WORK ARE:

	EXT.	BEEPER
B. NEWKIRK	5188	275-4351
V. CONCEL	6080	275-0336
P. ARTHUR	6846	275-0517

THE FOLLOWING WORK ORDERS HAVE BEEN AUTHORIZED TO WORK:

87-9323	RECORD SOLENOID VOLTAGE & ACCUMULATOR PRESSURE ON B21-F022D
87-9293	TROUBLESHOOT AIR PACK & SOLENOIDS, REWORK AS NECESSARY - 1B21-F022D (AFTER 9323)

11-05-87

OPERATIONS SUPPORT

RETESTS AND OTHER ACTIVITIES IN PRIORITY ORDER

** NOTIFY THE SOD SUPERVISOR AS SOON AS IT IS DETERMINED THAT AN ACTIVITY HAS FAILED, IS RESTRAINED OR NEEDS FURTHER ATTENTION.

I. FORCED OUTAGE RECOVERY, ISSUE AND COMPLETE ALL IDENTIFIED "08" OUTAGE ACTIVITIES. (NOTE: THE SOD WILL ISSUE ANY ADDITIONAL OUTAGE WORK AS TIME PERMITS.)

II. OPERATIONS QUARTERLY SCHEDULE "WEEK 05" IS DEPICTED ON ATTACHED FRAGNETS.

III. SUPPORT WORK AS LISTED ON THE US LIST.

IV. THE ATTACHED FRAGNET DEPICTS LONG TERM C51 NOISE REDUCTION WORK.

V. ATTACHED IS THE FRAGNET FOR UNIT 2 DIV 2 COORDINATED ELECTRICAL MAINT. WORK. THE EXPECTED DURATION OF THIS WORK IS 3 WEEKS. (REQUIRED GROUND STRAPS ARE BEING OBTAINED TO COMPLETE T/O)

VI. WHEN ACID AND CAUSTIC ARE LOADED OPERATIONS IS REQUESTED TO LEAK CHECK THE DRAIN AND FILL LINES FOR TANKS 0P21-A006 AND 0P21-A007 TO COMPLETE THE RETEST OF WORK ORDERS 87-2742 AND 87-2743 RESPECTIVELY.

VII. OPS IS REQUESTED TO ASSIST HEALTH PHYSICS BY RELEASING SVI E31T5190 SOURCE LEAKAGE AND/OR CONTAMINATION TESTING. HEALTH PHYSICS WILL CONTACT UNIT SUPERVISOR THURSDAY 11/5.

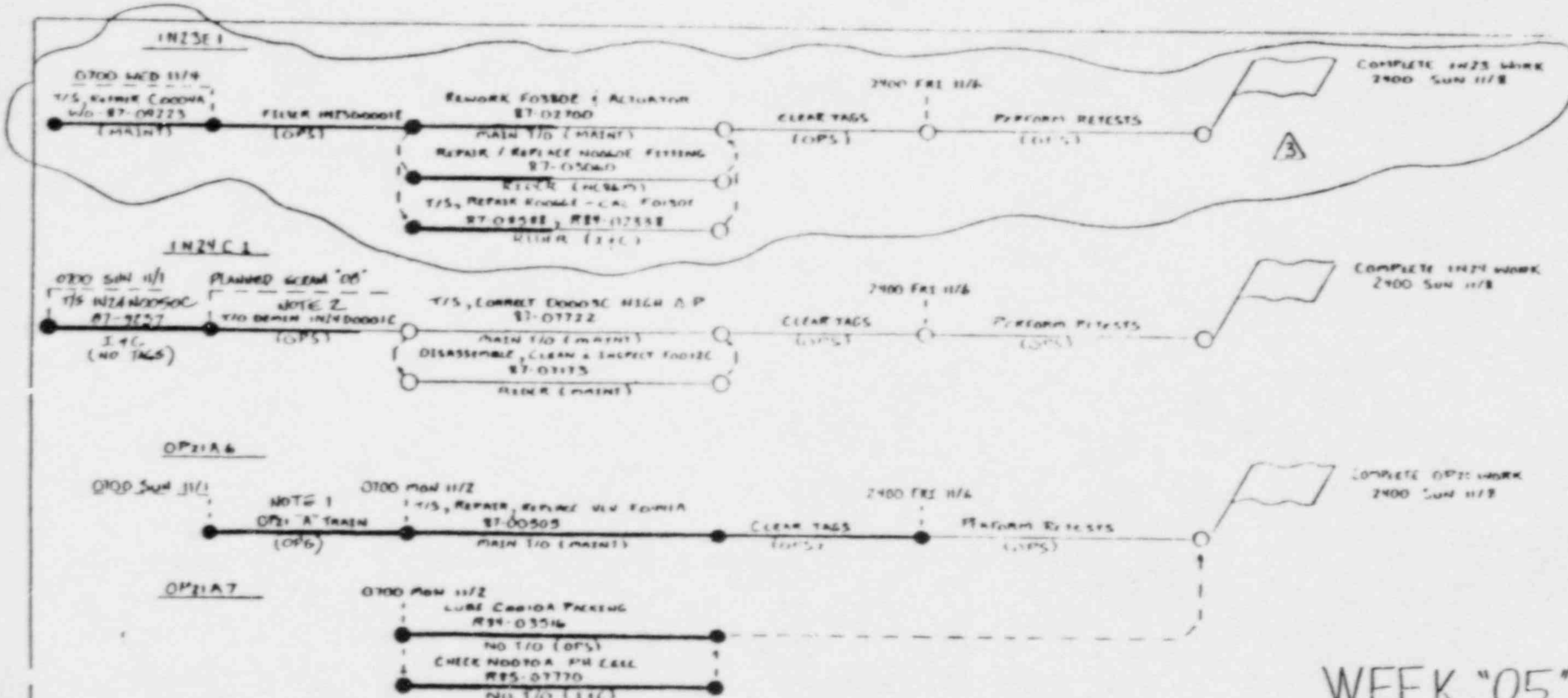
VIII. DURING PERFORMANCE OF THE MONTHLY RUN OF DIVISION I DIESEL GENERATOR, OPS IS TO RELEASE AND SUPPORT WO 87-8929 TO BALANCE CYLINDER TEMPERATURES AS REQUIRED.

IV. OPERATIONS IS REQUESTED TO PERFORM THE FOLLOWING RETESTS:

A.	87-7804	0G51F0050A	PERFORM ISLT ON F0050A FLANGE TO VERIFY NO LEAKAGE.
B.	87-3566	0G41F0360	PERFORM STROKE TEST OF THE FILTER DEMIN.
C.	87-5317	0G50F1029	ISLT THE RWCU BACK WASH SETTLING TANK CROSS CONNECT
D.	87-6473	0G41F0085	OPS TO PERFORM FUNCTIONAL STROKE TEST OF F0085 TO ENSURE PROPER OPERATION AND INDICATION
E.	86-15029	0M40C0002B	PERFORM VIBRATION TESTING ON FAN. NO PEAKS GREATER THAN .314 ALLOWED
F.	86-5280	1N34	F0505 LEAK CHECK FOR LUBE OIL ISOLATION
G.	87-8686	1N71D001A	FUNCTIONAL TEST OF THE "A" AMERTAP SCREEN
H.	87-8687	1N71D0001B	FUNCTIONAL TEST OF THE "B" AMERTAP SCREEN

OPERATIONS SUPPORT

I.	87-8690	1N71D001E	FUNCTIONAL TEST OF THE "E" AMERTAP SCREEN
J.	87-8692	1N71D0001G	OPS TO STROKE INNER SCREEN OPEN AND CLOSED TWICE
K.	87-8693	1N71D0001H	OPS TO STROKE INNER SCREEN OPEN AND CLOSED TWICE
L.	87-7414	1N71F0611B	PERFORM ISLT ON F0611B FLANGE TO ENSURE NO LEAKAGE
M.	87-8585	1N71F0616A	PERFORM IN-SERVICE LEAK CHECK ON VALVE PACKING GLAND
N.	87-8586	1N71F0616B	PERFORM IN-SERVICE LEAK CHECK ON VALVE PACKING GLAND
O.	87-8587	1N71F0616C	PERFORM IN-SERVICE LEAK CHECK ON VALVE PACKING GLAND
P.	87-505	0P21F0441A	PERFORM OPERABILITY TEST ON F0441A. VERIFY NO LEAKAGE
Q.	87-5671	1P52D0003A	ISLT OF INSPECTION PORT AND COORDINATE WITH CHEM AND PERFORM AIRBLOWS. PERFORM FUNCTIONAL TEST.
R.	87-7453	1P52D0003A	PERFORM FUNCTIONAL TEST ON INSTRUMENT AIR DRYER TO ENSURE HEATER OPERATION
S.	86-2638	1P52J0409	CHEM TO PERFORM AIR PARTICLE COUNT.
T.	87-4341	1P52C0001	RUN INSTRUMENT AIR COMPRESSOR FOR 1 WEEK TO VERIFY SYSTEM OIL TEMP. STAYS WITHIN SETPOINT. FUNCTIONAL TEST VALVE. (1 WEEK RUN WILL BE COMPLETE 11/11.)
U.	87-4649	0P61B0001B	CHECK THE 'B' AUX BOILER FUEL OIL LINES FOR LEAKS
V.	87-5188	0P62F515	FUNCTIONAL & LEAK CHECK OF FUEL OIL FLOW METER ISOLATION VALVE. (OSC WHEN FUEL OIL LOADED)
W.	86-13265	0P84	PERFORM ISLT ON TEMP FLOW METER.
X.	87-5978	0P84	FUNCTIONAL & LEAK CHECK OF THE SALT DISOLVER TANK INLET VALVE.
Y.	87-8935	1P54	OPS TO PERFORM ISLT ON SYSTEM WITH FIRE PUMP RUNNING
Z.	85-13143	2R22S0004	FUNCTIONAL TEST OF BUS LH-2-B INTERLOCKS
AA.	85-13137	2R22S0005	FUNCTIONAL TEST OF BUS LH-2-B INTERLOCKS



WEEK "05"

11/5/87

FOR PLANNING USE ONLY

NOTES:

1) PRIOR TO HANGING TAGS, OPERATIONS SHOULD ENSURE THAT BOTH P21 & STORAGE TANKS ARE TOPPED OFF & THAT "B" TRAIN IS FRESHLY REGENERATED

2) IF T/S OF 1N24N005OC (87-9237) INDICATES NO PROBLEM WITH THEN MAINT & CHEMISTRY WILL EVALUATE RESIN TRAP 87-7722 DURING PLANNED SCRAM "08".

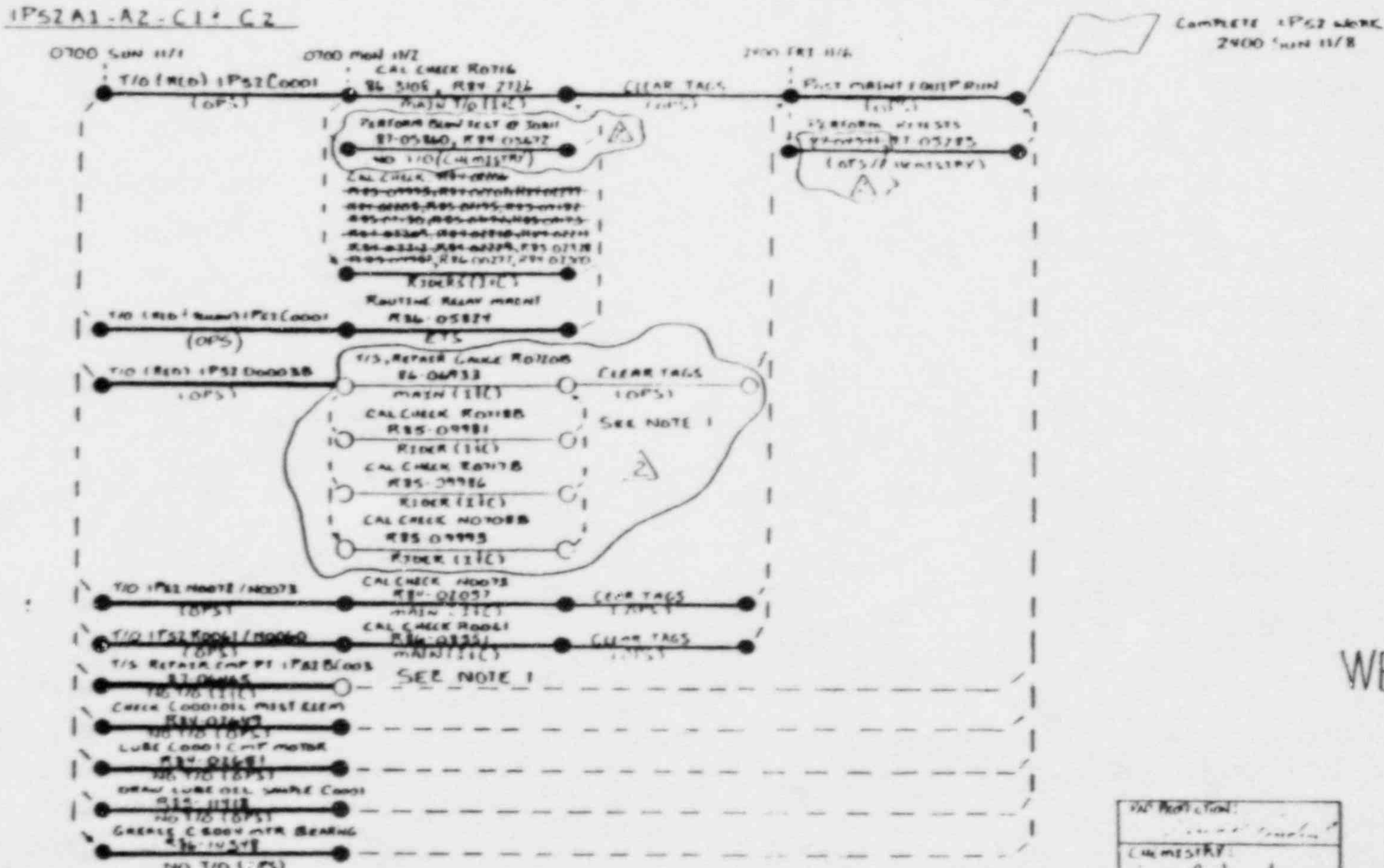
REV. NO.	DATE	PURPOSE
3	11-5-87	ADDED 1N23E1 BACK ON DUE TO FORCED OUTAGE
1	11-2-87	ADDED 87-09223 TO 1N23E1
2	11-3-87	[illegible]

RAD PROTECTION:	[illegible]
CHEMISTRY:	[illegible]
RADWASTE:	[illegible]
PLANNER:	[illegible]
LEAD PLANNER:	[illegible]
OPERATIONS:	[illegible]
OUTAGE PLANNING:	[illegible]

CLEVELAND ELECTRIC ILLUMINATING CO
PERRY NUCLEAR POWER PLANT
PROJECT PLANNING AND SCHEDULING

OPS QUARTERLY SCHEDULE

SHEET 1 OF 2 | REVISION



WEEK "05"

11/5/87

FOR PLANNING USE ONLY

NOTES: 1.) CONTROL ROOM IS HOLDING WO'S UNTIL MSIV PROBLEMS ARE RESOLVED.

REV. NO.	DATE	PURPOSE
0	10.29.87	WEEK "05"
1	11-4-87	ADDED NOTE 1
1	11-5-87	87-05860 RETEST ... REVISED NOTE 1

RAD PROTECTION:	
CHEMISTRY:	
RADWASTE:	
PLANNER:	
LEAD PLANNER:	
OPERATIONS:	
OUTAGE PLANNING:	

CLEVELAND ELECTRIC ILLUMINATING CO.
PERRY NUCLEAR POWER PLANT
PROJECT PLANNING AND SCHEDULING

OPS QUARTERLY SCHEDULE

SHEET 2 OF 2 | REVISION 1

** RIDERS MAIN T/O ON THIS US LIST
*** RIDERS CURRENTLY HUNG TAGOUT

UNIT SUPERVISOR'S LIST
WO'S TO BE WORKED

	WORK ORDERS	TAG OUT	SYST	COMMENTS	WORK GROUP	RESTR CODE	PR
A.	**1N24 REGEN/ACID OUTAGE - OPS REQUEST**						
1.	85-12544	MAIN	1N24	REPAIR/REPLACE F0565A	NC86M	NA	4A
2.	86-6993	**	1N24	REPAIR AIR LEAK REG. FOR 1H51P0299	NC86M	NA	4C
3.	87-1752	**	1N24	T/S C0002B - REPAIR AS REQ'D	MAINT	NA	3A
4.	86-3863	**	1N24	REMOVE ACID BUILD-UP FROM F0566A	MAINT	NA	3A
5.	86-3864	**	1N24	REMOVE ACID BUILD-UP FROM F0566B	MAINT	NA	3A
6.	R86-12331	**	1N24	CHANGE C0002A OIL/GREASE MOTOR BEARINGS	OPERA	NA	3A
7.	R86-12332	**	1N24	CHANGE C0002B OIL/GREASE MOTOR BEARINGS	OPERA	NA	3A
B.	**ADDITIONAL WORK TO BE RELEASED AS TIME AND PERSONNEL AVAILABILITY PERMITS**						
1.	87-2795		1D19	T/S CAUSE OF NOISE SPIKES	I&C	NA	3F
2.	87-5750		1D21	INSTALL CONDUIT/SUPPORTS - DCP-87-0139	NC86E	87	3D
3.	87-4431		2E22	REMOVE S0001 TURBO CHARGER/ML2-0110 R/1	MAINT	NA	4F
4.	86-14425	MAIN	G36	REPLACE LAMP SOCKETS/INPUT JACK P0002	MAINT	NA	3A
5.	87-8606		0G50	R304B, T/S-REWORK DRIVE MOTOR	I&C	NA	4A
6.	87-6030		1N27	REPAIR CRACKS IN SPARE WEDGE	MAINT	NA	3F
7.	87-8721		1N27	N020B, CLEAR SENSING LINE	I&C	NA	3A
8.	87-8863		1N11	R275A, REPLACE REGULATOR	I&C	NA	3A
9.	87-6111	MAIN	1N64	F920, TEST NEW SPRING	MAINT	NA	5F
10.	87-8276	MAIN	1N64	B0112D, T/S-REWORK LOW FLOW ALARM	MAINT	NA	3A
11.	87-4987		1P53	A3050A, REPLACE TROMBETTA SOLENOID	MAINT	NA	3D
12.	87-4988		1P53	A3050B, REPLACE TROMBETTA SOLENOID	MAINT	NA	3D
13.	87-7827	MAIN	0P72	REPAIR LINKAGE-C0001D BKR SW	NC86E	NA	3A

NOTE: THIS PUMP IS PRESENTLY INOPPED & FUSES ARE PULLED

** RIDERS MAIN T/O ON THIS US LIST
*** RIDERS CURRENTLY HUNG TAGOUT

UNIT SUPERVISOR'S LIST
WO'S TO BE WORKED

B. ADDITIONAL WORK TO BE RELEASED AS TIME AND PERSONNEL AVAILABILITY PERMITS (CONT'D)

	WORK ORDERS	TAG OUT	SYST	COMMENTS	WORK GROUP	RESTR CODE	PR.
14.	87-9069		1R22	Q642A, REPLACE RELAY	ETS	NA	3A
15.	87-9070		1R22	Q806B, REPLACE RELAY	ETS	NA	3A
16.	87-8754		1R23	INSTALL THREADED SWITCH CAPS	OPERA	NA	4B
17.	87-8756		2R23	INSTALL THREADED SWITCH CAPS	OPERA	NA	4C
18.	87-9287		0R24	S038, MTA MCC BUCKET FROM 2R24-S041	EASTE	NA	3F
19.	87-8005		1R63	REPLACE CH '8' CARD W/MODIFIED CARD	I&C	NA	3D
20.	87-6603	MAIN	0M40	D001A, INITIATE CARBON SAMPLING	MAINT	14	3C
21.	87-8640	MAIN	0G41	CHANGEOUT INCORRECT WIRE-F0280	MAINT	NA	4A

NOTE: THIS WORK REQUIRES ISOLATION OF ALL 4 DEMINERALIZERS FOR 1 SHIFT

C. MAINT. RPTSKS

	WORK ORDERS	TAG OUT	SYST	COMMENTS	WORK GROUP
1.	R86-8143	MAIN	1M15	LUBE LATCHING DOGS-D001A	OPERA
2.	R86-9325	MAIN	0M31	LUBE FAN & CPLG. - C001A	OPERA
3.	R86-10231	MAIN	1N34	GREASE MSP UPPER BRG-C006	OPERA
4.	R87-2706	MAIN	1N64	GREASE UNIT/INSPECT V-BELTS-B112C	MAINT
5.	R86-10770	MAIN	0P50	LUBE MTR & CPLG - C001A	OPERA
6.	R85-1506	MAIN	0P61	CHANGE OIL/GREASE BRGS - C004C	OPERA
7.	R86-13838	MAIN	1R22	BKR EXERCISE & SERVICE-H1109 (P50-B001A)	MAINT
8.	R86-12669	MAIN	1P45	CHANGE OIL/GREASE BRGS - D002A	MAINT

D. TAGS ARE BEING HUNG

	WORK ORDERS	TAG OUT	SYST	COMMENTS	WORK GROUP
1.	R87-881	MAIN	2R22	BUS SERVICE & CLEANING, EH22	MAINT
2.	R87-795	**	2R22	BKR EXERCISE & SERVICE, EH2204	MAINT
3.	R87-797	**	2R22	BKR EXERCISE & SERVICE, EH2209	MAINT
4.	R87-793	**	2R22	BKR EXERCISE & SERVICE, EH2212	MAINT

** RIDERS MAIN T/O ON THIS US LIST
*** RIDERS CURRENTLY HUNG TAGOUT

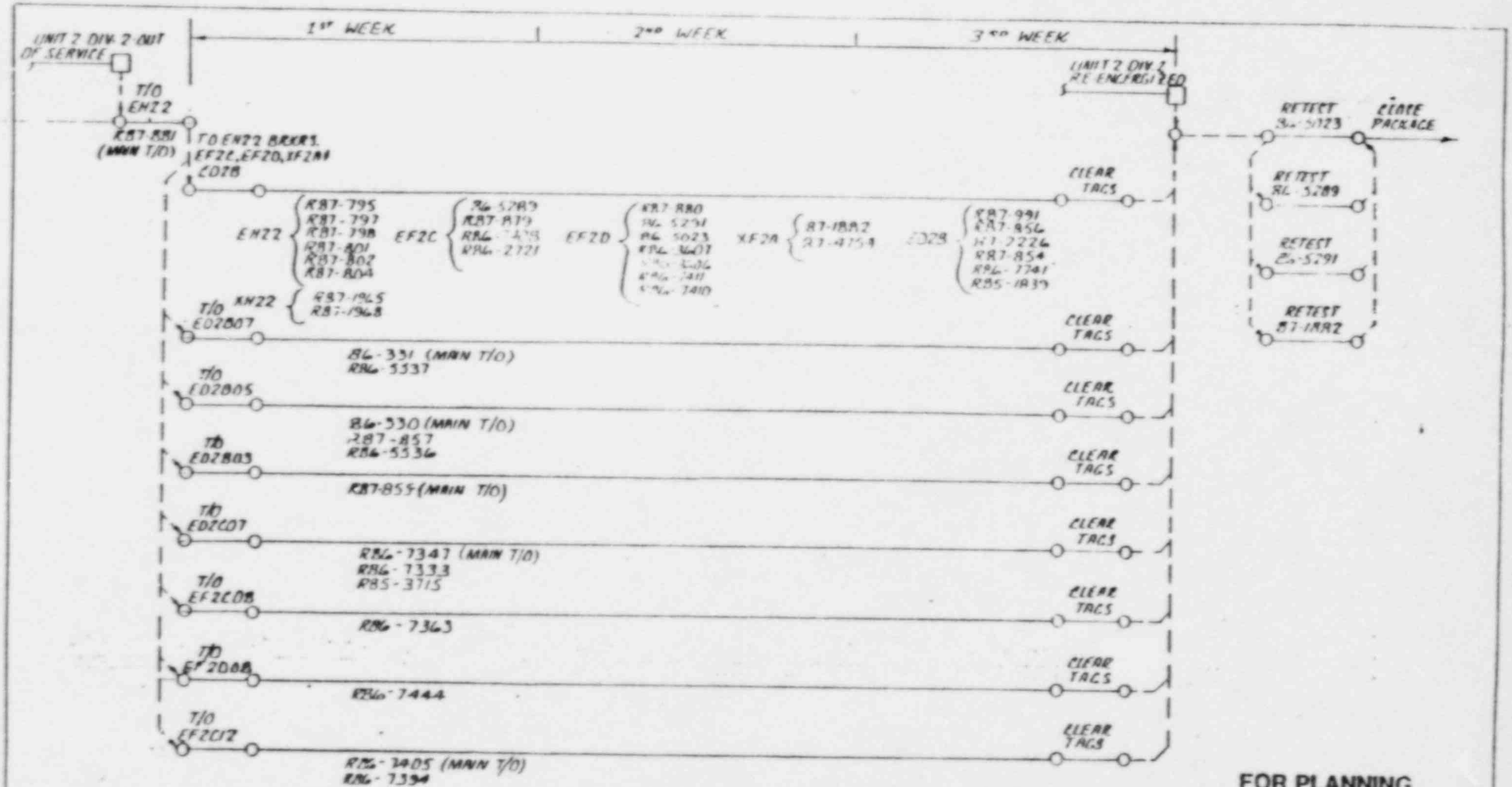
UNIT SUPERVISOR'S LIST
WO'S TO BE WORKED

WORK ORDERS	TAG OUT	SYST	COMMENTS	WORK GROUP	RESTR CODE	PR[illegible]
D. TAGS ARE BEING HUNG (CONT'D)						
5. R87-801	**	2R22	BKR EXERCISE & SERVICE, EH2213	MAINT		
6. R87-802	**	2R22	BKR EXERCISE & SERVICE, EH2214	MAINT		
7. R87-804	**	2R22	BKR EXERCISE & SERVICE, XH2204	MAINT		
8. 86-5289	**	2R23	INSTALL NEW FAN CONTACTOR ON EF-2-C	MAINT	NA	4C
9. R87-87[illegible]	**	2R23	BUS SERVICE & CLEANING EF-2-C	MAINT		
10. R86-7408	**	2R23	ROUTINE BKR MAINT EF2C13	MAINT		
11. R86-2721	**	2R23	ROUTINE BKR MAINT EF2C03	MAINT		
12. R87-880	**	2R23	BUS SERVICE & CLEANING EF-2-D	MAINT		
13. 86-5291	**	2R23	INSPECT FAN CKT CONTACTOR COIL ON EH F-2-D	MAINT		
14. 86-5023	**	2R23	REVISE ALARM SENSING PER DCP ON EHF-2-D	MAINT		
15. R86-3607	**	2R23	ROUTINE BKR MAINT EF2D03	MAINT		
16. R86-3606	**	2R23	ROUTINE RELAY MAINT Q616	MAINT		
17. 87-1882	**	2R23	CHANGE FUSES/FUSE BLOCK ON XF2A	MAINT		
18. 87-4754	**	2R23	REWORK XFMR XF2A TO ELIMINATE NOISE	MAINT		
19. R87-991	**	2R42	BKR EXERCISE & SERVICE ED2B01	MAINT		
20. R87-856	**	2R42	BKR EXERCISE & SERVICE ED2B04	MAINT		
21. 87-2226	**	2R42	PERFORM VISUAL INSPECTION OF WIRING HARNESS ON ED2B02	MAINT		
22. R87-854	**	2R42	BKR EXERCISE & SERVICE ED2B02	MAINT		
23. R86-7741	**	2R42	ROUTINE RELAY MAINT Q1802	MAINT		
24. R86-7411	**	2R23	ROUTINE BKR MAINT EF2D06	MAINT		
25. R86-7410	**	2R23	ROUTINE RELAY MAINT Q619	MAINT		

** RIDERS MAIN T/O ON THIS US LIST
*** RIDERS CURRENTLY HUNG TAGOUT

UNIT SUPERVISOR'S LIST
WO'S TO BE WORKED

	WORK ORDERS	TAG OUT	SYST	COMMENTS	WORK GROUP	RESTR CODE	PRI
D.	TAGS ARE BEING HUNG (CONT'D)						
26.	86-331	MAIN	2R42	PERFORM BKR MAINT ON ED2B07	MAINT		
27.	R86-5537	**	2R42	PERFORM RELAY MAINT Q1807	MAINT		
28.	86-330 R87-857 R86-5536	MAIN	2R42	PERFORM BKR MAINT ON ED2B05	MAINT		
29.	R86-7347	MAIN	2R23	PERFORM ROUTINE BKR MAINT ON EF2C07	MAINT		
30.	R86-7333	**	2R23	PERFORM ROUTINE RELAY MAINT Q607	MAINT		
31.	R85-3715	**	2R24	SWITCHGEAR CLEANING & SERVICING EF2C07	MAINT		
32.	R86-7405	MAIN	2R23	ROUTINE BKR MAINT EF2C12	MAINT		
33.	R86-7394	**	2R22	ROUTINE RELAY MAINT Q612	MAINT		
34.	R87-855	MAIN	2R42	ROUTINE BKR MAINT ED2B03	MAINT		
35.	R87-1965	MAIN	2R22	ROUTINE BKR MAINT XH2201	MAINT		
36.	R86-7363	MAIN		ROUTINE BKR MAINT EF2C08	MAINT		
37.	R86-7444	MAIN		ROUTINE BKR MAINT EF2D08	MAINT		
38.	87-7722	MAIN	N24	HIGH ΔP ON D003C	MAINT		
39.	87-7173	**	N24	CLEAN & INSPECT	MAINT		
	NOTE: RELEASE AS SOON AS DEMIN IS NO LONGER NEEDED						
40.	86-6933	MAIN	1P52	TEMP GAUGE R720B	I&C		
41.	R85-9981	**	1P52	CAL CHECK R718B	I&C		
42.	R85-9986	**	1P52	CAL CHECK R717B	I&C		
43.	R85-9993	**	1P52	CAL. CHECK N0708B	MAINT		

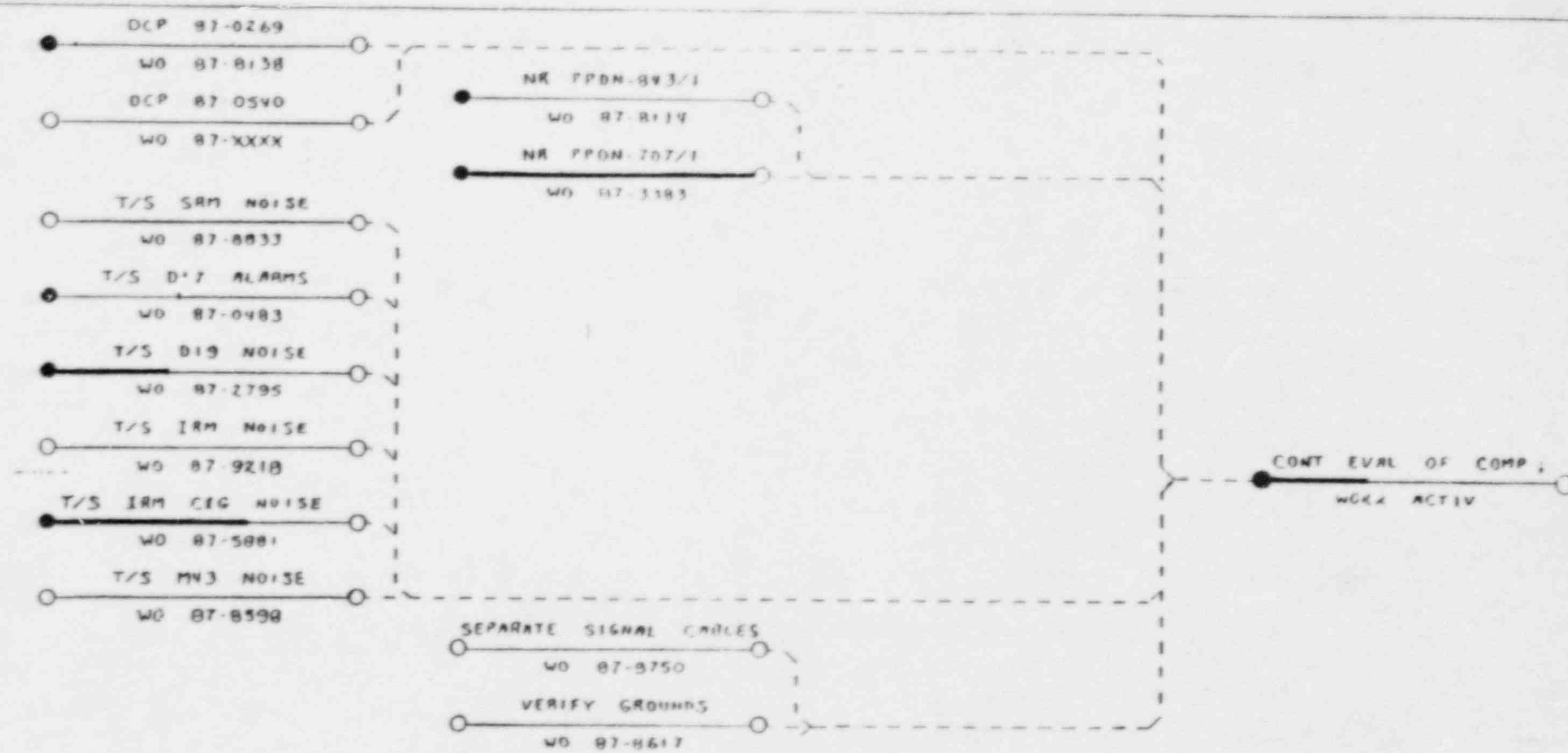


FOR PLANNING USE ONLY

NOTES:

REV. NO.	DATE	PURPOSE
0	10-22-87	INITIAL ISSUE

PLANNER: DVD	CLEVELAND ELECTRIC ILLUMINATING CO. PERRY NUCLEAR POWER PLANT PROJECT PLANNING AND SCHEDULING
LEAD PLANNER:	
OPERATIONS:	UNIT 2 - DIV. 2 OUTAGE SCHEDULE
OUTAGE PLANNING:	SHEET 1 OF 1 — REVISION 0



FOR PLANNING
USE ONLY

NOTES: 1) WORK IS GENERALLY INDEPENDENT OF OTHER WORK
2) THESE ACTIVITIES CAN BE PERFORMED IN ANY PLANT MODE
3) WORK IS PER THE GND/NOISE TASK FORCE

REV. NO.	DATE	PURPOSE
6	10/30	ADD NEW WORK
4	10/22	SELECT COMP ACTIV
5	10/22	ADD NEW WORK

PLANNER: BJW
EC TASK FORCE: SCD
OUTAGE PLANNING

CLEVELAND ELECTRIC ILLUMINATING CO.
PERRY NUCLEAR POWER PLANT
PROJECT PLANNING AND SCHEDULING

CSI NOISE REDUCTION WORK

SHEET 1 OF 1 | REVISION 7

DRAFT
11-5-87

AIR SYSTEM TROUBLESHOOTING PLAN

A. INBOARD MSIV 1B21F0022D.

1. PERFORM AIR BLOW INTO PILLOWCASE FROM ACCUMULATOR DRAIN VALVE (COMPLETE) FOR ONE MINUTE. (WO 87-9323).

2. AFTER AIR PACK REMOVAL:

   -INSTALL FITTING TO LIMIT AIR FLOW AT FLEX HOSE TO AIR PACK CONNECTION.

   -OPEN AIR SUPPLY ISOLATION VALVE TO DRYWELL ACCUMULATORS.

   -PERFORM AIR BLOW INTO PILLOWCASE FROM FLEX HOSE FOR 5 TO 10 MINUTES (QUALITATIVE).

   -PERFORM PARTICLE COUNT CHECK (QUANTITATIVE).

   -PERFORM DEW POINT MEASUREMENT (QUANTITATIVE).

B. OUTBOARD MSIV 1B21F0028D.

1. PERFORM AIR BLOW INTO PILLOWCASE FROM ACCUMULATOR DRAIN VALVE FOR ONE MINUTE.

2. AFTER AIR PACK REMOVAL:

   -INSTALL FITTING TO LIMIT AIR FLOW AT FLEX HOSE TO AIR PACK CONNECTION.

   -OPEN AIR SUPPLY ISOLATION VALVE TO STEAM TUNNEL ACCUMULATORS.

   -PERFOM AIR BLOW INTO PILLOWCASE FROM FLEX HOSE FOR 5 TO 10 MINUTES (QUALITATIVE).

   -PERFORM PARTICLE COUNT CHECK (QUANTITATIVE).

   -PERFORM DEW POINT MEASUREMENT (QUANTITATIVE).

B/94-

C. PERFORM THE FOLLOWING AS NECESSARY:

1. IF AIR QUALITY PROBLEMS ARE FOUND AT F022D AIR PACK, PERFORM ADDITIONAL SAMPLING (PILLOWCASE, PARTICLE COUNT, DEW POINT) AT DRYWELL PENETRATION (F643).

2. IF AIR QUALITY PROBLEMS ARE FOUND AT F028D AIR PACK, PERFORM ADDITIONAL SAMPLING (PILLOWCASE, PARTICLE COUNT, DEW POINT) AT DRAIN VALVE (F781) IN 2" SUPPLY LINE TO OUTBOARD MSIV'S.

DOC. 100/hq

Points Sampled by Air Blow and Pillowcase

1) 4 way valve (F0013A) exhaust port

2) 3 way valve (C007A) orificed exhaust port

3) 2 way valve (B004A) exhaust port

4) #1 solenoid valve ¼" exhaust port

5) #2 & #3 solenoid valves ¼" exhaust port

6) Accumulator (B21-A001D) drain valve 1B21-F083D

TEMP CHANGE
1
PAGE 14 OF 24

Air supply to 3 way Air valve
(3/8" line)

INFORMATION ONLY

OM1A: PAP-1102
Page: 81
Rev.: 1

Attachment 50
Form: PAP-1102-44

Air Log

Date/Time 11/6/93 10605

Sample: Instrument Air Filter Effluent, P52-J811 (1)

(2)

Parameter	Frequency Req./Admin	Limit Req - Admin	Ops Cond.	Action Notes	Results		Inst MPL	Init
Particle Count,	A / -	None - >15μ	6	A,B	>3.0	344	670-Mara	KS
					>5.0	65		
					>8.0	24		
					>10.0	17		
					>12.0	12		
					>15.0	6		

Sample: Safety-Related Air Desiccator, P57-F501/502 (Test Connection)

Parameter	Frequency Req./Admin	Limit Req - Admin	Ops Cond.	Action Notes	Results		Inst MPL	Init
Particle Count,	A / -	None - >15μ	6	A,B	>3.0			
					>5.0			
					>8.0			
					>10.0			
					>12.0			
					>15.0			

Remarks: NOTE(1) Alternate Sample point (Air Supply to Solenoid - Ds INBOARD MSIV) approved DWP KMR

NOTE 2: Run #I KMS

Reviewed By: [signature] 11/6/93

Action Notes:

A. Branch lines shall be checked to determine the extent of the problem when effluent limits are exceeded.

B. Analysis required post-maintenance as per PAP-0204, Housekeeping/Cleanliness Control Program.

Attachment 63
Form: PAP-1102-59

Log Continuation Sheet

Log Sheet Continued: Form: PAP-1102- 44 Date: 11/6/87

	Sample I.D.		Parameter	Time	Limit	Results		Inst MPL	Init
3	SEE NOTE (1)	RUN II	Particle Count	0615	NONE >15μ	>3.0	254	L70-Y091A	KAS
	(1)	RUN II		0615		>5.0	48	L70-Y091A	KAS
	(1)	RUN II		0615		>8.0	18	L70-Y091A	KAS
	(1)	RUN II		0615		>10.0	11	L70-Y091A	KAS
	(1)	RUN II		0615		>12.0	7	L70-Y091A	KAS
	(1)	RUN II		0615		>15.0	2	L70-Y091A	KAS
4	(1)	RUN III	Particle Count	0620	NONE >15μ	>3.0	158	L70-Y091A	KAS
	(1)	RUN III		0620		>5.0	28	L70-Y091A	KAS
	(1)	RUN III		0620		>8.0	11	L70-Y091A	KAS
	(1)	RUN III		0620		>10.0	7	L70-Y091A	KAS
	(1)	RUN III		0620		>12.0	7	L70-Y091A	KAS
	(1)	RUN III		0620		>15.0	3	L70-Y091A	KAS
	N/A								

Remarks: NOTE 3: Backup to previous POL KAS
NOTE 4: 2ND Backup to previous POL KAS
N/A KAS

Reviewed By: [signature] 11/11/87

TEMP CHANGE # 1
PAGE 14 OF 24

Air supply shuttle valve (1 ...)

Attachment 50
Form: PAP-1102-44

Air Log

Date/Time 11/6/87 / 0530

Sample: Instrument Air Filter Effluent, P52-J811 ①

②

Parameter	Frequency Req./Admin	Limit Req - Admin	Ops Cond.	Action Notes	Results		Inst MPL	Init
Particle Count,	A / -	None - >15µ	6	A,B	>3.0	1440	D- Yea/A	KAS
					>5.0	252		
					>8.0	98		
					>10.0	70		
					>12.0	57		
					>15.0	24		

Sample: Safety-Related Air Desiccator, P57-F501/502 (Test Connection)

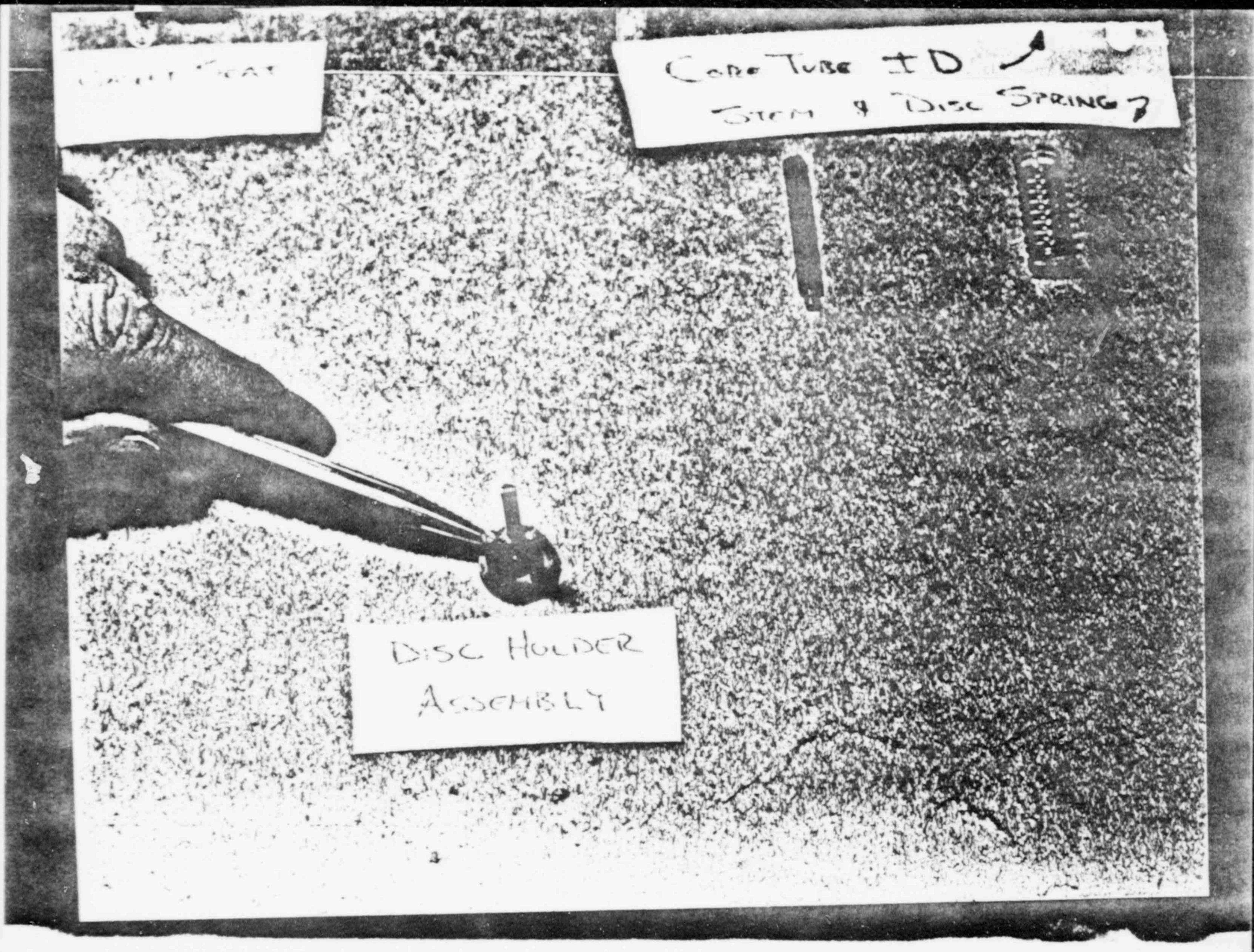
Parameter	Frequency Req./Admin	Limit Req - Admin	Ops Cond.	Action Notes	Results		Inst MPL	Init
Particle Count,	A / -	None - >15µ	6	A,B	>3.0			
					>5.0			
					>8.0			
					>10.0			
					>12.0			
					>15.0			

Remarks: NOTE 1: Sample pnt (Air Supply to Actuator for 2 inboard MSIV) Required DJ Piller KAS
NOTE 2: Run # I KAS

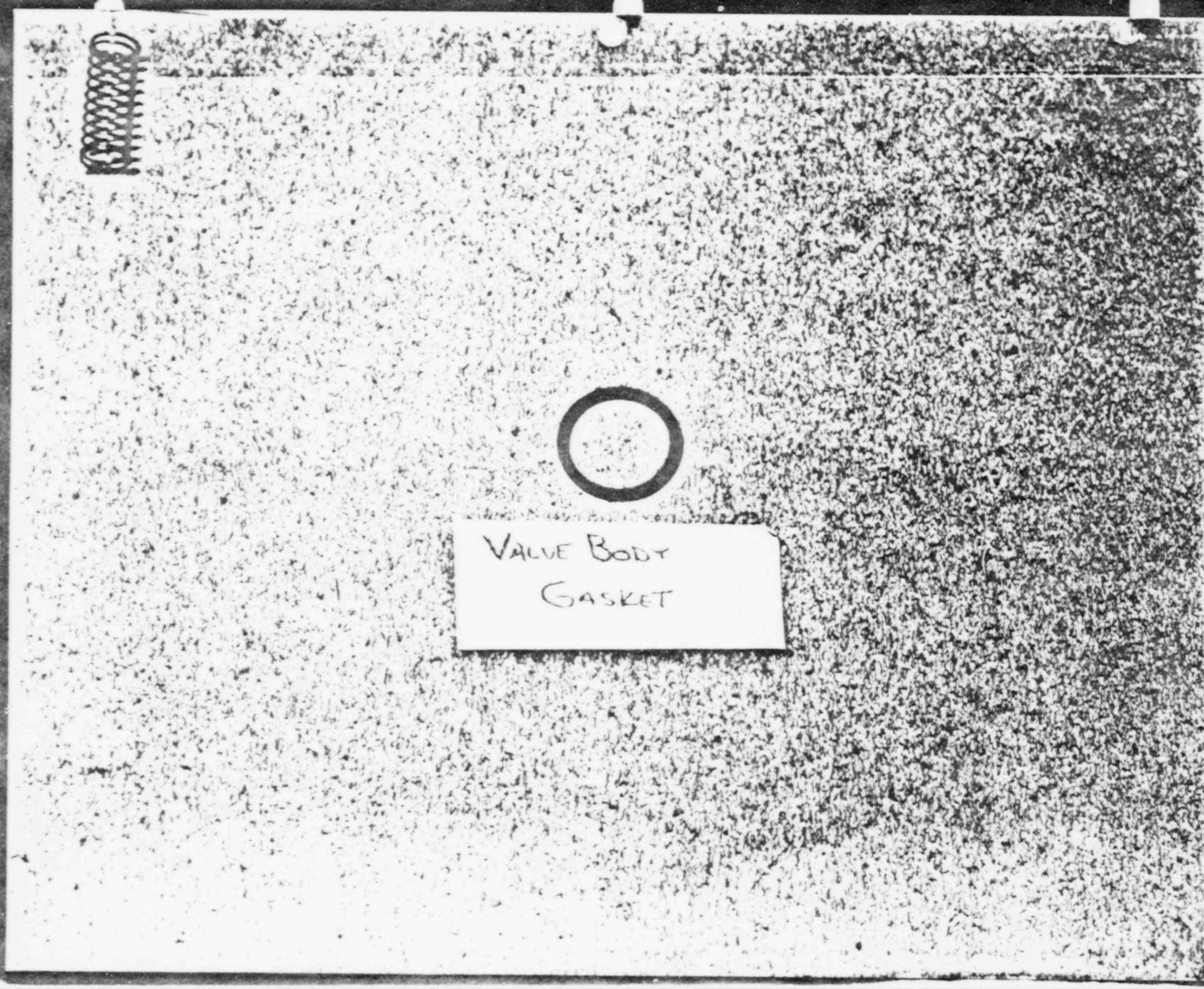
Reviewed By: [signature] 11/6/87

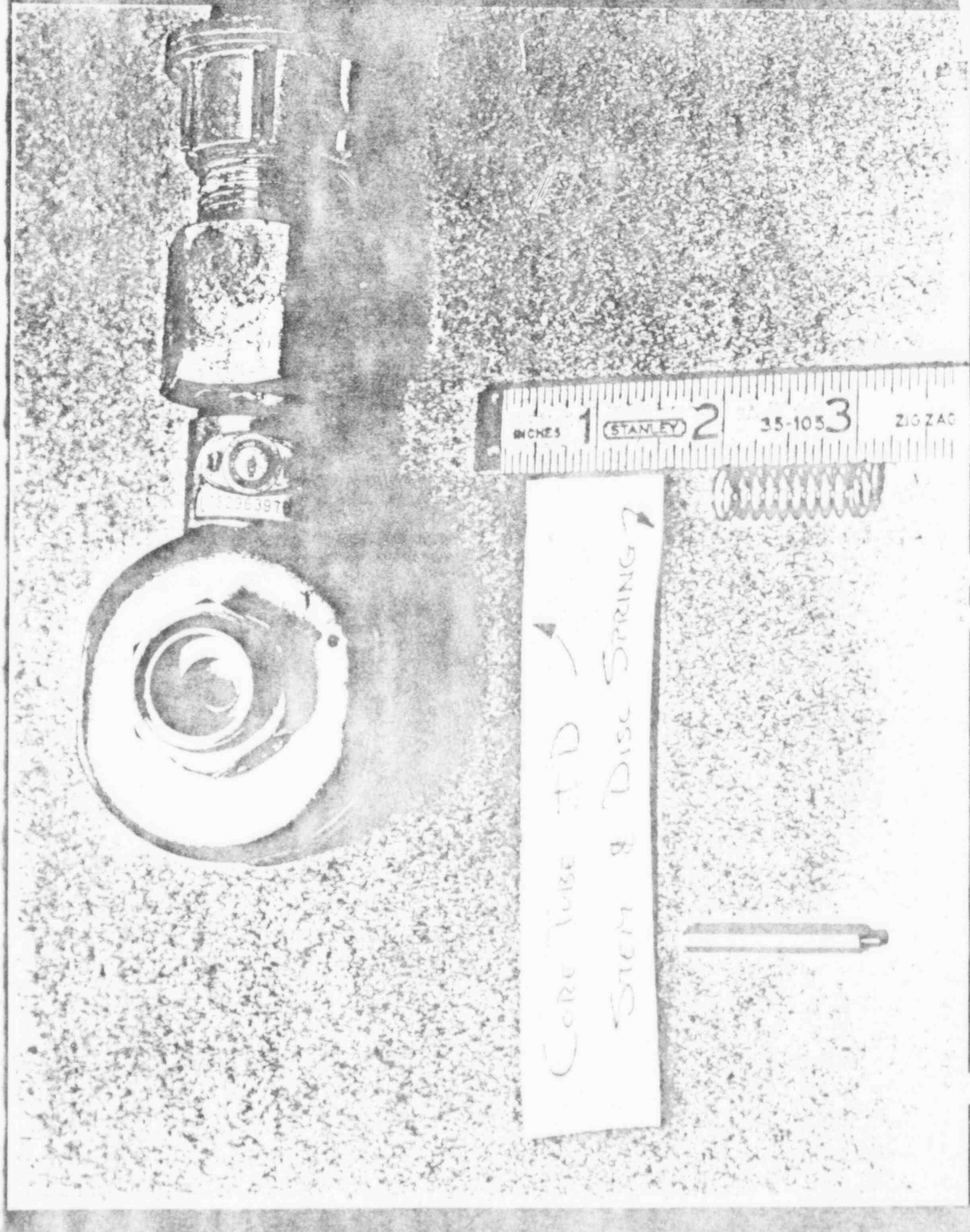
Action Notes:

A. Branch lines shall be checked to determine the extent of the problem when effluent limits are exceeded.
B. Analysis required post-maintenance as per PAP-0204, Housekeeping/Cleanliness Control Program.

