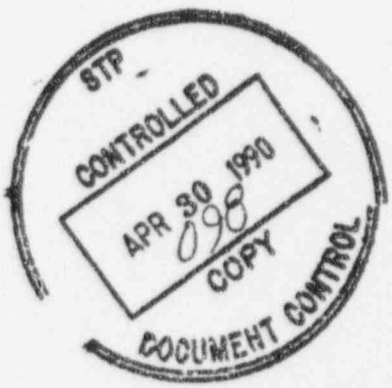
HL&P 6589(12-85)

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION INDEPENDENT SAFETY ENGINEERING GROUP ASSESSMENTS AND INVESTIGATIONS	NUMBER ISEG-06	REV. NO. 1
	PAGE 1 OF 8	
	EFFECTIVE DATE 04-30-90	

Approval: M A McBurnett Date: 4-17-90
Manager, Nuclear Licensing

Approval: D K Katsuyama Date: 4-17-90
Director, ISEG



1.0 PURPOSE

This procedure provides general requirements for the performance of Assessments and Investigations by ISEG.

2.0 SCOPE

This procedure applies to the conduct of Assessments and Investigations performed by ISEG.

3.0 DEFINITIONS

3.1 Assessment/Investigation

An in-depth evaluation of various Plant activities, incidents, work practices, and management controls for the purpose of identifying areas where improvements could be made or to identify causal factors of undesirable events to preclude recurrence.

4.0 REFERENCES

4.1 ISEG-01, Organization and Responsibilities.

4.2 ISEG-03, Task Administration and Report Preparation.

5.0 RESPONSIBILITIES

5.1 The Director, ISEG is responsible for approving Assessment and Investigation Plans.

5.2 The Task Lead is responsible for proper performance and reporting of assigned Assessments and Investigations.

6.0 REQUIREMENTS

6.1 Administrative Processing of Assessments and Investigations is performed in accordance with ISEG-03, Task Administration and Report Preparation.

6.2 Assessments

6.2.1 Plan

The Task Lead ensures that an Assessment Plan is prepared which provides structure and direction for the performance of the Assessment. The plan includes the following minimum information:

6.2.1.1 Purpose.

6.2.1.2 Scope.

6.2.1.3 Individuals to be interviewed.

6.2.1.4 Documents to be reviewed (includes technical references, procedures, design input/output, computer data, etc.)

6.2.1.5 Activities and hardware to be observed.

6.2.1.6 Tentative schedule.

The Director, ISEG approves the Assessment Plan. The Task Lead ensures that the plan is revised when significant changes in the stated scope or schedule occur.

6.2.2 Preparation

The Task Lead ensures that personnel assigned to the Assessment are prepared to perform the assessment through the following actions, as appropriate:

6.2.2.1 Review of the Assessment Plan and division of Assessment responsibilities among assigned personnel.

6.2.2.2 Familiarization with Plant systems/structures involved.

6.2.2.3 Review of relevant instructions, procedures and other controlling documents.

6.2.2.4 Familiarization with applicable industry practices and standards.

6.2.2.5 Development of checklists or assumptions to be verified and questions to be answered.

6.2.3 Performance

ISEG personnel ensure that when conditions appear to present a potentially significant adverse Plant safety and reliability concern,

they are to immediately inform the Task Lead, the responsible organization management, and the Director, ISEG. Such conditions include those that may involve entry into a Plant Technical Specification action statement, or may involve showing the Plant to be in a condition outside the bounding assumptions of safety analyses, or may present an immediate and significant industrial safety hazard, or which may otherwise present an unjustifiable risk to Plant reliability.

The Task Lead ensures that appropriate management and supervision are informed of ISEG's intent to perform an Assessment.

Applicable guidance in Exhibit ISEG-06-A is utilized for the performance of the Assessment.

6.2.4 Reporting

6.2.4.1 The Task performers determine which preliminary conclusions are valid and significant and develop corresponding recommendations for areas where improvements could be made.

6.2.4.2 The Task Lead ensures that an Assessment report is prepared and processed in accordance with ISEG-03, Task Administration and Report Preparation.

6.3 Investigations

6.3.1 Plan

The Task Lead ensures that an Investigation Plan is prepared which provides structure and direction for the performance of the Investigation. The plan includes the following minimum information:

6.3.1.1 Problem statement.

6.3.1.2 Purpose.

6.3.1.3 Scope.

6.3.1.4 Individuals to be interviewed.

6.3.1.5 Documents to be reviewed (includes technical references, procedures, design input/output, computer data, etc.).

6.3.1.6 Activities and hardware to be observed.

6.3.1.7 Tentative schedule.

The Director, ISEG approves the Investigation Plan. The Task Lead ensures that the plan is revised when significant changes in the stated scope or schedule occur.

6.3.2 Preparation

The Task Lead ensures that personnel assigned to the Investigation are prepared to perform the investigation through the following actions, as appropriate:

6.3.2.1 Review of the Investigation Plan and division of investigation responsibilities among assigned personnel.

6.3.2.2 Familiarization with Plant systems/structures involved.

6.3.2.3 Review of relevant instructions, procedures and other controlling documents.

6.3.2.4 Development of checklists or assumptions to be verified and questions to be answered.

6.3.3 Performance

ISEG's involvement with Investigations is independent of line organization performance of IP-1.45Q, Station Problem Reporting, Problem Report (PR) investigations. When PRs are assigned to line organizations for investigation, ISEG may also be requested to investigate the event. When this occurs ISEG investigates the event and submits an Investigation report in accordance with ISEG-03, Task Administration and Report Preparation, to the appropriate managers. If the Problem Report has been investigated (and associated

Station Problem Report completed) the Director, ISEG may have the Task assigned as a Review of the PR event and investigation and performed in accordance with ISEG-05, Observations and Reviews.

When conditions appear to present a potentially significant adverse Plant safety and reliability concern, Investigation performers are to immediately inform the Task Lead, the responsible organization management, and the Director, ISEG.

The Task Lead ensures that appropriate management and supervision are informed that ISEG is performing an Investigation.

Applicable guidance in Exhibit ISEG-06-A is utilized for the performance of the Investigation.

6.3.4 Reporting

6.3.4.1 The Task Lead determines the sequence of events involved with the subject event. The Task Lead ensures that appropriate causal factor, barrier and change analyses are performed. The Investigation team determines the causal factors and develops corresponding recommendations to prevent future occurrence of similar events.

6.3.4.2 The Task Lead ensures that an Investigation report is prepared and processed in accordance with ISEG-03, Task Administration and Report Preparation.

7.0 DOCUMENTATION

7.1 QA Records

7.1.1 As discussed in ISEG-03.

7.2 Working Documents

7.2.1 As discussed in ISEG-03.

8.0 ATTACHMENTS

8.1 ISEG-06-A - Guidance for Assessments and Investigations.

EXHIBIT ISEG-06-A
GUIDANCE FOR ASSESSMENTS AND INVESTIGATIONS

The guidance and/or requirements for assessment and investigation performance provided in IP-1.45Q, in NTD041, Systematic Problem Solving Process (SPSP) Training Program, and the following additional guidance is followed to the extent feasible given the conditions present.

a. Ensure personnel being observed or interviewed are aware that the observer is from ISEG and that they are aware of ISEG's purpose in assessing or investigating activities.

b. While observing, interviewing, and reviewing, take notes in sufficient detail such that specific hardware, documents and personnel involved can be sought out at a later date if additional questions arise. As soon as possible after the interview, review, or observation clarify and summarize all notes.

c. While observing activities and interviewing personnel maintain an awareness of and note surrounding equipment status, work activity status, and possible industrial safety hazards.

d. Do not prompt or lead those individuals being observed or questioned. The mere presence of an observer influences the behavior observed. Prompting further diminishes the validity that the observed performance resembles the usual performance.

e. Maintain a central working file containing notes and supporting documentation.

f. Keep the Task Lead informed of the progress of the task in terms of summaries of the information obtained, preliminary conclusions drawn, and additional time and actions necessary for completion.

ENSg

STP 486 (08/92) SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION OPGP03-ZX-0002

STATION PROBLEM REPORT

PAGE ___ OF ___

CAG | CATEGORY ☐1 ☐2 ☐3 ☒4 ☐5 ☐6 | SPR NO. 930470

ORIGINATOR

PART 1: IDENTIFICATION OF CONCERN

A. UNIT # ☐ 1 ☐ COMMON ☑ 2 ☐ BOTH

INITIATED: NAME JB COOK DEPT PED
POSITION NSSS SECTION SUP PHONE NO. 8218
DATE 2/11/93 TIME 1120

DISCOVERY: DATE 2/10/93 TIME 1500

IMMEDIATE SUPERVISOR CONCURRENCE: NAME VR ALBERT
DATE 2/11/93 TIME 1135

B. PROBLEM DESCRIPTION STI-94-011880-7

AFTER SI-MOV-0031A FAILED TO OPEN, A SEARCH OF WMS HISTORY REVEALED THAT THIS SAME VALVE HAS BURNED UP A MOTOR PREVIOUSLY. NO ROOT CAUSE WAS FOUND AT THAT TIME. ONE MOTOR ON UNIT ONE HAS ALSO BURNED UP.

[ ] CONTINUATION SHEET ATTACHED

C. IMMEDIATE COMPENSATORY OR REMEDIAL ACTIONS TAKEN 2/11/93

WR: ~~SF~~ RH-170062 WAS WRITTEN TO REPAIR THE MOV. THE MOV WAS MANUALLY SHUT TO PLACE IT IN A KNOWN CONFIGURATION.

[ ] CONTINUATION SHEET ATTACHED

D. IDENTIFICATION

SYSTEM SI COMPONENT NAME COLD LEG INJ. ISOLATION

COMPONENT NO. AZSIMOV0031A. BLDG RCB ROOM 108

SPR No. _____ REV ____

PAGE ____ OF ____

INSTRUCTIONS FOR PART 1 COMPLETION

ORIGINATOR:

DESCRIBE YOUR CONCERN GIVING AS MUCH INFORMATION AS POSSIBLE. FILL IN ALL APPLICABLE SECTIONS OR ATTACH DOCUMENTATION. INDICATE WHAT, WHEN, WHO, WHY, WHERE, HOW. LIST ANY REFERENCES.

DESCRIBE ANY IMMEDIATE COMPENSATORY/REMEDIAL ACTIONS TAKEN IN ADDITION TO WRITING THE SPR.

IF A COMPONENT, SYSTEM, BUILDING, ETC., IS INVOLVED, THEN COMPLETE THE APPLICABLE PORTION OF PART I.

IF YOU HAVE ENOUGH INFORMATION TO IDENTIFY THE CAUSE AND REMEDIAL ACTION, THEN SO STATE.

OBTAIN IMMEDIATE SUPERVISORS CONCURRENCE IF POSSIBLE. IF NOT POSSIBLE OR IF ORIGINATOR DISAGREES WITH IMMEDIATE SUPERVISORS POSITION, DELIVER TO SHIFT SUPERVISOR OR CAG AS APPROPRIATE.

NOTE: IF POTENTIALLY REPORTABLE, OR IF ANY DOUBT EXISTS REGARDING REPORTABILITY, THEN HAND CARRY IMMEDIATELY TO THE SHIFT SUPERVISOR. OTHERWISE, DELIVER TO THE CAQ ADMINISTRATOR.

IF ANY SECTION OR BLANK IS NOT COMPLETED, THEN RECORD N/A IN THE APPROPRIATE SECTION.

SHIFT SUPERVISOR\LICENSING

PART 2: REPORTABILITY

A. PLANT MODE: (CIRCLE ONE) 1 2 3 (4) 5 6 NO-MODE

Rx POWER 0 Rx TEMP 343°F Rx PRESSURE 385 PSIG Rx TRIP YES [ ] NO [X]

ESF ACTUATION NA INITIATING SIGNAL NA

B. OPERABILITY

[ ] OPERABILITY REVIEW REQUIRED WITHIN 24 HOURS [ ] JCO REQUIRED [X] NA

SHIFT SUPERVISOR _____ DATE/TIME 2-11-93 1232

C. REPORTABILITY DETERMINATION PER REPORTING MANUAL

[ ] REPORTABLE PER _____ WITHIN _____
LAW/PERMIT/LICENSE TIME:HOURS

NOTIFICATIONS (SS)

DUTY PLANT MANAGER	[ ] N/A	PERSON CONTACTED _____	DATE/TIME _____	INITIALS _____
NRC RESIDENT INSP	[ ] N/A	PERSON CONTACTED _____	DATE/TIME _____	INITIALS _____
NRC OPS CENTER	[ ] N/A	PERSON CONTACTED _____	DATE/TIME _____	INITIALS _____
OTHER	[ ] N/A	PERSON CONTACTED _____	DATE/TIME _____	INITIALS _____

[ ] ADDITIONAL REPORTABILITY EVALUATION REQUIRED

[X] NOT REPORTABLE

SHIFT SUPERVISOR _____ DATE/TIME 2-11-93 1232

D. FINAL REPORTABILITY REVIEW

[ ] REPORTABLE PER _____ WITHIN _____
LAW/PERMIT/LICENSE TIME:HOURS

[X] NOT REPORTABLE

LICENSING REPRESENTATIVE James M Pigott DATE 2/12/93

[ ] CONTINUATION SHEET ATTACHED

E. WRITTEN REPORT

TYPE _____ DUE DATE _____

F. NUCLEAR NETWORK REQUIRED [ ] YES [X] NO

CAQ

PART 3: ACTION ASSIGNMENT

ACTION ORGANIZATION(S)

DEPARTMENT DED	ACTION Investigation	DUE 3-11-93
DEPARTMENT _____	ACTION _____	DUE _____
DEPARTMENT _____	ACTION _____	DUE _____

[ ] CONTINUATION SHEET ATTACHED

INVESTIGATOR

PART 4: EVENT DESCRIPTION

[ ] CONTINUATION SHEET ATTACHED

A. DESCRIPTION

SEE THE ATTACHED PAGES

B. PROBLEM EVENT CODES

N.3.9

INVESTIGATOR

PART 5: SPR CAUSES AND GENERIC IMPLICATIONS

[ ] CONTINUATION SHEET ATTACHED

A. CAUSES

SEE THE ATTACHED PAGES

B. GENERIC IMPLICATIONS

[ ] CONTINUATION SHEET ATTACHED

SEE THE ATTACHED PAGES

C. CAUSE CODES

EVENT CAUSE

NOT DETERMINED YET. FINAL INVESTIGATION WILL PROVIDE THIS INFORMATION.

#1 _____ PRIMARY _____ SECONDARY _____ ADDITIONAL

#2 _____ PRIMARY _____ SECONDARY _____ ADDITIONAL

#3 _____ PRIMARY _____ SECONDARY _____ ADDITIONAL

INVESTIGATOR

PART 6: REMEDIAL/COMPENSATORY/CORRECTIVE ACTIONS

A. REMEDIAL/COMPENSATORY ACTION COMPLETED (BEYOND PART 1.C)

SEE THE ATTACHED PAGES

B. CORRECTIVE ACTIONS [ ] CONTINUATION SHEET ATTACHED

C1 SEE ATTACHMENT

_____ DUE DATE _____ RESP. MANAGER _____ DATE _____

C2 _____

_____ DUE DATE _____ RESP. MANAGER _____ DATE _____

C3 _____

_____ DUE DATE _____ RESP. MANAGER _____ DATE _____

SIGNOFFS

PART 7: APPROVALS/CONCURRENCE

A. INVESTIGATOR [illegible] DATE 3/19/93 INVESTIGATING MGR [illegible] M Pacy DATE 3/19/93

B. CAG (IF REQ'D) [illegible] DATE 12-27-9 Based upon investigation of SR932417

C. PORC (IF REQ'D) MTG No. _____

D. PLANT MANAGER (IF REQ'D) _____ DATE _____

E. QA (IF REQ'D) _____ DATE _____

CAG\QA

PART 8: CLOSEOUT

A. CLOSEOUT SUMMARY

CLOSURE AUTHORITY [illegible] DATE [illegible]
QA OR CAG

PART 4: EVENT DESCRIPTION

A. DESCRIPTION

Motor Operated Valve (MOV) A2SIMOV0031A allows the Residual Heat Removal (RHR) or Low Head Safety Injection (LHSI) system Train A alignment with cold leg of the Reactor Coolant System (RCS). This Westinghouse supplied 8-inch flexible wedge gate valve is normally open. It is located in the RHR system and is designated as XRH0031A. The other two valves which perform a similar function in B and C Trains of the RHR system are XRH0031B and XRH0031C.