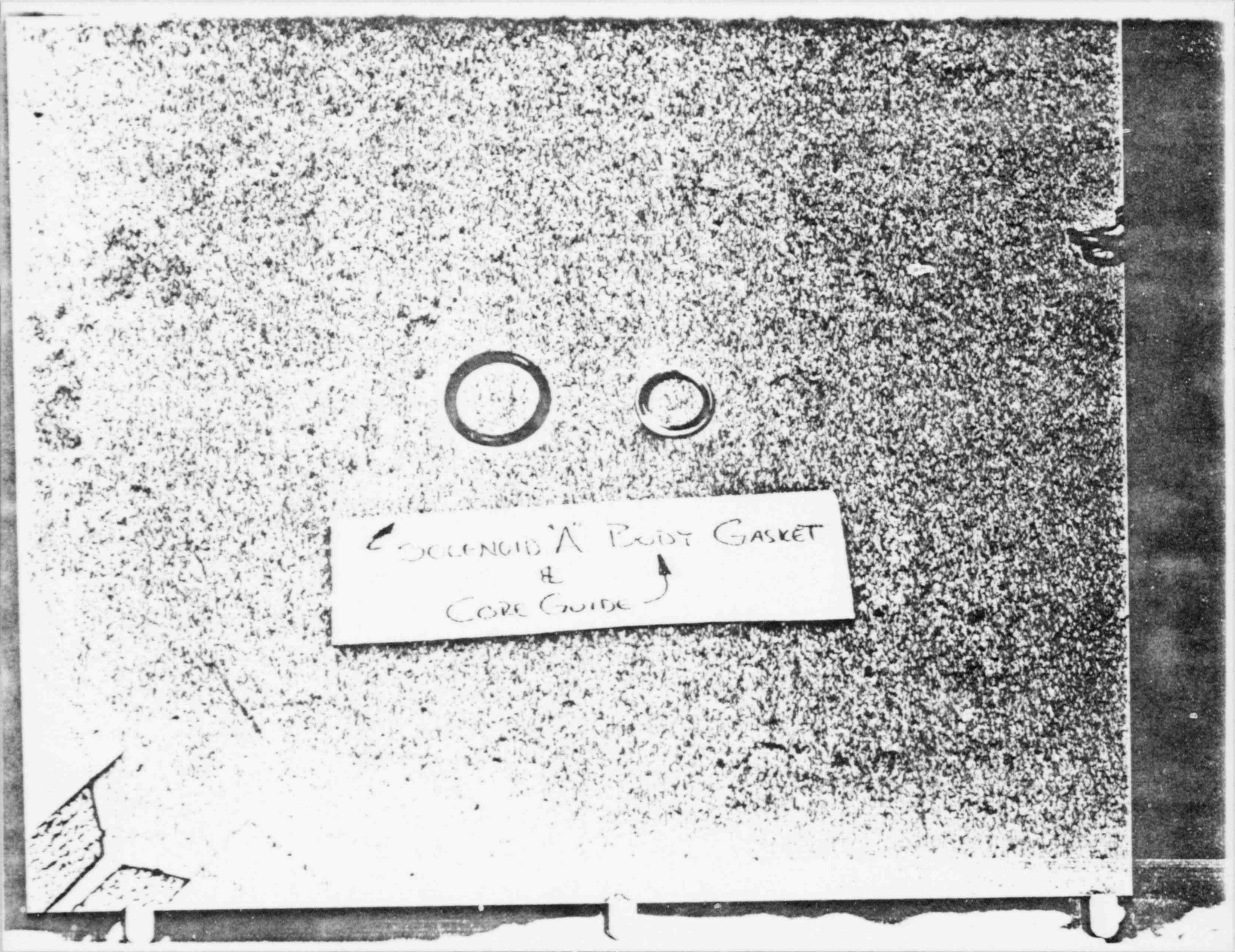


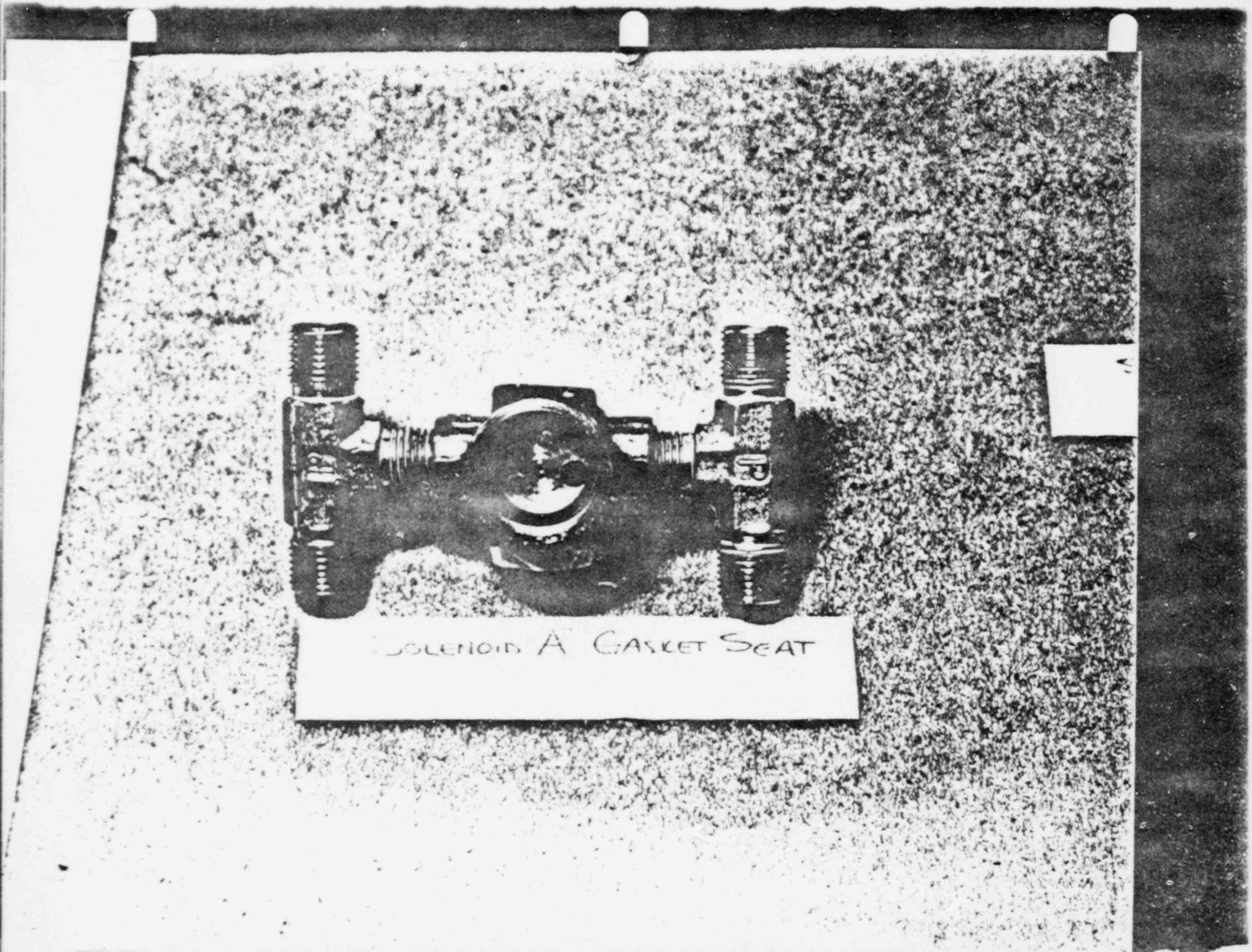
CORE TUBE ID
STEM & DISC SPRING
DISC HOLDER
ASSEMBLY

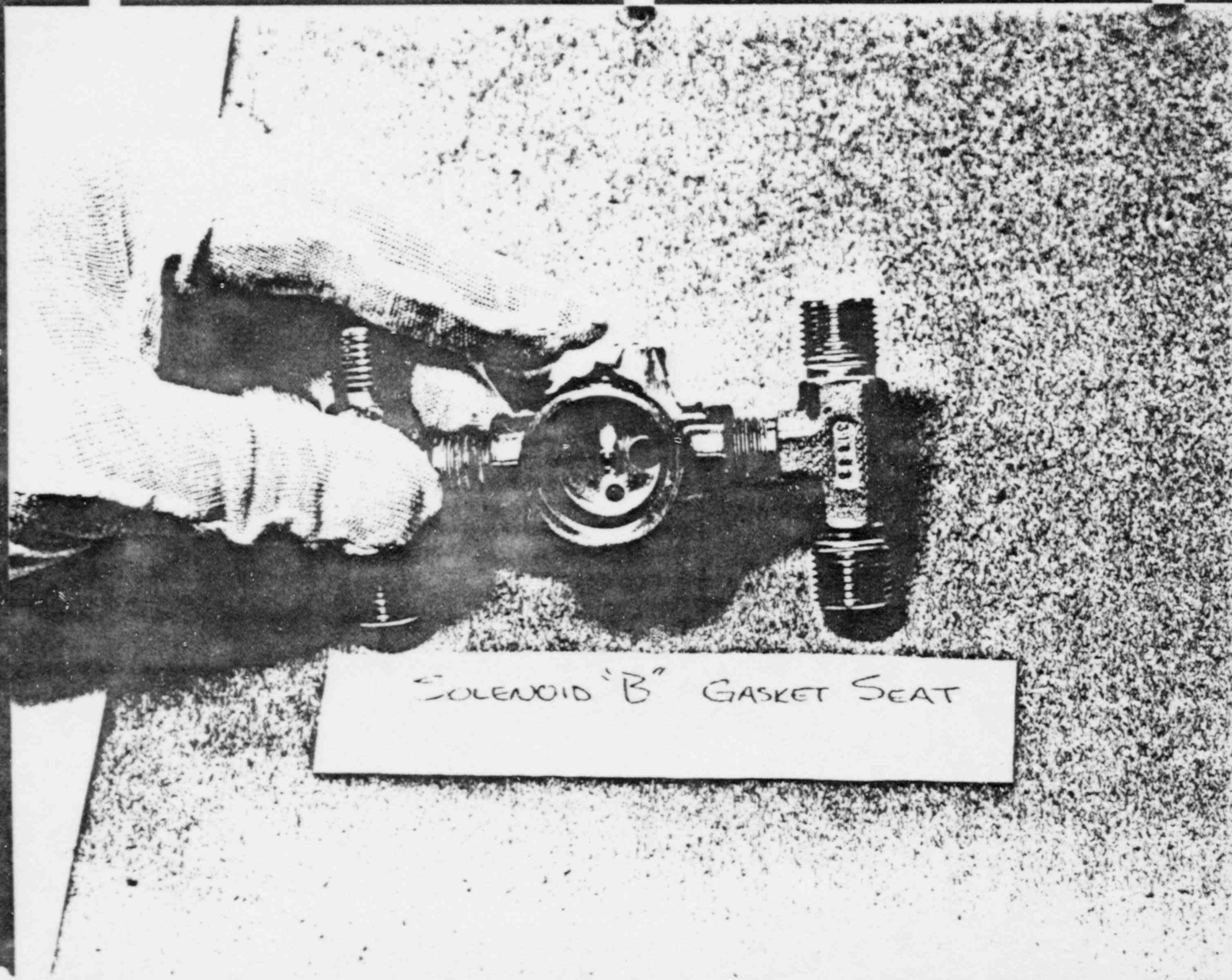

VALVE BODY
GASKET

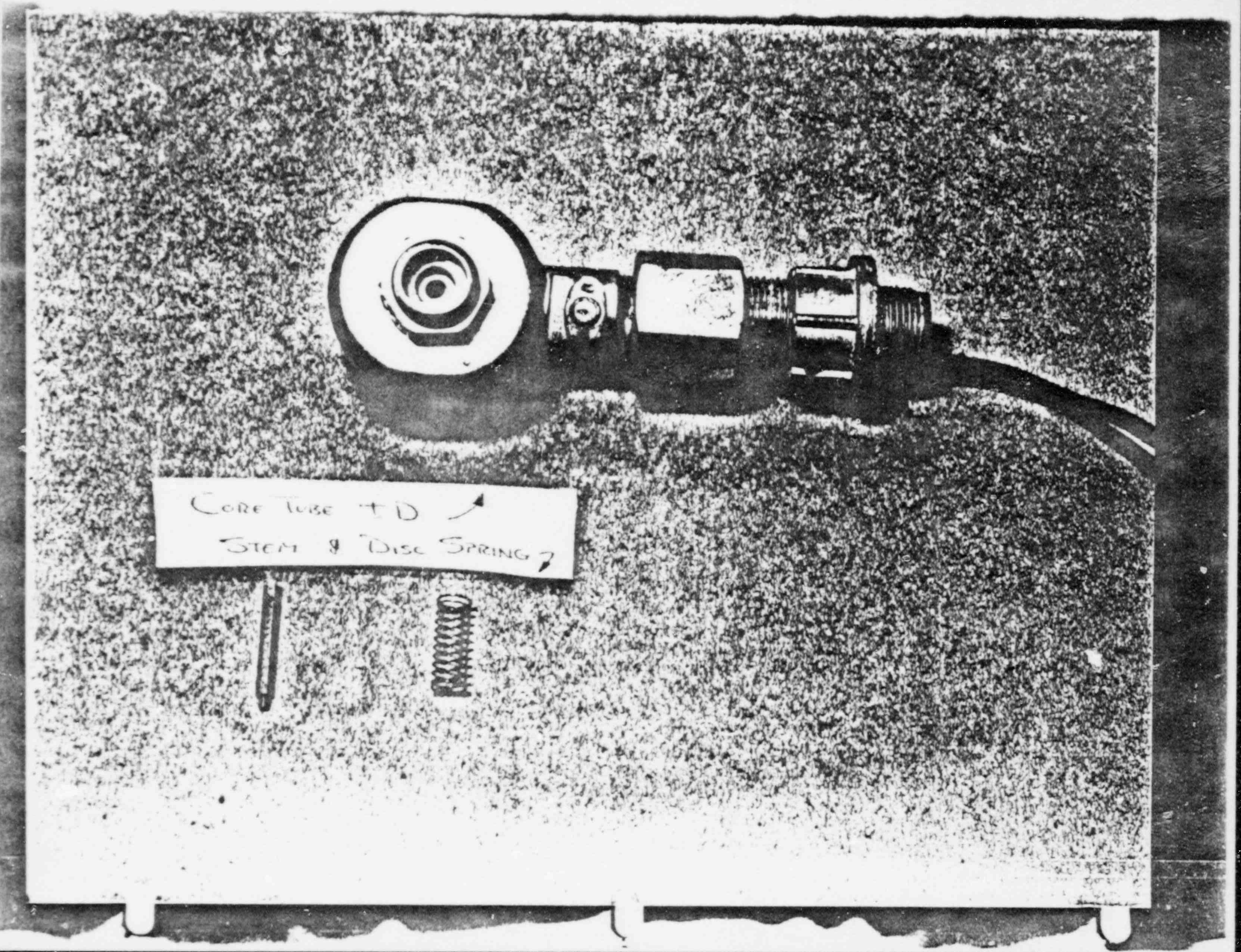


INCHES 1 STANLEY 2 35-105 3 ZIG ZAG
Core Tube TD
Stem & Disc Spring?

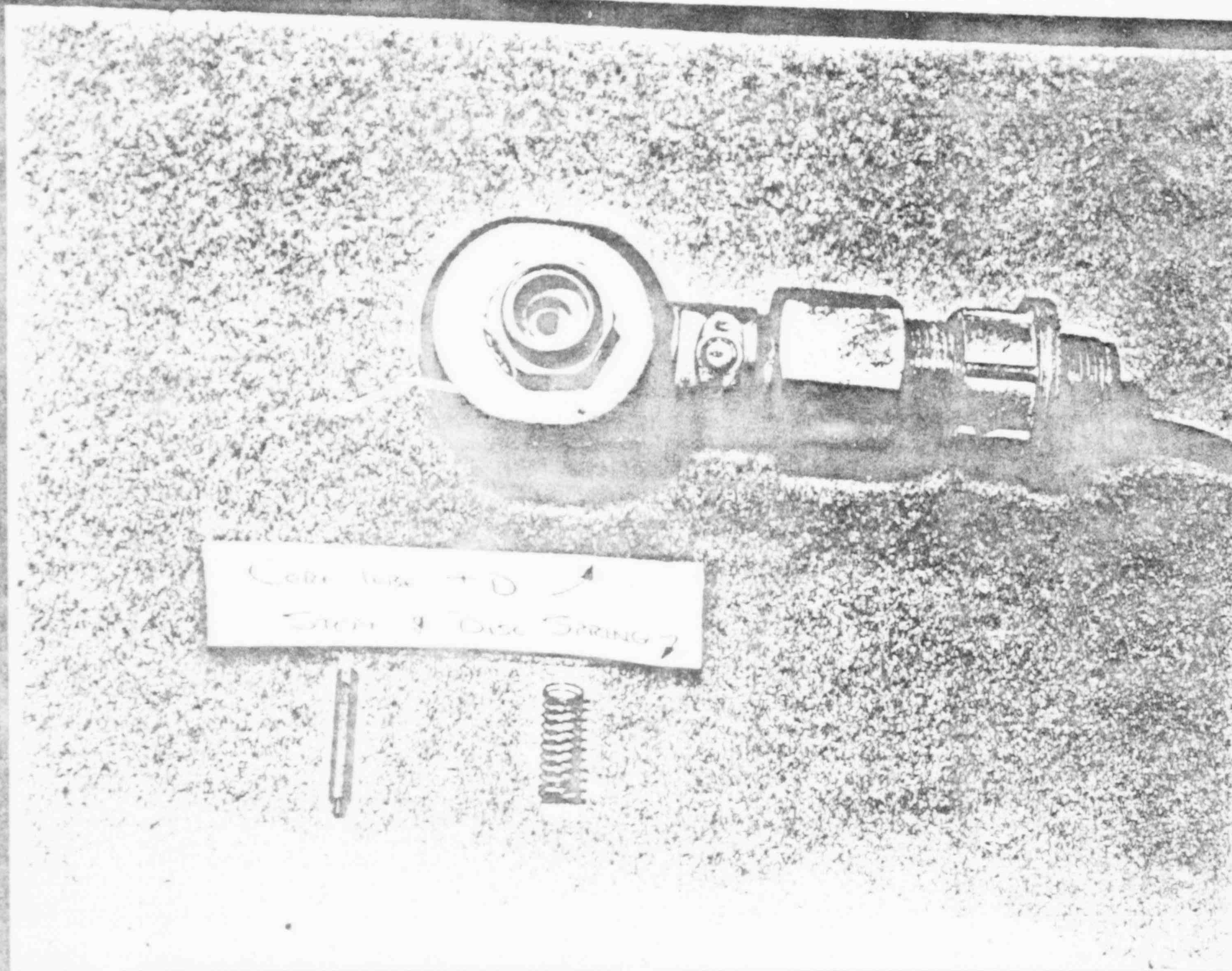

SOLENOID "A" BODY GASKET
&
CORE GUIDE


SOLENOID A GASKET SEAT

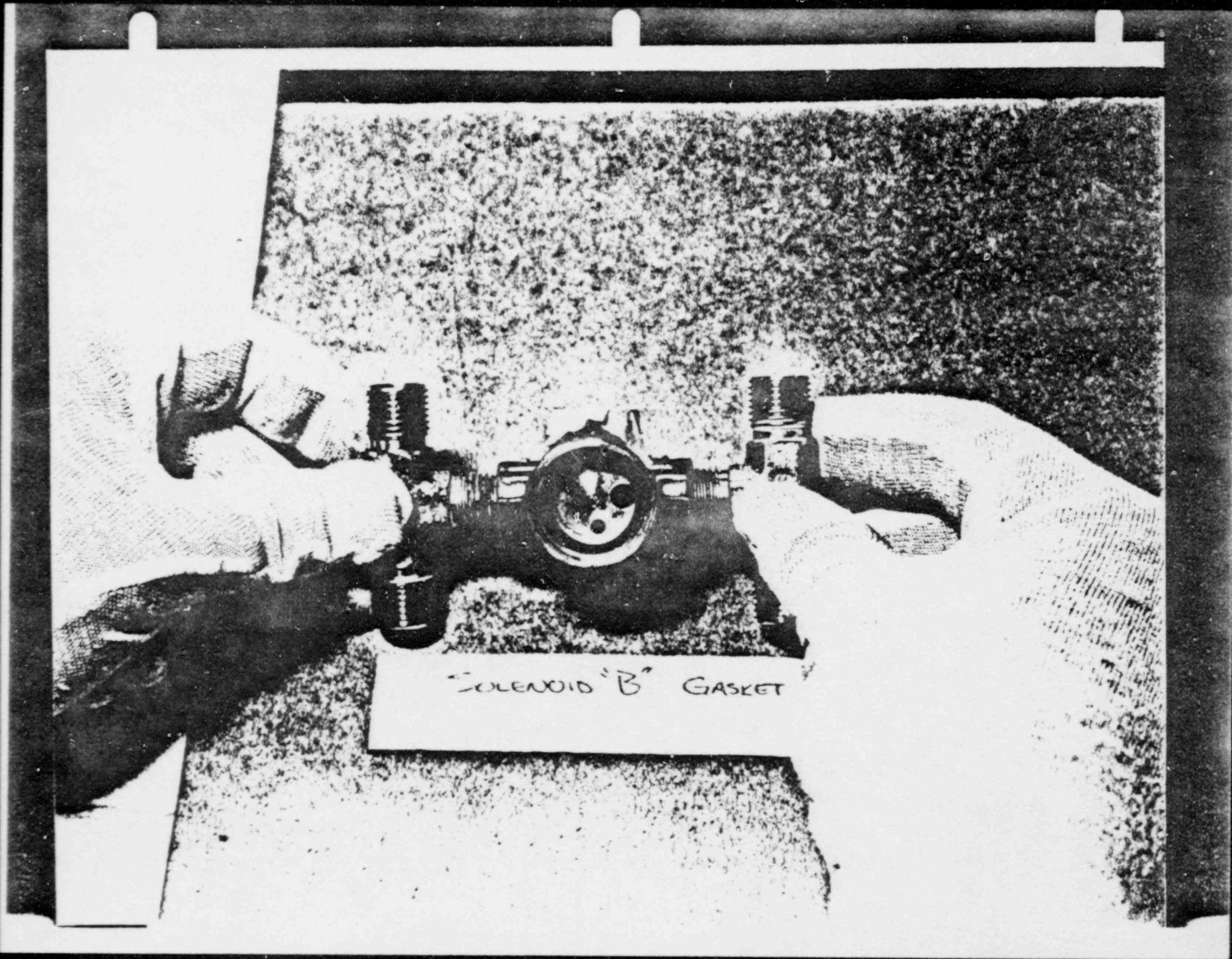

SOLENOID "B" GASKET SEAT



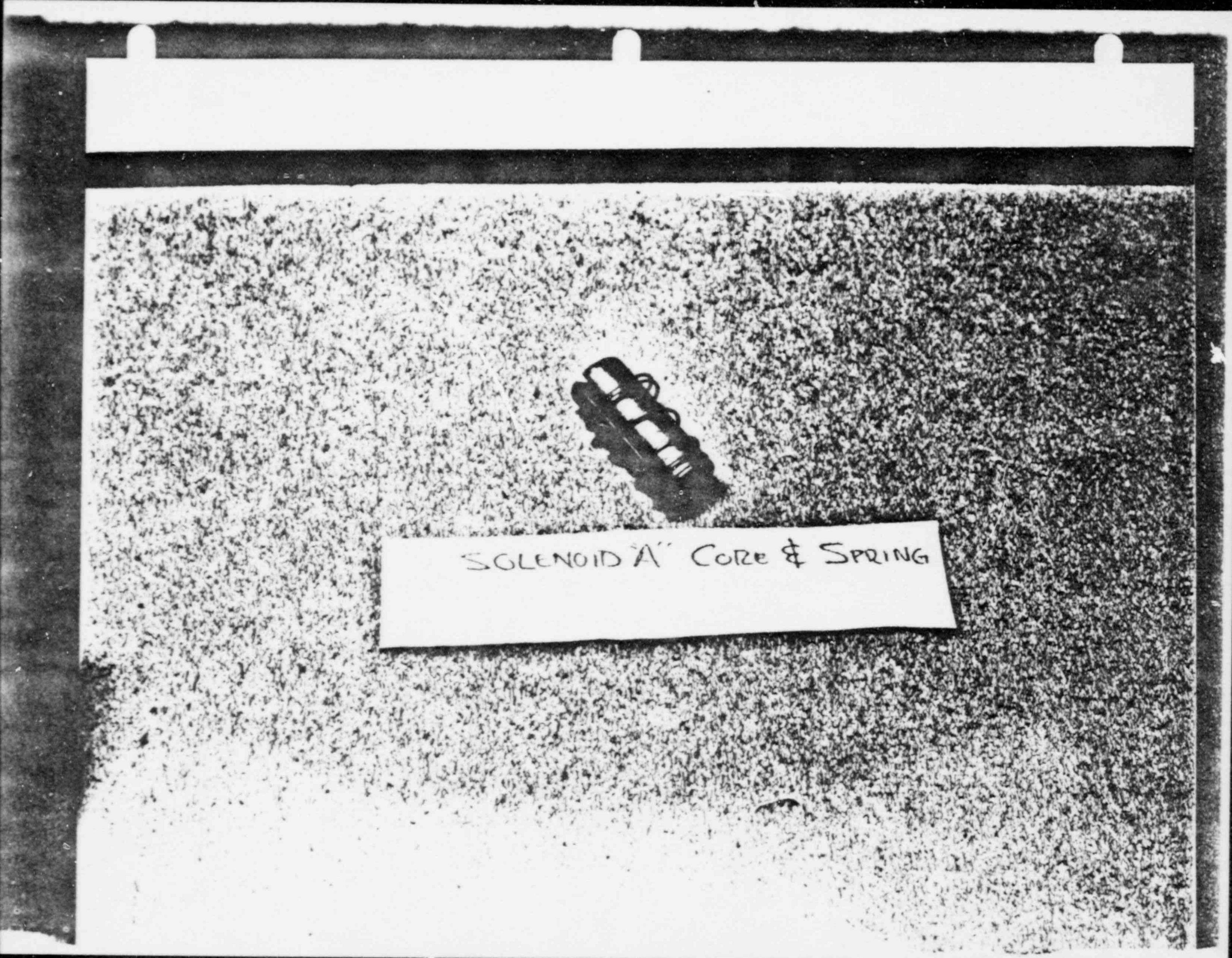
CORE TUBE + D
STEM & DISC SPRING

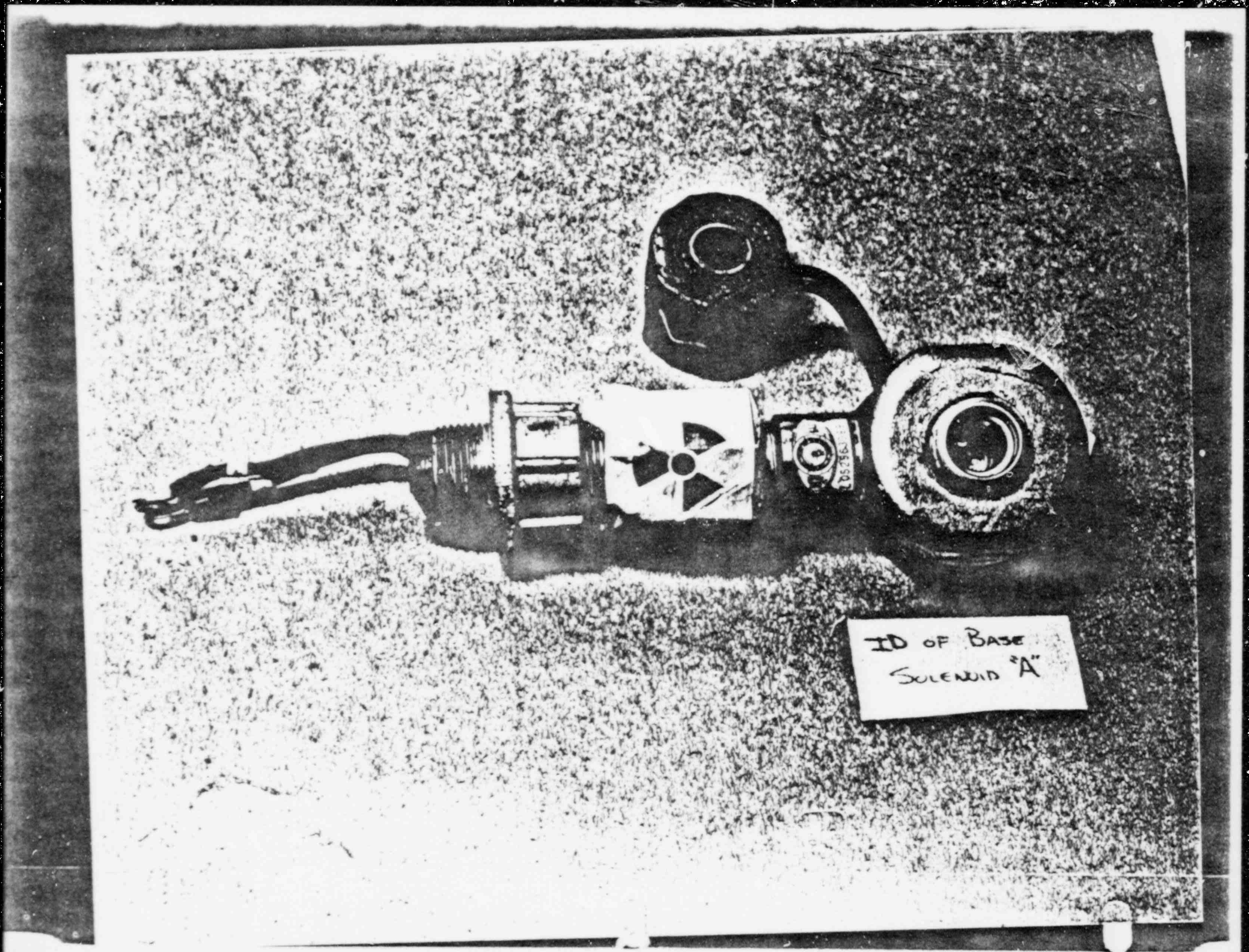

COLD LEG + D
STEM & DISC SPRING

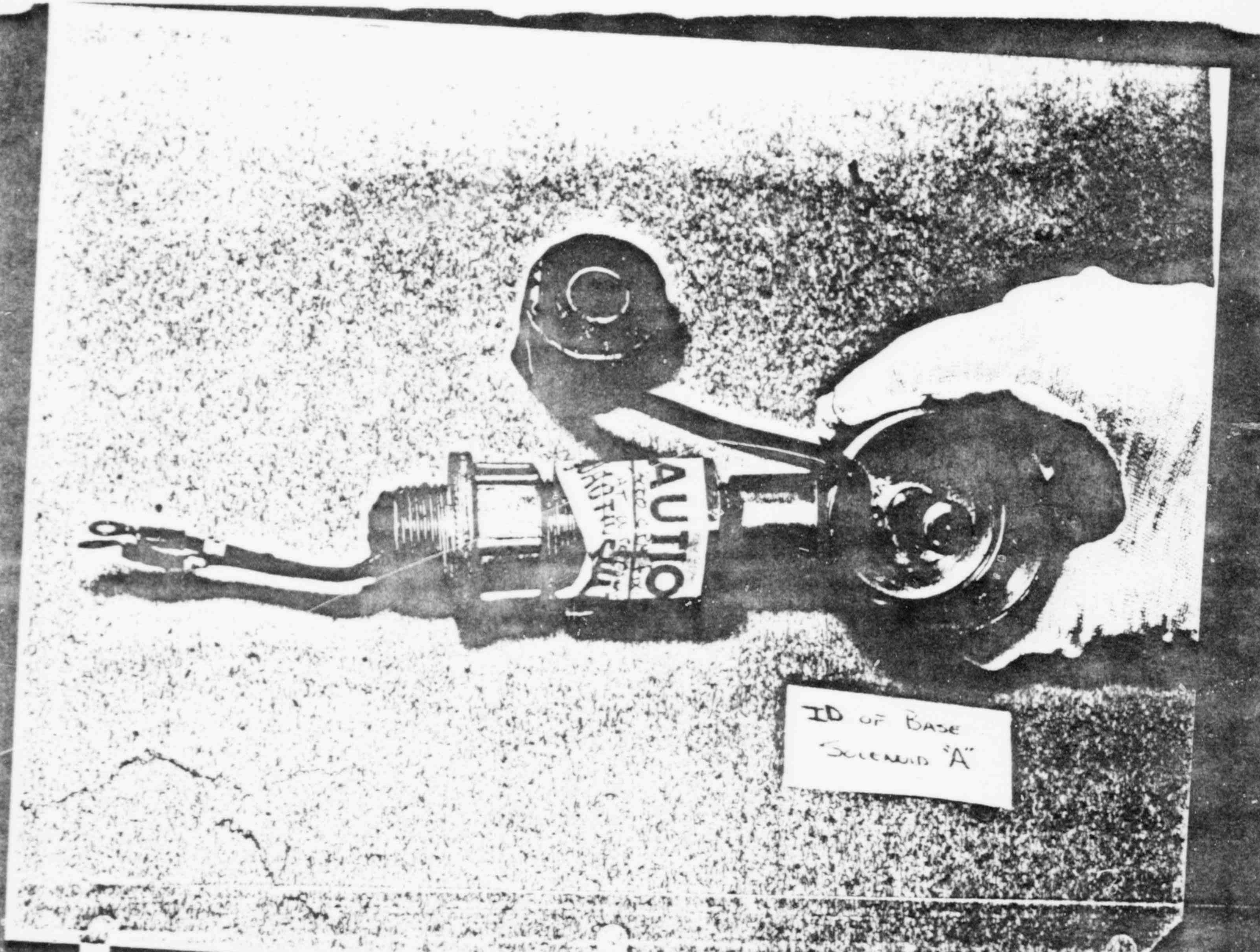

DISC HOLDER
ASSEMBLY

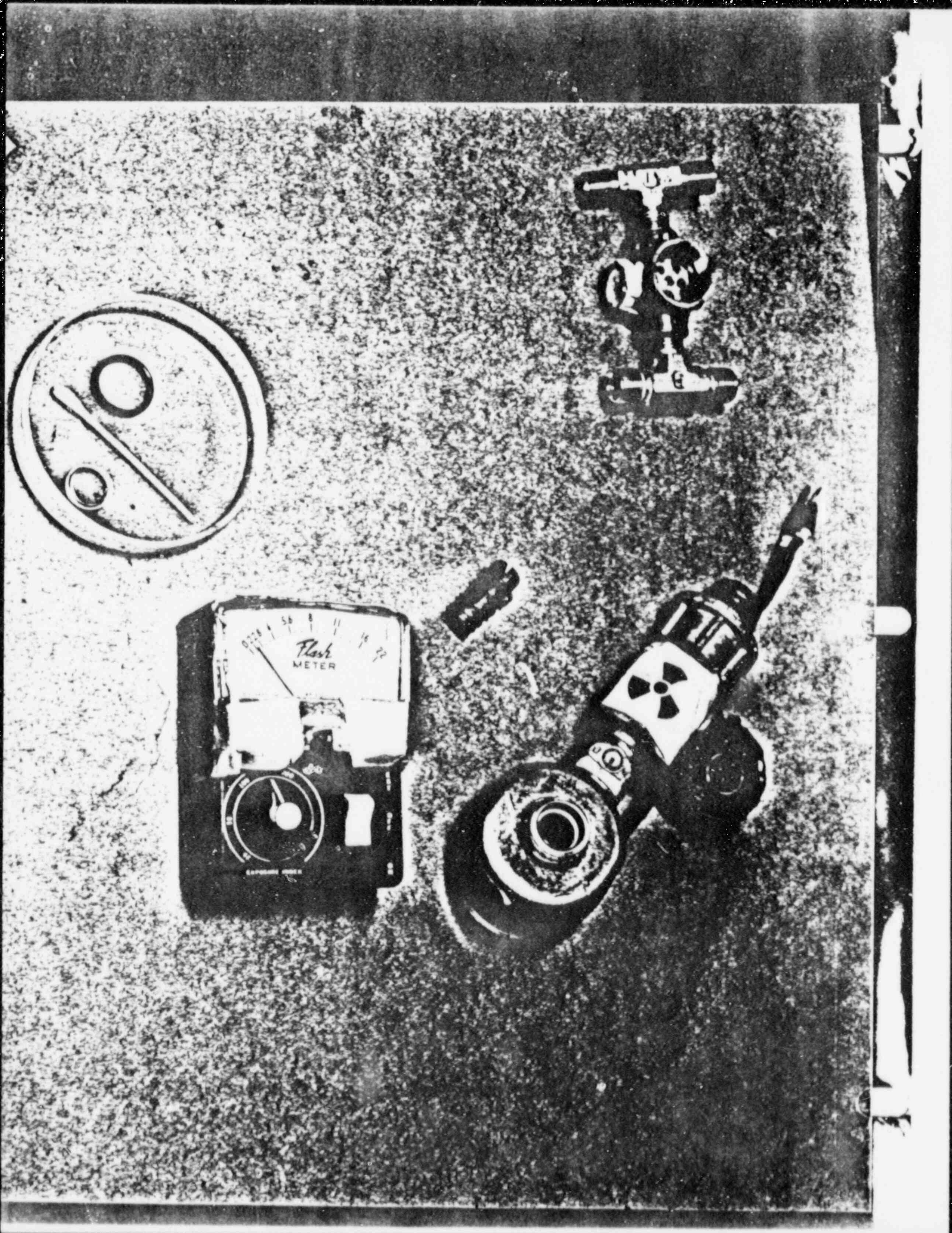

SOLENOID "B" GASKET


SOLENOID "A" CORE & SPRING


SOLENOID "A" CORE & SPRING


ID OF BASE
SOLENOID "A"


ID OF BASE
SOLENOID "A"
AUTIO


Flash
METER

ROOT CAUSE ANALYSIS

EXECUTIVE SUMMARY

This document describes the evaluations performed to determine the cause of events on October 29 and November 3, 1987 when Perry Unit 1 Main Steam Isolation Valves (MSIVs) failed to fast close on command. The most probable root cause, based on data currently available, is failure of an Automatic Switch Company (ASCO) Model 8323 3-way dual solenoid valve. The primary suspected cause is hardening and dimpling of the EPDM rubber disc seat material and other EPDM seals, causing the disc holder assembly to wedge in place when the solenoid was de-energized. Several mechanisms have been proposed that could lead to EPDM degradation, the most probable of which is a local high temperature environment.

This document is organized into four sections. Section 1 describes the most probable root cause, and the basis for its selection as such. Section 2 gives an overview of how the root cause analysis team reached its conclusions. Section 3 describes potential component failure modes that could lead to MSIV failure to close, and finally, Section 4 describes specific failures within the ASCO Model 8323 valve that could lead to the observed conditions, and discusses environmental conditions that could lead to the failure.

11/09/87

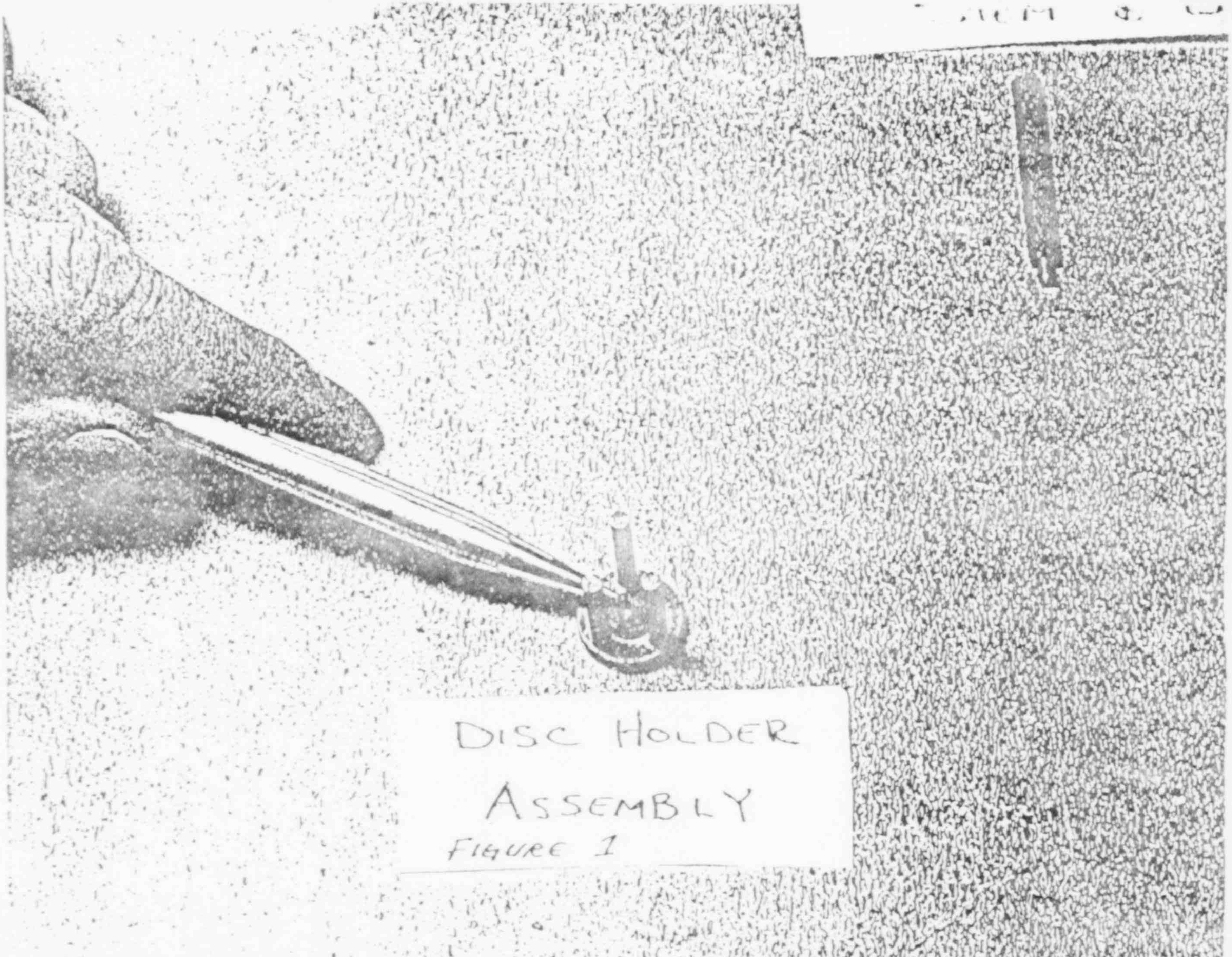
SECTION 1 MOST PROBABLE ROOT CAUSE

The most probable root cause of the observed MSIV failure to close is failure of the Automatic Signal Company (ASCO) Model 8323 3-way dual solenoid valve to shift from the energized to de-energized position. Within the component, the Ethylene Propylene Diene Monomer (EPDM) rubber disc seat material was found to be deformed. A "dimple" (see figure 1 and 2) was found in the EPDM seat material on the disc holder. This is also indicative of a general hardening and degradation of the rubber seals within the valve. If the disc holder sticks to the orifice the MSIV will not close. Delayed closure is consistent with de-energizing of the solenoid, followed by sticking of the disc holder to the orifice for some period of time, when the disc holder breaks loose and allows the air pressure to relieve through the orifice. Once the air pressure is relieved, the MSIV will close.

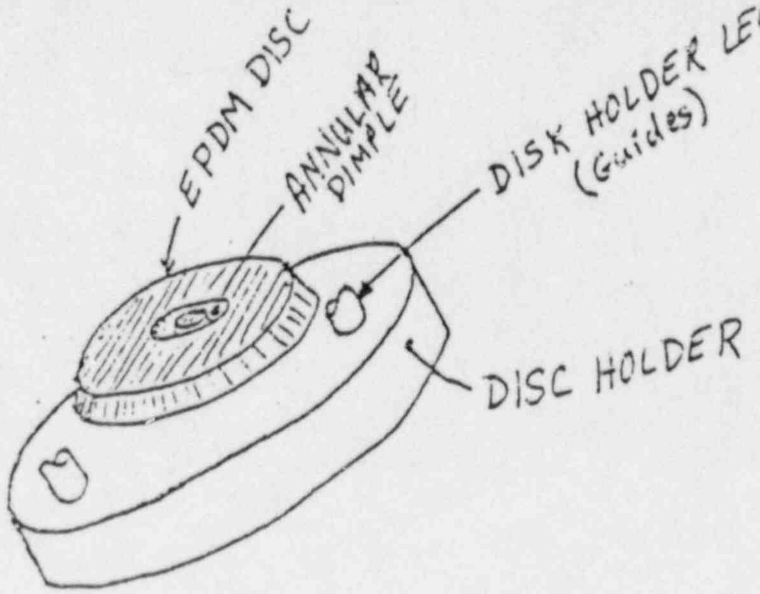
Failure of this component is the only failure that is consistent with the observed failure. No other single component failure will result in a delayed MSIV closure.

The EPDM degradation is most probably caused by exceeding the temperature limits of the EPDM material. EPDM was chosen for this application because of its radiation resistance from an equipment qualification standpoint. Perry has experienced bulk drywell and steam tunnel temperatures which have approached tech spec limits during much of the startup test program. Additionally, steam leaks have occurred in the vicinity of the affected MSIV solenoids. While no data exists to actually confirm that the local temperatures have exceeded the capability of the EPDM rubber, a good correlation exists between the location of steam leaks and the affected valves.

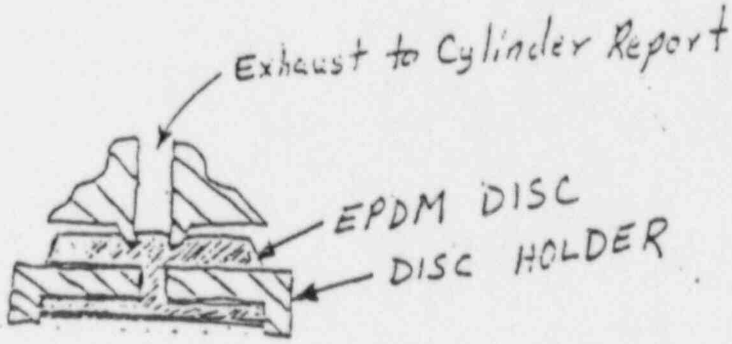
Several other mechanisms have been postulated for the EPDM degradation, and sufficient data does not currently exist to absolutely prove or disprove any hypothesis. It is true, however, that the temperatures near the valves have been close to the maximum allowable for EPDM material, and this is the most likely cause.



DISC HOLDER
ASSEMBLY
FIGURE 1



SKETCH SHOWING DISC HOLDER GENERAL APPEARANCE



SKETCH SHOWING CROSS-SECTION OF DISC IN ITS SEATED POSITION

Figure 2

SECTION 2 ANALYSIS TECHNIQUES AND OVERVIEW

Following the failure of the B21-F022"B" and "D" Main Steam Isolation Valves, a multi-discipline team was convened with the charter to determine the most likely cause of the problem. This activity would be useful prior to actuator disassembly and inspection. The team consisted of senior engineers from the CEI mechanical and electrical engineering and technical departments, as well as the architect engineer (Gilbert) and NSSS supplier (General Electric).

Problems analysis proceeded using standard Kepner-Tregoe (KT) Problem Analysis techniques. The initial thrust of the team was to determine which equipment failures would cause the failure of a MSIV to close in the delayed manner observed. An initial brainstorming session was held to determine potential component failure which might cause the observed behavior. These potential failures were then compared with known facts and design conditions, using "is/is-not" techniques to rate the postulated failures as to probability.

Twenty four (24) potential component failures were initially postulated. Of these, 19 were rated as unlikely, one (1) as potential, and four (4) as probable causes. All five of the potential and highly likely candidates involved either the ASCO Model 8323 3-way Dual Solenoid Valve, or the air supply to these components. Specific work items and inspection steps were thus incorporated in other site action plans to address these components in detail.

Section 3 of this report documents each of the 24 postulated component failures. It is organized in order of highest to lowest probability. Each potential cause is described, discussed and conclusions drawn with regard to root component failure.

Following disassembly of the actuator air packs and diagnostic tests on the air supply system, it was determined that the most likely failure mode was, in fact, the ASCO Model 8323 3-way dual solenoid valve. The suspected cause was dimpling of the EPDM rubber disc seat material, causing the disc holder assembly to wedge in place when the solenoid was de-energized. The team was again convened, this time to evaluate the environmental and design conditions which could be responsible for the observed component failure.

Analysis techniques similar to those utilized in the component evaluation were used to screen the potential causes. Absolute determination of the root cause is difficult. However, the most likely condition leading to the failure was local high temperatures leading to EPDM degradation. Analysis results are given in Section 4, again describing each of the nine (9) postulated root cause conditions and discussion of the evidence to confirm or deny the postulated condition as root cause.

SECTION 3

COMPONENT FAILURE DESCRIPTIONS

Potential Cause

Failure of the Part #4 ASCO Model 8323 3-way Dual Solenoid Valve

Discussion

Failure of the ASCO Model 8323 3-way dual solenoid valve to shift from the energized to de-energized position could cause the delayed closure event experienced by Perry.

This failure mode has happened in the past due to various reasons as evidenced by IE Notices 85-17 and 86-57, (copies attached) and INPO SER 57-85.

Conclusion

This failure mode is the most likely candidate for root component failure of the problem. The post-disassembly inspection has found dimpling of the EPDM rubber disc seat material. This could cause the disc holder assembly to wedge in place when the solenoid is de-energized. This would in turn not allow air pressure to relieve through the #3 air port, and preclude MSIV closure.