On 2/09/93, the RHR Train 2A was in operation. At 22:35, RHR Pump 2B was started. The Low Pressure Letdown was switched from Train 2A to Train 2B. A2SIMOV0031A was closed at 22:51 to allow Train A removal from service and perform a scheduled surveillance testing.

At 23:06, A2SIMOV0031A failed when stroked open from the control room for normal system alignment; the motor started to smoke and the breaker tripped due to thermal overload. The plant operator noticed an oily fluid leaking from the motor onto the lagging. The RHR and LHSI Train A was declared inoperable. The plant operator confirmed the valve's closed position by manual operation of the hand wheel.

The actuator was disassembled, cleaned, and inspected. The spring pack belleville springs were found to be filled with slightly hardened grease. The torque switch and limit switch assemblies were not damaged. The switch contacts properly operated from close to open and open to close actuation.

PART 5: SPR CAUSES AND GENERIC IMPLICATIONS

DISCUSSION

During a Design Basis Accident (DBA), the XRH0031 valves are closed to align flow from the LHSI pumps to the corresponding hot leg of the RCS for recirculation. Also, during initiation of the RHR system operation, XRH-0031 is closed to permit boron equalization within the RHR system prior to delivering flow to the RCS.

During normal operation, when putting the RHR train in service, this MOV is closed prior to starting the RHR pump. Then the RHR pump is started to warm-up the system and equalize the boron concentration in the system. After the boron is equalized and the system is warmed up, the MOV is opened to align the system with the RCS Cold Leg for cooldown process or maintaining the Mode 4 operation.

The investigation included a review of thermal binding and pressure locking scenario. The following summary is included for information:

Thermal Binding

When subjected to rapid cool down, the valve body contracts a greater amount than the disc and pinches the disc in the seat; thus, causing the seat to bind the disc tightly. Excessive closing force also contributes to thermal binding phenomenon by driving the disc more into the seat, because, on cooling, the thermal binding effect is increased. Several potential remedies have been suggested to alleviate this situation. They are:

a. Slightly opening and re-closing a valve during cooldown.

b. Limiting valve actuator closing force.

c. Changing the valve closure scheme ~~form~~ from torque to limit control to eliminate excessive seating forces during closing.

d. Using Limitorque Model SB actuators with compensating spring pack.

e. Replacing the disc with a more flexible disc.

Pressure Locking

Pressure locking generally develops because of the rise in temperature of fluid trapped in the bonnet cavity and the area between the discs. The fluid may enter during the normal valve cycling, or by leaking through the seat of a closed valve with a delta-p across the disc. The fluid's thermal expansion increases the bonnet cavity pressure and results in pressure locking the valve disc.

Pressure locking phenomenon can delay the valve's stroke time or cause the valve actuator motor to stall. The suggested methods to prevent pressure locking are:

a. Drilling a small hole on the upstream side of the valve disc to relieve pressure buildup in the bonnet and between the discs.

b. Installing a pressure relief or vent valve in the bonnet.

c. Installing an external bypass line with a manual valve from the bonnet to the upstream side of the valve.

d. Stopping the valve disc travel by position limit switches rather than by motor torque.

Generally, valve operators are not sized to actuate against the binding forces which are generated by the thermal binding or by the pressure locking phenomena. Actuation in these conditions may result in locked-rotor current and rapid increase in temperature of the motor internals. Within 10 to 15 seconds, the heat may damage the motor or degrade the motor's capability to deliver a specified torque.

Industry experience has shown that the double disc and flexible wedge gate valves in many safety applications have not been operable due to the pressure locking and thermal binding.

A. CAUSE of EVENT

On 1/26/88, 1SI-0031A failure resulted in a motor burn out. The root cause investigation by SPR 88-0030 was inconclusive. Because the change in temperature was not significant, the thermal binding was not considered as a potential root cause.

On 7/31/88, 2SI-0031A failure resulted in a motor burn out. Subsequently, a temporary motor installed to continue the Hot Functional Testing (HFT) also burned out on 8/31/88. However, the valve was manually stroked four times with ease after the second motor's burnout. Based on subsequent valve stroking the thermal binding was not considered a probable root cause. The temporary motor failure was caused by the motor bearing failure.

On 4/09/89, 2SI0031A again failed to open and resulted in a motor burn out. The system operation data showed that within one minute the RHR system temperature had dropped 120°F. There is no hard evidence of thermal binding, however, a possibility of thermal binding can not be completely discounted. Torque seating of the valve also could have been a contributing factor in thermal binding.

Prior to the 2/09/93 motor failure, the MOV 2SI-0031A was set for torque closure. Actuator inspection has revealed that the spring pack was full of semi-hardened grease. This condition could have restrained the spring pack compression and caused the valve disc to travel with much higher torque into the seat. In addition, the RHR Train 2A experienced a rapid cooldown of 120°F. Therefore, a potential of thermal binding exists.

Based on the above information DED has determined the primary root cause of SI-31A failure to be the hydraulic locking of the spring pack, resulting in excessive seating force and mechanical binding. Thermal binding may have been a contributing factor.

B. GENERIC IMPLICATIONS

Implications of this event were considered for the Residual Heat Removal (RHR) trains B and C in Unit 2, and Trains A, B, and C in Unit 1.

A comparison of the system layout in the RHR trains A, B, and C indicates that Train-A has the shortest distance between the RHR heat exchanger discharge and the Cold Leg Isolation valve.

Train A	41 Ft. (Approximately)
Train B	55 Ft. (Approximately)
Train C	67 Ft. (Approximately)

The change in the system temperature during SI-31 valve closure is similar in magnitude. Since, the temperature change in all RHR trains is similar and there is no history of any valve problems in trains B and C, it is concluded that root cause of SI-31A failure in both units is not a result of thermal binding.

The Unit 1 MOVs and the train A MOV in Unit 2 are set to close on limit thus decreases the possibility of excessive force during valve closure and mechanical or thermal binding. The MOVs in trains B and C in Unit 2 are scheduled to change from torque close to limit close in the current refueling outage to eliminate their potential of mechanical or thermal binding. In addition, the actuators installed on these valves already have a compensating spring pack installed on them. The compensating spring pack prevents hard seating of the limit close valves by absorbing the excess seating force in spring pack compression.

In high temperature systems, motor operated gate valves may fail due to thermal binding when subjected to rapid cooling just prior to the opening stroke. Also, torque closing of the gate valves could potentially contribute to the excessive seating load when the spring pack is full of grease.

C. CONCLUSIONS

Based on the above information DED has determined the primary root cause of SI-31A failure to be the hydraulic locking of the spring pack, resulting in excessive seating force and mechanical binding. Thermal binding may have been a contributing factor.

PART 6: REMEDIAL/COMPENSATORY/CORRECTIVE ACTIONS

A. REMEDIAL/COMPENSATORY ACTION COMPLETED

R1. Service Request SI-178013 was written to change the closure scheme of the actuator from torque closed to limit closed. This activity was completed on 2/18/93.

R2. DED initiated Service Request SI-179892, 178305, 178306 to inspect internals of the valves XRH0031A/B/C for damage and wear. This activity is scheduled in 2RE03.