Potential Cause

Instrument Air System Quality
(oils, moisture, particulates)

Discussion

This potential cause has been experienced at other plants. This is evidenced by IE Information Notices No. 86-57 and 85-17.

In the likelihood that poor instrument air quality, such as the presence of moisture, particulates, and/or oils, the possibility of failure related to several Main Steam Isolation Valve components would be highly likely. The main concerns would resolve around the Automatic Switch Company (ASCO) solenoid valves. Since the seal and discs internal to these valves are Ethylene propylene, any intrusion of oil into the instrument air system could cause degradation. Degradation of the seals and discs would, in this case, be caused by hydrocarbon contamination that would distort them and could result in malfunction of the valves. However, at Perry this is unlikely because of the "oil free air" compressors. Disassembly and inspection of the ASCO NP8323-20E dual solenoid valve from MSIV F022D did not reveal any hydrocarbon substance which could have been borne from the instrument air (as described below).

A visual inspection of the EPDM parts of the ASCO solenoid valves was conducted. This inspection indicated that the EPDM disc was hard and brittle versus a new EPDM disc which is pliable and resilient. In addition, the discs were handled with white cotton gloves, and no residual was left on the white cotton gloves. The surface of the disc also did not appear to be sticky or tacky while it was being handled with the gloves. This is important since any residual would be an indication of the EPDM breaking down due to hydrocarbon contamination.

The possible intrusion of water or moisture into the air system could cause residue to form on the ASCO valve internals and cause malfunction of the valves over a period of time. The moisture may collect during outage periods and form residue during plant operation when the ambient temperatures are higher. Dewpoint measurements were performed for the supply air to both the inboard and outboard MSIVs. Measured dewpoints were minus 55°F or lower indicating that intrusion of moisture into the air system is not a concern. Grab samples from the instrument air supply to containment were analyzed for hydrocarbons using gas chromatography. Neither sample analyzed revealed detectable condensable hydrocarbons greater than 0.1 ppm.

Twelve particulate air samples were also obtained. The results from all the samples have not been completed. The results that are available show a trend of very low total particle counts with relatively few particles above 40 microns. Results from past air analysis have shown numerous counts for particles below 40 micron with relatively few indications of particles greater than 40 micron.

The disassembly and inspection of the ASCO NP8323-20E dual solenoid valve revealed no traces of moisture or particulate contamination. There was no wear on either the EPDM or the metal components of the solenoid valve. This result, in addition to the very low number of total particles in the air system and the low dewpoint temperatures would indicate that the root cause is not associated with the instrument air quality.

The concerns addressed above also apply to the C.A. Norgren Shuttle Valves; however, the shuttle valves are much more tolerant to poor instrument air quality.

Conclusion

The air samples taken do not reflect a problem with hydrocarbon contamination. The presence of this type of interaction between the valve materials and hydrocarbon contamination would be seen as a swell of the material. This is not the case where the material has been found to be embrittled. The investigation as the cause of failure will be pursued with conversations to be held with Susquehanna, Brunswick and Riverbend. Possible causes of the failure could be related to elevated temperature ... the valves due to steam leaks in the vicinity. There will be further investigation to determine the root cause of the failure which could involve destructive testing of the components. The air sample counting will be completed and particles greater than 40 micron will be quantified. Our past experience with higher distribution of total particles indicates that the failure of the component was not attributed to the particle size or quantity since our total results had been low. ASCO has determined that particles less than 50 micron are acceptable for reliable operation of their valves.

We plan to continue our investigation as to the root cause through analysis of the EPDM components. With the technical information we will obtain from the plants mentioned above, our plans are to formulate a testing plan that addresses both embrittlement and hydrocarbon contamination as the failure mechanics. The existing data obtained will allow us to envelop and quantify our failure analysis.

Potential Cause

Obstructions/Foreign Materials in Air Lines/Accumulators

Discussion

This potential cause has been experienced at other plants as evidenced by IE Information Notice 86-57 and 85-17. Obstructions/Foreign Materials in the air lines/accumulators is a likely cause since it would permit valve failures as experienced. The obstructions may permit periodic operation of the valves and depending on the instrument air cycling could temporarily become dislodged. This could result in the same characteristics discussed in the write-up on "Poor Air Quality".

Conclusion

This item was initially considered to have a high potential as root component failure. Inspections of the air lines and accumulators found no defect that could cause the observed operational pattern, however, so this potential cause is unlikely to be a root component failure.

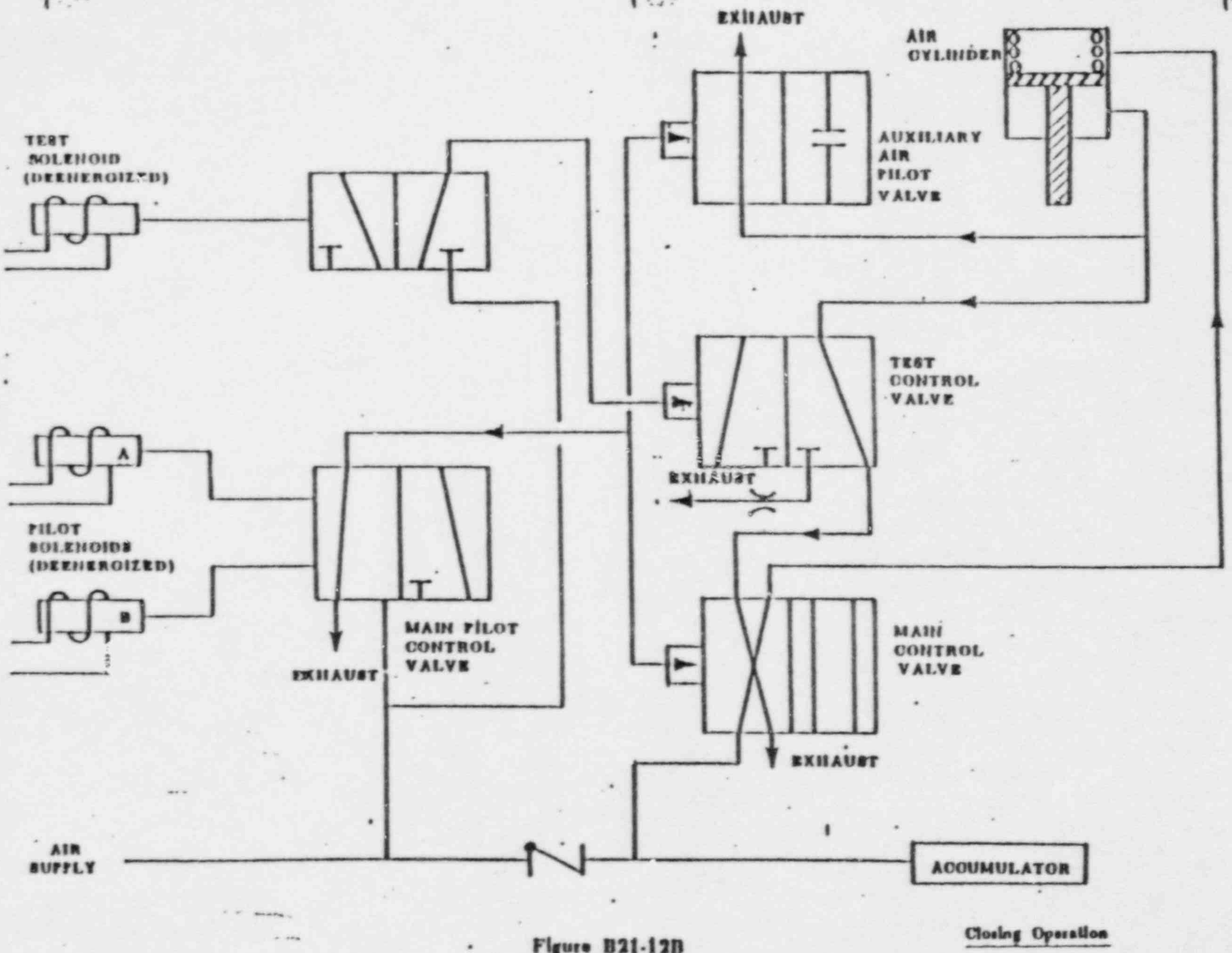


Figure B21-12B
MSIV Pneumatic Control

DRAWING UN[
CONFIGURATION
AS OF REV. ____

PARTIAL DWG:
D209-013 sheet 2

D1 D2 NUCLEAR S/

NOTES.-

1. FOR GENERAL NOTES, SEE DWG. D-209-001, SHEETS 1 AND 2.
2. TERMINAL BOX LAYOUT, SEE DWG. D-209-001, SHEET 1.
3. FOR PHYSICAL LAYOUT AND WIRING INFORMATION, SEE ATWOOD & MORRILL COMPANY DWG. 13560-01-H, SHEETS 1 THRU 4. (FLD40-003, SHEETS 1 THRU 4) OR G.E. DWG. 105D5228.
4. WIRED BY VENDOR.
5. JUMPERS FIELD TO INSTALL. COLOR PER FIELD CABLE DIVISION.
6. FOR CONAX CONDUIT SEAL ASSEMBLY WIRING DETAILS, SEE DWG D-209-001 SHEETS 7,8,9 & 10.
7. BISCO TYPE LOCA SEAL INSTALLED IN CONDUIT ASSEMBLY FOR EACH SOLENOID TO SERVE AS AN ENVIRONMENTAL MOISTURE SEAL (DCP 85-0618).

10-13-8

DATE

TH

PERF

ELE

(1B2)

CES B4

1B21-F0022A
SOLENOID VALVES NOTE 5

NOTE 6

PARTIAL DWG:
D209-013 sheet 2

SOLENOID # 1

	WIRE MARK	COLOR CODE
1	B21H3613A	6
2	B21H3615A	5

SOLENOID # 2

	WIRE MARK	COLOR CODE
1	B21H3613A	4
2	B21H3611A	3

NOTE 4
AND
NOTE 7

SOLENOID # 3

	WIRE MARK	COLOR CODE
1	B21H3603A	2
2	B21H3601A	1

NOTE 4
AND
NOTE 7

Potential Cause

One or both of the pilot solenoid valves for each of the MSIVs failed to decouple (mechanically separate) upon de-energization.

Discussion

Electrical control circuits identify positive de-energization of the respective pilot solenoids. This is verified via the indicating light and any meters as shown per elementary diagrams per B-208-013 H011 and H036. The testing sequence and visual verification has identified that the solenoids have been de-energized, although the MSIVs failed to open or delayed opening. If either solenoid fails to decouple, the MSIVs will not operate. No method exists to remotely determine whether one or both of the solenoids for a particular valve failed to decouple.

The mis-operation (erratic) closure or deferred closure may possibly be attributed to this occurrence. As such it may be a highly susceptible cause. Further evaluation identified that each of the pilot solenoids were sealed with Bisco Locaseal at the conduit entry point. This design change implemented per DCP 850618 is the only change initiated recently. The degradation and/or migration of foreign matter could also be a cause to prevent decoupling of the solenoids.

Conclusion

This item was initially classified as a high potential, and condition of the Bisco Locaseal was evaluated upon solenoid disassembly. Since no interference with the valve operation was noted, this cause has been eliminated from consideration.

Potential Cause

Solenoid valve exhaust port blocked.

Discussion

Blockage of the exhaust port could occur through internal or external contamination. The port is open to the ambient. Particles may fall below the disc preventing shifting of the solenoid valve from its normally energized to normally de-energized position. Subsequent actuation could blow the blockage out of the valve allowing normal operation thereafter. This is considered a potential cause for the Perry delayed MSIV closure experience.

Conclusion

This was initially considered to be a potential cause for the Perry delayed MSIV closure experience. Inspection for blockage was performed, and on one solenoid a piece of tape was discovered to be blocking one port. Subsequent testing determined that this blockage was insufficient to preclude MSIV actuation.

Potential Cause

Failure of the Part #3 Norgren Model B0004A 2-way shuttle valve.

Discussion

The 2-way shuttle valve works in conjunction with the Part #1 4-way shuttle valve to open and close the MSIV. The 4-way shuttle valve provides the primary logic for pressurization and venting of the actuator cylinder. The potential failure mode description is the same as that for the 4-way shuttle valve operation.

The 2-way shuttle valve cannot by itself open or maintain the actuator in the open position unless the 4-way valve is energized or stuck in the energized position.

Conclusion

The delayed closure event experienced at Perry is unlikely to have been caused by the 2-way valve failure, since it requires dual mode failure.

Potential Cause

Hydraulic Speed Control Failure

Discussion

The hydraulic cylinder function is to slow the closing speed of the MSIV to specification limits under a wide variation of applied forces.

The closing speed of the MSIV is accomplished through adjustment of the Monatrol needle flow control valves Parts #6 and #7 as shown in the drawing 13560-01-4 hydraulic flow logic schematic.

Should either or both flow control valve(s) and also all other fluid leak paths (e.g. ring gaps in piston) become totally blocked, motion would be prevented.

Such a situation is unlikely because:

1. The amount of contamination would need to be so large that it would not disappear after one cycle.
2. The hydraulic fluid was installed under clean controlled conditions. The system is closed and pressurized, preventing contamination from external sources.
3. Such a failure mechanism is not supported by historical experience.

NOTE: The flow control valves are designed to provide a flow path even at the maximum choked condition.

Conclusion

Unlikely to be occurring.

Potential Cause

MSIV internal binding.

Discussion

Poppet binding against the upper body ribs due to poppet rotation is very unlikely due to poppet concentricity and long length of rib engagement. Binding of the stem against the packing gland edge is considered extremely unlikely by the valve manufacturer. Potential for the lantern ring to cock and bind to the stem is a possibility with inadequate packing compression but is also considered unlikely. The packing compression used in the reassembled valves is estimated to be adequate to prevent lantern ring movement.

Conclusion

The low probability of binding and lack of reported industry cases, is inconsistent with the multiple valve failures or the time factor seen in the free up of some valves. This is unlikely to be occurring.

Potential Cause

Swagelok fittings improper installation/assembly/leakage

Discussion

Excessive fitting leakage would not cause an irregular operation of the valve. This type of leakage would induce a constant operational characteristic, i.e. slow rate of change.

Likewise, the accumulator would close the valve in case of leakage on ASCO pilot control valve tubing.

Conclusion

Unlikely to be occurring.

Potential Cause

Failure of the Part #5 ASCO Model 8320 3-way solenoid valve.

Discussion

The model 8320 3-way solenoid valve is used to slowly stroke the MSIV (close MSIV when energized). When the solenoid valve is energized (opened), pneumatic pressure is routed to the Part #2 3-way air valve. This causes the 3-way air valve to vent the rod side of the actuator through a flow control orifice, while blocking the inlet air from air valve Part #1. The gradual loss of pressure from beneath the piston allows the actuator springs to slowly close the MSIV (up to 60 seconds).

The potential failure modes of the valve are:

a. Stuck open (failure to close when de-energized)
b. Stuck closed (failure to open when energized)
c. Stuck partially opened
d. Catastrophic failure of valve body

The effects of these failure modes are as follows:

a. A stuck open valve prevents reopening of the MSIV.
b. A stuck closed valve prevents operation of the MSIV in the slow closure mode. This is the normal (nontest) mode of the valve and does not affect the normal closure functions of the other subcomponents.
c. A partially opened valve will tend to close the MSIV; however more slowly than the normal fully opened condition. This affect can be visualized in the drawing 13560-01-H schematic. The 3-way solenoid valve, partially opened, would bleed inlet air from the system, e.g., exhausting it. Additionally it could pressurize the 3-way air valve resulting in further exhausting of both inlet and air pressure.
d. A catastrophic failure of the valve body would result in loss of pneumatic pressure resulting in MSIV closure.

None of the above failure modes support the delayed closure event at Perry.

Conclusion

Unlikely to be occurring.

Potential Cause

Valve packing too tight.

Discussion

Grafoil packing has replaced earlier asbestos packing on 7 of 8 MSIVs. While it is likely that the grafoil packing has greater breakaway friction due to increased compression of the softer material, the circumstances of the events showing quick closure after initial release make this somewhat unlikely as the cause.

Conclusion

Because other valves with grafoil packing and equal packing compression requirements showed no effect during fast or slow speed testing and the lack of industry experience of an MSIV being held up due to packing, this cause must be considered unlikely.

Potential Cause

Failure of the Norgren Model F0013A 4-way shuttle valve.

Discussion

The 4-way shuttle valve is energized by the Part #4 3-way dual solenoid valve. Upon energization it routes pneumatic pressure to the rod (bottom) side of the actuator cylinder piston and vents the blind (top) side of the piston. The resulting pressure differential across the piston forces the rod up, opening the MSIV.

The 3-way dual solenoid valve when de-energized, vents (de-energizes) the 4-way shuttle valve, venting the rod side and pressurizing the blind side. The resulting pressure differential across the piston in conjunction with the springs forces the MSIV closed.

The Part #3 2-way air valve is provided in the circuit to eliminate a single mode failure of the 4-way valve.

The failure mode of interest concerns failure of the MSIV to close when the 3-way dual solenoid valve is de-energized. Should the pressure leg of the 4-way valve stick, the pressure is still vented by the Part #3 2-way valve. If the exhaust leg sticks upon de-energization of the valve, the springs alone are capable of closing the MSIVs although at a slower rate.

If either leg partially sticks, the inlet pressure is exhausted, promoting closure of the MSIV.

Conclusion

The only failure of the 4-way valve which can result in delayed closure of the MSIVs as experienced at Perry is sticking of the pressure leg with a concurrent failure of the Part #3 2-way air valve. This is unlikely as it is double mode failure - requiring failure of two separate subcomponents. Thus this is unlikely to be occurring.

Potential Cause

Valve line-up of instrument air header system.

Discussion

Had an improper valve line-up in the instrument air header system occurred, numerous other air users throughout the plant would have been affected. Key valves and the possible consequences had they been advertently closed are listed below.

1) 1P52-F640 (manual drywell isolation). Improper line-up of this valve would have prevented repeated actuation of B21-F022A, B, C, and D. This valve would also isolate the MSR valves as well as the personnel air lock at 599'-0" Elevation.
2) 1P52-MCV-F646 (drywell isolation). Had this valve closed, it would have been indicated by status lights on both H13-P601 and H13-P870 panels in the control room. ERIS points EC-007 and 008 would have also indicated closed.
3) 1P52-MCV-F200 (containment isolation). (A) Had this valve been closed the entire air supply into containment would have been isolated which in turn would have affected instrument air supply to all the air users off of the air distribution manifolds P52-J600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, and 612. (B) Also, had this valve been closed it would have been indicated by status lights on both the H13-P601 and H13-P870 panels in the control room.
4) Manual valves P52-F554 and F605. Had these valves been closed they would have isolated a large number of the air users throughout the containment.

With all of the discussion above the fact remains that the valves did operate as observed. This would not have been the cause since the MSIVs would not have repeatedly functioned.

Conclusion

Unlikely to be occurring.

Potential Cause

Air pack wiring and termination failure resulting in a hot short.

Discussion

The air pack units are self contained for each solenoid and wired to a common junction box. This wiring and associated hardware is provided by the manufacturer. The field wiring is terminated at the respective solenoid valve junction boxes. Refer to drawings D-209-013 Sheets 2 through 9 for each of the MSIV assemblies.

Per review of the interconnection wiring diagrams and corresponding elementary schematics, the wiring and termination information is correct.

The control schematic for operation of the respective solenoids is "fail safe" by design basis, which requires the solenoid coil to be energized to prevent an isolation. De-energization would result in closure of the valve.

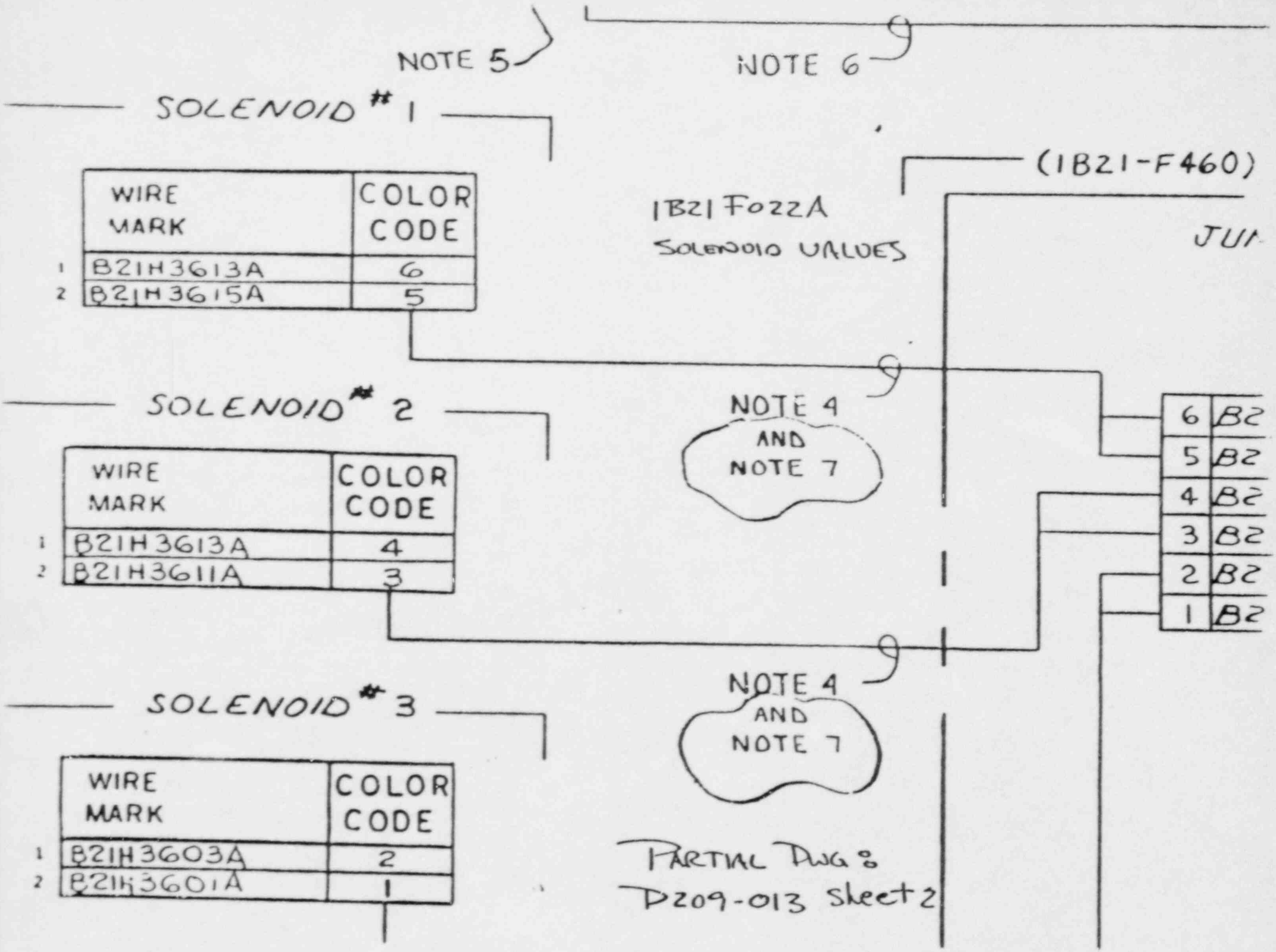
The wiring to each valve is classified as Class 1E. Although the 120VAC power to each of the A & B pilot solenoid valves pairs is contained in a common cable, each conductor is properly sized and meets the separation requirements. The cables are rated for 600 volt insulation, besides having minimum current draw. Therefore, the potential for a hot short is improbable.

References

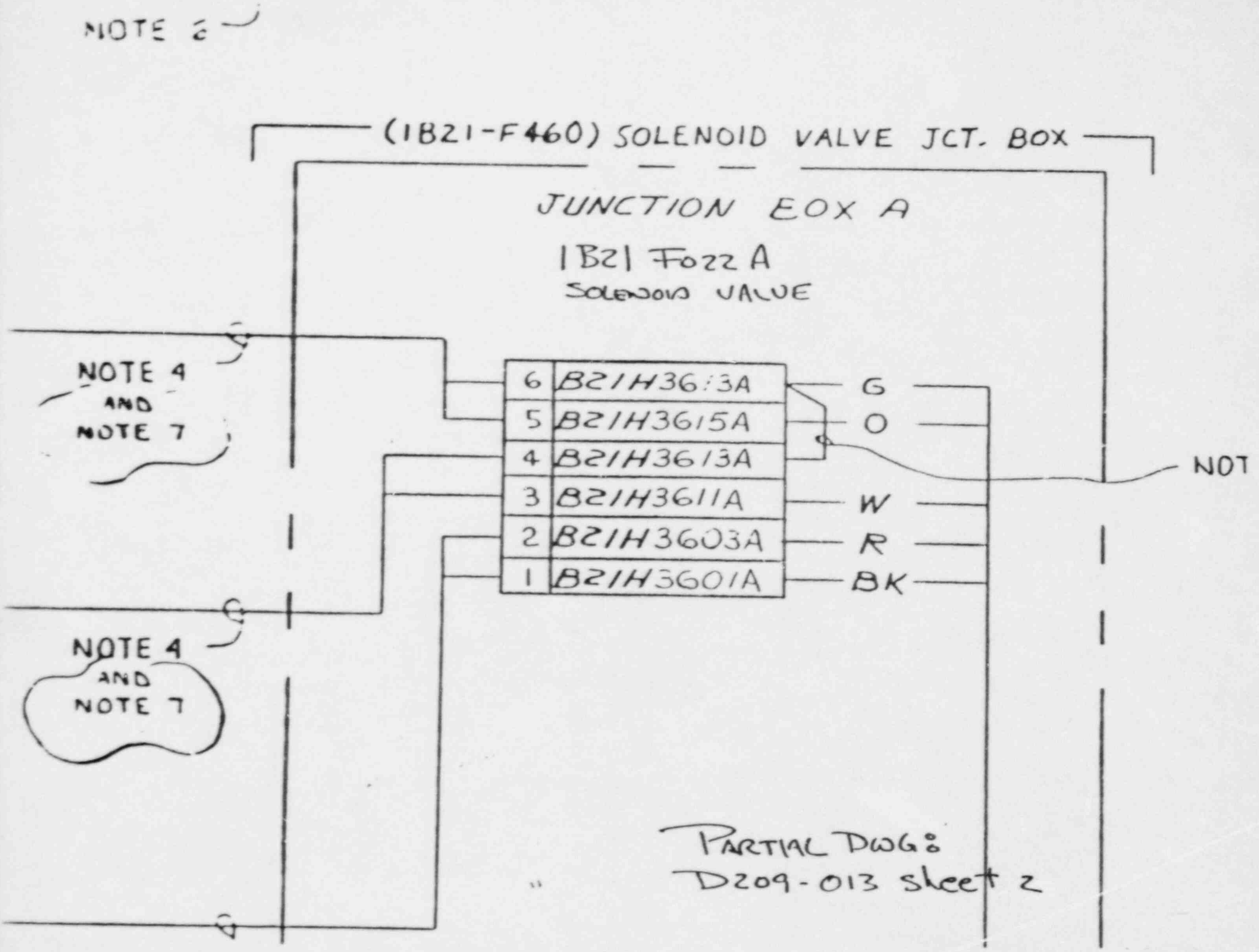
D-209-013 Sheets 2 through 9.

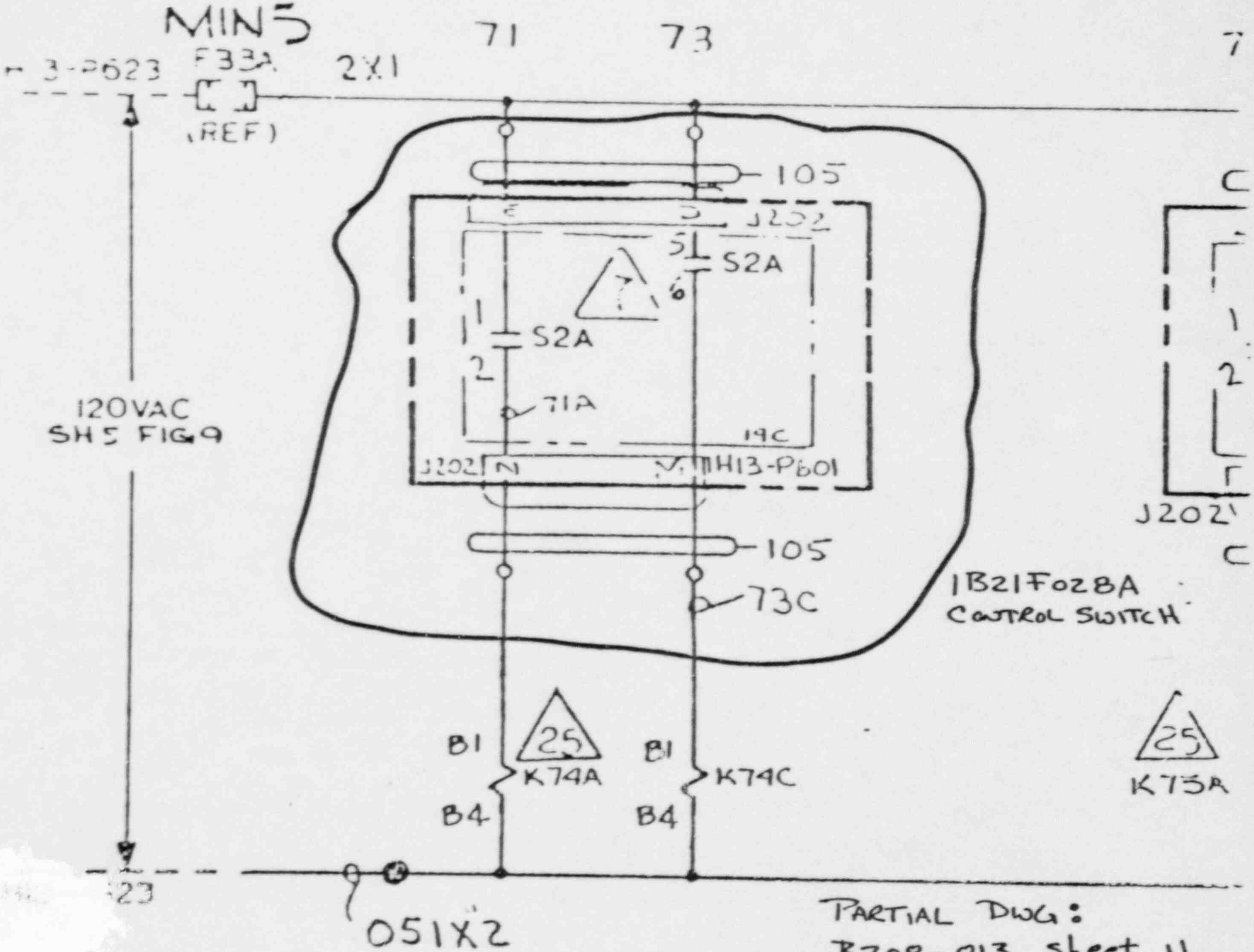
Conclusion

Unlikely that wiring or hot short is a potential cause.

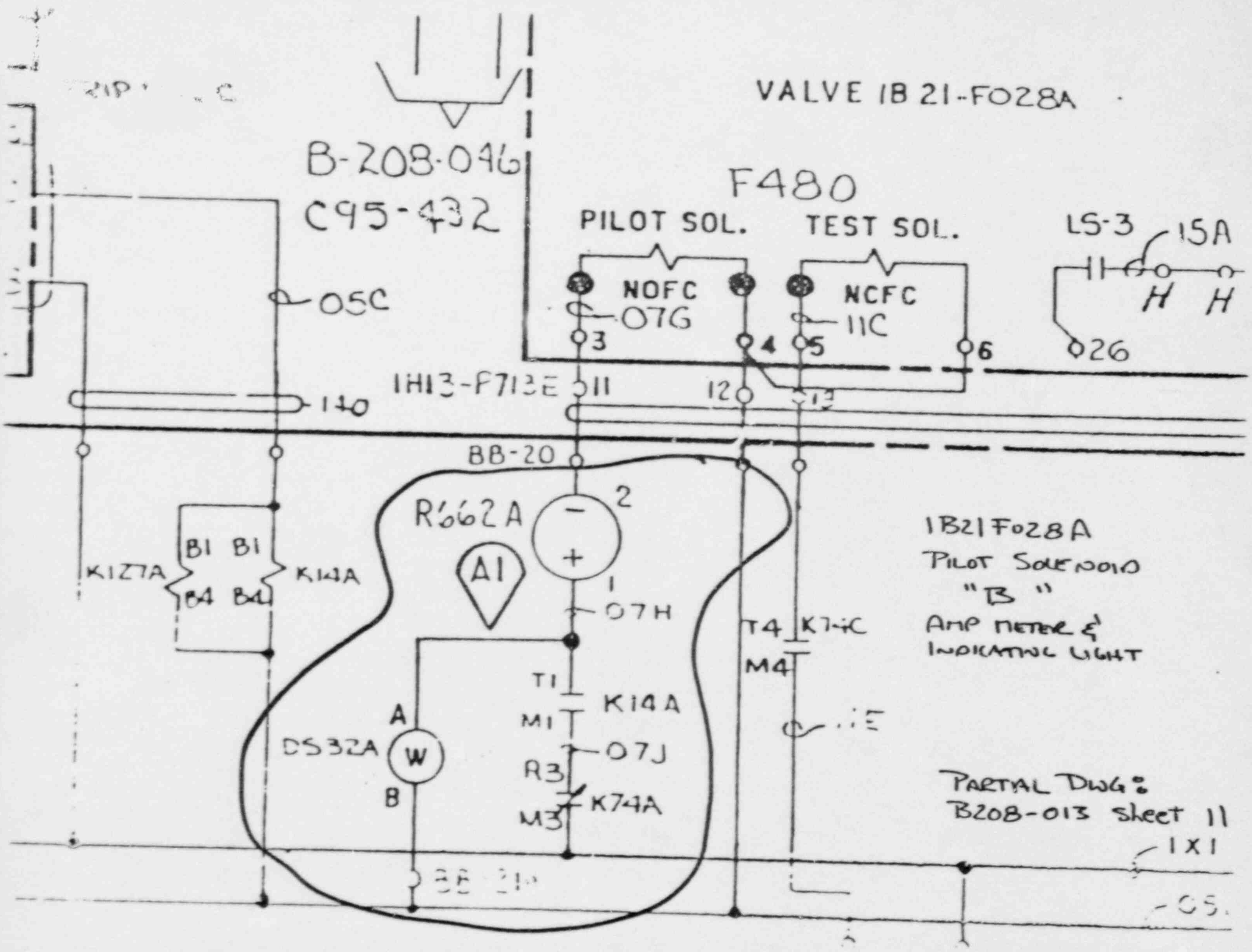


PARTIAL DWG of
D209-013 Sheet 2

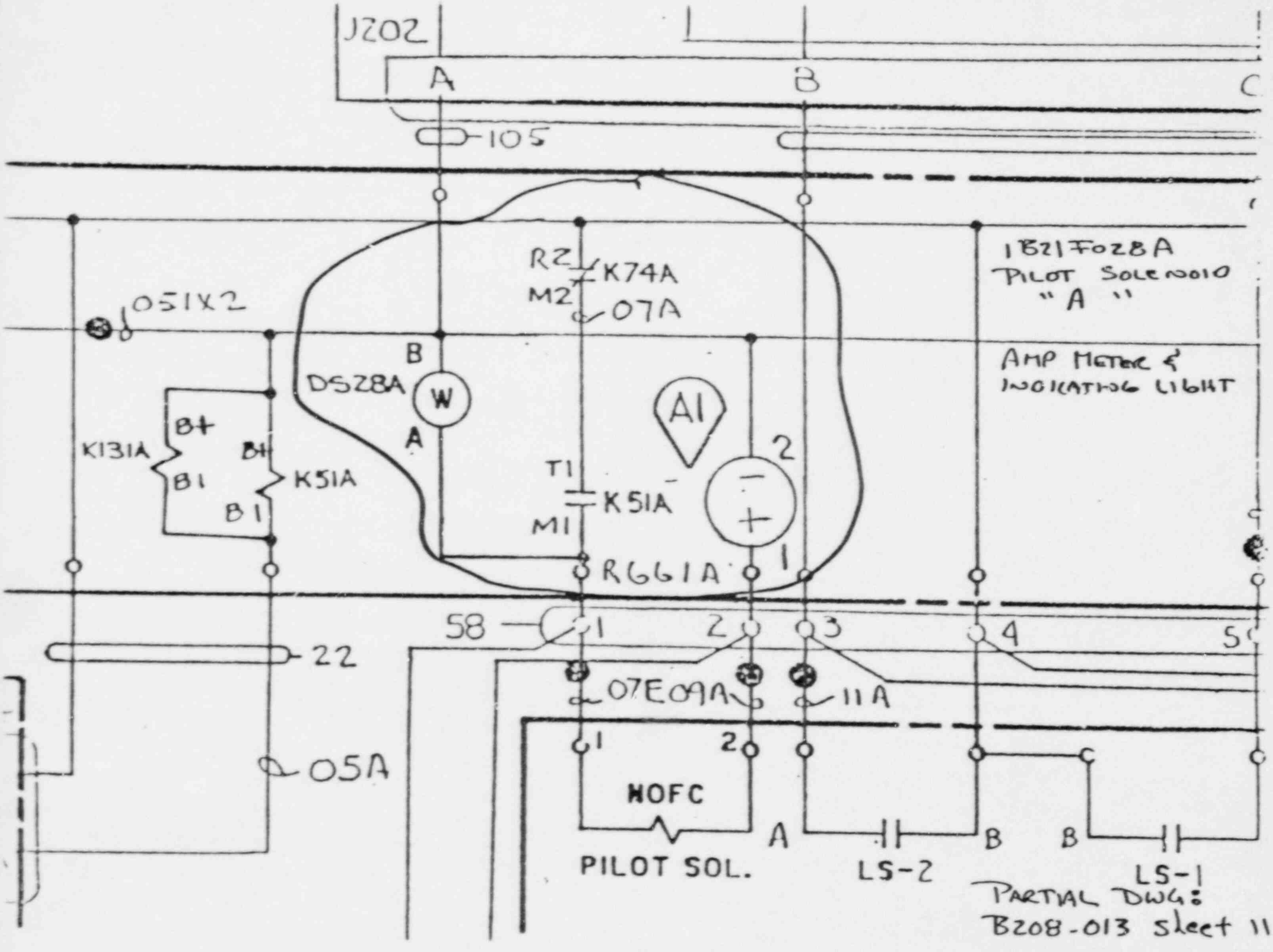

NOTE 2
(1B21-F460) SOLENOID VALVE JCT. BOX
JUNCTION BOX A
1B21 F022 A
SOLENOID VALVE
NOTE 4
AND
NOTE 7
6 B21H36:3A
5 B21H3615A
4 B21H3613A
3 B21H3611A
2 B21H3603A
1 B21H3601A
G
O
W
R
BK
NOT
NOTE 4
AND
NOTE 7
PARTIAL DWG:
D209-013 sheet 2



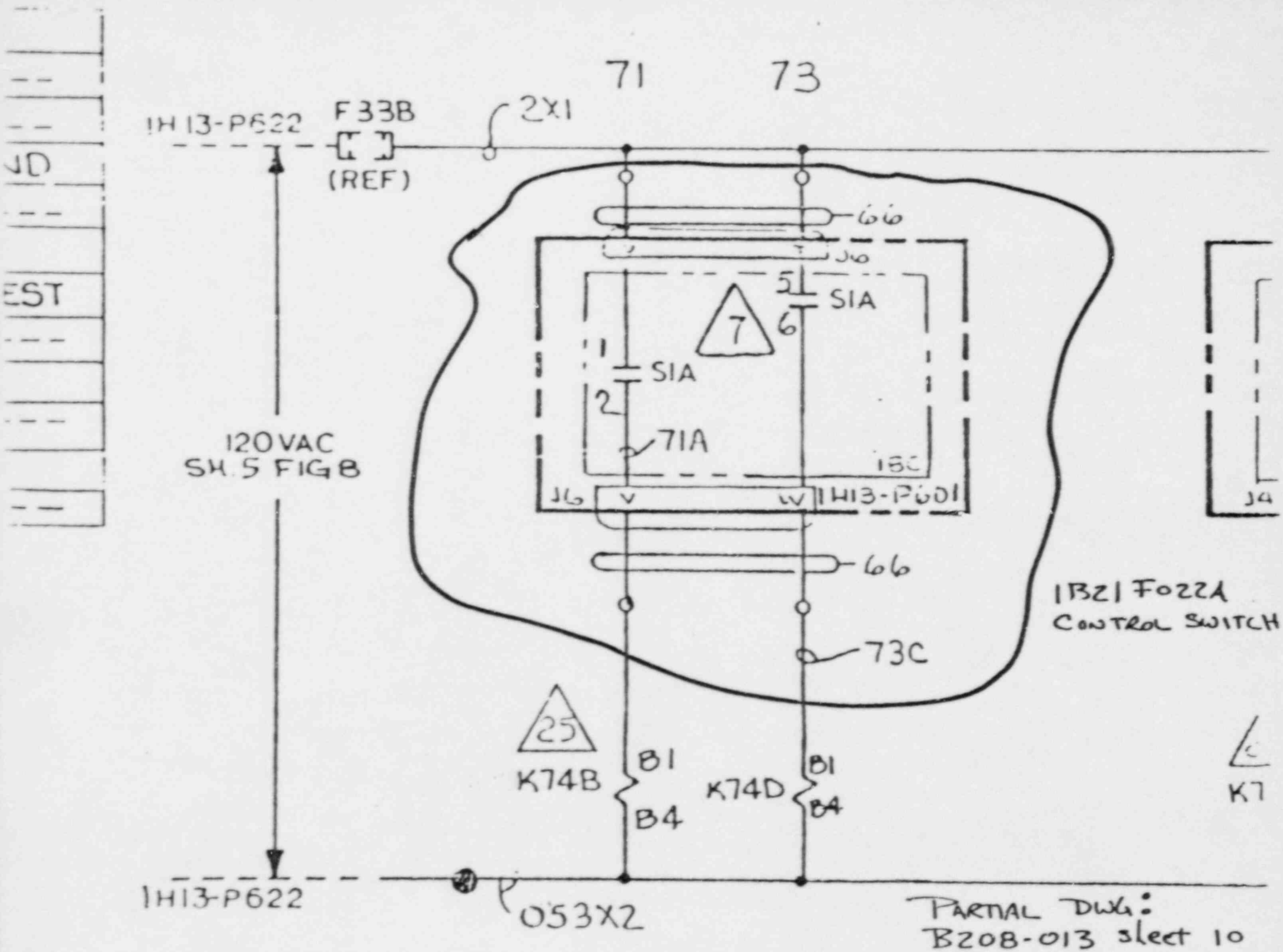
PARTIAL DWG:
B208-013 sheet 11

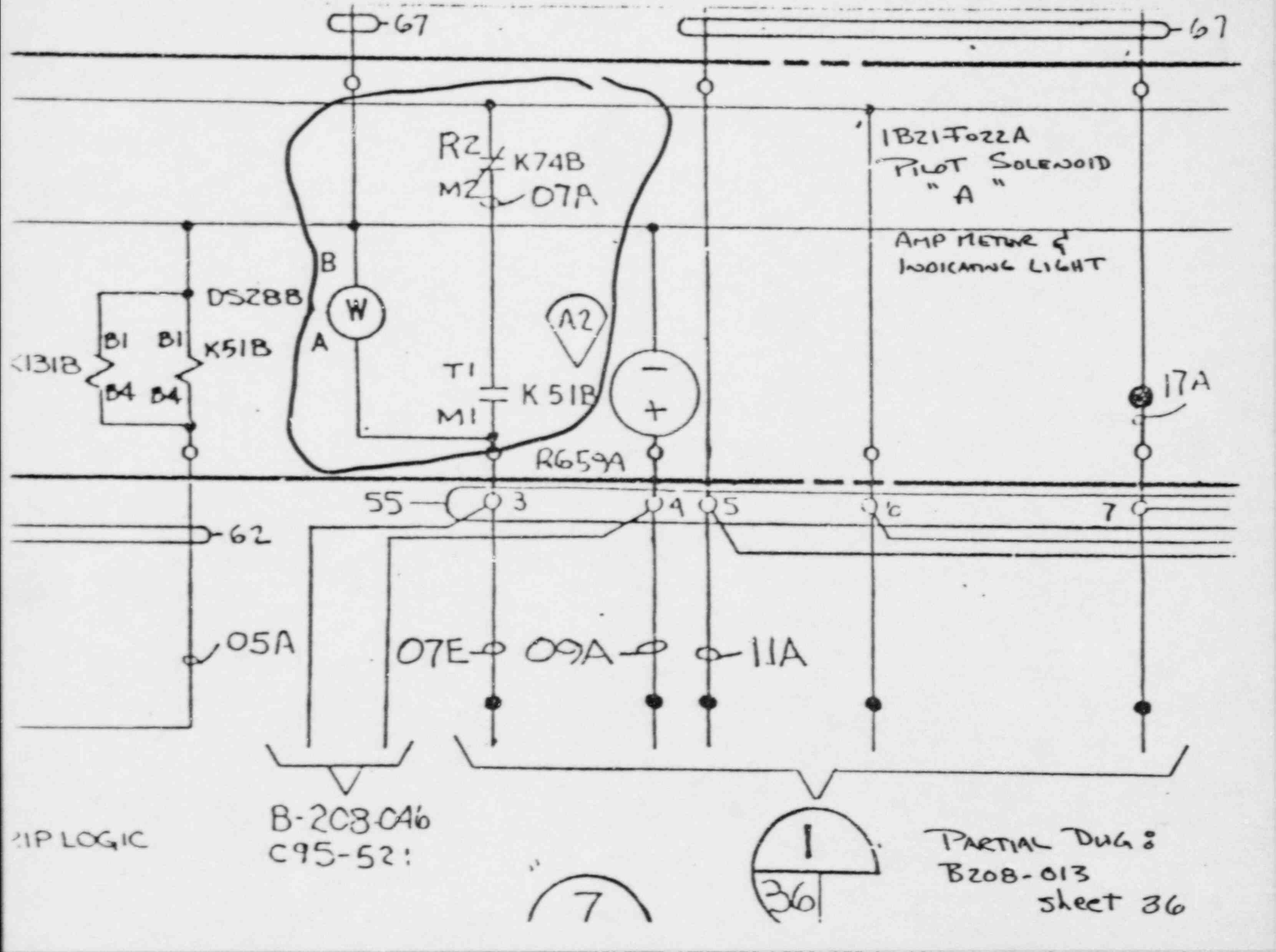


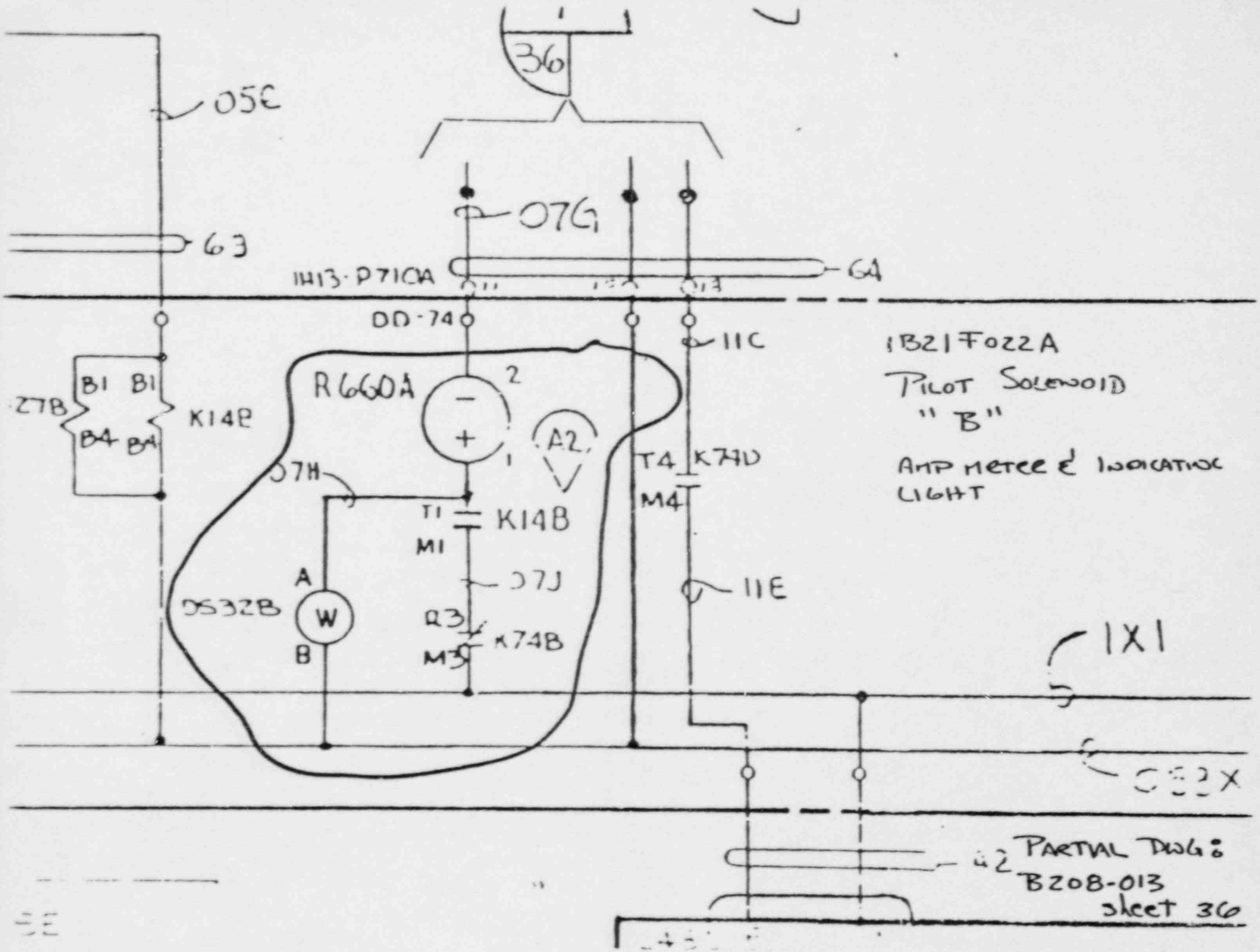
VALVE 1B 21-F028A
B-208-046
C95-432
F480
PILOT SOL.
TEST SOL.
LS-3
15A
NOFC
07G
NCFC
11C
H
H
3
4
5
6
26
05C
1H13-F713E
11
12
140
BB-20
R662A
2
A1
1
07H
K127A
B1
B1
K14A
B4
B4
T1
K14A
M1
07J
R3
K74A
M3
A
DS32A
W
B
T4
M4
1B21F028A
Pilot Solenoid
"B"
Amp meter &
Indicating Light
Partial Dwg:
B208-013 Sheet 11
1X1



J202
A
B
C
105
R2
K74A
M2
07A
1B21F028A
PILOT SOLENOID
"A"
051X2
B
DS28A
W
AMP METER &
INDICATING LIGHT
A1
B+
B+
K131A
B1
K51A
B1
A
2
T1
K51A
M1
R661A
1
58
1
2
3
4
5
22
07E09A
11A
05A
1
2
NOFC
A
B
B
PILOT SOL.
LS-2
LS-1
PARTIAL DWG:
B208-013 sheet 11


ND
EST
71
73
1H13-P622
F33B
(REF)
2X1
66
J6
5
6
S1A
7
1
S1A
2
71A
18C
J6
V
W
1H13-P601
66
J4
120VAC
SH.5 FIG8
1B21 F022A
CONTROL SWITCH
73C
25
K74B
B1
B4
K74D
B1
B4
K7
1H13-P622
053X2
PARTIAL DWG:
B208-013 sheet 10


67
67
R2
K74B
M2
07A
1B21-F022A
PILOT SOLENOID
"A"
AMP METER &
INDICATING LIGHT
B
DS28B
W
A2
A
B1
B1
K51B
K131B
B4
B4
T1
K51B
M1
17A
R659A
55
3
4
5
6
7
62
05A
07E
09A
11A
B-208-0A6
C95-52:
IP LOGIC
I
36
7
PARTIAL DWG:
B208-013
sheet 36



05E
63
36
07G
1H13-P710A
6A
DD-74
11C
1B21F022A
PILOT SOLENOID
"B"
AMP METER & INDICATING
LIGHT
R660A
2
1
A2
27B
B1 B1
B4 B4
K14B
07H
T1
M1
K14B
07J
R3
M3
K74B
DS32B
A
W
B
T4
K74D
M4
11E
1X1
42
PARTIAL DWG:
B208-013
sheet 36

Potential Cause

Glazed contacts on control and relay components creating a high resistance which would result in discontinuity and potential mis-operation of the MSIV circuitry.

Discussion

Contact integrity and circuit continuity of the respective solenoid valve coils is constantly monitored by measuring the coil circuit current, in addition to an indicating light (white) which relies on actuating contact integrity to remain energized. Refer to attached partial of drawing B-209-013, Sheet 10 and Sheet 11.

The isolation control circuit(s) are a "fail safe" design, which requires the solenoid coil to be energized to prevent an isolation. If contact glazing had occurred resulting in a discontinuity (high resistance at connection or contact points) in the control circuit(s), the resulting effects would cause the lack of voltage to the coil(s). This condition, due to the "fail safe" design, would cause an undesirable isolation (closure of the MSIV valves), rather than a failure to isolate.

References

D-208, Sheets H05, H10, H11 and H36.

Conclusion

Evidence of repetitive tasks to cycle these valves along with the proper configuration for power and control indication does not suggest any potential failure. Also, the control circuitry and electrical components for each of the inboard and outboard MSIVs are identical. In that there is no past or present evidence to support this cause scenario, it is highly unlikely that this is the root cause of the problem.

Potential Cause

Relay failure or incorrect operation resulting in mis-operation of the MSIV valves.

Discussion

The associated control and relay components are located in the PGCC which is designated as a non-harsh environment and is also seismically designed. Furthermore, this area is controlled for relative humidity and temperature. The likelihood of a failure or incorrect operation due to component failure is highly improbable in that this failure would have to occur on three (3) different MSIV logic/control circuits. The proper operation and closure of these valves and repetitive testing positively indicates that relay failure is not the cause. Also, as shown through testing and verification, the control functions and indication was correct.

Conclusion

Unlikely and highly improbable that relay failure is a potential cause.

Potential Cause

Panel control switch failure or mis-operation.

Discussion

The control switches nos. S1A-D and S2A-D are General Electric type CR2940, 3 position maintained contact switches. All of these are located in the PGCC. The control schematics, as shown per drawing B-208-013 Sheet 10 (inboard) and B-208-013 Sheet 11 (outboard), are identical. No test data or evidence has been identified to suggest a failure of the switches. Repetitive testing has demonstrated the proper operation of each of these control switches.

References

B-208-013 Sheet H04, H10, and H11.

Conclusion

Evidence of repeated acceptable testing to cycle these valves does not suggest any potential failure. As such it is highly unlikely that this is a potential root cause of the problem.

Potential Cause

Limit switch settings incorrect or inoperable.

Discussion

The limit switches (total of 6 each) for each of the MSIV inboard and outboard valves are NAMCO type, as furnished by Atwood & Morrill Company. These limit switches are not an active component in the control scheme which initiates opening or closure of the respective MSIV valves, rather they monitor and provide local indication in the control room for valve position. Refer to elementary drawings B-208-013 Sheets H10, H11, and H36.

The potential for inaccurate limit switch settings is possible, but other independent sources can verify and provide indication for closure or opening of the valves via instantaneous steam flow and steam line pressure. Again, this issue would not impact the actual operation of the valves.

References

B-208-013 Sheets H10, H11, and H36.

Conclusion

In that the limit switches are not part of the control circuits, mis-operation would not affect valve closure.

Potential Cause

Miswiring for indication of instrumentation or switches.

Discussion

This potential cause was recently a problem wherein the "A" and "B" solenoid valves were wired to a common Reactor Protection System (RPS) bus. The basis of the design requires that each of the trip solenoids A and B for each of the MSIVs be wired to different RPS buses. This issue was corrected via the preparation and issue of Design Change Package (DCP) 870414. As part of this design package and a prerequisite for start-up, each of the MSIVs were verified and tested for applicable power sources and functional operations. The probability of additional wiring errors is highly unlikely in that repetitive testing of these valves did not indicate mis-operation.

References

B-208-013 Sheets H05, H10, H11, and H36.

Conclusion

Although this item was a problem previously, it is highly unlikely that a similar type of problem could be the root cause. The efforts to resolve this RPS problem, retesting and management exposure significantly rule out this potential cause. Also, recent testing of the specific valves in question indicate that the instrumentation and switches are correct.

Potential Cause

Data acquisition failure.

Discussion

Failure in the data acquisition and recording system could lead to improper assessment of closing speed.

Valve speed data is taken and recorded using the TRA subsystem of ERIS. This system has the capability to sample data from a wide variety of signals for later analysis. Data on reactor power, steam flow, reactor pressure, limit switch position, and solenoid current are all consistent. Measurements exterior to ERIS, main control panel and back panel indicating lights, for example, are also consistent with the ERIS data. In summary, multiple concurrent failures necessary for this scenario to occur make it incredible.

Conclusion

Highly unlikely to be occurring.

Potential Cause

Procedural error for testing. Most previous fast speed MSIV closures have been performed using SVI B21-T2001. The first failure was noted while performing the test per STI-B21-025A section 8.3 and the remaining failures were noted while performing the MSIV strokes using the system operating instruction (S.O.I.)

Discussion

Although most previous tests have been performed using the SVI, this is not the first time that an STI has been performed. As early as 10/12/86, STI-B21-025A section 8.1 was used to fast stroke the valves. Additionally, the use of the SOI has been demonstrated before and after the failures. During the B21-F022D, B21-F028B, and B21-F028D failure on 10/29/87 and the B21-F022D and B21-F028D failure on 11/3/87, the SOI was used. However, this is the same SOI that was used for the remaining valves which passed their stroke time.

Conclusion

It is highly unlikely that there is a procedure problem.

Potential Cause

High Steam Flow/High Reactor Power Interaction. All previous low and high speed MSIV closure tests have been performed at low to medium reactor power. The potential exists that the higher steam flows associated with high reactor power could interfere with MSIV closure.

Discussion

Although all previous tests have been run at low power, the valve design basis is closure at full flow, and the capability of the valve to close under full power conditions has been demonstrated numerous times at numerous operating BWRs. The valves that showed delayed closure are identical in design to valves that closed within specifications, and the affected valves closed successfully following cycling. The valve design is such that pressure drop associated with steam flow will actually assist in closing the valve.

Conclusion

It is highly unlikely that this is the cause of the problem.

Potential Cause

Incorrect reassembly and installation of the air pack. The air packs were all removed, but not disassembled, during the September 22, 1987 forced MSIV outage. The purpose for removing all of the air packs was to allow for temporary air supply to be installed and allow local stroking of the MSIV to check stroke measurements.

Discussion

During the September 1987 outage all air packs were removed from the MSIVs to facilitate local stroking of each valve to set the stroke length. After final reinstallation of the air packs there were several fast and slow strokes performed. These strokes were performed using SVI C71-T0039 and SVI B21-T2001. Even though SVI C71-T0039 (slow stroke testing) does not test the same valves as SVI B21T2001 (fast stroke testing) the same air pack is used and the mating surface between the air pack and actuator remains the same, as do all hose connections.

Conclusion

It is highly unlikely that this is the problem due to the number of strokes performed after reassembly.

Potential Cause

Actuator binding/stem binding

Discussion

Binding of the actuator internals for both the hydraulic and pneumatic assemblies is highly unlikely. Neither assembly is subject to external loads to cause stem bending. The hydraulics are not subject to external particulate contamination and contamination within the main air cylinder may score the cylinder but could not likely stop the movement by resisting the air pressure force.

Conclusion

This cause would likely have shown up during prior history of stroking the valves and would not likely apply to multiple valves at one time. Nor would such binding likely apply to the top of stroke only. Thus this cause is estimated to be highly improbable.

SECTION 4

FAILURE ROOT CAUSE DESCRIPTIONS

Potential Cause

Local High temperature has caused deterioration of EPDM seal materials.

Discussion

Perry has experienced drywell and steam tunnel temperatures which have approached the Tech Spec limits during much of the startup test program. Figure 1 gives a history of the bulk drywell temperature since June of this year. In addition, localized temperatures in excess of the bulk drywell temperature during the past year. In addition, localized temperatures in excess of the bulk drywell temperature can be postulated to have occurred due to steam leakage from several valves. In particular, main steam isolation valve B21-F022B had a major steam leak just prior to the actuator/stem separation incident during September 1987. Leakage control system valves E32-F001N has also experienced several body to bonnet steam leaks. Figure 2 shows the physical location of these valves relative to the location of MSIVs B21-F022D, B21-F028B, and B21-F028D. One of the solenoids from B21-F028D was found to have rust and corrosion, indicative of a steam environment.

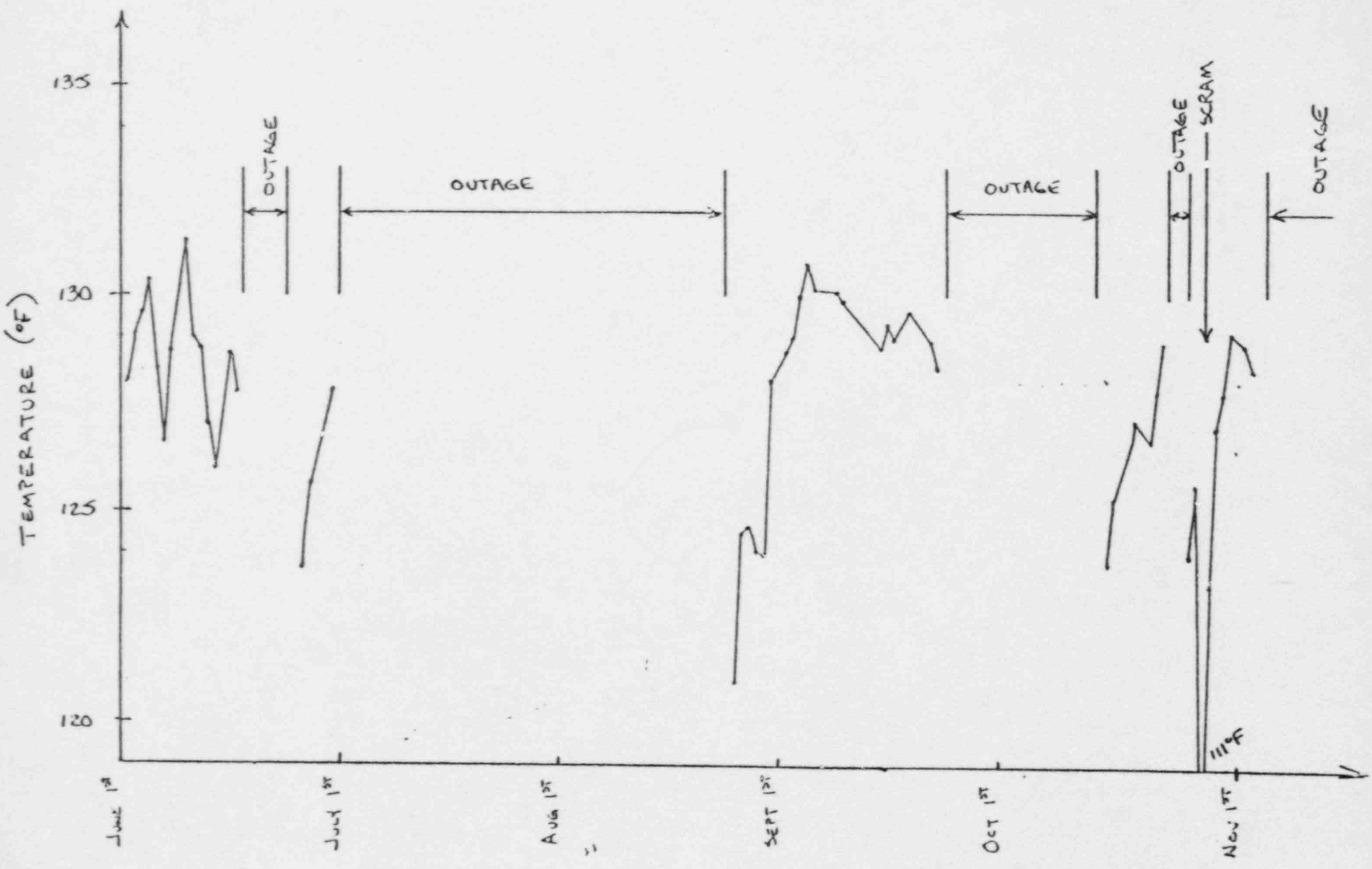
Adiabatic expansion of steam from 1000 psia to 15 psia will result in a steam jet temperature of about 300°F. This jet will, of course, rapidly cool and condense to saturation at drywell conditions. This local condition, along with the proximity of the leaking valves to the MSIVs which failed to close is indicative of a temperature related cause.

Discussions with Automatic Switch Company (ASCO), the manufacturer of the failed component, has indicated that elevated temperature is a potential cause of the hardening of the proprietary EPDM rubber compound used for the valve seals and o-rings. Seals and O-rings taken from MSIV solenoids for valves that had not demonstrated delayed closing do not have the level of degradation seen in seals from the failed valves. In particular, preliminary inspection of the seals from MSIV B21-F028C indicated this valve to have seals in a near-new condition. As shown in Figure 3 arrangement of ventilation in the steam tunnel is such that this valve would be expected to see the lowest ambient temperature, and conversely, F028D & B would see the highest ambient temperature. In combinatin with the previously discussed steam leakage, it is clear that F028D & B have been exposed to higher than expected ambient temperature.

Conclusion

Elevated local temperature is the most probable cause for degradation of the EPDM seals in the ASCO Model 8323 pilot solenoid valve. The material is known to be temperature sensitive, the potential for elevated temperature has been shown to exist, and the best performing valves are in the lowest temperature locations.

FIGURE 1
BULK DRYWELL TEMPERATURES



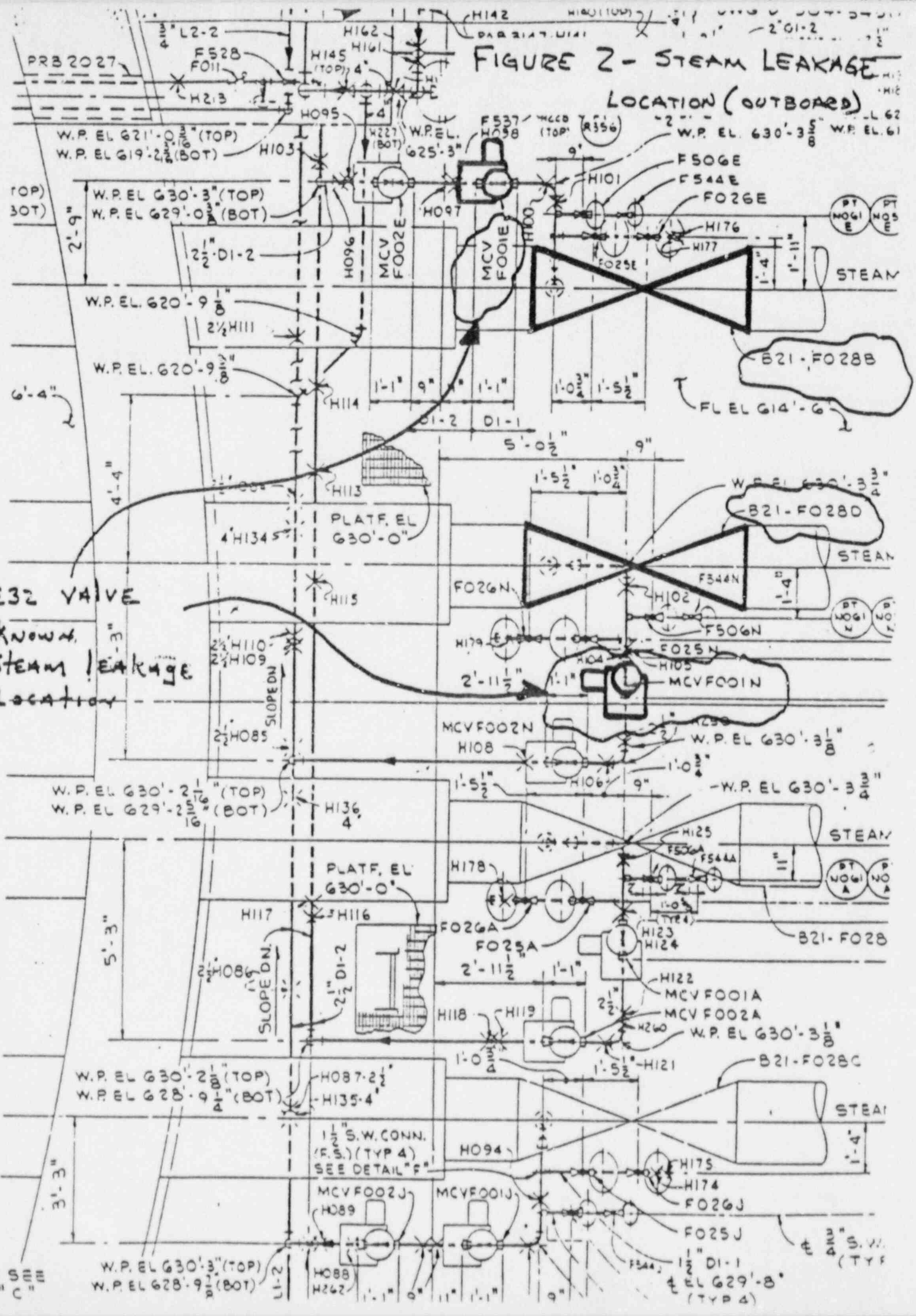
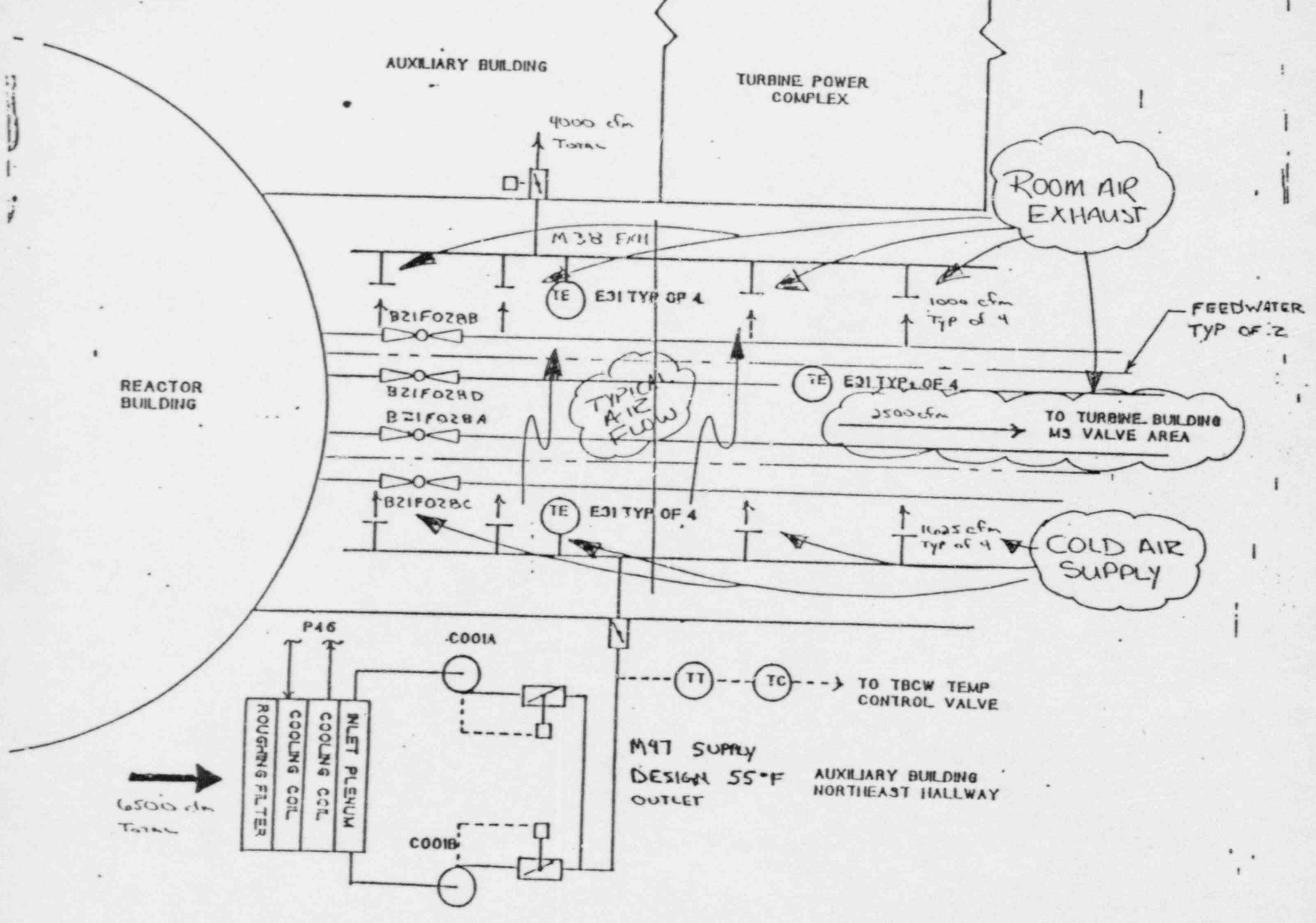


FIGURE 2 - STEAM LEAKAGE LOCATION (OUTBOARD)

FIGURE 3 - STEAM TUNNEL VENTILATION AIR FLOW



Potential Cause

Blockage of the dual solenoid valve exhaust port with tape.

Discussion

During the previous MSIV refurbishment where the air packs were removed, duct tape was used to cover exposed ports, including the solenoid valve exhaust port. On F028D the exhaust port tape had apparently not been removed following the refurbishment. Blockage of the solenoid valve exhaust port could delay the closure of the MSIV.

However, the strength of the tape adhesive is considered weak compared to the pneumatic pressure forces. Typically, the tape will blow outward, remaining connected on one side during de-energization and fall back in place like a flap. Further tests of the F028D valve has verified the tape is not an effective block.

Conclusion

Very unlikely to be occurring.

Potential Cause

Jamming of kinematic components.

Discussion

In order for the valve to shift to the de-energized condition, both solenoid movable cores must slide within their guides. The disc holder assembly is also a guided component which must shift for the valve to operate.

Failure of the components to shift may be caused by foreign material contamination of the sliding surfaces, either particulate or fluid (adhesive in nature), or by physical damage to the valve parts.

Examination of the F022D valve, and the air supply system has not identified any unusual substances or damage which could explain the MSIV delayed closure condition. Considering the proportion of valves which demonstrated the delayed closure (3 of 8), an extremely dirty system would be expected for this effect.

Conclusion

Unlikely to be occurring.

Potential Cause

Oxidation of EPDM rubber compound used in gaskets, seals and disc seal materials.

Discussion

Oxidation of EPDM rubber in the presence of a brass catalyst has been suggested as cause for a similar incident at Brunswick-2. This has been documented in INPO Significant Event Report 57-85. Review of SER 57-85 indicates that although catalytic oxidation is a potential cause for the Brunswick situation, that utility was never able to determine the exact cause for EPDM degradation. There is, however, a relatively large data base for use of EPDM elastomer in brass valve bodies with acceptable results. The solenoid valve supplier has stated that there is no evidence to suggest that catalytic oxidation has ever occurred. The condition of other Perry valves would be expected to be similar if oxidation were at fault. This has not occurred.

Conclusion

Catalytic oxidation of EPDM in the presence of brass cannot be completely ruled out as the root cause for pilot valve failure. While postulated as a failure mechanism, its validity has not been proven. If catalytic oxidation does play a part, it is most likely as a contributing factor, in the high temperature scenario, for example.

Potential Cause

Residual magnetism following coil de-energization.

Discussion

Sufficient residual magnetism of the ferritic steel materials in the region of the coil could cause the valve to remain open following de-energization.

No similar experience has been found elsewhere. The ASCO valve representative has identified that the solenoid valve return spring is sufficiently strong to overcome residual magnetism of the ferritic steel components. Any residual magnetic forces would be low compared to the closure force unless additional magnetic mass was added to the coil vicinity.

Conclusion

Unlikely to be occurring.

Potential Cause

Wrong materials.

Discussion

This failure root cause description considers the use of wrong materials for the disc holder elastomer seal. The potential for wrong lubricant is considered separately.

Dimpling of the disc holder seal in the dual solenoid valve is postulated to result in wedging of the seal in the exhaust to cylinder port. The use of a wrong material could result in the observed dimpling. The proper disc material is an ASCO proprietary EPDM, utilized in their nuclear qualified valves. Material problems may include the following:

- Wrong material of lower strength or thermal capability.
- Improperly cured EPDM.
- Improperly formulated EPDM.

An analysis of the disc material may be performed to identify the material or formulation; however, it is unlikely to determine the relative cure of the compound.

Conclusion

This is not expected to be occurring, and will be confirmed by material analyses.

Potential Cause

Locaseal vapors

Discussion

In order to seal the solenoid housings on the solenoid valves a Locaseal is poured in the opening and allowed to cure. The compounds contain no oils, solvents or reactive materials. Also, the alkylated phenols and aromatic amines are highly cross-linked and polymerized. This configuration does not allow the release of hydrocarbons. Furthermore, the lowest temperature that decomposition takes place would be approximately 500 degrees F. The ambient temperature of the air pack assemblies are greatly below 500 degrees F.

Conclusion

Unlikely to be occurring.

Potential Cause

O-ring/lubricant interaction

Discussion

During the disassembly and inspection of the ASCO dual solenoid valves, the three body gaskets (o-rings) were found to be significantly degraded. Degradation included hardening, flattening and adherence to the mating valve body.

The observed condition of the gaskets could be caused by an improper lubricant. The EPDM gaskets are susceptible to hydrocarbon oils. Normally a silicone oil (Dow Corning 550) is used as a gasket lubricant. EPDM is compatible with silicone fluids.

The degradation of the gaskets could not affect the valve itself, as they are located away from the moving components. However, vapors from the lubricant (no signs of fluid migration were observed) could result in softening of the disc pads resulting in the dimple effect suspected as being the physical cause of adherence.

Conclusion

Possible but unlikely since similar valves have not shown the same condition. The o-rings will be investigated for proper material and lubricant.

Potential Cause

Corrosion within solenoid enclosure.

Discussion

The "B" coil housing in the F028 MSIV dual solenoid valve was found to contain moisture and corrosion. Corrosion within the solenoid coil housing cannot affect the valve internals as the valve body is protected from external contamination through body gasket seals in the vicinity of the coil. The subject coil ("B" side) is the lower coil, such that any corrosion products escaping the coil enclosure would fall down away from the solenoid valve body. Additionally, corrosion products were not found within the valve body.

Conclusion

Very unlikely to affect performance.

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
PERRY NUCLEAR POWER PLANT

MEMORANDUM

TO W. Kanda ROOM SB314 FROM K. Matheny KAM DATE November 9, 1987
PHONE 6710 ROOM E290
SUBJECT MSIV Temperature Monitoring

Please find attached information for the MSIV Temperature Monitoring to be installed prior to start-up. This has been discussed with Phil Cherry prior to issuance of this memo and he is in tune with our (EQ's) request for this monitoring. A work request has been submitted to have the monitoring equipment installed.

When it has been determined that Monitoring of the MSIV's inside drywell is possible we will be glad to assist in determining the locations for these monitors.

If you have any questions or concerns please feel free to contact Larry Christ at extension 6676 during working hours (day shift) of after hours, home phone 255-2357.

Prepared by:

L. Christ

KAM/njc

cc: V. Concel
B. Walrath
A. Killian
J. Cichello
S. Litchfield
L. Christ
G. Dunn

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

June 6, 1979

IE Bulletin No. 79-01A

SUPPLEMENT NO. 79-01A TO IE BULLETIN 79-01 - ENVIRONMENTAL QUALIFICATION OF CLASS 1E EQUIPMENT (DEFICIENCIES IN THE ENVIRONMENTAL QUALIFICATION OF ASCO SOLENOID VALVES)

Description of Circumstances:

Recently, a noncompliance report under 10 CFR Part 21 was received by the NRC from the Henry Pratt Company, manufacturer of butterfly valves which are installed in the primary containment at the Three Mile Island Unit 2 Nuclear Station. These butterfly valves are used for purge and exhaust purposes and are required to operate during accident conditions. The report discusses the use of an unqualified solenoid valve for a safety-related valve function which requires operation under accident conditions. The solenoid valve in question is Catalogue No. HT-8331A45, manufactured by the Automatic Switch Company (ASCO) of Florham Park, New Jersey. This pilot valve is used to pilot control the pneumatic valve actuators which are installed on the containment ventilation butterfly valves at this facility.

The deficiency in these solenoid valves identified in the Part 21 Report concerns the parts made of acetal plastic material. The acetal disc holder assembly and bottom plug in the pilot valve assembly are stated by ASCO to have a maximum service limit of 400,000 Rad integrated dosage and 200 degrees F temperature. According to ASCO, exposure of these acetal plastic parts to specified maximum environmental conditions may render the solenoid pilot valve inoperable which would cause the associated butterfly valve to malfunction.

Further investigation at ASCO by the NRC staff has revealed that the valve seals in most ASCO solenoid valves contain Buna "N" elastomer material, which reportedly has a maximum service limit of 7,000,000 Rad integrated dosage and 180 degrees F temperature. The investigation further revealed that ASCO has available a line of qualified solenoid operated pilot valves (ASCO Catalogue No. NP-1) which have no plastic parts, utilize ethylene propylene or viton elastomers and have a continuously energized operating life of four years, under normal ambient conditions up to 140 degrees F. According to the manufacturer, at the end of this period, the coil, manual operator (optional feature) and all resilient parts must be replaced. These preventive maintenance instructions are specified in the installation and instruction bulletins which are provided to the purchaser with each shipment of solenoid valves.

The final items of concern identified during this investigation deals with the application of Class "A", "B", or "F", solenoid coils which are exposed to an accident environment. In this regard, ASCO representatives stated that the

B/97

high temperature coils identified as Class "HT" or "HB" are the only coils considered suitable for service under accident conditions; whereas, Class "A", "B", and "F" coils are not.

With respect to the corrective measures to be taken to resolve the above concerns, ASCO recommends the following:

1. The parts of the solenoid valve made of acetal plastic material should be replaced with similar parts made of metal which can be provided by ASCO.

2. The valve seals and gaskets which are made of Buna "N" material should be replaced with either ethylene propylene or viton elastomers, considered by ASCO as suitable for the service intended.

3. Review and determine that the coils of the solenoid valves installed inside containment are Class "HT" or "HB" as required for high temperature environmental conditions.

4. Review and determine that the solenoid enclosures installed inside containment have at least a NEMA 4 enclosure rating.

5. Establish a preventive maintenance program to assure replacement of those valve parts identified above in the time period recommended in the appropriate ASCO valve bulletin.

6. ASCO also stated that all unqualified solenoid valves inside containment be retrofitted to qualified ASCO No. NP-1 valves in lieu of the above.

7. Questions from licensees to ASCO concerning corrective measures should reference both catalogue and serial numbers of each valve in question. These numbers are stamped on the metal nameplate on each solenoid valve.

Action to be Taken by Licensees of all Power Reactor Facilities (except those 11 SEP Plants listed on Enclosure 3) with an Operating License:

1. Determine whether or not ASCO solenoid valves are used or planned for use in safety-related systems at your facility(ies).

2. If such valves are used or planned for use, identify the safety system involved and determine that: (a) valves which could be subjected to a LOCA environment are qualified to that environment. Specifically that no parts made of acetal plastic or Buna "N" materials or Class "A", "B", or "F" solenoid coils are used in such valves; (b) a preventive maintenance program is being conducted such that the solenoid coil, the manual operator (if applicable), and the resilient parts of the valve are being replaced in accordance with the time period established by the manufacturer and documented as the qualified life of the assembled component.

3. All holders of operating licenses of power reactor facilities are obligated to meet the review and reporting requirements established in previously issued IE Bulletin 79-01, regarding environmental qualification of electrical equipment installed in their plants.

No additional written response to this Supplement IE Bulletin is required other than those responses described above. NRC inspectors will continue to monitor the licensees' progress in completing the requested action described above. If additional information is required, contact the Director of the appro riate NRC Regional Office.

Approved by GAO, B180225 (R0072); clearance expires 7/31/80. Approval was given under a blanket clearance specifically for identified generic problems.

Enclosures:
1. List of IE Bulletins Issued in the past 12 months
2. List of SEP Plants (11)

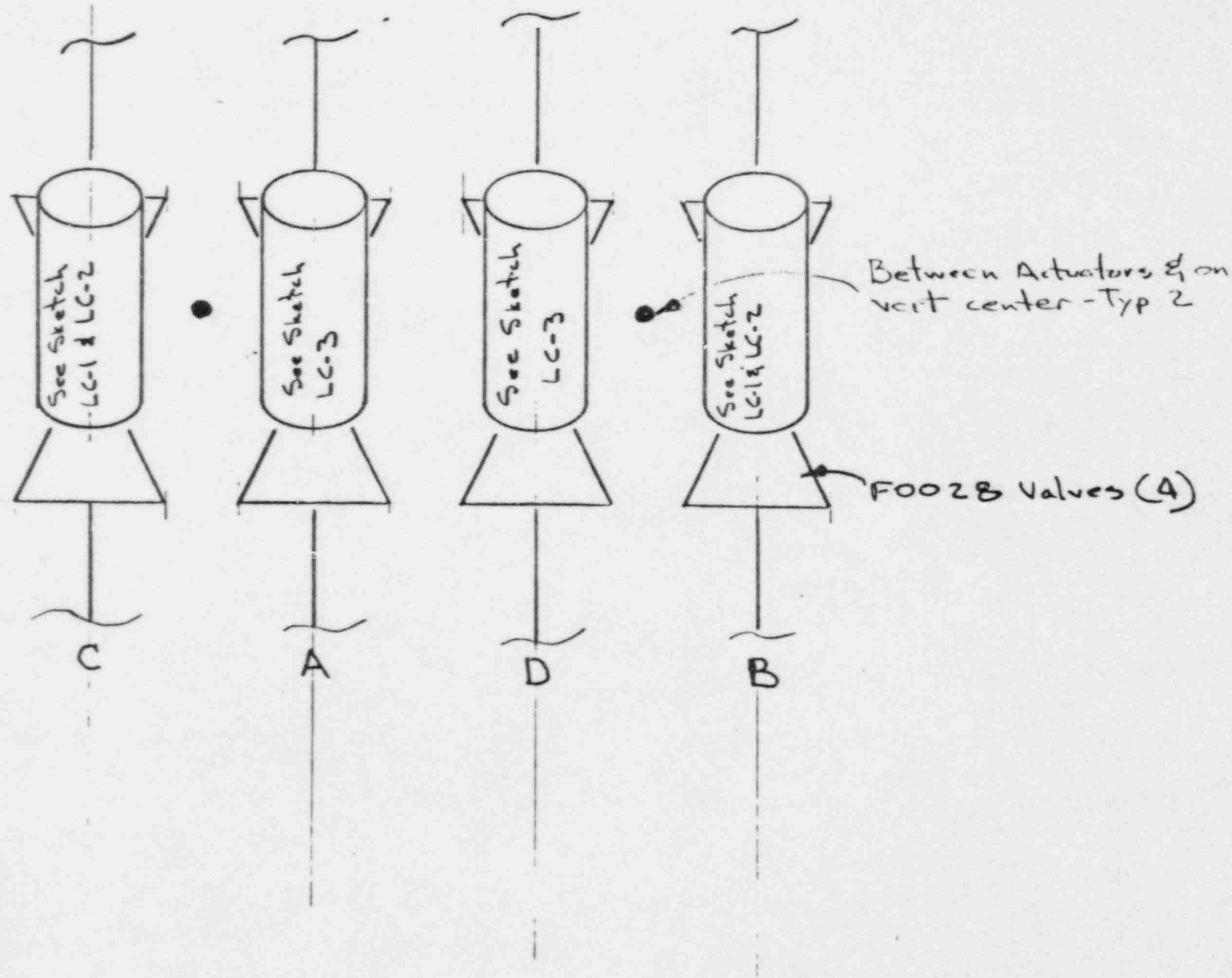
- Format for MSIV Monitoring -

A. Monitor Locations & Specifics

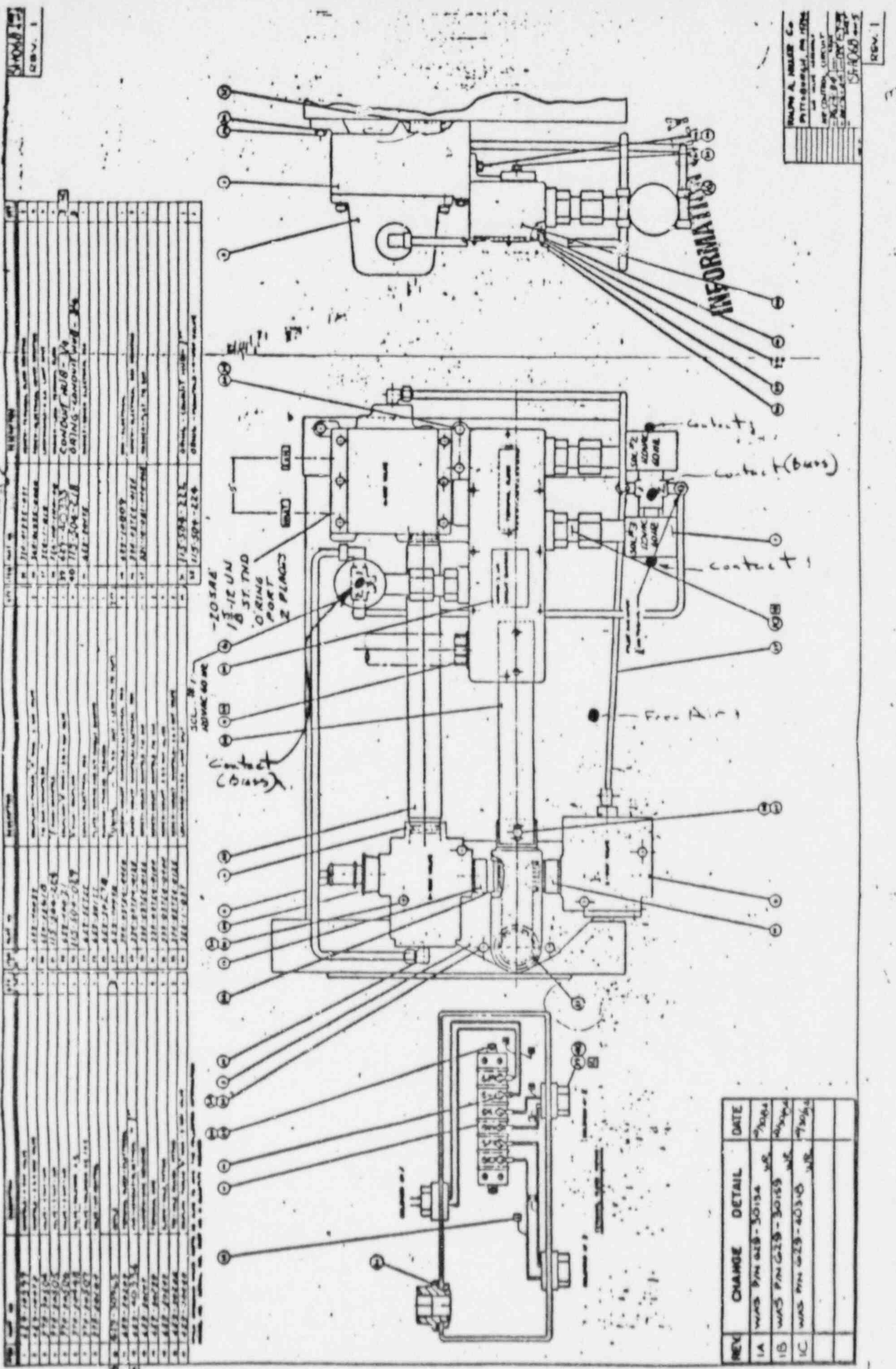
1. See sketches LCMP1, LC-1, LC-2, & LC-3
2. Total of 22 points
3. Each point to have a unique identifier related to its location
4. All charts, printouts etc. shall be marked with unique number for identification
5. Verification of location is required
6. Accurace of instrument ± 5°F.
7. All tapes (origionals) or computer printouts of data obtained is to be forwarded to Larry Christ (E-290) for retention & analysis.
8. Monitoring is not to be removed without the signed approval of Larry Christ or Stuart Litchfield.

B. When to record

1. After tagout cleared, solenoid valves energized, and prior to start-up. — 1 hr. recording
2. 25% power - 1hr. recording
3. 50% power - 1hr. recording
4. 75% power - 1hr. recording
5. 100% power - 1 hour recording every 24 hours for a 2 week period
6. None of these recordings are to be a restraint to power escalation. An attempt is to be made to obtain these recordings as close to the power ranges as possible.

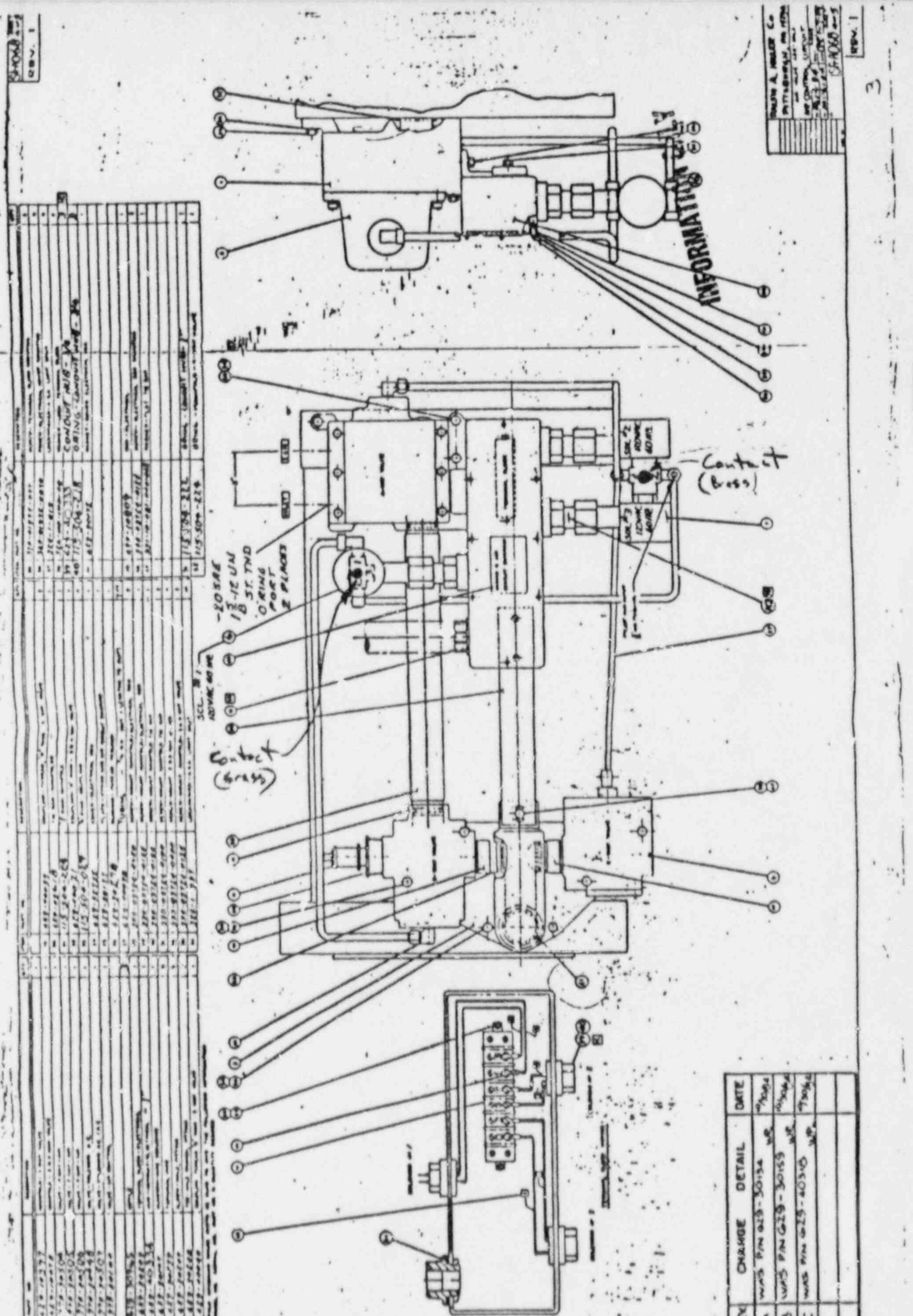


SKETCH LCMP-1



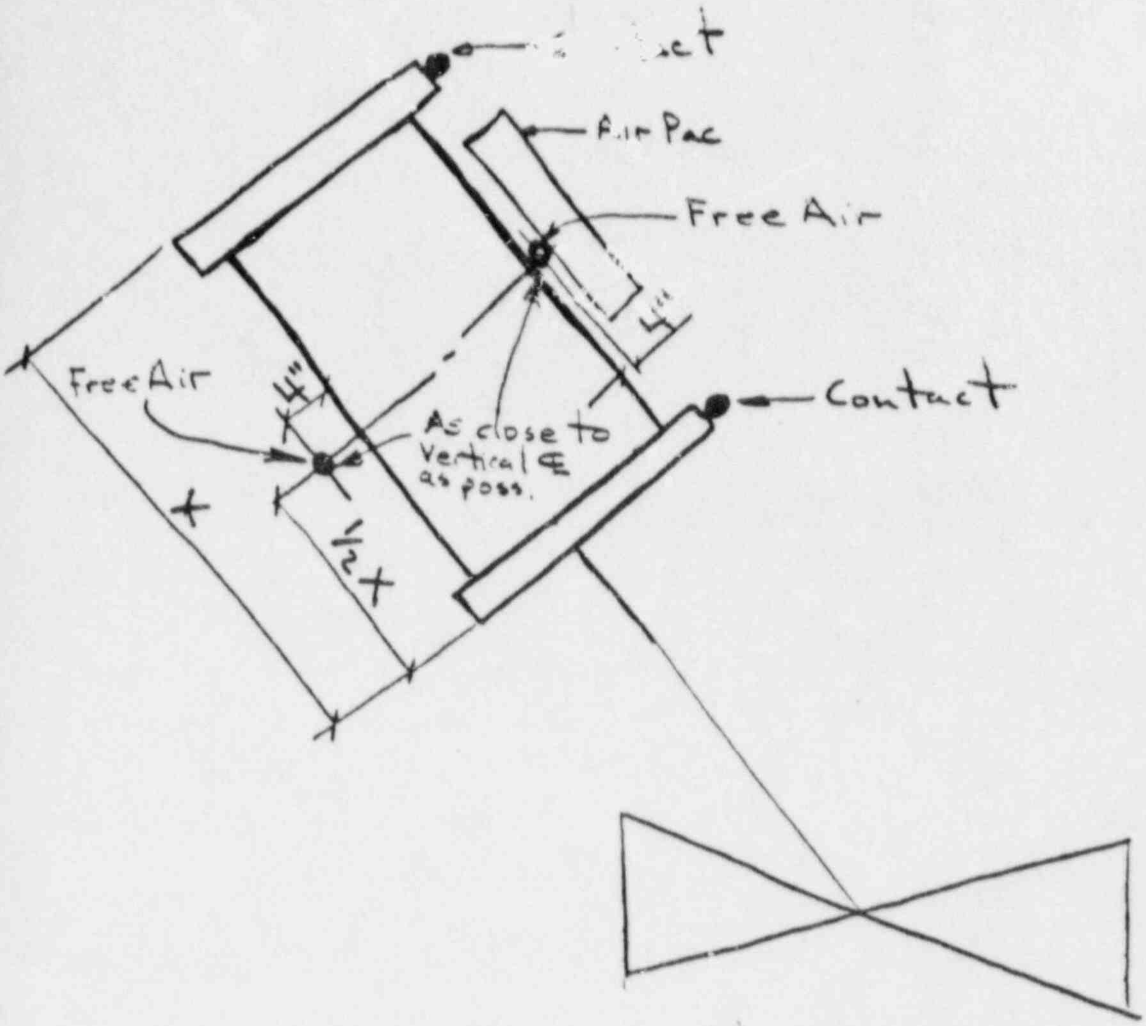
SKETCH LC-1

VALVES F0028B & F0028C



SKETCH LC-3

VALVES F0028A & F0028D



VALVES F0028B & F0028C

SKETCH LC-2

TEMP CHANGE # 10 PAGE 3 OF 17

TEMP CHANGE # 9 PAGE 1 OF 2

TEMP CHANGE # 8 PAGE 4 OF 21

● 8. Verify the Calibration Due Date is current on all test equipment. Attachment 1.

● 9. Record all test instruments, MPL, Cal Date, and Cal Due Date. Attachment 2.

TC 8

10. Verify the following: Attachment ~~2~~ 1.

● a. Switch 1C71A-S6A MAIN STEAM LINE ISOL VALVE TEST (P691) is in the NORM position.

● b. Switch 1C71A-S6B MAIN STEAM LINE ISOL VALVE TEST (P692) is in the NORM position.

● c. Switch 1C71A-S6C MAIN STEAM LINE ISOL VALVE TEST (P693) is in the NORM position.

● d. Switch 1C71A-S6D MAIN STEAM LINE ISOL VALVE TEST (P694) is in the NORM position.

5.0 SURVEILLANCE INSTRUCTION

5.1 Surveillance Test

● 1. Obtain the Supervising Operator's "Authorization to Start Test" signature on the Data Package Cover Sheet.

2. ~~Inform Supervising Operator that the following annunciators will come on and reset during this surveillance:~~

TC 10

a. ~~RPS MSIV CLOSURE (P680-5A-A6) (MODE 1 only)~~

b. c. DELETED

TC 9 | TC 8

TC
8

TEMP CHANGE
8
PAGE 5 OF 21

(PAGE INTENTIONALLY LEFT BLANK)

TC 8

5. Connect Digital Multimeter (DMM-1) to terminals B and C of relay 1C71A-K3A (P691) (set to ohms).

6. Connect Digital Multimeter (DMM-2) to terminals B and C of relay 1C71A-K3B (P692) (set to ohms).

@ 7. Inform Unit Supervisor that the MSIV's will be stroked. Record time and date. Obtain U.S. signature. Attachment 2.