R3. Service Request RH-2-170062 was written to replace the damaged motor with a new motor and to refurbish the actuator. The motor was replaced under WAN# 93006029. The actuator was disassembled, cleaned, inspected and refurbished. The spring pack was disassembled, cleaned and reassembled prior to installation.

B. CORRECTIVE ACTIONS

C1. Review operating procedures for the high temperature systems and identify the motor operated gate valves which, due to rapid cooling, are potentially susceptible to thermal binding. Perform with LTR IP 92-006 Item 5d

DUE DATE 9/10/93 RESP. MANAGER M. Pacy DATE M Pacy 3/19/93

C2. Provide corrective actions for the valves which are identified above in C1 as susceptible to thermal binding.

DUE DATE 9/10/93 RESP. MANAGER M. Pacy DATE M Pacy 3/19/93

C3. Perform failure analysis of the motor to determine root cause for the locked rotor condition. Provide corrective action, as appropriate.

DUE DATE 5/15/93 RESP. MANAGER M. Pacy DATE M Pacy 3/19/93

C4. Provide the root cause in a Final Investigation Report, and the Casual Factor Work Sheet after the completion of the above corrective and remedial actions.

DUE DATE 9/10/93 RESP.MANAGER M. Pacy DATE M Pacy 3/19/93

C6. Re-establish ~~thermal~~ conditions which occurred on 2/10/93 and ~~take~~ see if binding occurs (Unit 2

SPR ACTION COMPLETION VERIFICATION FORM

1. SPR#: 930470 Action Item # (If Known): C3
NRC Related [ ] Yes [X] No
Priority 3

2. ACTION #(s) STATEMENT(s) Perform failure analysis of the motor to determine Root Cause for the locked rotor condition. Provide Corrective action as appropriate

3. THE ABOVE ACTION HAS BEEN VERIFIED COMPLETE BY:

		Attached* Yes	No
a) Document(s)	# SPR 93-2417-I	[ ]	[X]
	#	[ ]	[ ]
	#	[ ]	[ ]
	#	[ ]	[ ]
	#	[ ]	[ ]

b) Describe The locked rotor event identified in SPR 93-0470 was duplicated in SPR 93-2417 on B1S1MOV0031B. The Root Cause was determined to be Thermal Binding of the Valve. **

4. DATE(s) COMPLETE: 12/16/93

AUTHORIZING SIGNATURE: [signature] 12/16/93 Date

* VERIFICATION DOCUMENTS SHALL BE PROVIDED FOR NRC RELATED ISSUES.

** Corrective actions are being developed as part of Corrective actions C1 & C2 of this SPR and as identified in the Corrective actions for SPR 93-2417.

Rev. 1
April 16, 1993

PORC Review Evaluation

SPR 930470

Subject _____

Does the subject SPR meet any of the following criteria:

		YES	NO
1)	Concerns a REPORTABLE EVENT?	___	✓
2)	Concerns a <u>significant</u> operating abnormality or <u>significant</u> deviation from normal and expected performance of plant equipment or systems that <u>affect nuclear safety</u>?	✓	___
3)	Concerns unanticipated deficiencies in the <u>design</u> or <u>operation</u> of structures, systems, or components that <u>affect nuclear safety</u>?	✓	___
4) *	Concerns any accidental, unplanned, or uncontrolled radioactive release?	___	✓
5)	Concerns the violation of: • Codes • Regulations • Orders • Technical Specifications • Operating Licensing Requirements having <u>nuclear safety</u> significance?	___	✓
6)	Concern the abnormal degradation of systems designed to contain radioactive material?	___	✓

If any of the above questions are answered YES, <u>THEN</u> the subject SPR <u>SHALL</u> be submitted to PORC.

H Henderson
Evaluator

12-27-73
Date

NOTE: SPR not to be submitted to PORC as SPR 932417 will be.

* An SPR that concerns uncontrolled radioactive release requires review and approval by the Plant Manager.

SOER 84-007 = #1

1.) REVIEW SUMMARY, cont.

Recommendation 1. Identify all gate valves in safety-related systems that are required to open for system operation and are potentially susceptible to the pressure locking of thermal binding phenomenon.

Evaluation: The review of all safety-related gate valves has been previously completed and included in the evaluation of OER item number SER 88-008, attached. This review included all normally closed 2 1/2 inch and larger safety-related, actuator-driven NSSS and BOP gate valves which may be susceptible to pressure locking or thermal binding due to process conditions. The valves identified are as follows:

Valve #	Valve Function
RH0019 A,B,C	RCS hot leg injection isolation
RH0060 A,B,C	RHR pump suction isolation
RH0061 A,B,C	RHR pump suction isolation
RH0066 A,B	RHR letdown to CVCS isolation
SI 008 A,B,C	HHSI hot leg injection isolation

Each of these valves is supplied by Westinghouse (not Anchor-Darling as in the subject SOER) and is provided with a valve stem leakoff connection. These valves are not susceptible to thermal binding since the system temperature during valve closure is not significantly different from the conditions which will exist when the valve is required to perform its safety function. Westinghouse performed a conservative analysis of the above valves to determine if the valve is capable of opening with consideration of pressure locking and thermal binding during all system operating modes. The results of this analysis (ref. ST-HL-WN-200000, dated November 25, 1986) indicated that six of these valves [RH0060 A,B,C and RH0061 A,B,C] could be susceptible to pressure locking or thermal binding and recommended that these valves be tested to demonstrate operability during hot functional testing. This testing was successfully performed (ref. SFR 87-0367).

Pressure locking or thermal binding of valves is an extremely unlikely event which requires an ideal combination of contributing factors. Some of these contributing factors are near perfect seating of the wedge, insignificant valve packing leakage, system operating mode, and system pressure and temperature. Therefore, the prediction of exactly which valves have the potential for this problem cannot be made with absolute certainty. The evaluation performed under SER 88-008 identified potentially susceptible valves; however, the only valve found to be inoperable due to possible pressure locking or thermal binding was the Unit 1 CV006 valve which was not identified in this evaluation. The evaluation performed on this valve and discussions with the valve vendor, Westinghouse, indicate that the failure of this valve was a highly unusual event which was due to a ideal, from the perspective of pressure locking and thermal binding, combination of contributing factors. This valve had extremely low packing leakage as demonstrated by test and a nearly perfect seat. This combination is postulated to have prevented the leakoff of fluid trapped in the valve bonnet which may have prevented the valve from operating. The identical valve in Unit 2 was tested and found to operate satisfactorily illustrating the random nature of this phenomenon. The corrective action taken was a modification of the Unit 1 valve CV006, ref. FCN TGXm-10726 to provide a pathway for pressure equalization across the wedge by drilling a hole in the valve disk as documented in the SER 88-008 evaluation. An alternative to this modification could have been a replacement of the existing wedge with a new wedge. This would have prevented the near perfect seating of this valve and allowed the valve to operate as required. Short of modifying all gate valves to provide a relief pathway (by drilling the disk or valve body) there is no method to assure that this phenomenon will never occur. Actions on this scale are not justified based on the unlikely occurrence of this event. In addition, there is no actions that can be taken during the design, procurement, installation, or maintenance of valves which can absolutely preclude this phenomenon. Since there is no satisfactory methodology for identifying which valves may be susceptible to pressure locking or thermal binding, no further action is required for recommendation 1 of SOER 84-007.

Recommendation 2: For the valves identified in recommendation #1, take appropriate actions to ensure that these gate valves will open when required.

Evaluation: As discussed in the evaluation of recommendation 1, actions to ensure valve operability have been taken. All valves are currently operable. No additional action is required.

Recommendation 3: Operations and maintenance personnel training should include instructions on the valve failure mechanisms discussed in this SOER, including how to diagnose the failure mechanism and the action necessary to recover from the failure.

Evaluation: The Westinghouse analysis and hot functional testing performed at STPEGS have demonstrated that all valves which may be susceptible to pressure binding are capable of operating as designed. The operability of these valves may be effected by manually seating the valve or by subsequent valve maintenance activities (wedge replacement or seat lapping). Operators should be trained regarding the potential for creating a pressure locked or thermally bound valve due to maintenance activities.

PORC Review Evaluation

SPR Subject 930470 SI 1MOV031A failure

Does the subject SPR meet any of the following criteria:

		YES	NO
1)	Concerns a REPORTABLE EVENT?	___	✓
2)	Concerns a significant operating abnormality or significant deviation from normal and expected performance of plant equipment or systems that affect nuclear safety?	✓	___
3)	Concerns unanticipated deficiencies in the design or operation of structures, systems, or components that affect nuclear safety?	___	✓
4)	Concerns any accidental, unplanned, or uncontrolled radioactive release?	___	✓
5)	Concerns the violation of: • Codes • Regulations • Orders • Technical Specifications • Operating Licensing Requirements having nuclear safety significance?	___	✓
6)	Concern the abnormal degradation of systems designed to contain radioactive material?	___	✓
7)	Should be otherwise reviewed by PORC? Explain: _____	___	___

If any of the above questions are answered YES, THEN the subject SPR SHALL be submitted to PORC.

W Henderson
Evaluator

3-23-93
Date

HL&P 1008A (5-91)

Houston Lighting & Power Company

OFFICE MEMORANDUM

4/26/93

To M. Pacy

From C. T. Bowman

Subject SPR # 93070

Based on our review, the subject SPR investigation has been reopened for the following reason(s).

Provide final investigation Report (ref c.4) and include discussion of long term hot leg mode of operation

Accordingly, your group is requested to reopen investigation with an assigned due date of 9-10-93.

SMH/pt

cc: ~~G. L Parkey~~
P. Fellingham

SPR ACTION COMPLETION VERIFICATION FORM

1. SPR#: 93-0470

Action Item # (If Known): 93-0470-I: NVEST.
NRC Related [ ] Yes [N] No
Priority 3

2. ACTION #(s) STATEMENT(s) Provide Root Cause in a final investigation report and include a causal factor work sheet after completion of Remedial & Corrective Actions

3. THE ABOVE ACTION HAS BEEN VERIFIED COMPLETE BY:

		Attached* Yes	No
a) Document(s)	# SPR-93-2417-I	M	~~X~~ MNS 12/21/93
	#	[ ]	[ ]
	#	[ ]	[ ]
	#	[ ]	[ ]
	#	[ ]	[ ]

b) Describe This event was duplicated in SPR 93-2417 on BISIMOV00318. That SPR was investigated and identified this event as part of the generic concerns

4. DATE(s) COMPLETE: 12/16/93

AUTHORIZING SIGNATURE: [signature] 12/16/93
Date

* VERIFICATION DOCUMENTS SHALL BE PROVIDED FOR NRC RELATED ISSUES.

The Root Cause was determined to be Thermal Binding of the Valve. Attachment 1 to SPR 93-2417-I provide the detailed engineering analysis. The documentation meet the intent of 93-0470-I-1. There is no need to write an additional report on this event.

concur [signature] 12-27-93

SPR ACTION COMPLETION VERIFICATION FORM

1. SPR#: 930470

Action Item # (If Known): R2
NRC Related [ ] Yes [N] No
Priority _____

2. ACTION #(s) STATEMENT(s) Perform Special Test Procedure ITEP07-RH-0001 to confirm that the proposed change to operating procedure OPOP02-RH-0001, adequately address the thermal binding issue for SI 31 MOV's.

3. THE ABOVE ACTION HAS BEEN VERIFIED COMPLETE BY:

		Attached* Yes	No
a) Document(s) #	ITEP07-RH-0001	[N]	[ ]
#		[ ]	[ ]
#		[ ]	[ ]
#		[ ]	[ ]
#		[ ]	[ ]

b) Describe Completed special test ITEP07-RH-0001 ~~under SR# 312798~~ & complete Satisfactorily

4. DATE(s) COMPLETE: 2/7/94

AUTHORIZING SIGNATURE: RR pp NB _____ 2/8/94 Date

* VERIFICATION DOCUMENTS SHALL BE PROVIDED FOR NRC RELATED ISSUES.

3

RHR TESTING DATA SHEET
1TEP07-RH-0001-1
(Page 1 of 1)

STEP

5.1	Shift Supervisor permission to start test:		
	[signature] Shift Supervisor	1047 Time	2-7-94 Date
5.5	RTD data taking commenced:	1220 Time	2-7-94 Date
5.9	Step 9.18 of 0POP02-RH-0001 complete:	1737 Time	2-7-94 Date
5.10	RTD Data taking completed:	2032 Time	2-7-94 Date
5.13	Shift Supervisor notified test complete:		
	[signature] Test Coordinator	2032 Time	2-7-94 Date

5.14 Test Results: (Attach RTD temperature data and ERFDADS data).

Remarks SEE Attached. Satisfactory test results. SI-MOV-0031B stroked properly and necessary data has been gathered

Reviewed By: [signature] Test Coordinator 02-07-94 Date

This form, when completed, SHALL be retained for the life of the plant.

1TEP07-RH-0001 DATA SHEET CONTINUATION

Initial assessment of raw data indicates that by cooling down RH-0031B first (using the pump "jog") the valve will attain uniform temperatures prior to its closure. This uniform temperature would help in solving the thermal binding problem.

The system was cooled passively by allowing it to sit idle with cooling to the heat exchanger. Although, large temperature transients were still seen at the pump suction and discharge RTDs.

An evaluation will be performed as to the effectiveness of this procedural revision. Relevent facts and observations that might effect this evaluation are listed below.

1. Much additional time elapsed between the initial jogging of the pump (step 9.7 of 0POP02-RH-0001. and the closing of MOV-0031B. Instead of a 70 minute expected time duration, it was about 3 hours, 45 minutes. This allowed additional passive cooling of the system. This time lapse occurred due to having to wait for MOVATs test equipment to be installed on MOV-0031B.

2. The pump jogs were longer than had been planned. The first and second jogs as observed by the test coordinator at the pump were 6 and 8 seconds respectively. This would act to cool the whole system down uniformly.

3. Prior to closing MOV-0031B in step 9.11, the valve had to be manually closed to provide clearance for the installation of strain gage instrumentation. No abnormally high torque was experienced during this manual stroke. It was then electrically opened to ensure proper positioning prior to its closed stroke.

4. The pump seal cavity and casing joint were observed during the pump cooldown portion of the procedure 0POP02-RH-0001, STEP 9.13. No leakage was seen. The slight seal leakage normally seen at higher temperatures, stopped.

5. The Fluke paper jammed up at 1604. The feeder had to be adjusted. Data printing was recommenced at 1613. This was during a thermally static portion of the procedure so it will have little impact.

6. The open stoke of the valve (step 9.17) had to be reperformed. On the first attempt the data connection into the computer came loose and no data was obtained. The valve was then electrically closed in order to perform opening stroke for VDT data.

2-7-94 2048

SPR ACTION COMPLETION VERIFICATION FORM

1. SPR#: 930470

Action Item # (If Known): C1
NRC Related [ ] Yes [X] No
Priority _____

2. ACTION #(s) STATEMENT(s) C1) Review Operating procedures for the High Temperature system' identify the MOV1 gate valves which, due to rapid cooling, are potentially susceptible to Thermal Binding.