@ 8. Request Supervising Operator to place MSL A INBD MSIV 1B21-F022A switch (P601-18C) to TEST. Attachment 2.

@ 9. Request Supervising Operator to place MSL A OTBD MSIV 1B21-F028A switch (P601-19C) to TEST. Attachment 2.

TC 10

10. Request Supervising Operator to depress and hold MSL A INBD MSIV TEST switch 1B21H-S3A (P601-18C) until the following occurs, then release switch: Attachment 2.

@ a. MSL A INBD MSIV 1B21-F022A green indicating light (P601-18C) is on.

TC 8 S@ b. DMM-1 indicates relay 1C71A-K3A contact closed.

TC 10 S@ c. DMM-2 indicates relay 1C71A-K3B contact closed.

d. DELETED

11. After MSL A INBD MSIV 1B21-F022A green indicating light (P601-18C) is off, verify the following: Attachment 2.

@ a. MSL A INBD MSIV 1B21-F022A green indicating light (P601-18C) is off.

TC 8 @ b. DMM-1 indicates relay 1C71A-K3A contact open.

@ c. DMM-2 indicates relay 1C71A-K3B contact open.

TC 10

12. Request Supervising Operator to depress and hold MSL A OTBD MSIV TEST switch 1B21H-S4A (P601-19C) until the following occurs, then release switch: Attachment 2.

   a. MSL A OTBD MSIV 1B21-F028A green indicating light (P601-19C) is on.
   b. DMM-1 indicates relay 1C71A-K3A contact closed.
   c. DMM-2 indicates relay 1C71A-K3B contact closed.
   d. DELETED

13. After MSL A OTBD MSIV 1B21-F028A green indicating light (P601-19C) is off, verify the following: Attachment 2.

   a. MSL A OTBD MSIV 1B21-F028A green indicating light (P601-19C) is off.
   b. DMM-1 indicates relay 1C71A-K3A contact open.
   c. DMM-2 indicates relay 1C71A-K3B contact open.
   d. DELETED

14. If in Mode 1 or 2 request Supervising Operator to place MSL A INBD MSIV 1B21-F022A switch (P601-18C) to AUTO. Attachment 2.

15. If in Mode 1 or 2 request Supervising Operator to place MSL A OTBD MSIV 1B21-F028A switch (P601-19C) to AUTO. Attachment 2.

16. If in Mode 3,4, or 5, request Supervising Operator to place MSL A INBD MSIV 1B21-F022A switch (P601-18C) to CLOSE. Attachment 2.

17. If in Mode 3,4, or 5, request Supervising Operator to place MSL A OTBD MSIV 1B21-F028A switch (P601-19C) to CLOSE. Attachment 2.

18. Connect Digital Multimeter (DMM-1) to terminals B and C of relay 1C71A-K3C (P693) (set to ohms).

19. Connect Digital Multimeter (DMM-2) to terminals B and C of relay 1C71A-K3H (P694) (set to ohms).

20. Request Supervising Operator to place MSL C INBD MSIV 1B21-F022C switch (P601-18C) to TEST. Attachment 2.

TEMP CHANGE # 10 PAGE 6 OF 17

TEMP CHANGE # 8 PAGE 8 OF 21

@ 21. Request Supervising Operator to place MSL C OTBD MSIV 1B21-F028C switch (P601-19C) to TEST. Attachment 2.

22. Request Supervising Operator to depress and hold MSL C INBD MSIV TEST switch 1B21H-S3C (P601-18C) until the following occurs, then release switch: Attachment 2.

@ a. MSL C INBD MSIV 1B21-F022C green indicating light (P601-18C) is on.
TC 8 $@ b. DMM-1 indicates relay 1C71A-K3C contact Closed.
$@ c. DMM-2 indicates relay 1C71A-K3H contact Closed.
TC 10 d. DELETED

23. After MSL C INBD MSIV 1B21-F022C green indicating light (P601-18C) is off, verify the following: Attachment 2.

@ a. MSL C INBD MSIV 1B21-F022C green indicating light (P601-18C) is off.
TC 8 @ b. DMM-1 indicates relay 1C71A-K3C contact open.
@ c. DMM-2 indicates relay 1C71A-K3H contact open.
TC 10 d. DELETED

24. Request Supervising Operator to depress and hold MSL C OTBD MSIV TEST switch 1B21H-S4C (P601-19C) until the following occurs, then release switch: Attachment 2.

@ a. MSL C OTBD MSIV 1B21-F028C green indicating light (P601-19C) is on.
TC 8 $@ b. DMM-1 indicates relay 1C71A-K3C contact closed.
$@ c. DMM-2 indicates relay 1C71A-K3H contact closed.
TC 10 d. DELETED

25. After MSL C OTBD MSIV 1B21-F028C green indicating light (P601-19C) is off, verify the following: Attachment 2.

@ a. MSL C OTBD MSIV 1B21-F028C green indicating light (P601-19C) is off.
TC 8 @ b. DMM-1 indicates relay 1C71A-K3C contact open.
@ c. DMM-2 indicates relay 1C71A-K3H contact open.
TC 10 @ d. DELETED

TC 8 @ 26. If in Mode 1 or 2 request Supervising Operator to place MSL C INBD MSIV 1B21-F022C switch (P601-18C) to AUTO. Attachment 2.

TC 8 @ 27. If in Mode 1or2 request Supervising Operator to place MSL C OTBD MSIV 1B21-F028C switch (P601-19C) to AUTO. Attachment 2.

@ 28. If in Mode 3,4, or 5, request Supervising Operator to place MSL C INBD MSIV 1B21-F022C switch (P601-18C) to CLOSE. Attachment 2.

@ 29. If in Mode 3,4, or 5, request Supervising Operator to place MSL C OTBD MSIV 1B21-F028C switch (P601-19C) to CLOSE. Attachment 2.

TC 10
30. DELETED

31. DELETED.

TC 8
32. Connect Digital Multimeter (DMM-1) to terminals B and C of relay 1C71A-K3G (P693) (set to ohms).

33. Connect Digital Multimeter (DMM-2) to terminals B and C of relay 1C71A-K3F (P692) (set to ohms).

@ 34. Request Supervising Operator to place MSL B INBD MSIV 1B21-F022B switch (P601-18C) to TEST. Attachment 2.

@ 35. Request Supervising Operator to place MSL B OTBD MSIV 1B21-F028B switch (P601-19C) to TEST. Attachment 2.

TC 10

36. Request Supervising Operator to depress and hold MSL B INBD MSIV TEST switch 1B21H-S3B (P601-18C) until the following occurs, then release switch: Attachment 2.

@ a. MSL B INBD MSIV 1B21-F022B green indicating light (P601-18C) is on.

TC 8 S@ b. DMM-1 indicates relay 1C71A-K3G contact closed.

S@ c. DMM-2 indicates relay 1C71A-K3F contact closed.

TC 10 d. DELETED

37. After MSL B INBD MSIV 1B21-F022B green indicating light (P601-18C) is off, verify the following: Attachment 2.

@ a. MSL B INBD MSIV 1B21-F022B green indicating light (P601-18C) is off.

TC 8 @ b. DMM-1 indicates relay 1C71A-K3G contact open.

@ c. DMM-2 indicates relay 1C71A-K3F contact open.

TC 10 d. DELETED

38. Request Supervising Operator to depress and hold MSL B OTBD MSIV TEST switch 1B21H-S4B (P601-19C) until the following occurs, then release switch: Attachment 2.

@ a. MSL B OTBD MSIV 1B21-F028B green indicating light (P601-19C) is on.

TC 8 $@ b. DMM-1 indicates relay 1C71A-K3G contact closed.

$@ c. DMM-2 indicates relay 1C71A-K3F contact closed.

TC 10 d. DELETED

39. After MSL B OTBD MSIV 1B21-F028B green indicating light (P601-19C) is off, verify the following: Attachment 2.

@ a. MSL B OTBD MSIV 1B21-F028B green indicating light (P601-19C) is off.

TC 8 @ b. DMM-1 indicates relay 1C71A-K3G contact open.

@ c. DMM-2 indicates relay 1C71A-K3F contact open.

TC 10 d. DELETED.

TC 8 @ 40. If in Mode 1 or 2 request Supervising Operator to place MSL B INBD MSIV 1B21-F022B switch (P601-18C) to AUTO. Attachment 2.

@ 41. If in Mode 1 or 2 request Supervising Operator to place MSL B OTBD MSIV 1B21-F028B switch (P601-19C) to AUTO. Attachment 2.

@ 42. If in Mode 3,4, or 5, request Supervising Operator to place MSL B INBD MSIV 1B21-F022B switch (P601-18C) to CLOSE. Attachment 2.

@ 43. If in Mode 3,4, or 5, request Supervising Operator to place MSL B OTBD MSIV 1B21-F028B switch (P601-19C) to CLOSE. Attachment 2.

TC 8

44. Connect Digital Multimeter (DMM-1) to terminals B and C of relay 1C71A-K3E (P691) (set to ohms).

45. Connect Digital Multimeter (DMM-2) to terminals B and C of relay 1C71A-K3D (P694) (set to ohms).

@ 46. Request Supervising Operator to place MSL D INBD MSIV 1B21-F022D switch (P601-18C) to TEST. Attachment 2.

@ 47. Request Supervising Operator to place MSL D OTBD MSIV 1B21-F028D switch (P601-19C) to TEST. Attachment 2.

48. Request Supervising Operator to depress and hold MSL D INBD MSIV TEST switch 1B21H-S3D (P601-18C) until the following occurs, then release switch: Attachment 2.

@ a. MSL D INBD MSIV 1B21-F022D green indicating light (P601-18C) is on.
TC 8 $@ b. DMM-1 indicates relay 1C71A-K3E contact closed.
$@ c. DMM-2 indicates relay 1C71A-K3D Contact closed.
TC 10 d. DELETED

49. After MSL D INBD MSIV 1B21-F022D green indicating light (P601-18C) is off, verify the following: Attachment 2.

@ a. MSL D INBD MSIV 1B21-F022D green indicating light (P601-18C) is off.
TC 8 @ b. DMM-1 indicates relay 1C71A-K3E contact open.
@ c. DMM-2 indicates relay 1C71A-K3D contact open.
TC 10 d. DELETED

50. Request Supervising Operator to depress and hold MSL D OTBD MSIV TEST switch 1B21H-S4D (P601-19C) until the following occurs, then release switch: Attachment 2.

@ a. MSL D OTBD MSIV 1B21-F028D green indicating light (P601-19C) is on.
TC 8 $@ b. DMM-1 indicates relay 1C71A-K3E Contact closed.
$@ c. DMM-2 indicates relay 1C71A-K3D contact closed.
TC 10 d. DELETED

51. After MSL D OTBD MSIV 1B21-F028D green indicating light (P601-19C) is off, verify the following: Attachment 2.

@ a. MSL D OTBD MSIV 1B21-F028D green indicating light (P601-19C) is off.

TC 8 @ b. DMM-1 indicates relay 1C71A-K3E contact open.

@ c. DMM-2 indicates relay 1C71A-K3D contact open.

TC 10 d. DELETED

TC 8 @ 52. If in Mode 1 or 2 request Supervising Operator to place MSL D INBD MSIV 1B21-F022D switch (P601-18C) to AUTO. Attachment 2.

@ 53. If in Mode 1 or 2 request Supervising Operator to place MSL D OTBD MSIV 1B21-F028D switch (P601-19C) to AUTO. Attachment 2.

@ 54. If in Mode 3,4, or 5, request Supervising Operator to place MSL D INBD MSIV 1B21-F022D switch (P601-18C) to CLOSE. Attachment 2.

@ 55. If in Mode 3,4, or 5, request Supervising Operator to place MSL D OTBD MSIV 1B21-F028D switch (P601-19C) to CLOSE. Attachment 2.

TC 10 56. DELETED

57.

58. DISCONNECT DMM-1 and DMM-2.

TC 8 @ 60. Inform Unit Supervisor that the stroking of the MSIV's is completed. Record time and date. Obtain U.S. signature. Attachment 2.

5.2 <u>Plant/System Restoration</u>

@ 1. Complete the System Restoration Checklist (Attachment 3) using the methods of Independent Verification. Upon completion, inform Supervising Operator of system restoration and return the keys for P691, P692, P693 and P694.

5.3 Acceptance Criteria

1. If any Technical Specification required items as indicated by dollar signs ($) on the Data Sheet have not been performed satisfactorily, notify the Unit Supervisor.

2. If any other items checked in this surveillance did not perform satisfactorily, notify the I&C Supervisor.

3. Satisfactory completion of the surveillance will be based on Technical Specification items (marked with a dollar sign) only.

@ 4. Check the appropriate block on the Data Package Cover Sheet as to whether the test results were acceptable or unacceptable and obtain Unit Supervisor's signature.

5.4 Records

The following documents are generated by this instruction:

1. Quality Assurance Records:

Data Package Cover Sheet
Prerequisites Sign-off Sheet
Data Sheets
System Restoration Checklist

2. Non Quality Records:
None

Records identification and disposition are accomplished in accordance with Records Retention/Disposition Schedule (RR/DS) and handled in accordance with PAP-1701, Plant Records Management.

6.0 REFERENCES

6.1 CEI Perry Technical Specifications

6.2 CEI Prints

B-208-013
B-208-040
B-208-222

7.0 ATTACHMENTS

7.1 Attachment 1-Prerequisites Sign-off Sheet

7.2 Attachment 2-Data Sheets

7.3 Attachment 3-System Restoration Checklist

7.4 Attachment 4-Relay Base Diagram

TEMP CHANGE
10
PAGE 11 OF 17

Attachment 1
Sheet 1 of 1

TEMP CHANGE
8
PAGE 13 OF 21

OM7A: SVI-C71-T0039
Page: 14
Rev.: 1

Main Steam Line Isolation
Valve Closure Channel Functional
Prerequisite Sign-off Sheet

Initials

TC 8 | 4.0.2. This instruction may be performed in Operational Condition 1,2,3,4 or 5. ____

4.0.3. No testing or maintenance is being performed which would initiate a half scram RPS signal. ____

4.0.4. The following annunciators are reset:

a. 1/2 SCRAM A/C (P680-5A-A9) ____

b. 1/2 SCRAM B/D (P680-5A-B9) ____

TC-10 | 4.0.5. DELETED

4.0.6. If unit is in MODE 3, 4, or 5:

a. C95 computer point, RPS CHANNEL ISOLATION A STATUS, B21EC013 indicates NORM. ____

b. C95 computer point, RPS CHANNEL ISOLATION B STATUS, B21EC014 indicates NORM. ____

c. C95 computer point, RPS CHANNEL ISOLATION C STATUS, B21EC015 indicates NORM. ____

d. C95 computer point, RPS CHANNEL ISOLATION D STATUS, B21EC016 indicates NORM. ____

TC 8 | 4.0.7 An RWP in effect. ☐ YES ☐ NO ____

4.0.8. Calibration Due Date is current on all test equipment. ____

TC 8 | — SEE ATTACHED PAGE 14a —

Performed by: ______________________ / ________ / ______

______________________ / ________ / ______
Signature Initials Date

TC 8

TEMP CHANGE # 8 PAGE 14 OF 21

Attachment 1 (Cont.)
Sheet 1a of 1

		Initials
4.0.10.a.	Switch 1C71A-S6A MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.	______
4.0.10.b.	Switch 1C71A-S6B MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.	______
4.0.10.c.	Switch 1C71A-S6C MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.	______
4.0.10.d.	Switch 1C71A-S6D MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.	______

TEMP CHANGE # 10 PAGE 12 OF 17

TEMP CHANGE # 9 PAGE 2 OF 2

TEMP CHANGE # 8 PAGE 15 OF 21

Main Steam Line Isolation Valve Closure Channel Functional Data Sheet

SECTION 5.1 — Initials

TC 8

TC-9

7. Unit Supervisor informed that the MSTV's will be stroked. ____ U.S. Signature ____/____ Time Date ____

8. MSL A INBD MSIV 1B21-F022A switch (P601-18C) placed to TEST. ____

9. MSL A OTBD MSIV 1B21-F028A switch (P601-19C) placed to TEST. ____

10.a. MSL A INBD MSIV 1B21-F022A green indicating light (P601-18C) is on. ____

TC 8

$ 10.b. DMM-1 indicates relay 1C71A-K3A contact closed. ____

$ 10.c. DMM-2 indicates relay 1C71A-K3B contact closed. ____

TC 10

10.d DELETED

11.a. MSL A INBD MSIV 1B21-F022A green indicating light (P601-18C) is off. ____

TC 8

11.b. DMM-1 indicates relay 1C71A-K3A contact open ____

11.c. DMM-2 indicates relay 1C71A-K3B contact open. ____

$ Denotes Technical Specification requirement.

TEMP CHANGE
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PAGE 13 OF 17

TEMP CHANGE
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SECTION 5.1

Initials

TC 10 | 11.d DELETED

12.a. MSL A OTBD MSIV 1B21-F028A green indicating light (P601-19C) is on. ____

TC 8 | $ 12.b. DMM-1 indicates relay 1C71A-K3A contact closed ____

$ 12.c. DMM-2 indicates relay 1C71A-K3B contact closed. ____

TC 10 | 12.D DELETED

13.a. MSL A OTBD MSIV 1B21-F028A green indicating light (P601-19C) is off. ____

TC 8 | 13.b. DMM-1 indicates relay 1C71A-K3A contact open. ____

13.c. DMM-2 indicates relay 1C71A-K3B contact open. ____

TC 10 | 13.d DELETED

TC 8 | 14. MSL A INBD MSIV 1B21-F022A switch (P601-18C) placed to AUTO. (Mode 1 or 2) ____

15. MSL A OTBD MSIV 1B21-F028A switch placed (P601-19C) to AUTO. (Mode 1 or 2) ____

16. MSL A INBD MSIV 1B21-F022A switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) ____

17. MSL A OTBD MSIV 1B21-F028A switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) ____

20. MSL C INBD MSIV 1B21-F022C switch (P601-18C) placed to TEST. ____

21. MSL C OTBD MSIV 1B21-F028C switch (P601-19C) placed to TEST. ____

22.a. MSL C INBD MSIV 1B21-F022C green indicating light (P601-18C) is on. ____

TC 8 | $ 22.b. DMM-1 indicates relay 1C71A-K3C contact closed. ____

$ 22.c. DMM-2 indicates relay 1C71A-K3H contact closed. ____

$ Denotes Technical Specification requirement.

TEMP CHANGE # 10 PAGE 14 OF 17

SECTION 5.1 | Initials

TC 10 | 22.d DELETED

23.a. MSL C INBD MSIV 1B21-F022C green indicating light (P601-18C) is off. ____

TC 8 | 23.b. DMM-1 indicates relay 1C71A-K3C contact open. ____

23.c. DMM-2 indicates relay 1C71A-K3H Contact open. ____

TC 10 | 23.d DELETED

24.a. MSL C OTBD MSIV 1B21-F028C green indicating light (P601-19C) is on. ____

TC 8 | $ 24.b. DMM-1 indicates relay 1C71A-K3C Contact closed. ____

$ 24.c. DMM-2 indicates relay 1C71A-K3H contact closed. ____

TC 10 | 24.d DELETED

25.a. MSL C OTBD MSIV 1B21-F028C green indicating light (P601-19C) is off. ____

TC 8 | 25.b. DMM-1 indicates relay 1C71A-K3C contact open. ____

25.c. DMM-2 indicates relay 1C71A-K3H Contact open. ____

TC 10 | 25.d DELETED

TC 8 | 26. MSL C INBD MSIV 1B21-F022C switch (P601-18C) placed to AUTO. (Mode 1 or 2) ____

27. MSL C OTBD MSIV 1B21-F028C switch placed (P601-19C) to AUTO. (Mode 1 or 2) ____

28. MSL C INBD MSIV 1B21-F022C switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) ____

29. MSL C OTBD MSIV 1B21-F028C switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) ____

TC 10 | 30. DELETED
31.

$ Denotes Technical Specification requirement.

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SECTION 5.1

Initials

34. MSL B INBD MSIV 1B21-F022B switch (P601-18C) placed to TEST. ____

35. MSL B OTBD MSIV 1B21-F028B switch (P601-19C) placed to TEST. ____

36.a. MSL B INBD MSIV 1B21-F022B green indicating light (P601-18C) is on. ____

TC 8 $ 36.b. DMM-1 indicates relay 1C71A-K3G Contact closed. ____

$ 36.c. DMM-2 indicates relay 1C71A-K3F Contact closed. ____

TC 10 36.d DELETED

37.a. MSL B INBD MSIV 1B21-F022B green indicating light (P601-18C) is off. ____

TC 8 37.b. DMM-1 indicates relay 1C71A-K3G contact open. ____

37.c. DMM-2 indicates relay 1C71A-K3F Contact open. ____

TC 10 37.d DELETED

38.a. MSL B OTBD MSIV 1B21-F028B green indicating light (P601-19C) is on. ____

TC 8 $ 38.b. DMM-1 indicates relay 1C71A-K3G Contact closed. ____

$ 38.c. DMM-2 indicates relay 1C71A-K3F Contact closed. ____

TC 10 38.d DELETED

39.a. MSL B OTBD MSIV 1B21-F028B green indicating light (P601-19C) is off. ____

TC 8 39.b. DMM-1 indicates relay 1C71A-K3G Contact open. ____

39.c. DMM-2 indicates relay 1C71A-K3F Contact open. ____

TC 10 39.d DELETED

TC 8 40. MSL B INBD MSIV 1B21-F022B switch (P601-18C) placed to AUTO. (Mode 1 or 2) ____

$ Denotes Technical Specification requirement.

TEMP CHANGE
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PAGE 16 OF 17

TEMP CHANGE
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SECTION 5.1

Initials

TC 8 | 41. MSL B OTBD MSIV 1B21-F028B switch placed (P601-19C) to AUTO. (Mode 1 or 2) ____

42. MSL B INBD MSIV 1B21-F022B switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) ____

43. MSL B OTBD MSIV 1B21-F028B switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) ____

46. MSL D INBD MSIV 1B21-F022D switch (P601-18C) placed to TEST. ____

47. MSL D OTBD MSIV 1B21-F028D switch (P601-19C) placed to TEST. ____

48.a. MSL D INBD MSIV 1B21-F022D green indicating light (P601-18C) is on. ____

TC 8 | $ 48.b. DMM-1 indicates relay 1C71A-K3E contact closed. ____

$ 48.c. DMM-2 indicates relay 1C71A-K3D contact closed. ____

TC 10 | 48.d DELETED

49.a. MSL D INBD MSIV 1B21-F022D green indicating light (P601-18C) is off. ____

TC 8 | 49.b. DMM-1 indicates relay 1C71A-K3E contact open. ____

49.c. DMM-2 indicates relay 1C71A-K3D contact open. ____

TC 10 | 49.d DELETED

50.a. MSL D OTBD MSIV 1B21-F028D green indicating light (P601-19C) is on. ____

TC 8 | $ 50.b. DMM-1 indicates relay 1C71A-K3E contact closed. ____

$ 50.c. DMM-2 indicates relay 1C71A-K3D contact closed. ____

TC 10 | 50.d DELETED

51.a. MSL D OTBD MSIV 1B21-F028D green indicating light (P601-19C) is off. ____

$ Denotes Technical Specification requirement.

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SECTION 5.1 — Initials

TC 8

51.b. DMM-1 indicates relay 1C71A-K3E Contact open. ____

51.c. DMM-2 indicates relay 1C71A-K3D Contact open ____

TC 10

51.d Deleted

TC 8

52. MSL D INBD MSIV 1B21-F022D switch (P601-18C) placed to AUTO. (Mode 1 or 2) ____

53. MSL D OTBD MSIV 1B21-F028D switch placed (P601-19C) to AUTO. (Mode 1 or 2) ____

54. MSL D INBD MSIV 1B21-F022D switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) ____

55. MSL D OTBD MSIV 1B21-F028D switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) ____

TC 10

56. Deleted
57.

TC 8

60. Unit Supervisor informed that stroking the MSIV's completed. ________/________ ____
Time / Date

____
U.S. Signature

SECTION 4.0
TEST INSTRUMENTS:

	MPL NUMBER	CAL. DATE	CAL DUE DATE	INT
DIGITAL MULTIMETER				
DIGITAL MULTIMETER				

COMMENTS: ________________________________

Performed by: ________________________/______/______

________________________/______/______

Independent Verifier: ________________________/______/______
Signature / Initials / Date

$ Denotes Technical Specification requirement.

SYSTEM RESTORATION CHECKLIST

Title: Main Steam Line Isolation Valve Closure Channel Functional

Verified By: ______________________________ __________

Signature/Initials Date

LOCATION	COMPONENT MPL OR NAME	REQUIRED POSITION	INITIALS FIRST VERIF	INITIALS SECOND VERIF	REMARKS
Control Rm P601-18C	MSL A INBD MSIV 1B21-F022A switch	*			
Control Rm P601-18C	MSL B INBD MSIV 1B21-F022B switch	*			
Control Rm P601-18C	MSL C INBD MSIV 1B21-F022C switch	*			
Control Rm P601-18C	MSL D INBD MSIV 1B21-F022D switch	*			
Control Rm P601-19C	MSL A OTBD MSIV 1B21-F028A switch	*			
Control Rm P601-19C	MSL B OTBD MSIV 1B21-F028B switch	*			
Control Rm P601-19C	MSL C OTBD MSIV 1B21-F028C switch	*			
Control Rm P601-19C	MSL B OTBD MSIV 1B21-F028B switch	*			
Control Rm P691	DMM	removed			
Control Rm P692	DMM	removed			
Control Rm P693	DMM	removed			
Control Rm P694	DMM	removed			

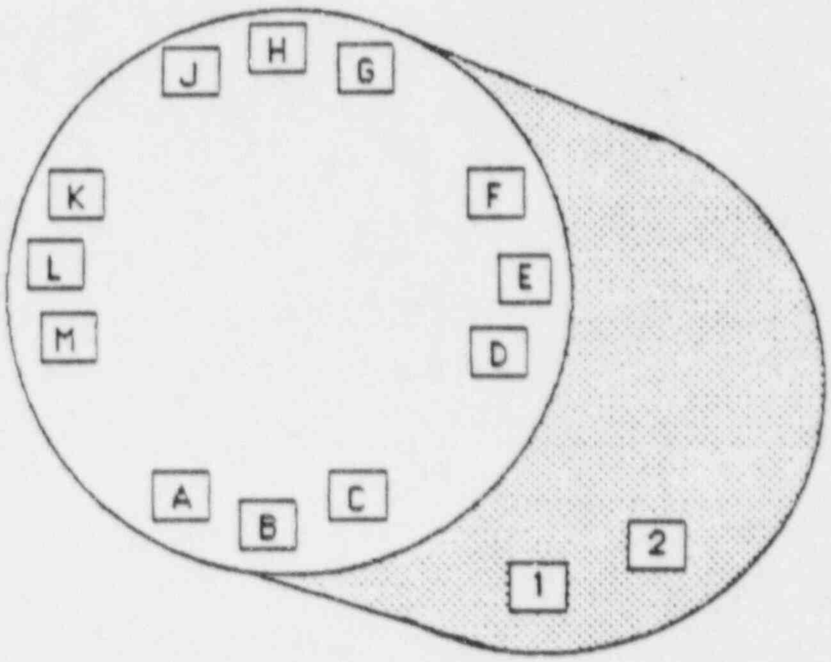
TC 8

TC 8 * As directed by Supervising Operator.

RELAY DRAWING

POTTER & BRUMFIELD

MDR RELAY



DATA PACKAGE COVER SHEET	INSTRUCTION NO.
PNPP NO. 6687 REV 10/86 PAP-1105-1	SVI-C71-T0039

TEST PERFORMANCE

AUTHORIZATION TO START PREREQUISITES: J Messina 11-2-87 1933
OPERATIONS UNIT SUPERVISOR — DATE AND TIME

AUTHORIZATION TO START TEST: L Brown 11/2/87 1942
SUPERVISING OPERATOR — DATE AND TIME

INSTRUCTION COMPLETION	[X] FULL	[ ] PARTIAL*		*See comments for extent of testing
TECH. SPEC. ACCEPTANCE CRITERIA	[X] ACCEPTABLE	[ ] UNACCEPTABLE	[ ] NA	When both As Left and As Found data are taken, acceptance will be based on As Left data only.
OTHER DATA CRITERIA	[X] ACCEPTABLE	[ ] UNACCEPTABLE	[ ] NA	When both As Left and As Found data are taken, acceptance will be based on As Left data only.
TASK COMPLETION	[X] CREDIT**	[ ] NO CREDIT		**Task fully completed or all failed/not completed items tracked per LCO Tracking, Work Orders, etc.

TCN'S IN EFFECT: 010, 009 & 008

COMMENTS: None

LEAD PERFORMER'S SIGNATURE Steve O2/ICP 11-2-87 2150
DATE AND TIME

MAIN OPERATIONS UNIT SUPERVISOR J Messina 11-2-87 2210
DATE AND TIME

SHIFT SUPERVISOR —N/A—
(Required If Tech. Spec. Acceptance Criteria Is Not Met, Otherwise Mark N/A) DATE AND TIME

TEST RESULTS REVIEW

COMMENTS

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER ______ DATE

504

TEMP CHANGE
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Attachment 1
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TEMP CHANGE
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Main Steam Line Isolation
Valve Closure Channel Functional
Prerequisite Sign-off Sheet

Initials

TC 8 | 4.0.2. This instruction may be performed in Operational Condition 1,2,3,4 or 5.

4.0.3. No testing or maintenance is being performed which would initiate a half scram RPS signal.

4.0.4. The following annunciators are reset:

a. 1/2 SCRAM A/C (P680-5A-A9)

b. 1/2 SCRAM B/D (P680-5A-B9)

TC-10 | 4.0.5. DELETED

4.0.6. If unit is in MODE 3, 4, or 5:

a. C95 computer point, RPS CHANNEL ISOLATION A STATUS, B21EC013 indicates NORM. 11-3-87

b. C95 computer point, RPS CHANNEL ISOLATION B STATUS, B21EC014 indicates NORM.

c. C95 computer point, RPS CHANNEL ISOLATION C STATUS, B21EC015 indicates NORM.

d. C95 computer point, RPS CHANNEL ISOLATION D STATUS, B21EC016 indicates NORM.

TC 8 | 4.0.7 An RWP in effect. ☐ YES ☒ NO

4.0.8. Calibration Due Date is current on all test equipment.

TC 8 | — SEE ATTACHED PAGE 14a —

Performed by: __________________, ______, 11-3-87

Signature Initials Date

TC
8

TEMP CHANGE
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Attachment 1 (Cont.)
Sheet 1a of 1

Initials

4.0.10.a. Switch 1C71A-S6A MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.

4.0.10.b. Switch 1C71A-S6B MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.

4.0.10.c. Switch 1C71A-S6C MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.

4.0.10.d. Switch 1C71A-S6D MAIN STEAM LINE ISOL VALVE TEST is in the NORM position.

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TEMP CHANGE
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Attachment 2
Sheet 1 of 6

TEMP CHANGE
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Main Steam Line Isolation Valve Closure Channel Functional Data Sheet

SECTION 5.1 — Initials

TC 8 — TC 9

7. Unit Supervisor informed that the MSTV's will be stroked.

U.S. Signature

2050 / 11-2-87
Time / Date

8. MSL A INBD MSIV 1B21-F022A switch (P601-18C) placed to TEST.

9. MSL A OTBD MSIV 1B21-F028A switch (P601-19C) placed to TEST.

10.a. MSL A INBD MSIV 1B21-F022A green indicating light (P601-18C) is on.

TC 8

$ 10.b. DMM-1 indicates relay 1C71A-K3A contact closed.

$ 10.c. DMM-2 indicates relay 1C71A-K3B contact closed.

TC 10

10.d DELETED

11.a. MSL A INBD MSIV 1B21-F022A green indicating light (P601-18C) is off.

TC 8

11.b. DMM-1 indicates relay 1C71A-K3A contact open.

11.c. DMM-2 indicates relay 1C71A-K3B contact open.

$ Denotes Technical Specification requirement.

TEMP CHANGE
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Attachment 2 (Cont.)
Sheet 2 of 6

TEMP CHANGE
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SECTION 5.1 | Initials

TC 10 | 11.d DELETED

12.a. MSL A OTBD MSTV 1B21-F028A green indicating light (P601-19C) is on.

TC 8 | $ 12.b. DMM-1 indicates relay 1C71A-K3A contact closed

$ 12.c. DMM-2 indicates relay 1C71A-K3B contact closed.

TC 10 | 12.D DELETED

13.a. MSL A OTBD MSTV 1B21-F028A green indicating light (P601-19C) is off.

TC 8 | 13.b. DMM-1 indicates relay 1C71A-K3A contact open.

13.c. DMM-2 indicates relay 1C71A-K3B contact open

TC 10 | 13.d DELETED

TC 8 | 14. MSL A INBD MSTV 1B21-F022A switch (P601-18C) placed to AUTO. (Mode 1 or 2)

15. MSL A OTBD MSTV 1B21-F028A switch placed (P601-19C) to AUTO. (Mode 1 or 2)

16. MSL A INBD MSTV 1B21-F022A switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) N/A

17. MSL A OTBD MSTV 1B21-F028A switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) N/A

20. MSL C INBD MSTV 1B21-F022C switch (P601-18C) placed to TEST.

21. MSL C OTBD MSTV 1B21-F028C switch (P601-19C) placed to TEST.

22.a. MSL C INBD MSTV 1B21-F022C green indicating light (P601-18C) is on.

TC 8 | $ 22.b. DMM-1 indicates relay 1C71A-K3C contact closed.

$ 22.c. DMM-2 indicates relay 1C71A-K3H contact closed.

$ Denotes Technical Specification requirement.

TEMP CHANGE
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Attachment 2 (Cont.)
Sheet 3 of 6

TEMP CHANGE
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SECTION 5.1 **Initials**

TC 10 | 22.d DELETED

23.a. MSL C INBD MSIV 1B21-F022C green indicating light (P601-18C) is off.

TC 8 | 23.b. DMM-1 indicates relay 1C71A-K3C contact open.

23.c. DMM-2 indicates relay 1C71A-K3H contact open.

TC 10 | 23.d DELETED

24.a. MSL C OTBD MSIV 1B21-F028C green indicating light (P601-19C) is on.

TC 8 | $ 24.b. DMM-1 indicates relay 1C71A-K3C contact closed.

$ 24.c. DMM-2 indicates relay 1C71A-K3H contact closed.

TC 10 | 24.d DELETED

25.a. MSL C OTBD MSIV 1B21-F028C green indicating light (P601-19C) is off.

TC 8 | 25.b. DMM-1 indicates relay 1C71A-K3C contact open.

25.c. DMM-2 indicates relay 1C71A-K3H contact open.

TC 10 | 25.d DELETED

TC 8 | 26. MSL C INBD MSIV 1B21-F022C switch (P601-18C) placed to AUTO. (Mode 1 or 2)

27. MSL C OTBD MSIV 1B21-F028C switch placed (P601-19C) to AUTO. (Mode 1 or 2)

28. MSL C INBD MSIV 1B21-F022C switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) N/A

29. MSL C OTBD MSIV 1B21-F028C switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) N/A

TC 10 | 30. DELETED
31.

$ Denotes Technical Specification requirement.

TEMP CHANGE
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SECTION 5.1

Initials

34. MSL B INBD MSIV 1B21-F022B switch (P601-18C) placed to TEST.

35. MSL B OTBD MSIV 1B21-F028B switch (P601-19C) placed to TEST.

36.a. MSL B INBD MSIV 1B21-F022B green indicating light (P601-18C) is on.

TC 8 $ 36.b. DMM-1 indicates relay 1C71A-K3G Contact closed.

$ 36.c. DMM-2 indicates relay 1C71A-K3F Contact closed.

TC 10 36.d DELETED

37.a. MSL B INBD MSIV 1B21-F022B green indicating light (P601-18C) is off.

TC 8 37.b. DMM-1 indicates relay 1C71A-K3G contact open.

37.c. DMM-2 indicates relay 1C71A-K3F Contact open.

TC 10 37.d DELETED

38.a. MSL B OTBD MSIV 1B21-F028B green indicating light (P601-19C) is on.

TC 8 $ 38.b. DMM-1 indicates relay 1C71A-K3G Contact closed.

$ 38.c. DMM-2 indicates relay 1C71A-K3F Contact closed.

TC 10 38.d DELETED

39.a. MSL B OTBD MSIV 1B21-F028B green indicating light (P601-19C) is off.

TC 8 39.b. DMM-1 indicates relay 1C71A-K3G Contact open.

39.c. DMM-2 indicates relay 1C71A-K3F Contact open.

TC 10 39.d DELETED

TC 8 40. MSL B INBD MSIV 1B21-F022B switch (P601-18C) placed to AUTO. (Mode 1 or 2)

$ Denotes Technical Specification requirement.

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TEMP CHANGE # 8 PAGE 19 OF 21

SECTION 5.1 — Initials

TC 8 41. MSL B OTBD MSIV 1B21-F028B switch placed (P601-19C) to AUTO. (Mode 1 or 2)

42. MSL B INBD MSIV 1B21-F022B switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) — N/A

43. MSL B OTBD MSIV 1B21-F028B switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) — N/A

46. MSL D INBD MSIV 1B21-F022D switch (P601-18C) placed to TEST.

47. MSL D OTBD MSIV 1B21-F028D switch (P601-19C) placed to TEST.

48.a. MSL D INBD MSIV 1B21-F022D green indicating light (P601-18C) is on.

TC 8 $ 48.b. DMM-1 indicates relay 1C71A-K3E contact closed.

$ 48.c. DMM-2 indicates relay 1C71A-K3D contact closed.

TC 10 48.d DELETED

49.a. MSL D INBD MSIV 1B21-F022D green indicating light (P601-18C) is off.

TC 8 49.b. DMM-1 indicates relay 1C71A-K3E contact open.

49.c. DMM-2 indicates relay 1C71A-K3D contact open.

TC 10 49.d DELETED

50.a. MSL D OTBD MSIV 1B21-F028D green indicating light (P601-19C) is on.

TC 8 $ 50.b. DMM-1 indicates relay 1C71A-K3E contact closed.

$ 50.c. DMM-2 indicates relay 1C71A-K3D contact closed.

TC 10 50.d DELETED

51.a. MSL D OTBD MSIV 1B21-F028D green indicating light (P601-19C) is off.

$ Denotes Technical Specification requirement.

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Attachment 2 (Cont.)
Sheet 6 of 6

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SECTION 5.1

Initials

TC 8

51.b. DMM-1 indicates relay 1C71A-K3E contact open

51.c. DMM-2 indicates relay 1C71A-K3D contact open

TC 10

51.d Deleted

TC 8

52. MSL D INBD MSIV 1B21-F022D switch (P601-18C) placed to AUTO. (Mode 1 or 2)

53. MSL D OTBD MSIV 1B21-F028D switch placed (P601-19C) to AUTO. (Mode 1 or 2)

54. MSL D INBD MSIV 1B21-F022D switch (P601-18C) placed to CLOSE. (Mode 3,4, or 5) N/A

55. MSL D OTBD MSIV 1B21-F028D switch placed (P601-19C) to CLOSE. (Mode 3,4, or 5) N/A

TC 10

56. Deleted
57.

TC 8

60. Unit Supervisor informed that stroking the MSIV's completed.

2142 Time / 11-2-87 Date

U.S. Signature

SECTION 4.0
TEST INSTRUMENTS:

	MPL NUMBER	CAL. DATE	CAL DUE DATE	INT.
DIGITAL MULTIMETER	L70-N052F	N/A	N/A	
DIGITAL MULTIMETER	L70 R348A	N/A.	N/A	

COMMENTS: None

Performed by: ______ 11-2-87

NONE

Independent Verifier: NONE Signature / Initials / Date

$ Denotes Technical Specification requirement.

Attachment 3
Sheet 1 of 1

TEMP CHANGE
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SYSTEM RESTORATION CHECKLIST

Title: Main Steam Line Isolation Valve Closure Channel Functional

Verified By: [signature] / DBC 11-2-87
[signature] / [initials] 11-2-87
Signature/Initials Date

LOCATION	COMPONENT MPL OR NAME	REQUIRED POSITION	INITIALS FIRST VERIF	INITIALS SECOND VERIF	REMARKS
Control Rm P601-18C	MSL A INBD MSIV 1B21-F022A switch	*	DBC	[initials]	SW IN AUTO
Control Rm P601-18C	MSL B INBD MSIV 1B21-F022B switch	*	DBC	[initials]	
Control Rm P601-18C	MSL C INBD MSIV 1B21-F022C switch	*	DBC	[initials]	
Control Rm P601-18C	MSL D INBD MSIV 1B21-F022D switch	*	DBC	[initials]	
Control Rm P601-19C	MSL A OTBD MSIV 1B21-F028A switch	*	DBC	[initials]	
Control Rm P601-19C	MSL B OTBD MSIV 1B21-F028B switch	*	DBC	[initials]	
Control Rm P601-19C	MSL C OTBD MSIV 1B21-F028C switch	*	DBC	[initials]	
Control Rm P601-19C	MSL B OTBD MSIV 1B21-F028B switch	*	DBC	[initials]	
Control Rm P691	DMM	removed	DBC	[initials]	NONE
Control Rm P692	DMM	removed	DBC	[initials]	
Control Rm P693	DMM	removed	DBC	[initials]	
Control Rm P694	DMM	removed	DBC	[initials]	

TC 8 * As directed by Supervising Operator.

ISEG Review of R61 & C91 for MSIV Failure

The Independent Safety Engineering Group was asked to review the Sequence of Events Recorder and Process Computer Sequence of Events Log over the time period that the Main Steam Isolation Valves (MSIVs) were being tested. The October 29 and November 3, 1987 printouts were reviewed for any alarms associated with the MSIVs. There were no alarms associated with the MSIVs on the Sequence of Events Recorder. The Process Computer Sequence of Events Log appropriately listed those times when the MSIVs moved past the ninety percent open position.

Stephen P. [illegible]

ISEG Supervisor

SEQUENCE OF EVENTS LOG 10-21-87

TIME	PT ID	NAME	STATUS
18:33:53.914	B21NC050	MSL ISOLATION CH D	TRIPPED
18:33:53.938	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
18:39:36.167	B21NC047	MSL ISOLATION CH A	RESET
18:39:36.337	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
21:01:01.268	B21NC050	MSL ISOLATION CH D	TRIPPED
21:01:01.294	B21NC047	MSL ISOLATION CH A	TRIPPED
21:03:23.306	B21NC047	MSL ISOLATION CH A	RESET
21:03:23.467	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
21:04:30.029	B21NC050	MSL ISOLATION CH D	TRIPPED
21:04:30.054	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
21:05:27.769	B21NC047	MSL ISOLATION CH A	RESET
21:05:27.923	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
21:42:00.362	B21NC050	MSL ISOLATION CH D	TRIPPED
21:42:00.362	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
21:43:09.061	B21NC047	MSL ISOLATION CH A	RESET
21:43:09.146	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
21:49:08.592	B21NC050	MSL ISOLATION CH D	TRIPPED
21:49:08.615	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
21:49:54.751	B21NC047	MSL ISOLATION CH A	RESET
21:49:54.815	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:09:59.097	B21NC048	MSL ISOLATION CH B	TRIPPED
22:09:59.105	B21NC049	MSL ISOLATION CH C	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:10:32.309	B21NC049	MSL ISOLATION CH C	RESET
22:10:32.321	B21NC048	MSL ISOLATION CH B	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:11:52.824	B21NC048	MSL ISOLATION CH B	TRIPPED
22:11:52.834	B21NC047	MSL ISOLATION CH A	TRIPPED
22:12:19.730	B21NC047	MSL ISOLATION CH A	RESET
22:12:19.763	B21NC048	MSL ISOLATION CH B	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:13:17.567	B21NC049	MSL ISOLATION CH C	TRIPPED
22:13:17.569	B21NC050	MSL ISOLATION CH D	TRIPPED
22:13:37.218	B21NC050	MSL ISOLATION CH D	RESET
22:13:37.232	B21NC049	MSL ISOLATION CH C	RESET

END SEQUENCE OF EVENTS LOG

TIME	PT ID		
22:14:27.720	B21NC049	MSL ISOLATION CH C	TRIPPED
22:14:27.738	B21NC046	MSL ISOLATION CH B	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:15:21.447	B21NC048	MSL ISOLATION CH B	RESET
22:15:21.490	B21NC049	MSL ISOLATION CH C	RESET
22:15:48.798	B21NC049	MSL ISOLATION CH C	TRIPPED
22:15:48.814	B21NC048	MSL ISOLATION CH B	TRIPPED
22:16:13.251	B21NC048	MSL ISOLATION CH B	RESET
22:16:13.291	B21NC049	MSL ISOLATION CH C	RESET
22:16:42.202	B21NC047	MSL ISOLATION CH A	TRIPPED
22:16:42.241	B21NC048	MSL ISOLATION CH B	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:17:28.832	B21NC048	MSL ISOLATION CH B	RESET
22:17:28.999	B21NC047	MSL ISOLATION CH A	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:18:10.585	B21NC050	MSL ISOLATION CH D	TRIPPED
22:18:10.647	B21NC049	MSL ISOLATION CH C	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:19:12.770	B21NC049	MSL ISOLATION CH C	RESET
22:19:13.011	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
22:33:21.383	B21NC050	MSL ISOLATION CH D	TRIPPED
22:33:21.753	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
23:37:01.582	B21NC047	MSL ISOLATION CH A	RESET
23:37:01.647	B21NC050	MSL ISOLATION CH B	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
11:55:59.454	B21NC048	MSL ISOLATION CH B	TRIPPED
11:55:59.463	B21NC049	MSL ISOLATION CH C	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
11:57:08.313	B21NC049	MSL ISOLATION CH C	RESET
11:57:08.317	B21NC048	MSL ISOLATION CH B	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
11:58:17.452	B21NC050	MSL ISOLATION CH D	TRIPPED
11:58:17.475	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
11:59:22.881	B21NC047	MSL ISOLATION CH A	RESET
11:59:23.040	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:00:21.535	B21NC050	MSL ISOLATION CH D	TRIPPED
12:00:21.559	B21NC047	MSL ISOLATION CH A	TRIPPED
12:01:17.993	B21NC047	MSL ISOLATION CH A	RESET
12:01:18.153	B21NC050	MSL ISOLATION CH D	RESET
12:02:08.251	B21NC046	MSL ISOLATION CH B	TRIPPED
12:02:08.259	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

UNIT PAGE 1 11-03-87 12:03

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:03:28.942	B21NC047	MSL ISOLATION CH A	RESET
12:03:28.977	B21NC048	MSL ISOLATION CH B	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:04:16.599	B21NC049	MSL ISOLATION CH C	TRIPPED
12:04:16.605	B21NC050	MSL ISOLATION CH D	TRIPPED

END SEQUENCE OF EVENTS LOG

1

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:05:49.436	B21NC050	MSL ISOLATION CH D	RESET
12:05:49.451	B21NC049	MSL ISOLATION CH C	RESET

END SEQUENCE OF EVENTS LOG

UNIT   PAGE 1   11-05-87   12:08

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:07:33.458	B21NC049	MSL ISOLATION CH C	TRIPPED
12:07:33.475	B21NC048	MSL ISOLATION CH B	TRIPPED

END SEQUENCE OF EVENTS LOG

UNIT   PAGE 1   11-03-87   12:09

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:08:44.256	B21NC048	MSL ISOLATION CH B	RESET
12:08:44.298	B21NC049	MSL ISOLATION CH C	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:14:28.479	B21NC050	MSL ISOLATION CH D	TRIPPED
12:14:28.498	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:15:52.688	B21NC047	MSL ISOLATION CH A	RESET
12:15:52.755	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:18:15.284	B21NC050	MSL ISOLATION CH D	TRIPPED
12:18:15.307	B21NC047	MSL ISOLATION CH A	TRIPPED

END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:19:23.181	B21NC047	MSL ISOLATION CH A	RESET
12:19:23.247	B21NC050	MSL ISOLATION CH D	RESET

- END SEQUENCE OF EVENTS LOG

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:20:18.753	B21NC047	MSL ISOLATION CH A	TRIPPED
12:20:18.790	B21NC048	MSL ISOLATION CH B	TRIPPED

END SEQUENCE OF EVENTS LOG

B21NC047 MSL ISOLATION C RESET

END QUENCE OF EVENTS LOG .RESET

UNIT PAGE 1 11-03-87 12:22

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:22:21.050	B21NC050	MSL ISOLATION CH D	TRIPPED
12:22:21.114	B21NC049	MSL ISOLATION CH C	TRIPPED

END SEQUENCE OF EVENTS LOG

UNIT PAGE 1 11-05-87 12:24

SEQUENCE OF EVENTS LOG

TIME	PT ID	NAME	STATUS
12:23:58.567	B21NC049	MSL ISOLATION CH C	RESET
12:23:58.806	B21NC050	MSL ISOLATION CH D	RESET

END SEQUENCE OF EVENTS LOG

PNPP No. 7310
Rev 2/87

INTENT
INSTRUCTION TEMPORARY CHANGE

PAP-0522-2

TEMPORARY CHANGE NO.
TCN- 10

INSTRUCTION NO.	REV	INSTRUCTION TITLE
OM7A: SVI-C71-T0039	1	MAIN STEAM LINE ISOLATION VALVE CLOSURE CHANNEL FUNCTIONAL
INCLS TCN(S): NONE		

ORIGINATOR	DATE	LIST EACH ATTACHED PAGE
Rush A. Webster	9/14/87	2,3,4,5,6,7,8,9,10,11,14,15,16,17,18,19,20.

REASON:
Half Scrams and associated annunciators will not occur as discribed by this instruction. Deleted those steps that were not in accordance with the system logic.

ADMIN USE ONLY

INFORMATION ONLY

REVIEWED: William T. Brownlee DATE: 9-14-87

10CFR50.59 APPLICABILITY CHECK

	YES	NO
Is there a Change to the plant as described in the FSAR?	☐	☒
REASON: NO CHANGE TO PLANT IS INVOLVED.		
Is there a Change to a procedure/instruction as described in the FSAR?	☐	☒
REASON: THIS INSTRUCTION IS NOT DETAILED IN THE FSAR.		
Is there a Test or experiment not described in the FSAR?	☐	☒
REASON: NO TEST OR EXPERIMENT IS INVOLVED.		
Is there a Change to Technical Specifications?	☐	☒
Is there an effect on the environment or change to the Environmental Protection Plan?	☐	☒
REASON: NO EFFECT ON THE ENVIRONMENT OR CHANGE TO THE EPP IS INVOLVED.		

☒ Answers to all questions are 'NO'. No potential for an Unreviewed Safety or Environmental Question exists. No further review required.

☐ Answers to one or more questions is 'YES'. Further review required.