3. THE ABOVE ACTION HAS BEEN VERIFIED COMPLETE BY:

		Attached* Yes	No
a) Document(s)	# DBR review packages	[ ]	[X]
	# _____	[ ]	[ ]
	# _____	[ ]	[ ]
	# _____	[ ]	[ ]
	# _____	[ ]	[ ]

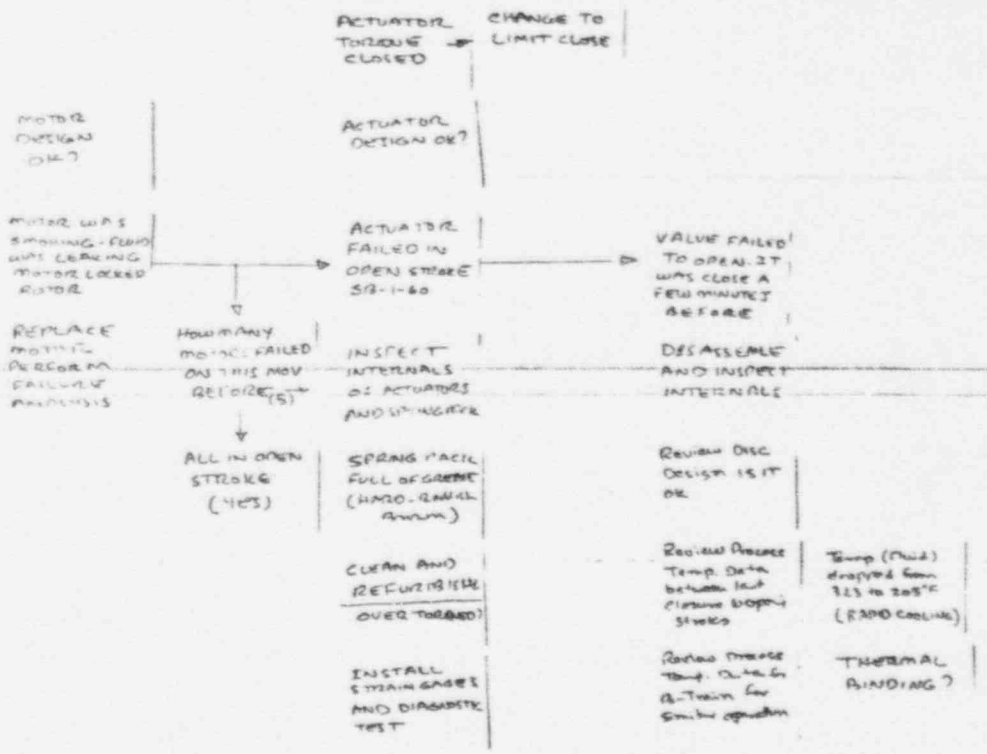
b) Describe During the Design Basis Review (DBR) process all GL 89-10 MOV1 were reviewed for potential susceptibility to Thermal Binding This is documented as part of the DBR review.

4. DATE(s) COMPLETE: 8/9/94

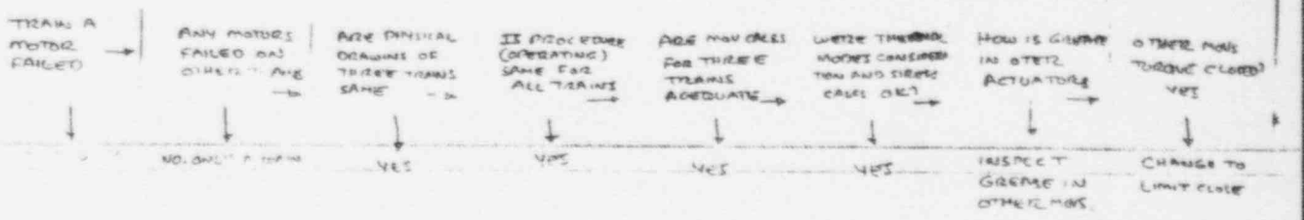
AUTHORIZING SIGNATURE: _____ 8/9/94 Date

* VERIFICATION DOCUMENTS SHALL BE PROVIDED FOR NRC RELATED ISSUES.

A2S1MOV0031A



TRAIN ANALYSIS FOR RHR SYSTEM



ARE ATTRIBUTES PERFORMED

↓

INSTALL STRAIN GAGES AND GNL 89-10 TEST

SPR ACTION COMPLETION VERIFICATION FORM

1. SPR#: 930470

Action Item # (If Known): C2
NRC Related [ ] Yes [X] No
Priority _____

2. ACTION #(s) STATEMENT(s) C2: Provide Corrective Actions for the valves which are identified in C1 as susceptible to Thermal Binding.

3. THE ABOVE ACTION HAS BEEN VERIFIED COMPLETE BY:

		Attached* Yes	No
a) Document(s)	# DBR review packages	[ ]	[X]
	# Pressure Locking + Thermal Binding Report 7/21/94	[ ]	[X]
	# _____	[ ]	[ ]
	# _____	[ ]	[ ]
	# _____	[ ]	[ ]

b) Describe See Attached

4. DATE(s) COMPLETE: 8/9/94

AUTHORIZING SIGNATURE: [signature] , 8/9/94 Date

* VERIFICATION DOCUMENTS SHALL BE PROVIDED FOR NRC RELATED ISSUES.

PRESSURE LOCKING AND THERMAL BINDING

REPORT

July 21, 1994

July 21, 1994

Subject: Pressure Locking and Thermal Binding Status Report as of June 28, 1994.

Reference Documents:

1) (Draft / Not issued) Pressure Locking / Thermal Binding Evaluation Program dated 1/18/94, see attachment 1. For Information Only.

2) (Draft / Not issued) Westinghouse Gate Valve Data / Calculation Study for STP's GNL 89-10 Program; dated 2/10/94, see attachment 2. For Information Only.

3) Engineering Instruction EI 4.06, entitled "MOV Design Basis Review", rev. 2, see attachment 3.

4) (Draft / Not issued) Calculation Binder No. MC-6441, entitled "Pressure Locking /Thermal Binding", rev. 0.

5) "STP Pressure Locking / Thermal Binding Order of Magnitude" Calculation, dated 1/29/94, see attachment 4.

6) Correspondence from L. Battaglia, to R. Kersey, dated 2/9/94; subject: "Effect of Line Loads on MOV requirements". See attachment 5.

7) Calculation No. MC-6442, section 3.24, rev. 0; entitled "Phase II GL 89-10 Justifications".

Executive Summary

The potential valve inoperability caused by the phenomena of Pressure Locking / Thermal Binding ("PL / TB") is a common-mode failure mechanism that can prevent a gate valve from opening, and could render redundant trains of safety systems or multiple safety systems inoperable. As a result, STP has developed a "PL / TB" Program and related documents (refs. 1 thru 6) for:

Executive Summary (cont'd)

* Identifying and evaluating the spectrum of GNL 89-10's MOV's, if any, that have been or that may be subjected to "PL / TB"

* Determining what conditions may introduce the failure mechanism under both normal and accident conditions.

* Providing a uniform and standard technical approach for all MOV related work.

* Proposing corrective actions as necessary.

The scope of this program has identified, specifically thru the Design Basis Review (DBR) package preparation process, approximately sixty six MOV's which are susceptible to "PL / TB", see table 1. From this group, thirty six MOV's had calculations (ref. 4) performed on a stand alone basis which applied analytical tools to quantify the additional thrust due to "PL / TB", as applicable. Twelve of these MOV's (1,2-RH-60 and 61 A,B,C) needed reconciliation as a result of thermal binding. See attachment 1 for more details.

Since none of the thirty six MOV's which had in-depth analysis performed produced any operability concerns , analysis for the thirty pending MOV's is being delayed until further industry and NRC thermal binding guidance exists .

Conclusion:

Corrective Action C2 requested that corrective actions be initiated for the 66 valves identified as being susceptible to Thermal Binding (TB). An engineering evaluation and corrective actions were performed for the SI 31 MOVs (6 MOVs total)with subsequent testing validating the effectiveness of the operational procedure changes. 30 additional MOVs had engineering evaluations performed with no additional corrective actions recommended. Based on the evaluations to date and the imminent issuance of an NRC Generic Letter on the subject, no further actions are being taken at this time and this corrective action should be closed. In addition, outside the MOV31's, STP has no evidence of an inoperability due to a Thermal Binding event.

Based on the corrective actions to the SIMOV31's, and the engineering evaluations completed to date Corrective Action C2 is considered complete.

TABLE I

"PL / TB" SUSCEPTIBLE MOV's

MOV ID(s)	DRAFT CALC. No.	ACCEPT. AS IS?	COMMENTS
1,2 - CV - 0003	MC-6441, rev. 0	Yes	
1,2 - CV - 0006	MC-6441, rev. 0	Yes	
1,2 - RH - 0060A	MC-6441, rev. 0	Yes	See Attachment 1
1,2 - RH - 0060B	MC-6441, rev. 0	Yes	See Attachment 1
1,2 - RH - 0060C	MC-6441, rev. 0	Yes	See Attachment 1
1,2 - RH - 0061A	MC-6441, rev. 0	Yes	See Attachment 1
1,2 - RH - 0061B	MC-6441, rev. 0	Yes	See Attachment 1
1,2 - RH - 0061C	MC-6441, rev. 0	Yes	See Attachment 1
1 2 - SI - 0008A	MC-6441, rev. 0	Yes	
1,2 - SI - 0008B	MC-6441, rev. 0	Yes	
1,2 - SI - 0008C	MC-6441, rev. 0	Yes	
1,2 - SI - 0019A	MC-6441, rev. 0	Yes	
1,2 - SI - 0019B	MC-6441, rev. 0	Yes	
1,2 - SI - 0019C	MC-6441, rev. 0	Yes	
1,2 - SI -0031A	MC-6441, rev. 0	Yes	
- SI -0031B	MC-6441, rev. 0	Yes	
SI -0031C	MC-6441, rev. 0	Yes	
2 - RC - 0001A	MC-6441, rev. 0	Yes	
2 - RC - 0001B	MC-6441, rev. 0	Yes	
1,2-RH-0066 A,B,C	PENDING		
1,2-RH-0067 A,B,C	PENDING		
1,2-SI-0016 A,B,C	PENDING		
1,2 - CV - 0465	PENDING		
1,2 - CV - 0468	PENDING		

TABLE I

"PL / TB" SUSCEPTIBLE MOV's

MOV ID(s)	DRAFT CALC. No.	ACCEPT. AS IS?	COMMENTS
1,2 - CV - 0112A	PENDING		
1,2 - CV - 0112B	PENDING		
1,2 - CV - 0112C	PENDING		
1,2 - CV - 0113A	PENDING		
1,2 - CV - 0113B	PENDING		

ORIGINAL

RFA Q0910

STP 646A (01/91) SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

RFA # 91-1852

REQUEST FOR ACTION

PAGE 1 OF 6

1. UNIT 2 2 SYSTEM ZZ

3. NEED DATE: 11/11/91

3A. EXPECTED DATE: 11/11/91

4. NONCONFORMING CONDITION: (YES) NO

REJECT	REWORK	DESIGN ENGINEERING EVALUATION	
		REPAIR	USE-AS-IS

15. SPR REQUIRED? YES (NO)

13. PRIORITY

MANDATORY

- CRITICAL TO CONTINUED OPERATION YES(PRI 1) NO
  - LCO EXPIRATION TIME/DATE
  - WORK DOCUMENT(S)
- CRITICAL TO WORK IN PROGRESS (YES(PRI 2)) NO
  - WORK DOCUMENT(S) SEE ATTACHED
- CRITICAL TO SCHEDULED WORK (YES(PRI 3)) NO
  - WORK WEEK/OUTAGE 2RW02
  - WORK DOCUMENT(S) SEE ATTACHED
- OTHER (JUSTIFY)

APPROVED BY

6. SUBJECT: RE THE USE OF OPMP02-ZG-0011 (ALTERNATE VALVE PACKING AND LIVE LOAD PACKING) AND THE USE OF SITE SPECIFICATION - 5L749TS101B (ALTERNATIVE VALVE PACKING AND LIVE LOAD DESIGN)

7. ACTION REQUESTED: ① APPROVE THE USE OF THE "INDIVIDUAL VALVE SURVEY SHEET" FROM THE SITE SPEC. - 5L749TS101B FOR DATA COLLECTION IN PLACE OF ADDENDUM 1 OF OPMP02-ZG-0011. THE ADDENDUM 1 DATA SHEET WILL REFERENCE ATTACHED SURVEY SHEET. (cont'd)

8. REASON FOR REQUEST: TO ENSURE TRACIBILITY OF PACKING DATA AND TO ENSURE PROPER REVIEW OF PACKING DATA, AS CALLED OUT IN OPMP02-ZG-0011.

9. REFERENCE DOCUMENTS: OPMP02-ZG-0011; OPMP04-ZG-0003; SITE SPECIFICATION - 5L749TS101B

A.D. JOYNT — 10 ORIGINATOR (PRINT)

7777 — 11 EXT

11-9-91 1500 — 12 DATE TIME

IPS/OMD — DEPT/DIV

R.F. PENN — 10A SUPERVISOR

STI-93-015466-5

NONCONFORMING CONDITIONS ONLY (REPORTABILITY CHECK)

MODE LIMITATION MR CRA REQUESTED ☐ YES ☒ NO CRA DUE BY N/A DATE N/A TIME

REASON FOR REQUEST N/A

SHIFT SUPERVISOR [signature] 11/9/91 DATE 1524 TIME

SHIFT SUPERVISOR REMARKS None

ROUTING TABLE (DEPT MANAGER NAMES ONLY)

FROM/DATE SENT	TO	DATE RECEIVED
MS BURNETT /	D. J. Denver	11-9-91
D. J. Denver 12-4-91	M Burnett	12-4-91
MS BURNETT / 4-16-92	LEA2	LRB 04-16-92

CLOSED

ORIGINAL

STP 6460 (01/91) SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

REQUEST FOR ACTION CONTINUATION SHEET

RFA # 91-1852 PAGE 2 OF 8

ACTION REQUESTED CONTINUED FROM COVER.

(2) ALLOW FOR SYSTEM ENGINEER APPROVAL SIGNATURE AND REVIEW SIGNATURE (OF PACKING DESIGN AND PACKING MANUFACTURE) ON THE REVIEW CYCLE OF THE WORK PACKAGE. AN ATTACHED LIST IS PROVIDED BY WR NUMBER AND VALVE NUMBER ~~FOR~~ as of 11-9-91, OF VALVES THAT WILL NEED SYSTEM ENGINEER REVIEW. PACKAGES THAT ARE NOT LISTED ON THE ATTACHMENT AND ARE FOUND TO MEET THE REVIEW CRITERIA SHOULD BE COVERED BY THIS REA.

(3) REFERENCE ATTACHED ADDENDUM 1 FOR SIGNATURE AND DATA REQUIREMENTS. * REQUIRES ENG. SIGNATURE.

(4) THIS RFA SHOULD NOT ADDRESS VALVES THAT ARE "LIVE-LOADED" THESE WORK PACKAGES ARE ALREADY ROUTED FOR SYSTEM ENGINEER REVIEW.

ORIGINAL

STP 6418 (01/81) SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

REQUEST FOR ACTION

RFA #: 91-1852

15 RESPONSE:

(1). It is permitted to use the Individual Valve Survey Sheet in place of the Addendum 1 Valve Packing Data Sheet as specified (e.g., the Addendum 1 sheet to reference the Survey Sheet, and the completed Survey Sheet attached to Addendum 1).

(2). Allowance is given for the H&SP Project Manager, or his designee, associated with the NNI Secondary Valve rework effort to sign for 'ENGINEER' in both the 'PLANNER' block and 'REVIEW' block on the Addendum 1 'Valve Packing Data Sheet' form. This allowance is provided for the valves that are static packed only with an alternate packing style. This includes these valves listed on the attached form as well as others that meet the above criteria.

This response will permit proper closure of the Secondary Valve work packages.

FOR NONCONFORMING CONDITIONS ONLY: RESPONDING DEPARTMENT'S DISPOSITION DETAILS

REJECT REPAIR (REWORK) USE-AS-IS

PARTIAL ☐ FINAL ☒ INVALIDATE ☐

DESIGN CHANGE DOCUMENT REQUIRED?