PREPARED	DATE	REVIEWED	DATE	APPROVED	DATE
W.T. Brownlee	9-14-87	Joseph C Hale	9/14/87	D.A. Philips FOR RAN	9-14-87

APPROVAL

NON PORC	RESPONSIBLE GS/GSE	DATE
	D.A. Philips FOR RANEWKIRK	9-14-87

PORC			DATE
PORC MTG. NO.: ______ RECOMMENDED FOR ☐ APPROVAL ☐ DISAPPROVAL	MANAGER PPTD		
	MANAGER PPOD		

EFFECTIVE DATE 9-14-87

DISAPPROVAL

	DATE

REASON FOR DISAPPROVAL

ENTERED BY: Miles C. DATE: 9-14-87

PNPP No. 7309
Rev. 2 87
PER-C522-1

NON-INTENT
INSTRUCTION TEMPORARY CHANGE

TEMPORARY CHANGE NO
TCN- 9

INSTRUCTION NO	REV.	INSTRUCTION TITLE
OM7A:SVI-C71-T0039	1	MSL ISOL VLV CLOSURE CH. FUNCT

CANCELS TCN(S): N/A

ORIGINATOR	DATE	LIST EACH ATTACHED PAGE:
Tony Wesolt	3-25-87	4,15

PROCESS FOR: ☐ CONDITIONAL APPROVAL ☑ FINAL APPROVAL ONLY

ADMIN. USE ONLY

REASON
DELETE STEPS THAT REQUIRE MSIV VALVE STEMS TO BE LUBRICATED AS PER SYSTEM ENG.

CONDITIONAL APPROVAL/IN DEPTH REVIEW

(Plant Management Staff) Robert Mazzi DATE 3/27/87

CONDITIONAL APPROVAL
(SS or US) N/A DATE

EFFECTIVE DATE 4-7-87

FINAL APPROVAL

NON PORC — APPROVED — RESPONSIBLE GS/DSE: DB Philyaw FOR RANEWKIRK — DATE 4-2-87

PORC — PORC MTG. NO.: ______
RECOMMENDED FOR: ☐ APPROVAL ☐ DISAPPROVAL
MANAGER PPTD — DATE
MANAGER PPOD — DATE

DISAPPROVAL — DATE
REASON FOR DISAPPROVAL: ______

ENTERED BY J. Brunicrat DATE 4/7/87

PNPP No. 7310
Rev 2/87

INTENT
INSTRUCTION TEMPORARY CHANGE

PAP-0522-2

TEMPORARY CHANGE NO.
TCN- 8

INSTRUCTION NO	REV	INSTRUCTION TITLE
OM7M:SVI-C71-T0039	1	MSIV CLOSURE CH FUNCTIONAL
CANCELS TCN(S): 1, 2, 5, 6, 7		

ORIGINATOR	DATE	LIST EACH ATTACHED PAGE:
Tony Wesett	3-4-87	1,2,3,4,5,6,7,8,9,10,11,14,14a,4a,15,16,17,18,19,20,21

REASON:
ADD STEP TO INFORM U.S. THAT MSIV'S MAY NEED LUBRICATING.
CANCEL + INCORP. ALL TC'S TO EASE IN PERFORMANCE OF SVI.

ADMIN USE ONLY

REVIEWED: Robert Murz DATE: 3-11-87

10CFR50.59 APPLICABILITY CHECK

	YES	NO
Is there a Change to the plant as described in the FSAR?	☐	☒
REASON: The design of the plant isn't changed by this SVI or TCN.		
Is there a Change to a procedure/instruction as described in the FSAR?	☐	☒
REASON: The details of this instruction aren't defined in the FSAR.		
Is there a Test or experiment not described in the FSAR?	☐	☒
REASON: This isn't a Test or Experiment. The responsibility for cycling MSIV's is directed to Operations by this TCN.		
Is there a Change to Technical Specifications?	☐	☒
Is there an effect on the environment or change to the Environmental Protection Plan?	☐	☒
REASON: No impact on environment		

☒ Answers to all questions are 'NO'. No potential for an Unreviewed Safety or Environmental Question exists. No further review required.

☐ Answers to one or more questions is 'YES'. Further review required.

PREPARED	DATE	REVIEWED	DATE	APPROVED	DATE
Robert Murz	3-11-87	Tony Wesett	3/11/87	R Stock for RAN	3-12-87

APPROVAL

NON PORC — RESPONSIBLE US/GSE: Robert H Stock for R A Newkirk — DATE: 3-12-87

PORC — PORC MTG. NO.: ______
RECOMMENDED FOR
☐ APPROVAL
☐ DISAPPROVAL

MANAGER PPTD ______ DATE ______

MANAGER PPOD ______ DATE ______

EFFECTIVE DATE: 3-13-87

DISAPPROVAL

DATE ______

REASON FOR DISAPPROVAL

ENTERED BY: J Barnscourt
DATE: 3/13/87

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

PERRY NUCLEAR POWER PLANT OPERATIONS MANUAL

Surveillance Instruction

TITLE: MAIN STEAM LINE ISOLATION VALVE CLOSURE CHANNEL FUNCTIONAL

REVISION: 1 EFFECTIVE DATE: 10/21/85

		DATE
PREPARER:	T.B. SHAFFER/ R.C. MILLER	10/13/85
REVIEWER:	Grantl Burkhart	10/16/85
PORC MEETING NO:	N/A	
APPROVED: JB 10/16/85	A.W. Kaand Jr.	10/17/85

10CFR50.59 Applicability Check

	Yes	No
Is there a change to the plant as described in the FSAR?	___	✓
Is there a change to a procedure/instruction as described in the FSAR?	___	✓
Is there a test or experiment not described in the FSAR?	___	✓
Is there a change to the Technical Specification?	___	✓
(If yes, perform a 10CFR50.59 Safety Evaluation per PAP-0305).		

Applicability Check Performed by S Henderson Date 10/16/85

SCOPE OF REVISION: 1. Instruction revised to incorporate format changes of TAP-0503.
2. Numerous corrections were made throughout the instruction.

Main Steam Line Isolation Valve Closure Channel Functional

1.0 DESCRIPTION

1.1 Scope:

The Main Steam Line Isolation Valve Closure instrumentation channels are functionally tested by stroking the MSIV's and monitoring each trip relay and their common annunciator.

This instruction fully satisfies the functional surveillance requirements of Technical Specification 4.3.1.1 Table 4.3.1.1-1 Item 6.

TC 8

This instruction fully satisfies the functional surveillance requirements of Technical Specification 4.3.1.1 Table 4.3.1.1-1 Item 6, and the fail safe function and partial exercise testing of valves 1B21-F022A, 1B21-F022B, 1B21-F022C, 1B21-F022D, 1B21-F028A, 1B21-F028B, 1B21-F028C and 1B21-F028D per Technical Specification 4.0.5.

This instruction will verify the operability of the following:

1. 1C71-N700A
2. 1C71-N700B
3. 1C71-N700C
4. 1C71-N700D
5. 1C71-N701A
6. 1C71-N701B
7. 1C71-N701C
8. 1C71-N701D
9. 1C71-N702A
10. 1C71-N702B
11. 1C71-N702C
12. 1C71-N702D
13. 1C71-N703A
14. 1C71-N703B
15. 1C71-N703C
16. 1C71-N703D

1.2 Frequency: At least once per 31 days

TC 8

1.3 Technical Specification Applicable Operational Conditions: 1(e)

(e) This function shall be automatically bypassed when the REACTOR MODE SWITCH is not in the RUN position.

1.4 Cross-Reference: N/A

2.0 PRECAUTIONS AND LIMITATIONS

1. Step numbers marked with a dollar sign ($) immediately to the left are required by Technical Specifications. Such items, if found to exceed their Allowable Value may be NRC reportable and shall be brought to the attention of the Unit Supervisor.

2. Those steps of this instruction designated by an "at" sign (@) are to be initialed or signed on the appropriate data sheet or Data Package Cover Sheet as data is entered or as each step is completed.

TC 8

3. All steps are to be performed in sequence and the instruction carried through to completion, unless otherwise indicated.

4. The Unit Supervisor or designated alternate must be notified immediately whenever an instructional step cannot be completed as stated, or if problems develop during the performance of this instruction.

5. This instruction should be read in its entirety before proceeding with the performance of the instructional steps.

TC 8

6. During the performance of this SVI the INBD and OTBD MSIV's will be stroked, In modes 1, 2 or 3 a steam sink may be required.

TC 10

DELETED

TC 8

8. Channel(s) will be made inoperable in section 5.0 of this instruction.

9. To avoid unnecessary valve wear, full stroking of MSIV's must be kept to a minimum.

3.0 MANPOWER AND EQUIPMENT

3.1 Manpower/Communications

TC 8

1. Two I&C technicians are required to perform this instruction.

   a. Two technicians in Control Room to monitor the trip relays at the following panels:

      1. DIV 1 RPS INSTRUMENTATION & AUXILIARY RELAY PANEL (1H13-P691)
      2. DIV 2 RPS INSTRUMENTATION & AUXILIARY RELAY PANEL (1H13-P692)
      3. DIV 3 RPS INSTRUMENTATION & AUXILIARY RELAY PANEL (1H13-P693)
      4. DIV 4 RPS INSTRUMENTATION & AUXILIARY RELAY PANEL (1H13-P694)

TC 8

2. Establish communications between the technicians and the Supervising Operator.

TC 8

3.2 Required Measuring and Test Equipment (M&TE)

1. 2 Digital Multimeters (DMM-1 & DMM-2), Fluke 77.

3.3 Additional Tools and Equipment

1. Keys needed for P691, P692, P693 and P694.

TC 8

4.0 PREREQUISITES

@ 1. Obtain the Unit Supervisor's "Authorization to Start Prerequisites" signature on the Data Package Cover Sheet.

TC 8 @ 2. This instruction may be performed in Operational Condition 1,2,3,4 or 5. Attachment 1.

@ 3. Verify that no testing or maintenance is being performed which would initiate a half scram RPS signal. Attachment 1.

4. Verify the following annunciators are reset: Attachment 1.

@ a. 1/2 SCRAM A/C (P680-5A-A9)
@ b. 1/2 SCRAM B/D (P680-5A-B9)

TC 10 5. DELETED
a.

6. If Unit is in MODE 3,4, or 5, verify the following: Attachment 2.

@ a. C95 computer point RPS CHANNEL ISOLATION A STATUS, B21EC013 indicates NORM.
@ b. C95 computer point RPS CHANNEL ISOLATION B STATUS, B21EC014 indicates NORM.
@ c. C95 computer point RPS CHANNEL ISOLATION C STATUS, B21EC015 indicates NORM.
@ d. C95 computer point RPS CHANNEL ISOLATION D STATUS, B21EC016 indicates NORM.

TC 8 @ 7. A RWP may be required for performance of this instruction. Attachment 1.

Slow Strokes/MSIVs

During Startup Testing:

5/10/87 Following a planned scram (LOOP) all MSIVs were stroked close. B21-F028B stroked slow (5.1 sec). Partial SVI-B21-T2001 performed on 5/12/87. Valve closed in 4 sec. SVI SAT.

During "04" Outage:

8/10/87 During SVI-B21-T2001, B21-F028C stroked slow, 5.3 sec. Item was tracked by W.O. 87-764. This W.O. involved DCP work to F028C. Technicians adjusted the fast stroke-time controller per ICI-B12-0. Valve subsequently restroked, per another SVI-B21-T2001 on 8/12/87. Valve time SAT.

(5) Previous Studies

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

6-2
REV. 1-82

MEMORANDUM

☐ I no longer wish to receive this material

TO: S.F. Kensicki ROOM: SB312 FROM: J. Cantlin DATE: 11-4-87
PHONE: 5112 ROOM: TTB1
SUBJECT: MSIV Stroke Times During Startup Tests

The following is a summary of MSIV stroke time results obtained during the Startup Test Program to-date.

Test Serial Number	Date	Test Summary
070	10-12-86	At 3.6% power and ~955 psig each MSIV was manually fast closed for STI-B21-025A-8.1, MSIV Closure Time Measurements. All times were acceptable (see attached data sheet).
169	3-24-87	Subsequent to the planned scram for the Shutdown from Outside the Control Room at 810 psig all MSIV's were automatically fast closed due to low reactor pressure. This was an expected closure for this test. All times were acceptable. (see attached ERIS SOE log).
208	5-10-87	Subsequent to the planned scram for the Loss of Offsite Power test at ~980 psig 6 MSIV's (the "C" line was isolated for the latter part of Test Condition 2) were automatically closed due to the expected loss of leak detection power. The stroke times were: F022A = 3.7 sec F022D = 3.0 sec F028A = 4.8 sec F028D = 3.0 sec F022B = 4.2 sec F028B = 5.1 sec All times were satisfactory except for the F028B which was 0.1 sec too slow. This valve was reset and tested satisfactory. (see attached TD log).

214	5-17-87	At 43% power and ~938 psig each MSIV was manually fast closed for STI-B21-25A-8.1, MSIV Closure Time Measurements. All times were acceptable. (see attached data sheet).
451	10-29-87	The fastest MSIV (B21-F022D based on previous tests) was fast closed manually at 75% power and ~962 psig. The valve failed to move for 19.6 sec then stroked with an acceptable closure time. (see attached ERIS tabular trend report).

In addition to the stroke times available from the preceeding Startup Tests, when the loss of one RPS bus (6-17-87) caused the four outboard MSIV's to close they were verified to close within acceptable stroke times. (see scram report #1-87-9).

There have also been numerous stroke time measurements made for retest purposes - the PPTD System Engineer should be able to obtain these results.

If you need further information, please let me know.

cc: L. B. Biddlecome - CC300
B. Liddel - E220

JGC/sc
M.M.-5 #37

Attachment 1
Form: STI-B21-025A-1

MSIV Closure Time

MSIV	AP_{10} (%)	AP_{90} (%)	t_o' (sec)	t_{10} (sec)	t_{90} (sec)	$^*t_s$ (sec)	$^{**}t_{sol}$ (sec)	$^{***}t_d$ (Max) (sec)	$t_{sol} + t_d$ (sec)
F022A	13.8	90.0	0.2[illegible] sec defined @19:41:58.00	0.98 @19:41:58.70	4.04 @19:42:01.76	4.02	4.16	0.28	4.44
F022B	12.4	90.0	0.28 sec defined @19:45:19.41	0.91 @19:45:20.04	3.61 @19:45:22.74	3.48	3.68	0.28	3.96
F022C	17.1	90.5	0.28 sec defined @20:01:16.02	0.98 @20:01:16.72	3.13 @20:01:18.81	2.93	3.13	0.28	3.41
F022D	14.4	90.0	0.28 sec defined @20:05:30.49	0.92 @20:05:31.12	2.41 @20:05:33.61	3.29	3.46	0.28	3.74
F028A	14.1	89.8	0.28 sec defined @20:13:16.75	1.14 sec @20:13:17.61	4.00 @20:13:20.47	3.78	4.11	0.28	4.39
F028B	13.2	90.2	0.28 sec defined @20:15:21.50	0.98 @20:15:22.20	3.52 @20:15:24.74	3.30	3.56	0.28	3.84
F028C	7.8	90.3	0.28 sec defined @20:18:45.45	0.89 @20:19:46.06	2.65 @20:19:48.92	3.35	3.69	0.28	3.97
F028D	15.8	90.2	0.28 sec defined @20:21:52.26	0.87 @20:21:52.84	3.50 @20:21:55.41	3.31	3.54	0.28	3.82

$$^*t_s = \frac{(t_{90} - t_{10})}{(AP_{90} - AP_{10})} \times 100\%$$

Acceptance Criteria 3.1.1: $2.5 \text{ sec} \le t_s \le 5.0 \text{ sec}$

$t_{sol} + t_d \le 5.5$ sec

$$^{**}t_{sol} = (t_{90} - t_o') + \frac{(t_{90} - t_{10})}{(AP_{90} - AP_{10})} (100\% - AP_{90})$$

$^{***}t_d$ - as determined by 1B21C-P-001

Date of t_d measurement - 12-8-85

[signature] 10-12-86
Performed By/Date

[signature] 10/12/86
Verified By/Date

OFFICIAL TEST COPY

Serial No. 070

SEQUENCE OF EVENTS AUTOMATIC LOG

REPORT TIME: 24-MAR-87 17:34:22.000
STATION ID :

(* INDICATES LOW CONFIDENCE DATA)

DATE	TIME	POINT ID	POINT NAME	STATUS
24-MAR-87	17:34:20.561	B21EC014	RPS CHANNEL ISOLATION B STATUS	ISOLATE
24-MAR-87	17:34:21.964	N32EC001	TURBINE TRIP STATUS	TRIP
24-MAR-87	17:34:21.976	N32EC001	TURBINE TRIP STATUS	NORM
24-MAR-87	17:34:22.064	N32EC001	TURBINE TRIP STATUS	TRIP
24-MAR-87	17:34:22.300	C34EC002	TDFP B TRIP STATUS	TRIP
24-MAR-87	17:34:22.316	N41EC003	GENERATOR TRIP STATUS	TRIP
24-MAR-87	17:34:22.501	R22EC022	L1006 CB POSITION	CLOSED
24-MAR-87	17:34:22.501	R22EC023	L1009 CB POSITION	CLOSED
24-MAR-87	17:34:28.055	B21EC013	RPS CH ISOL A STATUS	ISOL
24-MAR-87	17:34:28.200	B21EC069	INBOARD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.200	B21EC072	INBOARD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.200	B21EC075	INBOARD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.200	B21EC078	INBOARD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.200	B21EC081	OUTBD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.200	B21EC084	OUTBD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.200	B21EC087	OUTBD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.200	B21EC090	OUTBD MSIV SOLENOID STATUS	DE-ENER
24-MAR-87	17:34:28.688	B21EC089	OUTBD MSIV POSITION	CLOSE
24-MAR-87	17:34:28.692	B21EC092	OUTBD MSIV POSITION	CLOSE
24-MAR-87	17:34:28.744	B21EC080	INBOARD MSIV POSITION	CLOSE
24-MAR-87	17:34:28.748	B21EC074	INBOARD MSIV POSITION	CLOSE
24-MAR-87	17:34:28.764	B21EC086	OUTBD MSIV POSITION	CLOSE
24-MAR-87	17:34:28.780	B21EC071	INBOARD MSIV POSITION	CLOSE
24-MAR-87	17:34:28.824	B21EC077	INBOARD MSIV POSITION	CLOSE
24-MAR-87	17:34:28.916	B21EC083	OUTBD MSIV POSITION	CLOSE
24-MAR-87	17:34:29.785	B21EC016	RPS CHANNEL ISOL D STATUS	ISOL
24-MAR-87	17:34:29.901	B21EC001	ISLN VALVE GR-1 A COMMAND	ISOL
24-MAR-87	17:34:30.681	B21EC015	RPS CHANNEL ISOL C STATUS	ISOL
24-MAR-87	17:34:30.801	B21EC002	ISLN VALVE GROUP 1-B COMMAND	ISOLATE
24-MAR-87	17:34:30.988	B21EC076	INBOARD MSIV POSITION	FULLCLOS
24-MAR-87	17:34:31.240	B21EC079	INBOARD MSIV POSITION	FULLCLOS
24-MAR-87	17:34:31.272	B21EC091	OUTBD MSIV POSITION	FULLCLOS
24-MAR-87	17:34:31.308	B21EC085	OUTBD MSIV POSITION	FULLCLOS
24-MAR-87	17:34:31.372	B21EC088	OUTBD MSIV POSITION	FULLCLOS
24-MAR-87	17:34:31.388	B21EC073	INBOARD MSIV POSITION	FULLCLOS
24-MAR-87	17:34:31.804	B21EC070	INBOARD MSIV POSITION	FULLCLOS
24-MAR-87	17:34:31.824	B21EC082	OUTBD MSIV POSITION	FULLCLOS

TSN-16 9

TSN-15 9

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UNIT 1 STARTUP TEST PROGRAM
PERRY NUCLEAR POWER PLANT

TEST DIRECTOR
CHRONOLOGICAL TEST LOG
STI-RV3-031 Loss of Turbine Generator and Offsite Power (31)

PAGE 5

DATE	TIME	KEYWORD	REMARKS
5-12-87	1830	C11	SCRAM DISCHARGE VOLUME DRAIN VALVES 1C11-F011 AND 1C11-F181 SHOWED DUAL INDICATION AFTER THE SCRAM. C.R. 87-251 AND W.O.'s 87-4150, 87-4149 AND 87-4152 WERE INITIATED TO RESOLVE THIS PROBLEM. [initials]
5-12-87	1837	MSIVs*	REVIEW OF MSIV CLOSING TIMES (TABULAR TREND) REVEALED MSIV F028B REQUIRED GREATER THAN* 5 SECONDS TO CLOSE. A PARTIAL OF SVI-B21-T2002 HAS BEEN INITIATED TO FURTHER INVESTIGATE THIS PROBLEM. (~5.1 sec 5-12-87) [initials]
5-12-87	1840	DIV 2 DG	DURING OPERATION OF THE DIV 2 D.G. THE BUS INDICATED FLUCTUATIONS IN LOAD. THIS DID NOT IMPACT THE TEST BUT W.O. 87-4136 WAS INITIATED TO FURTHER INVESTIGATE. [initials]
5-12-87	1843	P47A	CHILLER P47-B001A TRIPPED ON LOW CONDENSING FLOW. APPARENT PROBLEM IS IN THE LOOP LOGIC SWAPOVER FROM NCC TO ECC AND CHILLER START. W.O. 87-4181 HAS BEEN INITIATED TO INVESTIGATE. [initials]
5.12.87	1921	Log closure	Test log is closed — [signature]
			WCD 5-12-87

* MSIV adjusted and subsequently retested satisfactorily / 5-17-87

TSM-208

Attachment 1
Form: STI-B21-025

MSIV Closure Time

MSIV	AP_{10} (%)	AP_{90} (%)	t_o' (Hr:Min:Sec)	t_{10} (Hr:Min:Sec)	t_{90} (Hr:Min:Sec)	$^{*}t_s$ (sec)	$^{**}t_{sol}$ (sec)	$^{***}t_d$ (Max) (sec)	$t_{sol} + t_d$ (sec)
F022A	13.8	90.0	14:53:37.575	14:53:38.350	14:53:41.360	3.95	4.080	0.28	4.360
F022B	12.4	90.0	14:59:56.030	14:59:56.670	14:59:59.390	3.38	3.595	0.28	3.875
F022C	17.1	90.5	15:05:37.360	15:05:38.075	15:05:30.235	2.94	3.155	0.28	3.435
F022D	14.4	90.0	15:09:14.480	15:09:15.120	15:09:17.600	3.28	3.449	0.28	3.725
F028A	14.1	89.8	15:14:49.315	15:14:50.115	15:14:52.185	4.05	4.281	0.28	4.561
F028B	13.2	90.2	15:19:14.610	15:19:15.335	15:19:17.900	3.33	3.616	0.28	3.896
F028C	7.8	90.3	15:26:09.155	15:26:09.745	15:26:12.460	3.29	3.624	0.28	3.904
F028D	10.8	90.2	15:31:09.400	15:31:09.950	15:31:13.660	3.30	3.523	0.28	3.803

$$^{*}t_s = \frac{(t_{90} - t_{10})}{(AP_{90} - AP_{10})} \times 100\%$$

Acceptance Criteria 3.1.1: $2.5 \text{ sec} \leq t_s \leq 5.0 \text{ sec}$

$t_{sol} + t_d \leq 5.5 \text{ sec}$

$$^{**}t_{sol} = (t_{90} - t_o') + \frac{(t_{90} - t_{10})}{(AP_{90} - AP_{10})} (100\% - AP_{90})$$

$^{***}t_d$ - as determined by 1B21C-P-001

Date of t_d measurement - 12/8/85

Performed By/Date 5/12/87

Verified By/Date 5/17/87

OFFICIAL TEST COPY

Serial No. 214

TnPE45121/449

PA
1 of

TABULAR TREND REPORT
STI-B21-025A TSN 451, STEP 8.3.9/11

REPORT TIME: 29-OCT-87 21:51:08.000 DATA START: 29-OCT-87 18:34:5
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:2
NUMBER OF VALUES : 250 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

POINT ID POINT NAME	ANALOG ENG UNITS DIGITAL LOW AND HIGH STATE NAMES	ANALOG CONV. EQUATION CONVERSION CONSTANTS
1 B21EC078 INBOARD MSIV SOLENOID STATUS	DE-ENER ENER	
2 B21EC079 INBOARD MSIV POSITION	OPEN FULLCLOS	
3 B21EC080 INBOARD MSIV POSITION	CLOSE FULLOPEN	
4 C34EA017 STEAMLINE D FLOW	MLB/HR	Y=C2X + C1 C1= -0.1065E+01 C2= 0.1625E-03
5 C34EA028 NARROW RANGE RX DOME PRESSURE	PSIG	Y=C2X + C1 C1= 0.8000E+03 C2= 0.7687E-02

DATE	TIME	1	2	3	4	5	6
29-OCT-87	18:34:58.000	ENER	OPEN	FULLOPEN	2.7265	964.00	
	18:34:58.100	ENER	OPEN	FULLOPEN	2.7265	964.00	
	18:34:58.200	ENER	OPEN	FULLOPEN	2.7239	963.87	
	18:34:58.300	ENER	OPEN	FULLOPEN	2.7265	963.87	
	18:34:58.400	ENER	OPEN	FULLOPEN	2.7265	963.87	
	18:34:58.500	ENER	OPEN	FULLOPEN	2.7292	963.87	
	18:34:58.600	ENER	OPEN	FULLOPEN	2.7320	963.87	
	18:34:58.700	ENER	OPEN	FULLOPEN	2.7320	963.87	
	18:34:58.800	ENER	OPEN	FULLOPEN	2.7320	963.73	
	18:34:58.900	DE-ENER	OPEN	FULLOPEN	2.7315	963.73	
	18:34:59.000	DE-ENER	OPEN	FULLOPEN	2.7315	963.60	
	18:34:59.100	DE-ENER	OPEN	FULLOPEN	2.7424	964.00	
	18:34:59.200	DE-ENER	OPEN	FULLOPEN	2.7343	963.87	
	18:34:59.300	DE-ENER	OPEN	FULLOPEN	2.7260	963.60	

TSN-451

TAPE451Z1/449

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TABULAR TREND REPORT
STI-B21-025A,TSN 451,STEP 8.3.9/11

REPORT TIME: 29-OCT-87 21:51:08.000   DATA START: 29-OCT-87 18:34:
STATION ID : PERRY_UNIT_1   0007   DATA END : 29-OCT-87 18:35:
NUMBER OF VALUES : 250   DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5
	18:34:59.400	DE-ENER	OPEN	FULLOPEN	2.7315	963.87
	18:34:59.500	DE-ENER	OPEN	FULLOPEN	2.7370	963.67
	18:34:59.600	DE-ENER	OPEN	FULLOPEN	2.7315	963.87
	18:34:59.700	DE-ENER	OPEN	FULLOPEN	2.7206	964.00
	18:34:59.800	DE-ENER	OPEN	FULLOPEN	2.7206	963.87
	18:34:59.900	DE-ENER	OPEN	FULLOPEN	2.7260	963.88
	18:35:00.000	DE-ENER	OPEN	FULLOPEN	2.7260	963.75
	18:35:00.100	DE-ENER	OPEN	FULLOPEN	2.7178	96[illegible].88
	18:35:00.200	DE-ENER	OPEN	FULLOPEN	2.7206	96[illegible]
	18:35:00.300	DE-ENER	OPEN	FULLOPEN	2.7315	96[illegible].88
	18:35:00.400	DE-ENER	OPEN	FULLOPEN	2.7260	963.88
	18:35:00.500	DE-ENER	OPEN	FULLOPEN	2.7178	963.88
	18:35:00.600	DE-ENER	OPEN	FULLOPEN	2.7260	963.88
	18:35:00.700	DE-ENER	OPEN	FULLOPEN	2.7396	964.01
	18:35:00.800	DE-ENER	OPEN	FULLOPEN	2.7424	963.91
	18:35:00.900	DE-ENER	OPEN	FULLOPEN	2.7372	963.91
	18:35:01.000	DE-ENER	OPEN	FULLOPEN	2.7398	963.79
	18:35:01.100	DE-ENER	OPEN	FULLOPEN	2.7481	963.91
	18:35:01.200	DE-ENER	OPEN	FULLOPEN	2.7453	964.04
	18:35:01.300	DE-ENER	OPEN	FULLOPEN	2.7426	964.17
	18:35:01.400	DE-ENER	OPEN	FULLOPEN	2.7372	964.04
	18:35:01.500	DE-ENER	OPEN	FULLOPEN	2.7426	964.04
	18:35:01.600	DE-ENER	OPEN	FULLOPEN	2.7426	963.91
	18:35:01.700	DE-ENER	OPEN	FULLOPEN	2.7317	963.79
	18:35:01.800	DE-ENER	OPEN	FULLOPEN	2.7289	963.79
	18:35:01.900	DE-ENER	OPEN	FULLOPEN	2.7369	963.87
	18:35:02.000	DE-ENER	OPEN	FULLOPEN	2.7315	963.87
	18:35:02.100	DE-ENER	OPEN	FULLOPEN	2.7260	963.87
	18:35:02.200	DE-ENER	OPEN	FULLOPEN	2.7315	964.00
	18:35:02.300	DE-ENER	OPEN	FULLOPEN	2.7315	963.87
	18:35:02.400	DE-ENER	OPEN	FULLOPEN	2.7232	963.87
	18:35:02.500	DE-ENER	OPEN	FULLOPEN	2.7315	964.00
	18:35:02.600	DE-ENER	OPEN	FULLOPEN	2.7315	963.87
	18:35:02.700	DE-ENER	OPEN	FULLOPEN	2.7341	963.87
	18:35:02.800	DE-ENER	OPEN	FULLOPEN	2.7315	963.97
	18:35:02.900	DE-ENER	OPEN	FULLOPEN	2.7309	963.83
	18:35:03.000	DE-ENER	OPEN	FULLOPEN	2.7255	963.70
	18:35:03.100	DE-ENER	OPEN	FULLOPEN	2.7255	963.83
	18:35:03.200	DE-ENER	OPEN	FULLOPEN	2.7227	963.83
	18:35:03.300	DE-ENER	OPEN	FULLOPEN	2.7309	963.97
	18:35:03.400	DE-ENER	OPEN	FULLOPEN	2.7255	963.97
	18:35:03.500	DE-ENER	OPEN	FULLOPEN	2.7255	963.97
	18:35:03.600	DE-ENER	OPEN	FULLOPEN	2.7364	963.83

TSN-451

InPL45121/449 InPL45121/449

P

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TABULAR TREND REPORT
STI-B21-023A,TSN 451,STEP 8.3.9/11

REPORT TIME: 29-OCT-87 21:51:08.000 DATA START: 29-OCT-87 18:34:
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:
NUMBER OF VALUES : 250 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5
	18:35:03.700	DE-ENER	OPEN	FULLOPEN	2.7419	963.83
	18:35:03.800	DE-ENER	OPEN	FULLOPEN	2.7364	963.83
	18:35:03.900	DE-ENER	OPEN	FULLOPEN	2.7317	963.83
	18:35:04.000	DE-ENER	OPEN	FULLOPEN	2.7370	963.83
	18:35:04.100	DE-ENER	OPEN	FULLOPEN	2.7370	963.96
	18:35:04.200	DE-ENER	OPEN	FULLOPEN	2.7370	963.83
	18:35:04.300	DE-ENER	OPEN	FULLOPEN	2.7370	964.09
	18:35:04.400	DE-ENER	OPEN	FULLOPEN	2.7479	963.96
	18:35:04.500	DE-ENER	OPEN	FULLOPEN	2.7479	963.83
	18:35:04.600	DE-ENER	OPEN	FULLOPEN	2.7426	963.83
	18:35:04.700	DE-ENER	OPEN	FULLOPEN	2.7398	963.83
	18:35:04.800	DE-ENER	OPEN	FULLOPEN	2.7453	963.97
	18:35:04.900	DE-ENER	OPEN	FULLOPEN	2.7479	963.97
	18:35:05.000	DE-ENER	OPEN	FULLOPEN	2.7398	963.83
	18:35:05.100	DE-ENER	OPEN	FULLOPEN	2.7398	963.83
	18:35:05.200	DE-ENER	OPEN	FULLOPEN	2.7426	963.83
	18:35:05.300	DE-ENER	OPEN	FULLOPEN	2.7370	963.83
	18:35:05.400	DE-ENER	OPEN	FULLOPEN	2.7317	963.83
	18:35:05.500	DE-ENER	OPEN	FULLOPEN	2.7370	963.97
	18:35:05.600	DE-ENER	OPEN	FULLOPEN	2.7426	963.97
	18:35:05.700	DE-ENER	OPEN	FULLOPEN	2.7426	964.10
	18:35:05.800	DE-ENER	OPEN	FULLOPEN	2.7317	963.97
	18:35:05.900	DE-ENER	OPEN	FULLOPEN	2.7313	963.93
	18:35:06.000	DE-ENER	OPEN	FULLOPEN	2.7341	963.80
	18:35:06.100	DE-ENER	OPEN	FULLOPEN	2.7369	964.07
	18:35:06.200	DE-ENER	OPEN	FULLOPEN	2.7369	964.07
	18:35:06.300	DE-ENER	OPEN	FULLOPEN	2.7422	963.93
	18:35:06.400	DE-ENER	OPEN	FULLOPEN	2.7478	963.80
	18:35:06.500	DE-ENER	OPEN	FULLOPEN	2.7422	963.67
	18:35:06.600	DE-ENER	OPEN	FULLOPEN	2.7369	963.80
	18:35:06.700	DE-ENER	OPEN	FULLOPEN	2.7313	963.80
	18:35:06.800	DE-ENER	OPEN	FULLOPEN	2.7369	964.07
	18:35:06.900	DE-ENER	OPEN	FULLOPEN	2.7313	963.93
	18:35:07.000	DE-ENER	OPEN	FULLOPEN	2.7313	963.93
	18:35:07.100	DE-ENER	OPEN	FULLOPEN	2.7313	964.07
	18:35:07.200	DE-ENER	OPEN	FULLOPEN	2.7286	963.93
	18:35:07.300	DE-ENER	OPEN	FULLOPEN	2.7369	963.93
	18:35:07.400	DE-ENER	OPEN	FULLOPEN	2.7396	963.80
	18:35:07.500	DE-ENER	OPEN	FULLOPEN	2.7396	963.80
	18:35:07.600	DE-ENER	OPEN	FULLOPEN	2.7450	963.93
	18:35:07.700	DE-ENER	OPEN	FULLOPEN	2.7478	964.07
	18:35:07.800	DE-ENER	OPEN	FULLOPEN	2.7396	963.93
	18:35:07.900	DE-ENER	OPEN	FULLOPEN	2.7455	963.94

TSN-451

TAPE451Z1/449

TABULAR TREND REPORT
STI-B21-025A,TSN 451,STEP 8.3.9/11

REPORT TIME: 29-OCT-87 21:51:08.000 DATA START: 29-OCT-87 18:34:
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:
NUMBER OF VALUES : 250 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5
	18:35:08.000	DE-ENER	OPEN	FULLOPEN	2.7455	963.94
	18:35:08.100	DE-ENER	OPEN	FULLOPEN	2.7427	963.82
	18:35:08.200	DE-ENER	OPEN	FULLOPEN	2.7346	963.69
	18:35:08.300	DE-ENER	OPEN	FULLOPEN	2.7374	963.82
	18:35:08.400	DE-ENER	OPEN	FULLOPEN	2.7291	963.82
	18:35:08.500	DE-ENER	OPEN	FULLOPEN	2.7374	963.69
	18:35:08.600	DE-ENER	OPEN	FULLOPEN	2.7346	963.82
	18:35:08.700	DE-ENER	OPEN	FULLOPEN	2.7346	964.07
	18:35:08.800	DE-ENER	OPEN	FULLOPEN	2.7374	964.07
	18:35:08.900	DE-ENER	OPEN	FULLOPEN	2.7349	964.07
	18:35:09.000	DE-ENER	OPEN	FULLOPEN	2.7349	963.94
	18:35:09.100	DE-ENER	OPEN	FULLOPEN	2.7349	963.82
	18:35:09.200	DE-ENER	OPEN	FULLOPEN	2.7377	963.94
	18:35:09.300	DE-ENER	OPEN	FULLOPEN	2.7430	963.94
	18:35:09.400	DE-ENER	OPEN	FULLOPEN	2.7377	964.20
	18:35:09.500	DE-ENER	OPEN	FULLOPEN	2.7266	964.20
	18:35:09.600	DE-ENER	OPEN	FULLOPEN	2.7322	963.94
	18:35:09.700	DE-ENER	OPEN	FULLOPEN	2.7377	963.82
	18:35:09.800	DE-ENER	OPEN	FULLOPEN	2.7349	963.94
	18:35:09.900	DE-ENER	OPEN	FULLOPEN	2.7396	964.06
	18:35:10.000	DE-ENER	OPEN	FULLOPEN	2.7479	964.19
	18:35:10.100	DE-ENER	OPEN	FULLOPEN	2.7424	964.06
	18:35:10.200	DE-ENER	OPEN	FULLOPEN	2.7370	964.06
	18:35:10.300	DE-ENER	OPEN	FULLOPEN	2.7424	964.19
	18:35:10.400	DE-ENER	OPEN	FULLOPEN	2.7424	963.93
	18:35:10.500	DE-ENER	OPEN	FULLOPEN	2.7396	963.93
	18:35:10.600	DE-ENER	OPEN	FULLOPEN	2.7370	964.06
	18:35:10.700	DE-ENER	OPEN	FULLOPEN	2.7424	964.19
	18:35:10.800	DE-ENER	OPEN	FULLOPEN	2.7424	964.03
	18:35:10.900	DE-ENER	OPEN	FULLOPEN	2.7367	964.03
	18:35:11.000	DE-ENER	OPEN	FULLOPEN	2.7313	964.03
	18:35:11.100	DE-ENER	OPEN	FULLOPEN	2.7367	963.90
	18:35:11.200	DE-ENER	OPEN	FULLOPEN	2.7478	964.03
	18:35:11.300	DE-ENER	OPEN	FULLOPEN	2.7450	964.15
	18:35:11.400	DE-ENER	OPEN	FULLOPEN	2.7476	964.15
	18:35:11.500	DE-ENER	OPEN	FULLOPEN	2.7450	964.03
	18:35:11.600	DE-ENER	OPEN	FULLOPEN	2.7531	964.03
	18:35:11.700	DE-ENER	OPEN	FULLOPEN	2.7505	964.03
	18:35:11.800	DE-ENER	OPEN	FULLOPEN	2.7531	964.03
	18:35:11.900	DE-ENER	OPEN	FULLOPEN	2.7538	964.09
	18:35:12.000	DE-ENER	OPEN	FULLOPEN	2.7538	964.09
	18:35:12.100	DE-ENER	OPEN	FULLOPEN	2.7538	964.09
	18:35:12.200	DE-ENER	OPEN	FULLOPEN	2.7538	964.09

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TABULAR TREND REPORT

STI-821-025A,TSN 451;STEP 8.3.9/11

REPORT TIME: 29-OCT-87 21:51:08.000 DATA START: 29-OCT-87 18:34:5
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:2
NUMBER OF VALUES : 250 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5	6
	18:35:12.300	DE-ENER	OPEN	FULLOPEN	2.7538	964.09	
	18:35:12.400	DE-ENER	OPEN	FULLOPEN	2.7484	964.09	
	18:35:12.500	DE-ENER	OPEN	FULLOPEN	2.7429	964.09	
	18:35:12.600	DE-ENER	OPEN	FULLOPEN	2.7484	964.09	
	18:35:12.700	DE-ENER	OPEN	FULLOPEN	2.7538	964.09	
	18:35:12.800	DE-ENER	OPEN	FULLOPEN	2.7538	964.13	
	18:35:12.900	DE-ENER	OPEN	FULLOPEN	2.7515	964.13	
	18:35:13.000	DE-ENER	OPEN	FULLOPEN	2.7487	964.13	
	18:35:13.100	DE-ENER	OPEN	FULLOPEN	2.7432	964.25	
	18:35:13.200	DE-ENER	OPEN	FULLOPEN	2.7543	964.13	
	18:35:13.300	DE-ENER	OPEN	FULLOPEN	2.7378	964.13	
	18:35:13.400	DE-ENER	OPEN	FULLOPEN	2.7296	964.00	
	18:35:13.500	DE-ENER	OPEN	FULLOPEN	2.7378	964.26	
	18:35:13.600	DE-ENER	OPEN	FULLOPEN	2.7351	964.13	
	18:35:13.700	DE-ENER	OPEN	FULLOPEN	2.7378	964.00	
	18:35:13.800	DE-ENER	OPEN	FULLOPEN	2.7378	964.13	
	18:35:13.900	DE-ENER	OPEN	FULLOPEN	2.7426	964.13	
	18:35:14.000	DE-ENER	OPEN	FULLOPEN	2.7534	964.26	
	18:35:14.100	DE-ENER	OPEN	FULLOPEN	2.7508	964.13	
	18:35:14.200	DE-ENER	OPEN	FULLOPEN	2.7396	964.13	
	18:35:14.300	DE-ENER	OPEN	FULLOPEN	2.7317	964.13	
	18:35:14.400	DE-ENER	OPEN	FULLOPEN	2.7372	964.26	
	18:35:14.500	DE-ENER	OPEN	FULLOPEN	2.7426	964.13	
	18:35:14.600	DE-ENER	OPEN	FULLOPEN	2.7398	964.13	
	18:35:14.700	DE-ENER	OPEN	FULLOPEN	2.7372	964.00	
	18:35:14.800	DE-ENER	OPEN	FULLOPEN	2.7481	964.12	
	18:35:14.900	DE-ENER	OPEN	FULLOPEN	2.7507	964.12	
	18:35:15.000	DE-ENER	OPEN	FULLOPEN	2.7533	964.12	
	18:35:15.100	DE-ENER	OPEN	FULLOPEN	2.7479	964.12	
	18:35:15.200	DE-ENER	OPEN	FULLOPEN	2.7452	964.12	
	18:35:15.300	DE-ENER	OPEN	FULLOPEN	2.7479	964.12	
	18:35:15.400	DE-ENER	OPEN	FULLOPEN	2.7479	964.00	
	18:35:15.500	DE-ENER	OPEN	FULLOPEN	2.7479	964.12	
	18:35:15.600	DE-ENER	OPEN	FULLOPEN	2.7424	964.00	
	18:35:15.700	DE-ENER	OPEN	FULLOPEN	2.7533	964.25	
	18:35:15.800	DE-ENER	OPEN	FULLOPEN	2.7479	964.00	
	18:35:15.900	DE-ENER	OPEN	FULLOPEN	2.7533	964.01	
	18:35:16.000	DE-ENER	OPEN	FULLOPEN	2.7479	964.01	
	18:35:16.100	DE-ENER	OPEN	FULLOPEN	2.7424	964.27	
	18:35:16.200	DE-ENER	OPEN	FULLOPEN	2.7424	964.01	
	18:35:16.300	DE-ENER	OPEN	FULLOPEN	2.7424	964.14	
	18:35:16.400	DE-ENER	OPEN	FULLOPEN	2.7370	964.01	
	18:35:16.500	DE-ENER	OPEN	FULLOPEN	2.7343	964.01	

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TABULAR TREND REPORT
STI-821-025A,TSN 451,STEP 8.3.9/11

REPORT TIME: 29-OCT-87 21:51:08.000 DATA START: 29-OCT-87 18:34:5
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:2
NUMBER OF VALUES : 250 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5	6
	18:35:16.600	DE-ENER	OPEN	FULLOPEN	2.7424	963.88	
	18:35:16.700	DE-ENER	OPEN	FULLOPEN	2.7424	963.88	
	18:35:16.800	DE-ENER	OPEN	FULLOPEN	2.7370	963.98	
	18:35:16.900	DE-ENER	OPEN	FULLOPEN	2.7310	964.11	
	18:35:17.000	DE-ENER	OPEN	FULLOPEN	2.7364	963.98	
	18:35:17.100	DE-ENER	OPEN	FULLOPEN	2.7364	963.72	
	18:35:17.200	DE-ENER	OPEN	FULLOPEN	2.7364	963.85	
	18:35:17.300	DE-ENER	OPEN	FULLOPEN	2.7419	963.85	
	18:35:17.400	DE-ENER	OPEN	FULLOPEN	2.7474	963.85	
	18:35:17.500	DE-ENEP	OPEN	FULLOPEN	2.7419	964.11	
	18:35:17.600	DE-ENER	OPEN	FULLOPEN	2.7474	964.11	
	18:35:17.700	DE-ENER	OPEN	FULLOPEN	2.7474	964.11	
	18:35:17.800	DE-ENER	OPEN	FULLOPEN	2.7500	963.85	
	18:35:17.900	DE-ENER	OPEN	FULLOPEN	2.7427	963.84	
	18:35:18.000	DE-ENER	OPEN	FULLOPEN	2.7318	963.84	
	18:35:18.100	DE-ENER	OPEN	FULLOPEN	2.7318	963.84	
	18:35:18.200	DE-ENER	OPEN	FULLOPEN	2.7374	963.97	
	18:35:18.300	DE-ENER	OPEN	FULLOPEN	2.7318	963.84	
	18:35:18.400	DE-ENER	OPEN	FULLOPEN	2.7265	963.97	
	18:35:18.500	DE-ENER	OPEN	CLOSE	2.7209	963.84	
	18:35:18.600	DE-ENER	OPEN	CLOSE	2.7154	963.84	
	18:35:18.700	DE-ENER	OPEN	CLOSE	2.7045	963.97	
	18:35:18.800	DE-ENER	OPEN	CLOSE	2.6825	963.98	
	18:35:18.900	DE-ENER	OPEN	CLOSE	2.6667	964.11	
	18:35:19.000	DE-ENER	OPEN	CLOSE	2.6447	964.36	
	18:35:19.100	DE-ENER	OPEN	CLOSE	2.6228	964.36	
	18:35:19.200	DE-ENER	OPEN	CLOSE	2.5901	964.36	
	18:35:19.300	DE-ENER	OPEN	CLOSE	2.5626	964.50	
	18:35:19.400	DE-ENER	OPEN	CLOSE	2.5353	964.50	
	18:35:19.500	DE-ENER	OPEN	CLOSE	2.4888	964.76	
	18:35:19.600	DE-ENER	OPEN	CLOSE	2.4424	964.89	
	18:35:19.700	DE-ENER	OPEN	CLOSE	2.3905	965.02	
	18:35:19.800	DE-ENER	OPEN	CLOSE	2.3357	965.53	
	18:35:19.900	DE-ENER	OPEN	CLOSE	2.2670	965.49	
	18:35:20.000	DE-ENER	OPEN	CLOSE	2.1631	966.01	
	18:35:20.100	DE-ENER	OPEN	CLOSE	2.0648	966.14	
	18:35:20.200	DE-ENER	OPEN	CLOSE	1.9281	966.66	
	18:35:20.300	DE-ENER	OPEN	CLOSE	1.7695	967.05	
	18:35:20.400	DE-ENER	OPEN	CLOSE	1.5398	967.82	
	18:35:20.500	DE-ENER	OPEN	CLOSE	1.2775	968.86	
	18:35:20.600	DE-ENER	FULLCLOS	CLOSE	0.89199	970.16	
	18:35:20.700	DE-ENER	FULLCLOS	CLOSE	0.49021	971.33	
	18:35:20.800	DE-ENER	FULLCLOS	CLOSE	0.27145	972.04	

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TABULAR TREND REPORT
STI-B21-025A,TSN 451,STEP 8.3.9/11

REPORT TIME: 29-OCT-87 21:51:08.000 DATA START: 29-OCT-87 18:34:5
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:2
NUMBER OF VALUES : 250 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5	6
	18:35:20.900	DE-ENER	FULLCLOS	CLOSE	0.19522	972.44	
	18:35:21.000	DE-ENER	FULLCLOS	CLOSE	0.10778	973.21	
	18:35:21.100	DE-ENER	FULLCLOS	CLOSE	0.10776	973.08	
	18:35:21.200	DE-ENER	FULLCLOS	CLOSE	0.10502	973.34	
	18:35:21.300	DE-ENER	FULLCLOS	CLOSE	8.047-2	974.12	
	18:35:21.400	DE-ENER	FULLCLOS	CLOSE	0.10225	974.51	
	18:35:21.500	DE-ENER	FULLCLOS	CLOSE	0.11867	975.29	
	18:35:21.600	DE-ENER	FULLCLOS	CLOSE	0.12972	976.07	
	18:35:21.700	DE-ENER	FULLCLOS	CLOSE	0.13785	976.45	
	18:35:21.800	DE-ENER	FULLCLOS	CLOSE	0.14061	977.36	
	18:35:21.900	DE-ENER	FULLCLOS	CLOSE	0.12972	977.92	
	18:35:22.000	DE-ENER	FULLCLOS	CLOSE	0.14061	978.56	
	18:35:22.100	DE-ENER	FULLCLOS	CLOSE	0.17344	979.21	
	18:35:22.200	DE-ENER	FULLCLOS	CLOSE	0.16239	979.99	
	18:35:22.300	DE-ENER	FULLCLOS	CLOSE	0.15979	980.38	
	18:35:22.400	DE-ENER	FULLCLOS	CLOSE	0.14614	980.89	
	18:35:22.500	DE-ENER	FULLCLOS	CLOSE	0.14061	981.15	
	18:35:22.600	DE-ENER	FULLCLOS	CLOSE	0.17344	981.67	
	18:35:22.700	DE-ENER	FULLCLOS	CLOSE	0.19246	982.31	
	18:35:22.800	DE-ENER	FULLCLOS	CLOSE	0.18157	982.40	
	18:35:22.900	DE-ENER	FULLCLOS	CLOSE	0.16743	982.53	

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TABULAR TREND REPORT
STI B21-025A, TSN451,STEP8.3.9/11

REPORT TIME: 30-OCT-87 05:13:45.000 DATA START: 29-OCT-87 18:35:23.000
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:32.900
NUMBER OF VALUES : 100 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

POINT ID	POINT NAME	ANALOG ENG UNITS DIGITAL LOW AND HIGH STATE NAMES	ANALOG CONV. EQUATION CONVERSION CONSTANTS
1 B21EC078	INBOARD MSIV SOLENOID STATUS	DE-ENER ENER	
2 B21EC079	INBOARD MSIV POSITION	OPEN FULLCLOS	
3 B21EC080	INBOARD MSIV POSITION	CLOSE FULLOPEN	
4 ? ?EA017	STEAMLINE D FLOW	MLB/HR	Y=C2X + C1 C1= -0.1065E+01 C2= 0.1625E-03
5 C34EA026	NARROW RANGE RX DOME PRESSURE	PSIG	Y=C2X + C1 C1= 0.8000E+03 C2= 0.7687E-02

DATE	TIME	1	2	3	4	5	6
29-OCT-87	18:35:23.000	DE-ENER	FULLCLOS	CLOSE	0.18937	982.79	
	18:35:23.100	DE-ENER	FULLCLOS	CLOSE	0.19473	982.91	
	18:35:23.200	DE-ENER	FULLCLOS	CLOSE	0.19197	983.18	
	18:35:23.300	DE-ENER	FULLCLOS	CLOSE	0.20026	983.18	
	18:35:23.400	DE-ENER	FULLCLOS	CLOSE	0.18384	983.31	
	18:35:23.500	DE-ENER	FULLCLOS	CLOSE	0.20026	983.44	
	18:35:23.600	DE-ENER	FULLCLOS	CLOSE	0.19197	983.44	
	18:35:23.700	DE-ENER	FULLCLOS	CLOSE	0.20302	983.69	
	18:35:23.800	DE-ENER	FULLCLOS	CLOSE	0.20562	983.69	
	18:35:23.900	DE-ENER	FULLCLOS	CLOSE	0.20026	983.71	
	18:35:24.000	DE-ENER	FULLCLOS	CLOSE	0.18937	983.71	
	18:35:24.100	DE-ENER	FULLCLOS	CLOSE	0.18937	983.71	
	18:35:24.200	DE-ENER	FULLCLOS	CLOSE	0.18384	983.58	
	18:35:24.300	DE-ENER	FULLCLOS	CLOSE	0.20578	983.98	

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TABULAR TREND REPORT
STI B21-025A, TSN451,STEP8.3.9/11

REPORT TIME: 30-OCT-87 05:13:45.000 DATA START: 29-OCT-87 18:35:23.000
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:32.900
NUMBER OF VALUES : 100 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5	6
	18:35:24.400	DE-ENER	FULLCLOS	CLOSE	0.18937	983.71	
	18:35:24.500	DE-ENER	FULLCLOS	CLOSE	0.18937	983.46	
	18:35:24.600	DE-ENER	FULLCLOS	CLOSE	0.18937	983.71	
	18:35:24.700	DE-ENER	FULLCLOS	CLOSE	0.19490	983.71	
	18:35:24.800	DE-ENER	FULLCLOS	CLOSE	0.21131	983.71	
	18:35:24.900	DE-ENER	FULLCLOS	CLOSE	0.24365	983.84	
	18:35:25.000	DE-ENER	FULLCLOS	CLOSE	0.23829	983.71	
	18:35:25.100	DE-ENER	FULLCLOS	CLOSE	0.22724	983.71	
	18:35:25.200	DE-ENER	FULLCLOS	CLOSE	0.21082	983.58	
	18:35:25.300	DE-ENER	FULLCLOS	CLOSE	0.22188	983.58	
	18:35:25.400	DE-ENER	FULLCLOS	CLOSE	0.18904	983.71	
	18:35:25.500	DE-ENER	FULLCLOS	CLOSE	0.21635	983.71	
	18:35:25.600	DE-ENER	FULLCLOS	CLOSE	0.21635	983.58	
	18:35:25.700	DE-ENER	FULLCLOS	CLOSE	0.21635	983.46	
	18:35:25.800	DE-ENER	FULLCLOS	CLOSE	0.23276	983.33	
	18:35:25.900	DE-ENER	FULLCLOS	CLOSE	0.21082	983.58	
	18:35:26.000	DE-ENER	FULLCLOS	CLOSE	0.20822	983.71	
	18:35:26.100	DE-ENER	FULLCLOS	CLOSE	0.21082	983.71	
	18:35:26.200	DE-ENER	FULLCLOS	CLOSE	0.21635	983.97	
	18:35:26.300	DE-ENER	FULLCLOS	CLOSE	0.21359	983.84	
	18:35:26.400	DE-ENER	FULLCLOS	CLOSE	0.22724	983.84	
	18:35:26.500	DE-ENER	FULLCLOS	CLOSE	0.21082	983.84	
	18:35:26.600	DE-ENER	FULLCLOS	CLOSE	0.24365	983.97	
	18:35:26.700	DE-ENER	FULLCLOS	CLOSE	0.22188	983.71	
	18:35:26.800	DE-ENER	FULLCLOS	CLOSE	0.22188	984.00	
	18:35:26.900	DE-ENER	FULLCLOS	CLOSE	0.18319	983.74	
	18:35:27.000	DE-ENER	FULLCLOS	CLOSE	0.16141	984.25	
	18:35:27.100	DE-ENER	FULLCLOS	CLOSE	0.19961	984.13	
	18:35:27.200	DE-ENER	FULLCLOS	CLOSE	0.19408	984.25	
	18:35:27.300	DE-ENER	FULLCLOS	CLOSE	0.21602	984.00	
	18:35:27.400	DE-ENER	FULLCLOS	CLOSE	0.22415	983.74	
	18:35:27.500	DE-ENER	FULLCLOS	CLOSE	0.22691	984.00	
	18:35:27.600	DE-ENER	FULLCLOS	CLOSE	0.22415	983.74	
	18:35:27.700	DE-ENER	FULLCLOS	CLOSE	0.21602	984.00	
	18:35:27.800	DE-ENER	FULLCLOS	CLOSE	0.21050	984.00	
	18:35:27.900	DE-ENER	FULLCLOS	CLOSE	0.21619	984.61	
	18:35:28.000	DE-ENER	FULLCLOS	CLOSE	0.23260	984.35	
	18:35:28.100	DE-ENER	FULLCLOS	CLOSE	0.22171	984.22	
	18:35:28.200	DE-ENER	FULLCLOS	CLOSE	0.22171	984.09	
	18:35:28.300	DE-ENER	FULLCLOS	CLOSE	0.26007	984.09	
	18:35:28.400	DE-ENER	FULLCLOS	CLOSE	0.25454	984.22	
	18:35:28.500	DE-ENER	FULLCLOS	CLOSE	0.23260	984.22	
	18:35:28.600	DE-ENER	FULLCLOS	CLOSE	0.24365	984.35	

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TABULAR TREND REPORT
STI B21-025A, TSN451,STEP8.3.9/11

REPORT TIME: 30-OCT-87 05:13:45.000 DATA START: 29-OCT-87 18:35:23.000
STATION ID : PERRY_UNIT_1 0007 DATA END : 29-OCT-87 18:35:32.900
NUMBER OF VALUES : 100 DATA MODE : HISTORICAL
PROCESSING RATE : 0.100 SECONDS/SAMPLE

DATE	TIME	1	2	3	4	5	6
	18:35:28.700	DE-ENER	FULLCLOS	CLOSE	0.24625	984.35	
	18:35:28.800	DE-ENER	FULLCLOS	CLOSE	0.25731	984.34	
	18:35:28.900	DE-ENER	FULLCLOS	CLOSE	0.23813	983.96	
	18:35:29.000	DE-ENER	FULLCLOS	CLOSE	0.23813	984.34	
	18:35:29.100	DE-ENER	FULLCLOS	CLOSE	0.24365	984.34	
	18:35:29.200	DE-ENER	FULLCLOS	CLOSE	0.23260	983.70	
	18:35:29.300	DE-ENER	FULLCLOS	CLOSE	0.22724	984.21	
	18:35:29.400	DE-ENER	FULLCLOS	CLOSE	0.19977	984.34	
	18:35:29.500	DE-ENER	FULLCLOS	CLOSE	0.21619	984.21	
	18:35:29.600	DE-ENER	FULLCLOS	CLOSE	0.19977	984.21	
	18:35:29.700	DE-ENER	FULLCLOS	CLOSE	0.20253	984.34	
	18:35:29.800	DE-ENER	FULLCLOS	CLOSE	0.24902	983.96	
	18:35:29.900	DE-ENER	FULLCLOS	CLOSE	0.22724	984.15	
	18:35:30.000	DE-ENER	FULLCLOS	CLOSE	0.23260	984.54	
	18:35:30.100	DE-ENER	FULLCLOS	CLOSE	0.24902	984.15	
	18:35:30.200	DE-ENER	FULLCLOS	CLOSE	0.24365	983.76	
	18:35:30.300	DE-ENER	FULLCLOS	CLOSE	0.23260	983.89	
	18:35:30.400	DE-ENER	FULLCLOS	CLOSE	0.23260	984.02	
	18:35:30.500	DE-ENER	FULLCLOS	CLOSE	0.23260	984.15	
	18:35:30.600	DE-ENER	FULLCLOS	CLOSE	0.21619	983.76	
	18:35:30.700	DE-ENER	FULLCLOS	CLOSE	0.23260	984.41	
	18:35:30.800	DE-ENER	FULLCLOS	CLOSE	0.21619	984.11	
	18:35:30.900	DE-ENER	FULLCLOS	CLOSE	0.21927	983.72	
	18:35:31.000	DE-ENER	FULLCLOS	CLOSE	0.24122	983.59	
	18:35:31.100	DE-ENER	FULLCLOS	CLOSE	0.23293	983.72	
	18:35:31.200	DE-ENER	FULLCLOS	CLOSE	0.22204	983.98	
	18:35:31.300	DE-ENER	FULLCLOS	CLOSE	0.21391	983.98	
	18:35:31.400	DE-ENER	FULLCLOS	CLOSE	0.24398	983.72	
	18:35:31.500	DE-ENER	FULLCLOS	CLOSE	0.23569	983.72	
	18:35:31.600	DE-ENER	FULLCLOS	CLOSE	0.24398	983.98	
	18:35:31.700	DE-ENER	FULLCLOS	CLOSE	0.25487	983.85	
	18:35:31.800	DE-ENER	FULLCLOS	CLOSE	0.26576	983.72	
	18:35:31.900	DE-ENER	FULLCLOS	CLOSE	0.24382	983.73	
	18:35:32.000	DE-ENER	FULLCLOS	CLOSE	0.24382	983.86	
	18:35:32.100	DE-ENER	FULLCLOS	CLOSE	0.21099	983.99	
	18:35:32.200	DE-ENER	FULLCLOS	CLOSE	0.29030	983.86	
	18:35:32.300	DE-ENER	FULLCLOS	CLOSE	0.23293	983.73	
	18:35:32.400	DE-ENER	FULLCLOS	CLOSE	0.20010	983.99	
	18:35:32.500	DE-ENER	FULLCLOS	CLOSE	0.21375	983.73	
	18:35:32.600	DE-ENER	FULLCLOS	CLOSE	0.19733	983.73	
	18:35:32.700	DE-ENER	FULLCLOS	CLOSE	0.28754	983.73	
	18:35:32.800	DE-ENER	FULLCLOS	CLOSE	0.32037	983.87	

TSN-451

B21 - T2001

DATE	VALVES	PASS
12-16-86 0451	ALL	YES
4-9-87 0846	ALL	YES
5-13-87 0044	1B21-F028B	YES-PARTIAL
8-10-87 0303	ALL	YES EXCEPT 1B21-F028C STROKE TIME 5.3 SEC
8-11-87 1230	1B21-F028A 1B21-F022A	YES (WO RETEST) 87-766 & 87-768
8-12-87 1744	1B21-F028C	YES (WO RETEST) 87-764
10-9-87 2327	ALL	YES

36 -- 1 FAILURE 5.3 SEC

F022A	1	F028 A	1
F022 B	1	F028 B	1 1
F022 C	1	F028 C	1
F022 D	2 - 1	F028 D	1 1

9 - 3 $\boxed{45-4}$ → TOTAL INC 10-29-87

1B21-12001 — 8 34 58 400 / 19.600

DATE	VALVES	PASS
12/16/86 0451	ALL	YES
4/9/87 0846	ALL	YES
5/13/87 0044	1B21-F028B	YES - PARTIAL
8/10/87 0303.	ALL ~~B21-F028C~~	YES EXCEPT B21-F028C STROKETIME 5.3
8/17/87 1230	B21-F028A B21-F022A	YES (WO RETEST) 87-766 + 87-768
11/2/87 1744	B21-F028C	YES (WO RETEST) 87-764
10/9 2327	ALL	YES

36 - 1 failure $\boxed{5.3 \text{ sec}}$

F022A	1	F028A	1	
F022B	1	F028B	1	1
F022C	1	F028C	1	
F022D -	2 -1	F028D	1	1

9 - 3

$\boxed{45-4}$ → TOTAL INC 10/29

B21-T2001

DATE	VALVES	PASS
12-16-86 0451	ALL	YES
4-9-87 0846	ALL	YES
5-13-87 0044	1B21-F028B	YES-PARTIAL
8-10-87 0303	ALL	YES EXCEPT 1B21-F028C STROKE TIME 5.3 SEC
8-11-87 1230	1B21-F028A 1B21-F022A	YES (WO RETEST) 87-766 ✓ 87-768
8-12-87 1744	1B21-F028C	YES (WO RETEST) 87-764
10-9-87 2327	ALL	YES

36 — 1 FAILURE <u>5.3 SEC</u>

F022A	1	F028 A	1
F022 B	1	F028 B	1 1
F022 C	1	F028 C	1
F022D	2 - 1	F028 D	1 1

9 - 3 $\boxed{45 - 4}$ → TOTAL INC 10-29-87

B21-T2001

DATE	VALVES	PASS
12-16-86 0451	ALL	YES
4-9-87 0846	ALL	YES
5-13-87 0044	1B21-F028 D	YES-PARTIAL
8-10-87 0303	ALL	YES EXCEPT 1B21-F028C STROKE TIME 5.3 SEC
8-11-87 1230	1B21-F028A 1B21-F022A	YES (WO RETEST) 87-766 & 87-768
8-12-87 1744	1B21-F028C	YES (WO RETEST) 87-764
10-9-87 2327	ALL	YES

36 - 1 FAILURE <u>5.3 SEC</u>

F022A	1	F028 A	1
F022 B	1	F028 B	1 1
F022 C	1	F028 C	1
F022 D	2 - 1	F028 D	1 1

9 - 3 $\boxed{45-4}$ → TOTAL INC 10-29-87

DATA PACKAGE COVER SHEET

PNPP NO. 6687 REV 10/86 PAP-1105-1

INSTRUCTION NO. SVI-B21-T2001

TEST PERFORMANCE

AUTHORIZATION TO START PREREQUISITES: F.J. Fehn — OPERATIONS UNIT SUPERVISOR — 4/9/87 0845 DATE AND TIME

AUTHORIZATION TO START TEST: Dan Johnson — SUPERVISING OPERATOR — 4/9/87 0955 DATE AND TIME

Full 4/9/87

INSTRUCTION COMPLETION ☑ FULL ☐ PARTIAL* — *See comments for extent of testing

TECH. SPEC. ACCEPTANCE CRITERIA ☑ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

OTHER DATA CRITERIA ☑ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

TASK COMPLETION ☑ CREDIT** ☐ NO CREDIT — **Task fully completed or all failed/not completed items tracked per LCO Tracking, Work Orders, etc.

TCN'S IN EFFECT: 001, 002

COMMENTS: Performed in OC A, MSIV's left closed

LEAD PERFORMER'S SIGNATURE [illegible] — 4-9-87 1120 DATE AND TIME

OPERATIONS UNIT SUPERVISOR F.J. Fehn — 4/9/87 0545 DATE AND TIME

SHIFT SUPERVISOR N/A. — DATE AND TIME

(Required If Tech. Spec. Acceptance Criteria Is Not Met. Otherwise Mark N/A)

TEST RESULTS REVIEW

CLOSED 4-15-87

COMMENTS All Data Acceptable

Hut Review: [illegible] 4-13-87

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER Bryan L. [illegible] — 4/13/87 DATE

LRC [illegible] 4/17/87 16

DATA PACKAGE COVER SHEET

PNPP NO. 6687 REV 10/86 PAP-1105-1

INSTRUCTION NO. SVI 1B21-T2001

TEST PERFORMANCE

AUTHORIZATION TO START PREREQUISITES: Mike Nemcek — OPERATIONS UNIT SUPERVISOR — 12/16/86 0451 DATE AND TIME

AUTHORIZATION TO START TEST: Dennis M. Jones — SUPERVISING OPERATOR — 12/16/86 0459 DATE AND TIME

INSTRUCTION COMPLETION	[X] FULL	[ ] PARTIAL*		*See comments for extent of testing
TECH. SPEC. ACCEPTANCE CRITERIA	[X] ACCEPTABLE	[ ] UNACCEPTABLE	[ ] NA	When both As Left and As Found data are taken, acceptance will be based on As Left data only.
OTHER DATA CRITERIA	[X] ACCEPTABLE	[ ] UNACCEPTABLE	[ ] NA	When both As Left and As Found data are taken, acceptance will be based on As Left data only.
TASK COMPLETION	[X] CREDIT**	[ ] NO CREDIT		**Task fully completed or all failed/not completed items tracked per LCO Tracking, Work Orders, etc.

12/16/86 FWL

TCN'S IN EFFECT: 01

COMMENTS: NONE

LEAD PERFORMER'S SIGNATURE ~~[signature]~~ [signature] — 12/16/86 0530 DATE AND TIME

OPERATIONS UNIT SUPERVISOR Michael Nemcek — 12/16/86 0531 DATE AND TIME

SHIFT SUPERVISOR N/A — DATE AND TIME

(Required If Tech. Spec. Acceptance Criteria Is Not Met, Otherwise Mark N/A)

TEST RESULTS REVIEW

CLOSED 12-19-86

COMMENTS All Data Acceptable

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER Bryan L. [signature] — 12/19/86 DATE

684

DATA PACKAGE COVER SHEET

PNPP NO. 6687 REV 10/86 PAP-1105-1

INSTRUCTION NO. SUI-B21-T2001

TEST PERFORMANCE

PANPAL F0288 5/13 [illegible]

AUTHORIZATION TO START PREREQUISITES: [signature] OPERATIONS UNIT SUPERVISOR — 5-13-87 0044 DATE AND TIME

AUTHORIZATION TO START TEST: [signature] SUPERVISING OPERATOR — 5-13-87 0150 DATE AND TIME

INSTRUCTION COMPLETION ☐ FULL ☑ PARTIAL* — *See comments for extent of testing

TECH. SPEC. ACCEPTANCE CRITERIA ☑ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

OTHER DATA CRITERIA ☑ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

TASK COMPLETION ☐ CREDIT** ☑ NO CREDIT — **Task fully completed or all failed/not completed items tracked per LCO tracking, Work Orders, etc.

TCN'S IN EFFECT: 001, 002

COMMENTS: perform steps 5.1.2.4 thru 5.1.2.6

LEAD PERFORMER'S SIGNATURE [signature] — 5-13-87 0225 DATE AND TIME

OPERATIONS UNIT SUPERVISOR [signature] — 5/13/87 0407 DATE AND TIME

SHIFT SUPERVISOR N/A — NA DATE AND TIME

(Required If Tech. Spec. Acceptance Criteria Is Not Met, Otherwise Mark N/A)

TEST RESULTS REVIEW

CLOSED 5-13-87

COMMENTS Retest Data Acceptable

ANII REVIEW [signature] 5 14 87

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER [signature] 5/14/87 5/14/87 DATE

[illegible]

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Sign-Off Verification Sheet

PIT Required (Unit Supervisor) [ ] Yes [✓] No

SECTION/STEP		INITIALS
4.0	PREREQUISITES	
1.	Unit Supervisor's Authorization & PIT checkoff obtained.	[illegible]
2.	Plant in operational condition 2 or 3, or with steam lines wet in Operational Condition, 4 or 5.	[illegible]
3.	M&TE instrumentation properly recorded on appropriate data sheet.	[illegible]
4.	RWP in effect if necessary.	[illegible]
5.	MSIV ammeters indicating greater than 100 milliamps.	N/A
5.1	Surveillance Test	
1.	Supervising operator's authorization obtained.	[illegible]
2.	Condenser Low Vac Bypass switches in Bypass, if condenser vacuum is below MSIV trip setpoint.	[illegible]
5.1.1.2	MSIV 1B21-F022A ammeters downscale.	N/A
5.1.1.5	MSIV 1B21-F028A ammeters downscale.	N/A
5.1.2.2	MSIV 1B21-F022B ammeters downscale.	N/A
5.1.2.5	MSIV 1B21-F028B ammeters downscale.	[illegible]
5.1.3.2	MSIV 1B21-F022C ammeters downscale.	N/A
5.1.3.5	MSIV 1B21-F028C ammeters downscale.	N/A
5.1.4.2	MSIV 1B21-F022D ammeters downscale.	N/A
5.1.4.5	MSIV 1B21-F028D ammeters downscale.	N/A

SECTION/STEP | | INITIALS

5.1.5

$	1.	Calculate average fastest stroke time:		
		Steam line A fastest stroke time in section 5.1.1 (step 1 or 3)	N/A	N/A
		Steam line B fastest stroke time in section 5.1.2 (step 1 or 3)	+	
		Steam line C fastest stroke time in section 5.1.3 (step 1 or 3)	+	
		Steam line D fastest stroke time in section 5.1.4 (step 1 or 3)	+	
		Total	=	
		Divide by 4	=	
$	2.	Average stroke time is greater than or equal to 3 seconds.		

Stopwatch Crano 3-[illegible]

MPL L70-N326 Cal Date 2-23-87 Cal Due Date 8-23-87 Init [illegible]

Comments: Partial SVI on B21-F028B

Performed By:	Signature	Initials	Date
	[illegible]	[illegible]	5-13-87
	N/A		

$ Denotes Technical Specification requirement

MSIV FULL STROKE OPERABILITY TEST (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.1.1	1B21-F022A	OPEN	N/A	N/A	N/A	NA	N/A	NA	5	N/A			CLOSED
5.1.1.3	1B21-F022A	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.1.4	1B21-F028A	OPEN				NA	N/A	NA	5	N/A			CLOSED
5.1.1.6	1B21-F028A	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.1	1B21-F022B	OPEN				NA	N/A	NA	5	N/A			CLOSED
5.1.2.3	1B21-F022B	CLOSED	N/A	N/A	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.4	1B21-F028B	OPEN	[illegible]	N/A	N/A	NA	4	NA	5	✓	N/A	[illegible]	CLOSED
5.1.2.6	1B21-F028B	CLOSED	[illegible]	N/A	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) [signature] INITIAL [initial] DATE 5-13-87 TIME 0215
(SIGNATURE) N/A INITIAL ______ DATE ______ TIME ______
(SIGNATURE) ______ INITIAL ______ DATE ______ TIME ______

ISI REVIEWED BY: (SIGNATURE) ______ DATE ______ TIME ______

NOTE(S)

a) FULL-STROKE EXERCISE IS PLACING THE VALVE THROUGH ONE COMPLETE CYCLE OF OPERATION (i.e., NORMALLY CLOSED: FULL-STROKE EXERCISE BY OPENING AND THEN CLOSING THE VALVE OR FULL STROKE CHECK VALVES BY EXERCISING TO THEIR ALTERNATE POSITION) USING THE INDICATING LITES TO VERIFY MOVEMENT OR CHANGES IN SYSTEM PRESSURE, FLOW RATE, LEVEL, TEMPERATURE OR STEM MOVEMENT. FULL-STROKE EXERCISE IS DOCUMENTED BY AN INITIAL IN THE FULL-STROKE EXERCISE COLUMN (APPROPRIATE COLUMN).

b) POSITION INDICATION TEST (PIT) IS PERFORMED TO VERIFY REMOTE VALVE POSITION INDICATORS ACCURATELY REFLECT VALVE POSITION (i.e., VALVE OPEN - RED INDICATOR ENERGIZED AND VALVE CLOSED - GREEN INDICATOR ENERGIZED). POSITION INDICATION TEST (PIT) IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE STEM OR OTHER COLUMN, AS APPROPRIATE. IF THE POSITION INDICATION TEST (PIT) IS NOT REQUIRED N/A THE STEM OR OTHER COLUMN, AS APPROPRIATE.

c) FULL STROKE TIME: CLOSING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE CLOSE POSITION UNTIL THE RED POSITION INDICATING LIGHT EXTINGUISHES. OPENING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE OPEN POSITION UNTIL THE GREEN POSITION INDICATING LIGHT EXTINGUISHES. TIMING BY STEM POSITION SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE PROPER POSITION UNTIL STEM MOVEMENT TERMINATES.

d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORIALLY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

$ = DENOTES TECHNICAL SPECIFICATION REQUIREMENT

MSIV FULL STROKE OPERABILITY TEST (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSE	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.3.1	1B21-F022C	OPEN	N/A	N/A	N/A	NA	N/A	NA	5	N/A			CLOSED
5.1.3.3	1B21-F022C	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.3.4	1B21-F028C	OPEN				NA	N/A	NA	5	N/A			CLOSED
5.1.3.6	1B21-F028C	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.1	1B21-F022D	OPEN				NA	N/A	NA	5	N/A			CLOSED
5.1.4.3	1B21-F022D	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.4	1B21-F028D	OPEN				NA	N/A	NA	5	N/A			CLOSED
5.1.4.6	1B21-F028D	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) N/A INITIAL ________ DATE ________ TIME ________

(SIGNATURE) ________ INITIAL ________ DATE ________ TIME ________

(SIGNATURE) ________ INITIAL ________ DATE ________ TIME ________

ISI REVIEWED BY: (SIGNATURE) ________ DATE ________ TIME ________

NOTE(S)

a) FULL-STROKE EXERCISE IS PLACING THE VALVE THROUGH ONE COMPLETE CYCLE OF OPERATION (i.e., NORMALLY CLOSED: FULL-STROKE EXERCISE BY OPENING AND THEN CLOSING THE VALVE OR FULL STROKE CHECK VALVES BY EXERCISING TO THEIR ALTERNATE POSITION) USING THE INDICATING LITES TO VERIFY MOVEMENT OR CHANGES IN SYSTEM PRESSURE, FLOW RATE, LEVEL, TEMPERATURE OR STEM MOVEMENT. FULL-STROKE EXERCISE IS DOCUMENTED BY AN INITIAL IN THE FULL-STROKE EXERCISE COLUMN (APPROPRIATE COLUMN).

b) POSITION INDICATION TEST (PIT) IS PERFORMED TO VERIFY REMOTE VALVE POSITION INDICATORS ACCURATELY REFLECT VALVE POSITION (i.e., VALVE OPEN - RED INDICATOR ENERGIZED AND VALVE CLOSED - GREEN INDICATOR ENERGIZED). POSITION INDICATION TEST (PIT) IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE STEM OR OTHER COLUMN, AS APPROPRIATE. IF THE POSITION INDICATION TEST (PIT) IS NOT REQUIRED N/A THE STEM OR OTHER COLUMN, AS APPROPRIATE.

c) FULL STROKE TIME: CLOSING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE CLOSE POSITION UNTIL THE RED POSITION INDICATING LIGHT EXTINGUISHES. OPENING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE OPEN POSITION UNTIL THE GREEN POSITION INDICATING LIGHT EXTINGUISHES. TIMING BY STEM POSITION SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE PROPER POSITION UNTIL STEM MOVEMENT TERMINATES.

d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORIALLY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

$ = DENOTES TECHNICAL SPECIFICATION REQUIREMENT

DW/SVI119A/HH/2/ct

System Restoration Checklist

Instruction Title: MSIV Full Stroke Operability Test

Verified By: [signature] / [initials]   5-17-87
[signature] / [initials]   5/13/87
N/A /
Signature/Initials   Date

LOCATION	COMPONENT MPL OR NAME	REQUIRED POSITION	FIRST VERIF	SECOND VERIF	REMARKS
1H13-P601	1B21-F022A	Open*	N/A	N/A	C.S. in AUTO
1H13-P601	1B21-F022B	Open*			C.S. in AUTO
1H13-P601	1B21-F022C	Open*			C.S. in AUTO
1H13-P601	1B21-F022D	Open*			C.S. in AUTO
1H13-P601	1B21-F028A	Open*			C.S. in AUTO
1H13-P601	1B21-F028B	Open*	[initials]	[initials]	closed C.S. in AUTO
1H13-P601	1B21-F028C	Open*	N/A	N/A	C.S. in AUTO
1H13-P601	1B21-F028D	Open*			C.S. in AUTO

COMMENTS: Partial SVI on B21-F028B for operability. Left in closed position per US.

* In Operational Condition 4 or 5, valve position may be determined by the Unit Supervisor.

DATA PACKAGE COVER SHEET

PAP-1105-1

INSTRUCTION NO. SVI-B21-T2001 Rev. 3

TEST PERFORMANCE

AUTHORIZATION TO START PREREQUISITES: Don Johnson 8/10/87 0303
OPERATIONS UNIT SUPERVISOR — DATE AND TIME

AUTHORIZATION TO START TEST: 8-10-87 0330
SUPERVISING OPERATOR — DATE AND TIME

INSTRUCTION COMPLETION [X] FULL [ ] PARTIAL* — *See comments for extent of testing

TECH. SPEC. ACCEPTANCE CRITERIA [ ] ACCEPTABLE [X] UNACCEPTABLE [ ] NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

OTHER DATA CRITERIA [X] ACCEPTABLE [ ] UNACCEPTABLE [ ] NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

TASK COMPLETION [X] CREDIT** [ ] NO CREDIT — **Task fully completed or all failed/not completed items tracked per LCO Tracking, Work Orders, etc.

TCN'S IN EFFECT: 001, 002

COMMENTS: 1B21-F028C operation reported as "noisy". 1B21-F028C stroke time 5.3 sec. W.O. 87-764 is open to track repairs and retest of 1B21-F028C.

LEAD PERFORMER'S SIGNATURE Thomas Cloud 8.12.87/1400
DATE AND TIME

OPERATIONS UNIT SUPERVISOR MRM 8.12.87 2100
DATE AND TIME

SHIFT SUPERVISOR 8.12.87 2104
(Required If Tech. Spec. Acceptance Criteria Is Not Met, Otherwise Mark N/A) DATE AND TIME

Closed 8-13-87

TEST RESULTS REVIEW

COMMENTS 1B21-F028C Unacceptable All Other Data Acceptable

Audit Review 8-14-87

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER Bryan L. Andrie 8/13/87
DATE 8/17/87

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Sign-Off Verification Sheet

PIT Required [✓] Yes [ ] No
(Unit Supervisor)

SECTION/STEP		INITIALS	
4.0 PREREQUISITES			5-8-87 2030
1.	Unit Supervisor's Authorization & PIT checkoff obtained.	AOR	mjd
2.	Plant in operational condition 2 or 3, or with steam lines wet in Operational Condition, 4 or 5.	AOR	mjd
3.	M&TE instrumentation properly recorded on appropriate data sheet.	AOR	mjd
4.	RWP in effect if necessary.	AOR	mjd
5.	MSIV ammeters indicating greater than 100 milliamps. (note: MSIV's shut ammeters indicate zero)	AOR	note! mjd
5.1 Surveillance Test			
1.	Supervising operator's authorization obtained.	AOR	
2.	Condenser Low Vac Bypass switches in Bypass, if condenser vacuum is below MSIV trip setpoint.	AOR	
5.1.1.2	MSIV 1B21-F022A ammeters downscale.	mjd	
5.1.1.5	MSIV 1B21-F028A ammeters downscale.	mjd	
5.1.2.2	MSIV 1B21-F022B ammeters downscale.	AOR	
5.1.2.5	MSIV 1B21-F028B ammeters downscale.	AOR	
5.1.3.2	MSIV 1B21-F022C ammeters downscale.	TCR	
5.1.3.5	MSIV 1B21-F028C ammeters downscale.	TCR	
5.1.4.2	MSIV 1B21-F022D ammeters downscale.	AOR	
5.1.4.5	MSIV 1B21-F028D ammeters downscale.	AOR	

SECTION/STEP				INITIALS
5.1.5				
$	1.	Calculate average fastest stroke time:		
		Steam line A fastest stroke time in section 5.1.1 (step 1 or 3)	3.20	mJD
		Steam line B fastest stroke time in section 5.1.2 (step 1 or 3)	+ ~~4.6~~ 3.11	ADR
		Steam line C fastest stroke time in section 5.1.3 (step 1 or 3)	+ 3.3	TAR
		Steam line D fastest stroke time in section 5.1.4 (step 1 or 3)	+ ~~4.11~~ 3.19	ADR
		Total	= 12.8	TAR
		Divide by 4	= 3.2	TAR
$	2.	Average stroke time is greater than or equal to 3 seconds.		TAR

Stopwatch ______________

MPL L70-R835I Cal Date 6-10-87 Cal Due Date 12-10-87 Init ADR

Comments: Reverified prerequisites 0030 8-11-87 mJD
reverified prereqs 1300 8-12-87 TAR
1B21-F028C operation was reported as "noisy" by individual performing IST

Signature	Initials	Date
Performed By: [signature]	ADR	8/10/87
[signature]	mJD	8-11-87
[signature]	TAR	8-12-87

$ Denotes Technical Specification requirement

MSIV FULL STROKE OPERABILITY TEST ____________ (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.1.1	1B21-F022A	OPEN	mjD	mjD	n/a	NA	3.20	NA	5	✓		mjD	CLOSED
5.1.1.3	1B21-F022A	CLOSED	mjD	mjD	n/a	NA	NA	NA	NA	NA	NA	-	OPEN
5.1.1.4	1B21-F028A	OPEN	mjD	mjD	n/a	NA	3.46	NA	5	✓		mjD	CLOSED
5.1.1.6	1B21-F028A	CLOSED	mjD	mjD	n/a	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.1	1B21-F022B	OPEN	ADR	h	n/a	NA	3.11	NA	5	✓		ADR	CLOSED
5.1.2.3	1B21-F022B	CLOSED	ADR	h	n/a	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.4	1B21-F028B	OPEN	ADR	SKS	n/a	NA	4.60	NA	5	✓		ADR	CLOSED
5.1.2.6	1B21-F028B	CLOSED	ADR	SKS	n/a	NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) [illegible] INITIAL TSE ADR DATE 8/12/87 8/10/87 TIME 1310 0345

(SIGNATURE) [illegible] INITIAL [illegible] DATE 8-10-87 TIME 0345

(SIGNATURE) [illegible] INITIAL SKS DATE 8/10/87 TIME 0345

ISI REVIEWED BY: (SIGNATURE) ____________ DATE ________ TIME ________

NOTE(S)

a) FULL-STROKE EXERCISE IS PLACING THE VALVE THROUGH ONE COMPLETE CYCLE OF OPERATION (I.e., NORMALLY CLOSED: FULL-STROKE EXERCISE BY OPENING AND THEN CLOSING THE VALVE OR FULL STROKE CHECK VALVES BY EXERCISING TO THEIR ALTERNATE POSITION) USING THE INDICATING LITES TO VERIFY MOVEMENT OR CHANGES IN SYSTEM PRESSURE, FLOW RATE, LEVEL, TEMPERATURE OR STEM MOVEMENT. FULL-STROKE EXERCISE IS DOCUMENTED BY AN INITIAL IN THE FULL-STROKE EXERCISE COLUMN (APPROPRIATE COLUMN).

b) POSITION INDICATION TEST (PIT) IS PERFORMED TO VERIFY REMOTE VALVE POSITION INDICATORS ACCURATELY REFLECT VALVE POSITION (I.e., VALVE OPEN - RED INDICATOR ENERGIZED AND VALVE CLOSED - GREEN INDICATOR ENERGIZED). POSITION INDICATION TEST (PIT) IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE STEM OR OTHER COLUMN, AS APPROPRIATE. IF THE POSITION INDICATION TEST (PIT) IS NOT REQUIRED N/A THE STEM OR OTHER COLUMN, AS APPROPRIATE.

c) FULL STROKE TIME: CLOSING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE CLOSE POSITION UNTIL THE RED POSITION INDICATING LIGHT EXTINGUISHES. OPENING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE OPEN POSITION UNTIL THE GREEN POSITION INDICATING LIGHT EXTINGUISHES. TIMING BY STEM POSITION SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE PROPER POSITION UNTIL STEM MOVEMENT TERMINATES.

d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORIALLY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

$ = DENOTES TECHNICAL SPECIFICATION REQUIREMENT

MSIV FULL STROKE OPERABILITY TEST (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $(a)	STEM $(b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $(c)	CLOSED $(c)	ACCEPTABLE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $(d)	POST TEST POSITION
5.1.3.1	1B21-F022C	OPEN	TBR	TR	N/A	NA	3.3	NA	5	✓		TBR	CLOSED
5.1.3.3	1B21-F022C	CLOSED	TBR	TR	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.3.4	1B21-F028C	OPEN	TBR	TR	N/A	NA	5.3	NA	5	[illegible] ✓		TBR	CLOSED
5.1.3.6	1B21-F028C	CLOSED	TBR	TR	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.1	1B21-F022D	OPEN	ADR	DLS	N/A	NA	3.17	NA	5	✓		ADR	CLOSED
5.1.4.3	1B21-F022D	CLOSED	ADR	DLS	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.4	1B21-F028D	OPEN	ADR	[illegible]	N/A	NA	4.11	NA	5	✓		ADR	CLOSED
5.1.4.6	1B21-F028D	CLOSED	ADR	[illegible]	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) [signature] INITIAL ~~TBR~~ ADR DATE ~~8/12/87~~ 8/10/87 TIME ~~1310~~ 0720

(SIGNATURE) [signature] INITIAL [illegible] DATE 8/10/87 TIME 0730

(SIGNATURE) [signature] INITIAL DLS DATE 8/10/87 TIME 0740

ISI REVIEWED BY: (SIGNATURE) ____________ DATE ________ TIME ________

NOTE(S)

a) FULL-STROKE EXERCISE IS PLACING THE VALVE THROUGH ONE COMPLETE CYCLE OF OPERATION (I.e., NORMALLY CLOSED: FULL-STROKE EXERCISE BY OPENING AND THEN CLOSING THE VALVE OR FULL STROKE CHECK VALVES BY EXERCISING TO THEIR ALTERNATE POSITION) USING THE INDICATING LITES TO VERIFY MOVEMENT OR CHANGES IN SYSTEM PRESSURE, FLOW RATE, LEVEL, TEMPERATURE OR STEM MOVEMENT. FULL-STROKE EXERCISE IS DOCUMENTED BY AN INITIAL IN THE FULL-STROKE EXERCISE COLUMN (APPROPRIATE COLUMN).

b) POSITION INDICATION TEST (PIT) IS PERFORMED TO VERIFY REMOTE VALVE POSITION INDICATORS ACCURATELY REFLECT VALVE POSITION (I.e., VALVE OPEN - RED INDICATOR ENERGIZED AND VALVE CLOSED - GREEN INDICATOR ENERGIZED). POSITION INDICATION TEST (PIT) IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE STEM OR OTHER COLUMN, AS APPROPRIATE. IF THE POSITION INDICATION TEST (PIT) IS NOT REQUIRED N/A THE STEM OR OTHER COLUMN, AS APPROPRIATE.

c) FULL STROKE TIME: CLOSING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE CLOSE POSITION UNTIL THE RED POSITION INDICATING LIGHT EXTINGUISHES. OPENING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE OPEN POSITION UNTIL THE GREEN POSITION INDICATING LIGHT EXTINGUISHES. TIMING BY STEM POSITION SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE PROPER POSITION UNTIL STEM MOVEMENT TERMINATES.

d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORIALLY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

$ = DENOTES TECHNICAL SPECIFICATION REQUIREMENT

DW/SVI119A/HH/2/ct

[signature] TR 8/10/87 1430

System Restoration Checklist

Instruction Title: MSIV Full Stroke Operability Test

Verified By: [signature], ADR — 8/10/87
[signature] mjD — 8-10-87
[signature] DAJ — 8/11/87
Signature/Initials — Date
[signature] /TDR — 8-12-87
[signature] /TCR — 8-12-87

LOCATION	COMPONENT MPL OR NAME	REQUIRED POSITION	FIRST VERIF	SECOND VERIF	REMARKS	
1H13-P601	1B21-F022A	Closed mjD ~~Open*~~ 8/11/87	mjD	DAJ	Close ~~C.S. in AUTO~~	mjD 8-11-8
1H13-P601	1B21-F022B	Closed ~~Open*~~	ADR	mjD	Close ~~C.S. in AUTO~~	mjD 8-11-8
1H13-P601	1B21-F022C	Closed ~~Open*~~	TCR	TDR	Close ~~C.S. in AUTO~~	mjD 8-11-8
1H13-P601	1B21-F022D	Closed ~~Open*~~	ADR	mjD	Close ~~C.S. in AUTO~~	mjD 8-11-8
1H13-P601	1B21-F028A	Closed mjD ~~Open*~~	mjD	DAJ	Close ~~C.S. in AUTO~~	mjD 8-11-8
1H13-P601	1B21-F028B	Closed ~~Open*~~	ADR	mjD	Close ~~C.S. in AUTO~~	mjD 8-11-8
1H13-P601	1B21-F028C	Closed ~~Open*~~	TCR	TDR	Close ~~C.S. in AUTO~~	mjD 8-11-8
1H13-P601	1B21-F028D	Closed ~~Open*~~	ADR	mjD	Close ~~C.S. in AUTO~~	mjD 8-11-8

COMMENTS: VLVS are closed in condition 4

* In Operational Condition 4 or 5, valve position may be determined by the Unit Supervisor.

DW/SV119A/X/pw

DATA PACKAGE COVER SHEET

PNPP NO. 6687 REV 10/86 PAP-1105-1

INSTRUCTION NO. SVI-B21-T2001

TEST PERFORMANCE

AUTHORIZATION TO START PREREQUISITES: [signature] 8/11/87 1230

OPERATIONS UNIT SUPERVISOR — DATE AND TIME

AUTHORIZATION TO START TEST: [signature] 8/11/87 1445

SUPERVISING OPERATOR — DATE AND TIME

INSTRUCTION COMPLETION ☐ FULL ☑ PARTIAL* — *See comments for extent of testing

TECH. SPEC. ACCEPTANCE CRITERIA ☑ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

OTHER DATA CRITERIA ☑ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA — When both As Left and As Found data are taken, acceptance will be based on As Left data only.

TASK COMPLETION ☒ CREDIT** ☒ NO CREDIT — **Task fully completed or all failed/not completed items tracked per LCO Tracking, Work Orders, etc.

8-8-87

B21 F022A & B21-F028A 8/11/87

TCN'S IN EFFECT: 001 002

COMMENTS: PARTIAL SVI FOR RETEST OF WO- 87-766 & 768

LEAD PERFORMER'S SIGNATURE [signature] 999 — 1530 8/11/87

DATE AND TIME

MAM

OPERATIONS UNIT SUPERVISOR [signature] — 8/12/87 2100

DATE AND TIME

SHIFT SUPERVISOR NA — DATE AND TIME

(Required If Tech. Spec. Acceptance Criteria Is Not Met, Otherwise Mark N/A)

TEST RESULTS REVIEW

Cannot close date overlap

COMMENTS Retest Data Acceptable

ANII Reviewed [signature] 8-14-87

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER [signature] 8/13/87

DATE

[signature] 8/17/87

29

Sign-Off Verification Sheet

PIT Required [/] Yes [ ] No
(Unit Supervisor)

SECTION/STEP		INITIALS
4.0	**PREREQUISITES**	
1.	Unit Supervisor's Authorization & PIT checkoff obtained.	JL
2.	Plant in operational condition 2 or 3, or with steam lines wet in Operational Condition, 4 or 5.	JL
3.	M&TE instrumentation properly recorded on appropriate data sheet.	JL
4.	RWP in effect if necessary.	JL
5.	MSIV ammeters indicating greater than 100 milliamps.	JL
5.1	**Surveillance Test**	
1.	Supervising operator's authorization obtained.	JL
2.	Condenser Low Vac Bypass switches in Bypass, if condenser vacuum is below MSIV trip setpoint.	JL
5.1.1.2	MSIV 1B21-F022A ammeters downscale.	JL
5.1.1.5	MSIV 1B21-F028A ammeters downscale.	JL
5.1.2.2	MSIV 1B21-F022B ammeters downscale.	N/A
5.1.2.5	MSIV 1B21-F028B ammeters downscale.	
5.1.3.2	MSIV 1B21-F022C ammeters downscale.	
5.1.3.5	MSIV 1B21-F028C ammeters downscale.	
5.1.4.2	MSIV 1B21-F022D ammeters downscale.	
5.1.4.5	MSIV 1B21-F028D ammeters downscale.	

SECTION/STEP				INITIALS
5.1.5				
$	1.	Calculate average fastest stroke time:		
		Steam line A fastest stroke time in section 5.1.1 (step 1 or 3)	3.2	JC
		Steam line B fastest stroke time in section 5.1.2 (step 1 or 3)	+ N/A	
		Steam line C fastest stroke time in section 5.1.3 (step 1 or 3)	+ N/A	
		Steam line D fastest stroke time in section 5.1.4 (step 1 or 3)	+ N/A	
		Total	= N/A	
		Divide by 4	= N/A	
$	2.	Average stroke time is greater than or equal to 3 seconds.		

Stopwatch COLE PARMER

MPL 170-R733K Cal Date 5-27-87 Cal Due Date 10-27-87 Init JC

Comments: PARTIAL DONE FOR RETESTS FOR
W.O. 87000763
W.O. 87000766

	Signature	Initials	Date
Performed By:	Jim Case	JC	7-14-87

$ Denotes Technical Specification requirement

MSIV FULL STROKE OPERABILITY TEST (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.1.1	1B21-F022A	OPEN	JC	JC	N/A	NA	3.2	NA	5	✓		JC	CLOSED
5.1.1.3	1B21-F022A	CLOSED	JC	JC	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.1.4	1B21-F028A	OPEN	JC	JC	N/A	NA	3.8	NA	5			JC	CLOSED
5.1.1.6	1B21-F028A	CLOSED	JC	JC	N/A	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.1	1B21-F022B	OPEN				NA		NA	5				CLOSED
5.1.2.3	1B21-F022B	CLOSED			A	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.4	1B21-F028B	OPEN				NA		NA	5				CLOSED
5.1.2.6	1B21-F028B	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) J Cox INITIAL JC DATE 11/11/87 TIME 1515

(SIGNATURE) N/A INITIAL N/A DATE N/A TIME N/A

(SIGNATURE) N/A INITIAL N/A DATE N/A TIME N/A

ISI REVIEWED BY: (SIGNATURE) ______ DATE ______ TIME ______

NOTE(S)

a) FULL-STROKE EXERCISE IS PLACING THE VALVE THROUGH ONE COMPLETE CYCLE OF OPERATION (I.e., NORMALLY CLOSED: FULL-STROKE EXERCISE BY OPENING AND THEN CLOSING THE VALVE OR FULL STROKE CHECK VALVES BY EXERCISING TO THEIR ALTERNATE POSITION) USING THE INDICATING LITES TO VERIFY MOVEMENT OR CHANGES IN SYSTEM PRESSURE, FLOW RATE, LEVEL, TEMPERATURE OR STEM MOVEMENT. FULL-STROKE EXERCISE IS DOCUMENTED BY AN INITIAL IN THE FULL-STROKE EXERCISE COLUMN (APPROPRIATE COLUMN).

b) POSITION INDICATION TEST (PIT) IS PERFORMED TO VERIFY REMOTE VALVE POSITION INDICATORS ACCURATELY REFLECT VALVE POSITION (I.e., VALVE OPEN - RED INDICATOR ENERGIZED AND VALVE CLOSED - GREEN INDICATOR ENERGIZED). POSITION INDICATION TEST (PIT) IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE STEM OR OTHER COLUMN, AS APPROPRIATE. IF THE POSITION INDICATION TEST (PIT) IS NOT REQUIRED N/A THE STEM OR OTHER COLUMN, AS APPROPRIATE.

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d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORIALLY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

$ = DENOTES TECHNICAL SPECIFICATION REQUIREMENT

MSIV FULL STROKE OPERABILITY TEST (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.1.1	1B21-F022C	OPEN				NA		NA	5				CLOSED
5.1.1.3	1B21-F022C	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.1.4	1B21-F028C	OPEN				NA		NA	5				CLOSED
5.1.1.6	1B21-F028C	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.1	1B21-F022D	OPEN				NA		NA	5				CLOSED
5.1.4.3	1B21-F022D	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.4	1B21-F028D	OPEN				NA		NA	5				CLOSED
5.1.4.6	1B21-F028D	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE)________ INITIAL ______ DATE ______ TIME ______

(SIGNATURE)________ INITIAL ______ DATE ______ TIME ______

(SIGNATURE)________ INITIAL ______ DATE ______ TIME ______

ISI REVIEWED BY: (SIGNATURE)________ DATE ______ TIME ______

NOTE(S)

a) FULL-STROKE EXERCISE IS PLACING THE VALVE THROUGH ONE COMPLETE CYCLE OF OPERATION (i.e., NORMALLY CLOSED: FULL-STROKE EXERCISE BY OPENING AND THEN CLOSING THE VALVE OR FULL STROKE CHECK VALVES BY EXERCISING TO THEIR ALTERNATE POSITION) USING THE INDICATING LITES TO VERIFY MOVEMENT OR CHANGES IN SYSTEM PRESSURE, FLOW RATE, LEVEL, TEMPERATURE OR STEM MOVEMENT. FULL-STROKE EXERCISE IS DOCUMENTED BY AN INITIAL IN THE FULL-STROKE EXERCISE COLUMN (APPROPRIATE COLUMN).

b) POSITION INDICATION TEST (PIT) IS PERFORMED TO VERIFY REMOTE VALVE POSITION INDICATORS ACCURATELY REFLECT VALVE POSITION (i.e., VALVE OPEN - RED INDICATOR ENERGIZED AND VALVE CLOSED - GREEN INDICATOR ENERGIZED). POSITION INDICATION TEST (PIT) IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE STEM OR OTHER COLUMN, AS APPROPRIATE. IF THE POSITION INDICATION TEST (PIT) IS NOT REQUIRED N/A THE STEM OR OTHER COLUMN, AS APPROPRIATE.

c) FULL STROKE TIME: CLOSING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE CLOSE POSITION UNTIL THE RED POSITION INDICATING LIGHT EXTINGUISHES. OPENING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE OPEN POSITION UNTIL THE GREEN POSITION INDICATING LIGHT EXTINGUISHES. TIMING BY STEM POSITION SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE PROPER POSITION UNTIL STEM MOVEMENT TERMINATES.

d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORIALLY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

$ - DENOTES TECHNICAL SPECIFICATION REQUIREMENT

Attachment 3
Sheet 1 of 1

QM7A: SVI-B21-T2001
Page: 16 - LAST
Rev.: 3

System Restoration Checklist

Instruction Title: MSIV Full Stroke Operability Test

Verified By: J Case / JC 7/11/87
David P Baggs / DPB 8-11-87
/

Signature/Initials Date

LOCATION	COMPONENT MPL OR NAME	REQUIRED POSITION	FIRST VERIF	SECOND VERIF	REMARKS
1H13-P601	1B21-F022A	Open*	JC	DPB	C.S. in AUTO
1H13-P601	1B21-F022B	Open*	NA	NA	C.S. in AUTO
1H13-P601	1B21-F022C	Open*	NA	NA	C.S. in AUTO
1H13-P601	1B21-F022D	Open*	NA	NA	C.S. in AUTO
1H13-P601	1B21-F028A	Open*	JC	DPB	C.S. in AUTO
1H13-P601	1B21-F028B	Open*	NA	NA	C.S. in AUTO
1H13-P601	1B21-F028C	Open*	NA	NA	C.S. in AUTO
1H13-P601	1B21-F028D	Open*	NA	NA	C.S. in AUTO

COMMENTS: MSIV's LEFT IN CLOSED POSITION
PER U.S. DIRECTION

* In Operational Condition 4 or 5, valve position may be determined by the Unit Supervisor.

DW/SV119A/X/pw

DATA PACKAGE COVER SHEET

FORM NO. 6687 REV 10/86 PAP-1105-1

INSTRUCTION NO. SVI-B21-T20

PARTIAL 1B21-F028C 8/12/87

TEST PERFORMANCE

AUTHORIZATION TO START PREREQUISITES: [signature] 8/12/

OPERATIONS UNIT SUPERVISOR DATE

AUTHORIZATION TO START TEST: [signature] 8/12

SUPERVISING OPERATOR DATE

INSTRUCTION COMPLETION ☐ FULL ☒ PARTIAL* *See comments for extent of te

TECH. SPEC. ACCEPTANCE CRITERIA ☒ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA When both As Left and As Foun acceptance will be based on A

OTHER DATA CRITERIA ☒ ACCEPTABLE ☐ UNACCEPTABLE ☐ NA When both As Left and As Foun acceptance will be based on A

TASK COMPLETION ~~☒ CREDIT**~~ SOE 8/12/87 ☒ NO CREDIT **Task fully completed or all fa items tracked per LCO Tracking

TCN'S IN EFFECT: 02, 01

COMMENTS: Partial 5.1.3 for 28C only as a Retest For WO 87-764.

LEAD PERFORMER'S SIGNATURE [signature] 8/12/ DA

OPERATIONS UNIT SUPERVISOR MAM [signature] 8.12 DA

SHIFT SUPERVISOR NA DA

(Required If Tech. Spec. Acceptance Criteria Is Not Met, Otherwise Mark N/A)

TEST RESULTS REVIEW

Cannot Close

COMMENTS Retest Data Acceptable

Anti Review [initials] 8-14-87

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER Bryan L. Aucoin 8/1

[signature] 8/1

Sign-Off Verification Sheet

PIT Required (Unit Supervisor) [✓] Yes [ ] No

SECTION/STEP		INITIALS
4.0	PREREQUISITES	
1.	Unit Supervisor's Authorization & PIT checkoff obtained.	
2.	Plant in operational condition 2 or 3, or with steam lines wet in Operational Condition, 4 or 5.	
3.	M&TE instrumentation properly recorded on appropriate data sheet.	
4.	RWP in effect if necessary.	
5.	MSIV ammeters indicating greater than 100 milliamps.	
5.1	Surveillance Test	
1.	Supervising operator's authorization obtained.	
2.	Condenser Low Vac Bypass switches in Bypass, if condenser vacuum is below MSIV trip setpoint.	
5.1.1.2	MSIV 1B21-F022A ammeters downscale.	N/A
5.1.1.5	MSIV 1B21-F028A ammeters downscale.	N/A
5.1.2.2	MSIV 1B21-F022B ammeters downscale.	N/A
5.1.2.5	MSIV 1B21-F028B ammeters downscale.	N/A
5.1.3.2	MSIV 1B21-F022C ammeters downscale.	N/A
5.1.3.5	MSIV 1B21-F028C ammeters downscale.	
5.1.4.2	MSIV 1B21-F022D ammeters downscale.	N/A
5.1.4.5	MSIV 1B21-F028D ammeters downscale.	N/A

SECTION/STEP				INITIALS
5.1.5				
$	1.	Calculate average fastest stroke time:		
		Steam line A fastest stroke time in section 5.1.1 (step 1 or 3)	______	______
		Steam line B fastest stroke time in section 5.1.2 (step 1 or 3)	+______	______
		Steam line C fastest stroke time in section 5.1.3 (step 1 or 3)	+______	______
		Steam line D fastest stroke time in section 5.1.4 (step 1 or 3)	+______	______
		Total	=______	______
		Divide by 4	=______	______
$	2.	Average stroke time is greater than or equal to 3 seconds.		______

NA 8/12/87

Stopwatch ______________

MPL L70-R9221 Cal Date 6-10-87 Cal Due Date 12-10-87 Init ______

Comments: partial per WO sect 5.1.3 for EBC only

Signature	Initials	Date
Performed By: [signature]		8/12/87
[signature]		8/12/87

$ Denotes Technical Specification requirement

MSIV FULL STROKE OPERABILITY TEST ______ (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.1.1	1B21-F022A	OPEN				NA		NA	5				CLOSED
5.1.1.3	1B21-F022A	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.1.4	1B21-F028A	OPEN				NA		NA	5				CLOSED
5.1.1.6	1B21-F028A	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.1	1B21-F022B	OPEN				NA		NA	5				CLOSED
5.1.2.3	1B21-F022B	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.4	1B21-F028B	OPEN				NA		NA	5				CLOSED
5.1.2.6	1B21-F028B	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) ______ INITIAL ______ DATE ______ TIME ______

(SIGNATURE) ______ INITIAL ______ DATE ______ TIME ______

(SIGNATURE) ______ INITIAL ______ DATE ______ TIME ______

ISI REVIEWED BY: (SIGNATURE) ______ DATE ______ TIME ______

NOTE(S)

a) FULL-STROKE EXERCISE IS PLACING THE VALVE THROUGH ONE COMPLETE CYCLE OF OPERATION (i.e., [illegible]ALLY CLOSED: FULL-STROKE EXERCISE BY OPENING AND THEN CLOSING THE VALVE OR FULL STROKE CHECK VALVES BY EXERCISING TO THEIR ALTERNATE POSITION) USING THE INDICATING LITES TO VERIFY MOVEMENT OR CHANGES IN SYSTEM PRESSURE, FLOW RATE, LEVEL, TEMPERATURE OR STEM MOVEMENT. FULL-STROKE EXERCISE IS DOCUMENTED BY AN INITIAL IN THE FULL-STROKE EXERCISE COLUMN (APPROPRIATE COLUMN).

b) POSITION INDICATION TEST (PIT) IS PERFORMED TO VERIFY REMOTE VALVE POSITION INDICATORS ACCURATELY REFLECT VALVE POSITION (i.e., VALVE OPEN - RED INDICATOR ENERGIZED AND VALVE CLOSED - GREEN INDICATOR ENERGIZED). POSITION INDICATION TEST (PIT) IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE STEM OR OTHER COLUMN, AS APPROPRIATE. IF THE POSITION INDICATION TEST (PIT) IS NOT REQUIRED N/A THE STEM OR OTHER COLUMN, AS APPROPRIATE.

c) FULL STROKE TIME: CLOSING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE CLOSE POSITION UNTIL THE RED POSITION INDICATING LIGHT EXTINGUISHES. OPENING VALVE STROKE TIME SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE OPEN POSITION UNTIL THE GREEN POSITION INDICATING LIGHT EXTINGUISHES. TIMING BY STEM POSITION SHALL BE FROM WHEN THE CONTROL SWITCH IS PLACED IN THE PROPER POSITION UNTIL STEM MOVEMENT TERMINATES.

d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORIALLY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

$ = DENOTES TECHNICAL SPECIFICATION REQUIREMENT

DW/SVI119A/HH/2/pw

N/A 8/12/87

MSIV FULL STROKE OPERABILITY TEST (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.3.1	1B21-F022C	OPEN	N/A	N/A	N/A	NA	N/A	NA	5	N/A		N/A	CLOSED
5.1.3.3	1B21-F022C	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.3.4	1B21-F028C	OPEN	[illegible]	[illegible]	N/A	NA	4.59	NA	5	✓	N/A	[illegible]	CLOSED
5.1.1.6	1B21-F028C	CLOSED	[illegible]	[illegible]		NA	NA	N/A	NA	NA	NA	NA	OPEN
5.1.4.1	1B21-F022D	OPEN		N/A		NA		NA	5				CLOSED
5.1.4.3	1B21-F022D	CLOSED			8/12/82	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.4	1B21-F028D	OPEN				NA		NA	5				CLOSED
5.1.4.6	1B21-F028D	CLOSED				NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) [illegible] INITIAL [illegible] DATE 8/12/82 TIME 1744

(SIGNATURE) ____________ INITIAL ________ DATE ________ TIME ________

(SIGNATURE) ____________ INITIAL ________ DATE ________ TIME ________

ISI REVIEWED BY: (SIGNATURE) ____________ DATE ________ TIME ________

NOTE(S)

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d) VALVES WITH FAIL SAFE ACTUATORS WILL BE TESTED TO VERIFY PROPER FAIL SAFE OPERATION UPON LOSS OF ACTUATOR POWER. WHEN THE VALVE IS SATISFACTORILY FULL-STROKE EXERCISED BY THE CONTROL SWITCH THE FAIL SAFE FUNCTION IS SATISFACTORY AND DOCUMENTED BY AN INITIAL IN THE FAIL SAFE TEST COLUMN.

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DW/SVI119A/HH/2/ct

Attachment 3
Sheet 1 of 1

OM7A: SVI-B21-T2001
Page: 16 - LAST
Rev.: 3

System Restoration Checklist

Instruction Title: MSIV Full Stroke Operability Test

Verified By: [illegible] / dk — 8/12/87
[illegible] — 8/12/87

Signature/Initials — Date

LOCATION	COMPONENT MPL OR NAME	REQUIRED POSITION	FIRST VERIF	SECOND VERIF	REMARKS
1H13-P601	1B21-F022A	Open*			C.S. in AUTO
1H13-P601	1B21-F022B	Open*			C.S. in AUTO
1H13-P601	1B21-F022C	Open*			C.S. in AUTO
1H13-P601	1B21-F022D	Open*			C.S. in AUTO
1H13-P601	1B21-F028A	Open*			C.S. in AUTO
1H13-P601	1B21-F028B	Open*			C.S. in AUTO
1H13-P601	1B21-F028C	Closed ~~Open*~~	[illegible]	dk	C.S. in AUTO
1H13-P601	1B21-F028D	Open*	[illegible]	[illegible]	C.S. in AUTO

COMMENTS: in op cond 4 valve ~~test~~ 8/12/87
left closed - Partial per WO
F028C as ey valve operated

* In Operational Condition 4 or 5, valve position may be determined by the Unit Supervisor.

DW/SV119A/X/pw

DATA PACKAGE COVER SHEET

PNPP NO. 6687 REV 10/86 PAP-1105-1

INSTRUCTION NO. SVI-B21-T2001

TEST PERFORMANCE

AUTHORIZATION TO START PREREQUISITES: John Messina — 10/8/87 2317
OPERATIONS UNIT SUPERVISOR — DATE AND TIME

AUTHORIZATION TO START TEST: L. Brush — 10.8.87 2349
SUPERVISING OPERATOR — DATE AND TIME

INSTRUCTION COMPLETION	[x] FULL	[ ] PARTIAL*		*See comments for extent of testing
TECH. SPEC. ACCEPTANCE CRITERIA	[x] ACCEPTABLE	[ ] UNACCEPTABLE	[ ] NA	When both As Left and As Found data are taken, acceptance will be based on As Left data only.
OTHER DATA CRITERIA	[ ] ACCEPTABLE	[ ] UNACCEPTABLE	[x] NA	When both As Left and As Found data are taken, acceptance will be based on As Left data only.
TASK COMPLETION	[x] CREDIT**	[ ] NO CREDIT		**Task fully completed or all failed/not completed items tracked per LCO Tracking, Work Orders, etc.

Full Credit 10/9/87

TCN'S IN EFFECT: 01 & 02

COMMENTS:

LEAD PERFORMER'S SIGNATURE [signature] — 10-9-87 1730
DATE AND TIME

OPERATIONS UNIT SUPERVISOR [signature] — 10/9/87 1753
DATE AND TIME

SHIFT SUPERVISOR N/A.
(Required If Tech. Spec. Acceptance Criteria Is Not Met, Otherwise Mark N/A)
DATE AND TIME

TEST RESULTS REVIEW

Closed 10·10·87

COMMENTS

SYSTEM ENGINEER/RESPONSIBLE SECTION REVIEWER
DATE

Sign-Off Verification Sheet

PIT Required [✓] Yes [ ] No
(Unit Supervisor)

SECTION/STEP		INITIALS
4.0 PREREQUISITES		
1.	Unit Supervisor's Authorization & PIT checkoff obtained.	LAB
2.	Plant in operational condition 2 or 3, or with steam lines wet in Operational Condition, 4 or 5.	LAB
3.	M&TE instrumentation properly recorded on appropriate data sheet.	LAB
4.	RWP in effect if necessary.	LAB
5.	MSIV ammeters indicating greater than 100 milliamps.	N/A
5.1 Surveillance Test		
1.	Supervising operator's authorization obtained.	LAD
2.	Condenser Low Vac Bypass switches in Bypass, if condenser vacuum is below MSIV trip setpoint.	LAD
5.1.1.2	MSIV 1B21-F022A ammeters downscale.	BF
5.1.1.5	MSIV 1B21-F028A ammeters downscale.	LAD
5.1.2.2	MSIV 1B21-F022B ammeters downscale.	BF
5.1.2.5	MSIV 1B21-F028B ammeters downscale.	LAD
5.1.3.2	MSIV 1B21-F022C ammeters downscale.	BV
5.1.3.5	MSIV 1B21-F028C ammeters downscale.	LAD
5.1.4.2	MSIV 1B21-F022D ammeters downscale.	BF
5.1.4.5	MSIV 1B21-F028D ammeters downscale.	LAD

SECTION/STEP			INITIALS

5.1.5

$	1.	Calculate average fastest stroke time:		
		Steam line A fastest stroke time in section 5.1.1 (step 1 or 3)	3.5	
		Steam line B fastest stroke time in section 5.1.2 (step 1 or 3)	+ 3.3	
		Steam line C fastest stroke time in section 5.1.3 (step 1 or 3)	+ 3.8	
		Steam line D fastest stroke time in section 5.1.4 (step 1 or 3)	+ 3.2	
		Total	= 13.8	
		Divide by 4	= 3.45	
$	2.	Average stroke time is greater than or equal to 3 seconds.		

Stopwatch Cole Parmer

MPL L70-2554L Cal Date 6.5.87 Cal Due Date 12.5.87 Init LAB

Comments: None

Performed By: ______ / LAB 10.9.87
______ / ______ 10.9.87
______ / ______ ______
______ / ______ ______
Signature Initials Date

$ Denotes Technical Specification requirement

MSIV FULL STROKE OPERABILITY TEST ____________ (1B21) VALVE TESTING DATA SHEET

INSTRUCTION STEP NO.	VALVE MPL NUMBER	PRE-TEST POSITION	FULL-STROKE EXERCISE OF TRAVEL BY (INITIAL) LITE $ (a)	STEM $ (b)	OTHER $(a/b)	FULL STROKE TIME (SECONDS) OPEN $ (c)	CLOSED $ (c)	ACCEPTANCE MAXIMUM STROKE TIME (SECONDS) $ OPEN	$ CLOSED	CRITERIA SAT (CHECK) Y	N	FAIL-SAFE TEST (INITIAL) $ (d)	POST TEST POSITION
5.1.1.1	1B21-F022A	OPEN	BF	BF	BF	NA	3.5	NA	5	✓		BF	CLOSED
5.1.1.3	1B21-F022A	CLOSED	BF	BF	BF	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.1.4	1B21-F028A	OPEN	LOS	LOS	LOS	NA	3.5	NA	5	✓		LOS	CLOSED
5.1.1.6	1B21-F028A	CLOSED	LOS	LOS	LOS	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.1	1B21-F022B	OPEN	BF	BF	BF	NA	3.3	NA	5	✓		BF	CLOSED
5.1.2.3	1B21-F022B	CLOSED	BF	BF	BF	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.2.4	1B21-F028B	OPEN	LOS	LOS	LOS	NA	4.5	NA	5	✓		LOS	CLOSED
5.1.2.6	1B21-F028B	CLOSED	LOS	LOS	LOS	NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) [signature] INITIAL LOS DATE 10-4-87 TIME 0125

(SIGNATURE) Bernard [signature] INITIAL BF DATE 10-9-87 TIME 1730

(SIGNATURE) ____________ INITIAL ______ DATE ______ TIME ______

(8) REVIEWED BY: (SIGNATURE) ____________ DATE ______ TIME ______

NOTE(S)

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DW/SVI119A/HH/2/pw

MSIV FULL STROKE OPERABILITY TEST (1B21) VALVE TESTING DATA SHEET

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5.1.3.1	1B21-F022C	OPEN	BP	BP	BP	NA	3.8	NA	5	✓		BP	CLOSED
5.1.3.3	1B21-F022C	CLOSED	BSP	BSP	BSP	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.3.4	1B21-F028C	OPEN	LAS	LAS	LAS	NA	4.5	NA	5	✓		LAS	CLOSED
5.1.3.6	1B21-F028C	CLOSED	LAS	LAS	LAS	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.1	1B21-F022D	OPEN	BF	BF	BF	NA	3.7	NA	5	✓		BF	CLOSED
5.1.4.3	1B21-F022D	CLOSED	BF	BF	BF	NA	NA	NA	NA	NA	NA	NA	OPEN
5.1.4.4	1B21-F028D	OPEN	LAS	LAS	LAS	NA	4.0	NA	5	✓		LAS	CLOSED
5.1.4.6	1B21-F028D	CLOSED	LAS	LAS	LAS	NA	NA	NA	NA	NA	NA	NA	OPEN

PERFORMED BY: (SIGNATURE) L. A. Bush Jr. INITIAL LAS DATE 10-9-87 TIME 0153

(SIGNATURE) Bernd f. H. INITIAL BF DATE 10-9-87 TIME 1230

(SIGNATURE) ______ INITIAL ______ DATE ______ TIME ______

ISI REVIEWED BY: (SIGNATURE) ______ DATE ______ TIME ______

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$ - DENOTES TECHNICAL SPECIFICATION REQUIREMENT

System Restoration Checklist

Instruction Title: MSIV Full Stroke Operability Test

Verified By: [illegible signature], BH 10-9-87

Michael J. [illegible] mjd 10-9-87

Signature/Initials Date

LOCATION	COMPONENT MPL OR NAME	REQUIRED POSITION	FIRST VERIF	SECOND VERIF	REMARKS
1H13-P601	1B21-F022A	Open* *	BH	mjd	* C.S. in AUTO
1H13-P601	1B21-F022B	Open* *	BH	mjd	* C.S. in AUTO
1H13-P601	1B21-F022C	Open* *	BH	mjd	* C.S. in AUTO
1H13-P601	1B21-F022D	Open* *	BH	mjd	* C.S. in AUTO
1H13-P601	1B21-F028A	Open* *	BH	mjd	* C.S. in AUTO
1H13-P601	1B21-F028B	Open* *	BH	mjd	* C.S. in AUTO
1H13-P601	1B21-F028C	Open* *	BH	mjd	* C.S. in AUTO
1H13-P601	1B21-F028D	Open* *	BH	mjd	* C.S. in AUTO

COMMENTS: *All Valves Closed, C/S in CLOSE due To CONDITION 4.

* In Operational Condition 4 or 5, valve position may be determined by the Unit Supervisor.

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
PERRY NUCLEAR POWER PLANT

M E M O R A N D U M

TO: G. G. Rhoads ROOM: E220 **FROM:** J. P. Eppich **DATE:** November 9, 1987
PHONE: 5225 **ROOM:** E110
SUBJECT: MSIV CLOSURE/SCRAM TEST

Engineering was tasked with determining what the safety consequences would be if one main steam line failed to isolate during the MSIV closure/scram test at 100% reactor power. The determination was made in a two step process. First, General Electric examined this event in light of previously analyzed transients which are documented in the FSAR. General Electric analyzed the effects on the reactor's physical response to the transient and determined the transient would be within previously analyzed events and would therefore not adversely effect the plant. The second was done by MDS/Piping and Equipment Analysis Element and discussed the specific effects on the main steam piping. The conclusion of this analysis was that there would be no adverse effect on main steam piping. Both responses therefore concluded that no adverse consequences would result since analyzed transients/design bases are bounding and that Startup Test results, to date, support this conclusion.

B/95

GENERAL ELECTRIC
PERRY SITE
NUCLEAR ENERGY BUSINESS OPERATIONS
GENERAL ELECTRIC COMPANY • 175 CURTNER AVENUE • SAN JOSE, CALIFORNIA 95125

November 6, 1987

To: John Eppich, Senior Project Engineer
NSSS/Piping/Equipment
Cleveland Electric Illuminating

Subject: Effects of Isolation of 3 Main Steam Lines

In response to your questions in regard to possible transient effects if the present condition of the "D" MSIV's (F022D and F028D failed to close during performance of an SVI) had gone undetected, the following comments are offered.

Two FSAR transients bound the expected system transients.

a. Turbine trip with bypass system failure (figure 15.2-5)
   - Vessel pressure rise approximately 160psi
   - SRV's lift (safety)
   - No MSIV closure

b. Three second closure of all MSIV's (figure 15.2-6)
   - Vessel pressure rise approximately 120psi
   - Relief valves lift

These transients result in vessel pressure increases of approximately 160 and 120psi, respectively. Since total steam flow reduction is greater in both of these transients than expected if 3 of the 4 main steam lines were to isolate, the expected vessel pressure rise is less than 120psi. In a turbine trip, MSIV closure does not occur, so this transient is more limiting than the 3 steam line isolation case from a piping pressure transient standpoint.

In terms of steam flow, the steam flow in any one steam line is limited by the driving pressure drop in the line.

GENERAL ELECTRIC

The successful completion of generator load reject startup test (STI B21-027) with bypass valves has shown that the associated steam flows are of no consequence to the system design. Figure 15.2-9 of the FSAR indicates the predicted pressure rise for this event is approximately 115psi. Since the total reduction in steam flow is similar in this case to that expected to occur in a 3 line isolation, a similar reactor pressure transient should result. Though not absolutely conclusive, the successful completion of the load reject test indicates that the steam flows expected for the unanalyzed event are of no adverse consequences.

In conclusion, the transient effects of the unanalyzed event with one steam line failing to isolate are similar to those experienced in STI B21-027 and are considered to have no adverse consequences to the plant.

Terry McIntyre

T. R. McIntyre, Manager
Perry Site Engineering

TRM/vjc

cc: J. J. Larsen
J. Z. Sherk
D. D. Jones

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY
PERRY NUCLEAR POWER PLANT

MEMORANDUM

TO: J. P. Eppich ROOM: E110 FROM: J. E. Meyer DATE: November 6, 1987
PHONE: 6635 ROOM: E150
SUBJECT: MAIN STEAM LINE DESIGN

This memo is in regards to your question on consequences from failure to isolate one main steam line during MSIV closure/scram test at 100% power. No problems are anticipated from this event as detailed below.

<u>THERMAL</u>

The steam lines are analyzed for closure of the MSIV's on any one line. This analysis is equally appropriate for one line operating and three lines closed. The slope on the lines and the equalizing line will ensure no significant thermal expansion exists in this operating mode. The before seat drain on F020 and continual blowdown from the low point on the steam line will keep live steam in the lines isolated by MSIV closure.

<u>PRESSURE</u>

The piping wall thickness is in excess of that required for 1250 psig operating pressure. Transient pressure spikes from this event are far less severe than the pressure spike from main steam stop valve closure which was considered in the piping design.

<u>FLOW RATE</u>

This is not a normal input to piping analysis. It is used to determine heat transfer rates for Class One analysis, however, since the lines were already at full temperature, there will be no effect. The design pressure is conservatively based on zero flow because it does not take credit for pressure drop.

<u>VIBRATION</u>

Verification that flow induced vibrations are within acceptable limits is based upon startup testing. Based on data taken at 100% power, no major problem would be anticipated with an increase in flow rate.

PERRY NUCLEAR POWER PLANT EVALUATIONS OF SINGLE MSIV SLOW CLOSURE

The Project was tasked with performing an analysis to evaluate the safety significance of having one main steam line failed to isolate in the proper time. Both GE and Gilbert were used to help in this analysis.

First GE determined that two accident scenarios and three transients described in the FSAR took credit for closure of the MSIVs. The events were the following:

1) Steamline break outside containment
2) Inside containment breaks which reach Level 1
3) Pressure regulator failure transient
4) Loss of condenser vacuum transient
5) Loss of AC power transient

It was determined that the bounding event of those described above would be the steamline break outside containment, since this event would permit the largest amount of activity to reach the site boundary. Therefore, GE was tasked with determining what the mass flow would be for a main steam line break outside containment given the as found conditions that existed on November 3, 1987 (i.e. three main steam lines isolate with proper times, and the remaining main steam line isolates in 18 seconds). Enclosure 1 is the results of this analysis. The analysis was done using the GE's SAFE 06 Code, a NRC approved code which has been previously used by Perry in the ECCS performance analyses (FSAR Chapter 6). Note that the mass release determined by this code were much less than the mass release discussed in FSAR 15.6.4.4 for the main steam line break outside containment. This was due to the conservative assumptions used in the FSAR analysis, such as assuming that level rise time is 1.0 seconds, that mixture quality is a constant 7.0%, and that the system pressure remains constant at 1060 psig throughout MSIV closure.

B/96

However, it was decided that two calculations would be done. The first would use the mass release given in the FSAR (FSAR page 15.6-10) for the first 5.5 seconds and then using the GE supplied flow data after 5.5 seconds when only one main steamline is open. The second calculation used the GE supplied data throughout the event. For each calculation two results were determined. First the postulated amount of radiation which would be released in the 18 seconds it took for the D line to isolate on November 3, and secondly the total time it would take with one main steam line unisolated before 10CFR Part 100 limits were exceeded. A conservative assumption was used for these calculation that there would be no plateout, or hold up time for the release. Enclosure 2 documents the results of these calculations.

To summarize the results of Enclosure 2, the analyses was performed using realistic assumptions that no fuel failure would occur for the events. Therefore, FSAR Table 15.6-17 values were used for isotopic content of the reactor coolant.

For the calculation using the FSAR mass release the following conclusions were drawn:

EB Iodine dose with 18 second single MSIV closure - 192 Rem
EB Iodine dose with 79 second single MSIV closure - 300 Rem

For the calculation using the GE data the following conclusions were drawn:

EB Iodine dose with 18 second single MSIV closure - 82 Rem
EB Iodine dose with 120 second single MSIV closure - 300 Rem

As shown above for either calculation the slow closure (18 second) of the D MSIV line on November 3 would not have resulted in a release exceeding 10CFR100 guidelines. Also, depending on which calculation used it was determined that the plant would have had between 79 and 120 seconds to isolate that line under accident conditions prior to exceeding 10CFR100 guidelines. Therefore, the 18 second slow closure of the D main steam line penetration has been shown to be within the bounds of accident guidelines.

GENERAL ELECTRIC

PERRY SITE

NUCLEAR ENERGY BUSINESS OPERATIONS

GENERAL ELECTRIC COMPANY • 175 CURTNER AVENUE • SAN JOSE, CALIFORNIA 95125

November 6, 1987

To: Gary Rhoades
Cleveland Electric Illuminating

Subject: Estimate of Mass Flows for Break Outside of Containment

Per your request, the calculated mass flow rates for a steamline break outside containment with failure to isolate one steamline are attached. These values were calculated with the GE ECCS analysis code SAFE. All assumptions are identical to those in the FSAR for the steamline break outside the containment with the exception of only 3 lines isolating. These calculations have been verified and are filed in DRF 668-000036.

Also attached is a plot of these values compared to the original hand calculated estimate. The basis for the hand calculation was as follows:

t	assumption
0-4 sec	flow = FSAR calculation
4-5 sec	linear ramp to flow for 1 steam line open
5-10 sec	liquid bread flow based on Moody critical flow model
10-30 sec	steam break flow based on Moody critical flow model

As can be seen, the hand calculation was an excellent estimate of the SAFE results.

Please call if there are further questions.

D. D. Jones

D. D. Jones
Lead Site System Engineer
Extension 6908

DDJ/vjc

cc: D. A. Hamon
T. R. McIntyre

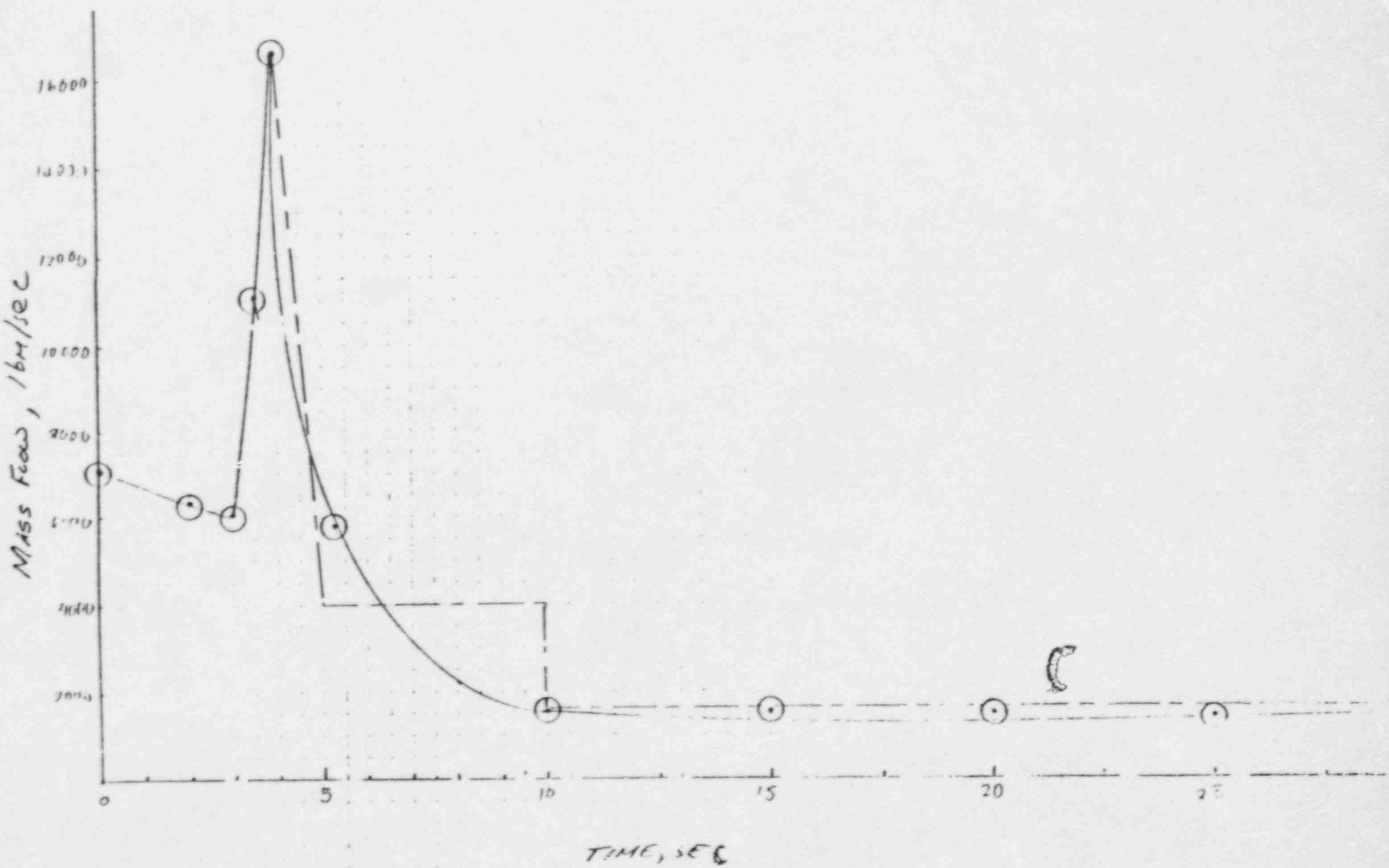
Steamline Break Outside Containment

— 3 Lines Isolate, 1 stays open

TIME	PRESSURE PSIA	BRK 1 FLOW LB/SEC	BREAK(16) QUALITY
0.	1.060E 03	7.086E 03	1.000E 00
0.1865234	1.035E 03	6.907E 03	1.000E 00
0.6240234	9.928E 02	6.616E 03	1.000E 00
1.1240234	9.672E 02	6.439E 03	1.000E 00
1.8935547	9.412E 02	6.260E 03	1.000E 00
2.3994141	9.296E 02	6.179E 03	1.000E 00
2.8134766	9.208E 02	6.118E 03	1.000E 00
3.0869141	9.151E 02	6.079E 03	1.000E 00
3.5244141	9.081E 02	1.117E 04	4.066E-01
3.9931641	9.080E 02	1.670E 04	1.734E-01
4.4619141	9.089E 02	1.456E 04	1.563E-01
5.2744141	9.154E 02	5.831E 03	2.170E-01
6.2119141	9.279E 02	3.449E 03	2.836E-01
7.1494141	9.393E 02	4.169E 03	1.858E-01
7.9150391	9.473E 02	4.885E 03	1.128E-01
8.1494141	9.499E 02	2.612E 03	4.308E-01
8.3837891	9.511E 02	1.582E 03	1.000E 00
8.6181641	9.520E 02	1.583E 03	1.000E 00
8.8525391	9.528E 02	1.585E 03	1.000E 00
9.0869141	9.535E 02	1.586E 03	1.000E 00
9.3212891	9.541E 02	1.587E 03	1.000E 00
9.5556641	9.546E 02	1.588E 03	1.000E 00
9.7900391	9.549E 02	1.589E 03	1.000E 00
10.024414	9.552E 02	1.589E 03	1.000E 00
10.258789	9.554E 02	1.589E 03	1.000E 00
10.493164	9.555E 02	1.590E 03	1.000E 00
10.727539	9.555E 02	1.590E 03	1.000E 00
10.961914	9.555E 02	1.589E 03	1.000E 00
11.196289	9.553E 02	1.589E 03	1.000E 00
11.430664	9.550E 02	1.589E 03	1.000E 00
11.665039	9.547E 02	1.588E 03	1.000E 00
11.899414	9.543E 02	1.587E 03	1.000E 00
12.133789	9.538E 02	1.587E 03	1.000E 00
12.368164	9.533E 02	1.586E 03	1.000E 00
12.602539	9.527E 02	1.585E 03	1.000E 00
12.836914	9.520E 02	1.583E 03	1.000E 00
13.071289	9.513E 02	1.582E 03	1.000E 00
13.305664	9.505E 02	1.581E 03	1.000E 00
13.540039	9.497E 02	1.579E 03	1.000E 00
13.774414	9.487E 02	1.578E 03	1.000E 00
14.008789	9.478E 02	1.576E 03	1.000E 00
14.243164	9.467E 02	1.574E 03	1.000E 00
14.524414	9.453E 02	1.572E 03	1.000E 00
14.993164	9.430E 02	1.568E 03	1.000E 00
15.461914	9.405E 02	1.564E 03	1.000E 00
15.930664	9.379E 02	1.559E 03	1.000E 00
16.399414	9.351E 02	1.554E 03	1.000E 00
16.868164	9.323E 02	1.549E 03	1.000E 00
17.336914	9.293E 02	1.544E 03	1.000E 00
17.805664	9.262E 02	1.539E 03	1.000E 00
18.274414	9.231E 02	1.533E 03	1.000E 00

Steamline Break Outside Containment
- 3 lines isolate, 1 stays open -

TIME	PRESSURE PSIA	BRK 1 FLOW LB/SEC	BREAK(16) QUALITY
18.743164	9.200E 02	1.768E 03	8.250E-01
19.211914	9.170E 02	1.864E 03	7.639E-01
19.680694	9.137E 02	1.517E 03	1.000E 00
20.149414	9.102E 02	1.511E 03	1.000E 00
20.868164	9.048E 02	1.502E 03	1.000E 00
21.566914	8.995E 02	1.648E 03	6.790E-01
22.118164	8.954E 02	1.486E 03	1.000E 00
22.805664	8.901E 02	1.477E 03	1.000E 00
23.461914	8.848E 02	1.468E 03	1.000E 00
24.055664	8.802E 02	1.460E 03	1.000E 00
24.711914	8.748E 02	1.451E 03	1.000E 00
25.274414	8.705E 02	1.443E 03	1.000E 00
25.868164	8.657E 02	1.435E 03	1.000E 00
26.461914	8.609E 02	1.427E 03	1.000E 00
27.024414	8.563E 02	1.419E 03	1.000E 00
27.586914	8.518E 02	1.411E 03	1.000E 00
28.211914	8.467E 02	1.403E 03	1.000E 00
28.836914	8.417E 02	1.394E 03	1.000E 00
29.461914	8.367E 02	1.386E 03	1.000E 00
30.024414	8.324E 02	1.378E 03	1.000E 00


MASS FLOW, lbm/sec
16000
12000
10000
8000
TIME, SEC
0
5
10
15
20

Gilbert/Commonwealth engineers and consultants

GILBERT/COMMONWEALTH, INC., P.O. Box 1498, Reading, PA 19603/Tel 215 775-2600/Cable Gilasoc/Telex 836-431

November 6, 1987

PY-GAI/CEI-19150
Information

The Cleveland Electric Illuminating Company
Project Organization Document Control Center
Perry Site
Post Office Box 97
Perry, Ohio 44081

Attention: K. R. Pech

Re: Perry Nuclear Power Plant
Evaluation of Exclusion Boundary
Dose with a single MSIV Closure
at 18 seconds

Dear Ken:

Per your verbal request of 11/5/87, we have evaluated the potential radiological consequences at the Exclusion Boundary (EB) based upon the following:

1. The postulated accidents result in no fuel damage per Reference 1.

2. The reactor coolant activity levels are per Reference 2.

3. Two cases were considered for the steam line break outside containment mass release for the first 5.5 seconds of the transient. The first is based on the data contained in FSAR section 15.6.4.4 and the second is based on data generated by GE using the SAFE 06 computer code. After 5.5 seconds the mass release in both cases is the same. Attachment 1 contains the GE data as verbally modified per our telephone conference to extend the table beyond 5 seconds.

4. Inboard MSIV closes in 18 seconds.

The details of the evaluation performed are presented as Attachment #2. The evaluation concludes:

1. That the enveloping accident is a double ended rupture of a main steam line outside containment. The reasoning behind this conclusion is as follows:

   Given release of the reactor coolant inventory with the above noted realistic activity levels, it becomes obvious that the maximum radioactivity release to the environment occurs with the event that releases the most mass to the environment. Thus the main steam break outside containment (SBOC) becomes the enveloping case. All postulated ruptures inside containment release coolant and the associated activity into the confines of containment. Thus less activity is released to the environment than in the SBOC. Breaks smaller than a full guillotine double ended rupture SBOC release less mass and activity in 18 seconds than a full size SBOC. Feedwater breaks release mainly 'clean' fluid and are isolated normally.

2. For the FSAR case the results are:

   EB iodine dose with 18 second single MSIV closure = 192

   EB iodine dose with 79 second single MSIV closure = 300 Rem

   EB noble gas dose for delayed single MSIV closure = 4.1 Rem

3. For the GE case the results are:

   EB iodine dose with 18 second single MSIV closure = 82 Rem

   EB iodine dose with 120 second single MSIV closure = 300 Rem

   EB Noble gas dose for delayed single MSIV closure = 4.1 Rem

   It should be noted that these results are not based on design verified safety related calculations. To complete a design package, verified design input regarding mass release and timing would be required from GE.

Should you have any questions, please contact us.

Very truly yours,

M. M. Waselus
Project Engineer - AEA

J. Ioannidi
Project Manager

MMW/JI:fll

cc: J. Ioannidi (2)
PO/DC (R-290)
J. Eppich (E-110)

R. E. Anderson
Enclosure

Steamline Break Outside Containment

TIME	PRESSURE PSIA	BRK 1 FLOW LB/SEC	BREAK(16, QUALITY
0.	1.060E 03	7.086E 03	1.000E 00
0.1865234	1.035E 03	6.907E 03	1.000E 00
0.6240234	9.928E 02	6.616E 03	1.000E 00
1.1240234	9.672E 02	6.439E 03	1.000E 00
1.8939547	9.412E 02	6.260E 03	1.000E 00
2.3994141	9.296E 02	6.179E 03	1.000E 00
2.8134766	9.208E 02	6.118E 03	1.000E 00
3.0869141	9.151E 02	6.079E 03	1.000E 00
3.5244141	9.081E 02	1.117E 04	4.066E-01
3.9931641	9.080E 02	1.670E 04	1.734E-01
~~4.4619141~~	~~9.090E 02~~	~~1.346E 04~~	~~1.633E-01~~
5.3369141	9.186E 02	8.178E 02	9.036E-01
6.2744141	9.395E 02	0.	1.000E 00
7.2119141	9.583E 02	0.	1.000E 00

As modified for A Single 15 Second MSIV closure

11/5/87

4.0	1.670 E 04
5.0	4.000 E 03
10.0	4.000 E 03
10.0	1.600 E 03
18.0	1.600 E 02

1.0 Purpose: To evaluate the radiological consequence (dose) at the exclusion boundary for the worst case accident assuming that there is no failed fuel and that one MSIV closes in 18 seconds while the other 3 MSIV's close in the normal 5.5 seconds

2.0 Design Input: See Design Input Record

3.0 Computer Data: Computer not used

4.0 References:

4.1 Letter DAH 87-1104, To T.P. McIntyre from D.R. Hamon / L.S. Buelk, 11/4/87
4.2 Letter PY-GEN/GAI-1810, To R.E. Gadkasst from R.C. Mitchell, 5/8/79
4.3 Containment And NSSS Interface, Data Book, Document No. 22A3759AL Rev 1
4.4 Main Steam Break Outside Containment Mass Release, Telecopy GE to CEI, 11-5-87 Att 1
4.6 FSAR Pg 15.6-10

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	ORIGINATOR	R.E. Ardeposal			
	DATE	11.5.87			

5.0 Calculation

5.1 Assumptions:

1/ The postulated scenarios will have no failed fuel (Per reference 4.1)

2/ Reactor coolant activity levels per Reference 4.2 (Also given as FSAR Table 15.6-17).

3/ Mass Steam break outside containment mass release as per (Reference 4.4 & Reference 4.5)

4/ Others noted as used

5.2 Definitions: None required

5.3 Methodology: Since there is no failed fuel (Reference 4.1), the activity released will be based on the realistic activity including iodine spike as per Reference 4.2.

Given release of reactor coolant inventory with the above noted realistic activity levels no matter what postulated accident occurs, it becomes obvious that the maximum radioactivity release to the environment occurs with the event that releases the most mass to the environment. Thus the main steam break outside containment (SBOC) becomes the enveloping case. All postulated ruptures inside containment release most of the lost reactor coolant & associated activity into the confines of containment, thus less activity is lost to the environment than in the SBOC. Smaller than full DER SBOC release less mass and activity in 18 seconds than full size SBOCs. Feedwater breaks release mainly 'clean' fluid and are isolated normally.

5.4 Estimate of Maximum Exclusion Boundary Dose Using Realistic RC Activity Levels

Use Reference 4.2 total isotopic activity levels
check both iodine and noble gas doses

Isotope	Activity (Curies)	Dose Conversion Factor (Rem/Curie) ①	Breathing Rate (m³/sec) ②	X/Q (sec/m³) ③	Iodine Dose (Rem)
I-131	1600	1.48 +6	3.47-4	4.3-4	353.3
I-132	2400	5.35 +4	↓	↓	19.2
I-133	3800	4.00 +5			226.8
I-134	4100	2.50 +4			15.2
I-135	3600	1.24 +5			66.6
					681.2

Isotope	Conv. Factor ④	Eγ (Mev/dis) ⑤	Activity (Curie)	X/Q (sec/m³) ③	Gamma Dose (Rem)
Xe-131m	0.25	0.0116	49	4.3-4	-
Xe-133	↓	0.0272	9600	↓	-
Xe-133m		0.0218	240		-
Xe-135		0.229	8200		0.2
Xe-135m		0.376	1300		0.1
Xe-137		0.18	7800		0.2
Xe-138		1.12	8000		1.0
Kr-83m		9.58-6	680		-
Kr-85		0.00204	370		-
Kr-85m		0.148	1700		-
Kr-87		0.75	2200		0.3
Kr-88		1.86	4600		0.9
Kr-89		2.1	6000		1.4
					4.1

①
②
③
④
⑤

5.5 Estimate of 18 Second MSIV Exclusion Boundary Dose Using Realistic RC Activity

Only the iodine dose need be evaluated since Sect. 5.4 shows the noble gas dose to be within 10 CFR 100 limits easily

Method - Use the S20C mass release to determine what percentage of RC activity is release (assuming instantaneous equlibrium of activity). This % represents the % of the total dose (iodine) calculated in Sect. 5.4 that would be released in 18 seconds.

S20C Mass Release - Reference 4.4

Time (Sec)	Mass Rate (lbm/sec)	Integrated Mass Release (lbm)
0.	7036	-
0.1865234	6907	1305
0.6240234	6616	2958.2
1.1240234	6439	3263.8
1.8935547	6260	4886.1
2.3994141	6179	3146.2
2.8134766	6118	2545.9
3.0269141	6079	1667.6
3.5244141	11170	3773.2
3.9931641	16700	6532.0
4.0	16700	114.2
5.0	4000	10350.0
10.0	4000	20000.0
10.0	1600	-
18.0	1600	12800.0
		73342.2

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	DATE	11-5-07				

5.5 Cont'd

Total Reactor Coolant Inventory = 613400 lbm .. Reference 4.2

Thus, the ratio of 520C @ second release to total RC inventory is

$\frac{73342.2}{613400} \cong 0.12$

Thus EE iodine dose is: $D_{EE} \cong 0.12 (681.2) \cong 82$ Rem.

Calculate @ what time the EE iodine dose = 300 Rem, the 10 CFR 100 limit:

Mass Fraction $\cong \frac{300}{681.2} \cong 0.4404$

Mass $\cong 0.4404 (613400) = 270141.4$ lbm

Time = 18 seconds + $\frac{(270141.4 - 73342.2)}{1600}$

Time $\cong$ 140 seconds

Assume 1600 lbm/sec is the constant release rate after 18 seconds

Say 120 seconds

5.6 Estimate of 18 Second MSIV Exclusion Boundary Dose Using Realistic RC Activity and A Combination FSAR/Ref. 4 Mass Release

Method - Same as in Section 5.5 except that the mass release to be used for the first 5.5 seconds of the SGTR will be taken from FSAR Page 15.6-10 (Ref. 4.5). The mass release after 5.5 seconds will be per reference 4.4. The use of the FSAR information is done for consistency with the plant licensing basis.

Time (Sec)	Mass Rate (lbm/sec)	Integrated Mass Release (lbm)
0 - 5.5	-	141687
5.5 - 10.0	4000	18000
10.0 - 18.0	1600	12800
		172487

Ratio = $\frac{172487}{613400} \approx 0.2812$

Thus EB dose ([illegible]) ≈ 0.2812 (601.2) ≈ 169 Rem

Time to reach 300 Rem is:

$$\text{Time} = 18 + \frac{(270141.4 - 172487)}{1600}$$

Assuming 1600 lbm/sec is the constant release rate after 18 seconds

Time ≈ 79 Seconds

6.0 Results: See pages 5, 7, 8

1/ EB iodine dose with 15 second single MSIV closure ≅ 82 Rem	With Bechtel Mass Release
2/ EB iodine dose with 150 second single MSIV closure ≅ 300 Rem	
3/ EB noble gas dose for delayed single MSIV closure ≤ 4.1 Rem	
4/ EB iodine dose with 15 second single MSIV closure ≅ 19.2 Rem	With Combustion Ref. 4.4.6 Ref. 4.5 Mass Release
5/ EB iodine dose with 79 second single MSIV closure ≅ 300 Rem	

7.0 Disposition of Results:

PLANT PERFORMANCE ENGINEERING
San Jose, CA

November 4, 1987
DAH 87-1104

cc: AE Rogers
S Wolf
SS Dua

To: T. R. McIntyre

Subject: Effect of Isolation Delay or Failure in One Steamline

Reference: Letter, DA Hamon to TR McIntyre, "FSAR MSIV Assumptions", November 3, 1987, DAH 87-1103.

This letter expands on the reference to provide a more detailed discussion of the fuel response and radiological analysis requirements associated with an isolation delay or failure in one steamline.

The Perry FSAR transient and ECCS performance analyses take credit for operation of the MSIVs for the following events:

1) Steamline break outside containment,
2) Inside containment breaks which reach Level 1,
3) Pressure regulator failure open transient,
4) Loss of condenser vacuum transient, and
5) Loss of AC power transient (2 FSAR events).

None of these events have been analyzed without credit for MSIV closure. Thus, if the MSIV problem at Perry had gone undetected it could have led to the occurrance of an unanalyzed event.

However, all of the transient events (items 3-5 above) are expected to be bounded by the FSAR ECCS performance analysis in Chapter 6. As far as the core is concerned, items 1 and 2 would not be significantly affected if the MSIVs failed to close and the calculated peak cladding temperature change for the limiting event would be negligible (probably change by less than 1°F). No fuel rod perforations were calculated to occur for any loss-of-coolant accident (LOCA) event in the Perry Chapter 6 analysis and none would be expected if one or more steamlines failed to isolate.

The only item substantially impacted by lack of MSIV closure would be the radiological release due to a loss-of-coolant accident. If one of the steamlines could not be closed, the releases would be much higher than calculated in the FSAR. After 3 of the 4 steamlines isolate, the mass flow rate out of a steamline break will be reduced by 75%. This reduction occurs because the limiting flow area is at the steamline flow limiters, and only one will be contributing to the break flow after isolation of 3 steamlines. By this time in the transient the break quality will be 1.0 (steam only).

Steamline breaks are very mild transients as far as peak cladding temperature (PCT) is concerned. Figures 6.3-65 through 6.3-68 of the Perry FSAR show the calculated response to a steamline break inside the containment for Perry. At no time does the calculated PCT exceed the normal operating temperature of the fuel. The response for a steamline break outside the containment is shown in FSAR Figures 6.3-69 through 6.3-72. No fuel heatup is calculated until after ADS actuation occurs, which is nearly 10 minutes after MSIV closure. If isolation of one steamline is delayed, the response would resemble that of the steamline break inside the containment (but with a much slower depressurization rate due to the smaller break area) until the time isolation finally occurs. Thus, no fuel damage (perforations) is expected for any steamline break with or without MSIV closure.

For the radiological analysis of a steamline break outside the containment, Reg. Guide 1.5 requires that the total coolant loss before isolation be evaluated. The coolant released must be assumed to contain tech spec maximum activity levels, with all activity becoming airborne and drifting to the site boundary. If isolation of one steamline is delayed, the additional amount of coolant lost would have to be considered, along with an iodine spiking term due to the resulting RPV depressurization. There is no requirement to postulate fuel damage unless it is expected to occur for this event.

A delay or failure to isolate one steamline would also substantially affect the radiological evaluation of the DBA recirculation line break inside the containment. For this event Reg. Guide 1.3 requires the assumption that 100% of all activity in the core be released, even though no fuel damage is expected for any LOCA event. This activity would then be available for transport outside the containment until all steamlines are isolated.

Please call if you have any questions.

D A Hamon
D. A. Hamon, Tech Leader
Plant Performance Engineering
M/C 763, Dial Comm 8*425-4593

Lloyd S Burns
L. S. Burns, Tech Leader
Plant Analysis Services
M/C 769, Dial Comm 8*425-6596

PERRY SITE
NUCLEAR ENERGY BUSINESS OPERATIONS
GENERAL ELECTRIC COMPANY • 175 CURTNER AVENUE • SAN JOSE, CALIFORNIA 95125

November 4, 1987
PER 87-1294

To: J. P. Eppich, Senior Project Engineer
Perry Nuclear Power Plant

Subject: MSIV Closure Testing

In response to your verbal question of last evening, I have discussed the situation with our systems engineers in San Jose, and prepared the attached response. Please note that this response is based soley on our best engineering judgement and significant computer resource would be required to verify the statements with regard to bounding ECCS analysis. We believe the statements to be correct, but no analyses have been performed.

TR McIntyre

T. R. McIntyre, Manager
Perry Site Engineering

TRM/vjc

cc: J. J. Larsen
J. Z. Sherk

Question:

If one main steam line failed to isolate during the MSIV closure/SCRAM test at 100% Reactor Power would this result in any adverse safety consequences?

Answer:

If the MSIV closure test at test condition 8 had been performed prior to detecting the failure of the "D" line MSIVs, there would have been no adverse safety consequences. In making this conclusion, it is assumed that no pipe break or abnormal transient, other than that caused by the isolation will occur. Transients do exist that take credit for MSIV closure in FSAR analyses, but all of these transients are expected to be bounded by the ECCS performance analysis in FSAR chapter six.

If the test had been run, and one steam line had failed to isolate, the challenge to the reactor system would have been substantially less severe than planned. Reactor isolation leads to a reactor pressure increase and power transient. One line remaining unisolated would reduce the severity of this transient. From a dynamic loads standpoint, the steam flow in the unisolated line would increase by a maximum of 5 percent, which is bounded by the steam flow assumed to occur in that line during pipe break scenarios, which is the piping design basis. At any rate, turbine stop valve closure would terminate steam flow in all lines.