YES ☐ NO ☒ IF YES, LIST IN BLOCK 17

ADMINISTRATIVE CONTROL(S)/ACTION(S) REQUIRED PER FINAL DISPOSITION?

NO ☒ YES ☐

IMPLEMENTING DEPT NA

IMPLEMENTING DEPT CONCURRENCE

NA / DATE

SDR REQUIRED? YES (NO) IF YES, SDR NO

RESPONSE BY: [signature] 12-4-91 / 1110 DATE / TIME 7854 EXT. PED DEPT./DIV

DEPT. MANAGER OR DESIGNEE [signature] 12-4-91 / 1110 DATE / TIME

FOR NONCONFORMING CONDITIONS

16. DISPOSITION APPROVAL:

PLANT MANAGER OR DESIGNEE [signature] 12-4-91 / 1110 DATE / TIME

SHIFT SUPERVISOR [signature] 12-4-91 / 1250 DATE / TIME

17. NCR DISPOSITION HAS BEEN IMPLEMENTED BY THE FOLLOWING DOCUMENT(S):

DOCUMENT	DATE IMPLEMENTED	IMPLEMENTED BY* (PRINT)	SIGNATURE
SEE ATTACHMENTS (PAGES 6-8 OF 8)	4/16/92	A.D. JOYNT	[signature]
	/ /		
	/ /		
	/ /		

*SIGNATURE BY INDIVIDUALS IMPLEMENTING DISPOSITIONS ASSOCIATED WITH WORK DOCUMENTS (I.E. WR, PM, ETC.)

18. RFA CLOSED ON 12/3/93 DATE RFA COORDINATOR [signature] 12/3/93 DATE

ADDENDUM 1
VALVE PACKING DATA SHEET
(Page 1 of 2)

ORIGINAL
PAGE 4 OF 8

Front of Typical Form

PACKDS.DGN 08/90

VALVE PACKING DATA SHEET
OPMP02-ZG-0011

1 MAP | 2 ALT NO

3 TAG/TPNS | 4 VALVE MFG. | 5 VALVE TYPE | 6 VALVE SIZE AND PRESSURE

7 VALVE FIGURE NO. | 8 VALVE ACTUATOR ☐ POWER ☐ MANUAL | 9 BONNET TYPE ☐ BOLTED ☐ WELDED ☐ OTHER ____

PLANNER

10 PACKING DESIGN
CONFIGURATION ☐ ADDENDUM 2 CONFIGURATION ____ ☐ OTHER (____ SHEETS ATTACHED DETAILING DESIGN)
LIVE LOAD ☐ NO ☐ YES (____ SHEETS ATTACHED DETAILING DESIGN)
ENGINEER _____ PRINT NAME / SIGNATURE / DATE

11 COMMENTS _____

12 PLANNER _____ PRINT NAME / SIGNATURE / DATE / EXTENSION

CRAFTSMAN

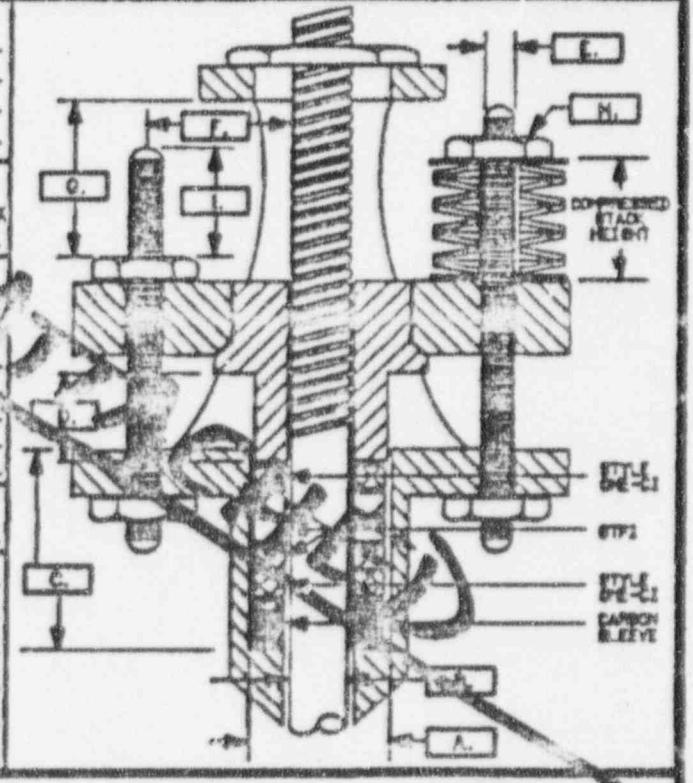
13 VALVE STUFFING BOX DATA
A - STUFFING BOX ID _____
B - VALVE STEM OD _____
C - STUFFING BOX DEPTH _____
D - BLAND END HEIGHT _____

14 LANTERN RING? ☐ YES ☐ NO
LOCATED _____ FROM BOTTOM OF STUFFING BOX
LANTERN RING HEIGHT _____

15 VALVE PACKING BLAND DATA
BLAND STUD TYPE: ☐ SWING BOLT ☐ ALL THREAD ☐ OTHER _____
E - BLAND STUD DIAMETER _____
F - RADIAL CLEARANCE _____
G - AXIAL CLEARANCE _____
H - NUT SIZE _____
I - AVAILABLE STUD LENGTH _____

16 BLAND NUTS TORQUED? ☐ YES ☐ NO
TORQUE APPLIED _____

17 COMMENTS _____



REVIEW

18 DRAFTSMAN _____ PRINT NAME / SIGNATURE / DATE

19 FOREMAN _____ PRINT NAME / SIGNATURE / DATE

20 ENGINEER _____ PRINT NAME / SIGNATURE / DATE

PAGE ___ OF ___

ORIGINAL

DATE _____

INDIVIDUAL VALVE SURVEY SHEET

DISTRIBUTOR _____ COMPLETED BY _____
SPECIALIST _____ REVIEWED BY _____
UTILITY _____ PLANT _____ VALVE NO. _____ PAGE NO. _____

VALVE DATA

EIN _____ DWG NO. _____

MFG. _____ MODEL NO. _____

SIZE _____ TYPE _____

SYSTEM PRESSURE _____ TEMP. _____

LOCATION:
SYSTEM _____
AREA _____

CONTAINMENT inside ☐ outside ☐
SAFETY RELATED yes ☐ no ☐

PROCEDURE NO. _____

ACTUATION power ☐ manual ☐
FREQUENCY OF ACTUATION _____

PACKING DATA

STYLE S300/GTPE
ID _____ OD _____ HT. _____

QTY. _____ ITEM # _____

STYLE ONE-OE
ID _____ OD _____ HT. _____

QTY. _____ ITEM # _____

SEQUENCE: _____

BUSHING DATA

I.D. _____ OD _____ HT. _____

QTY. _____ ITEM NO. _____

STUFFING BOX DATA

STEM O.D. _____ BOX I.D. _____

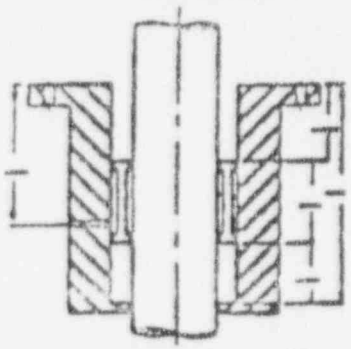
BOX DEPTH _____

LANTERN RING
yes ☐
no ☐
HT. _____

PIPED ☐

PLUGGED ☐

LANTERN RING



DATE PACKED: _____ _____ _____
_____ _____ _____
_____ _____ _____

COMMENTS: _____

09-NOV-91
02:35 PM

NNI --- CHESTERTON --- STP
VALVE REPACK PROGRAM-2RE02

WR NUMBER	TPNS NUMBER	VALVE SIZE	MANUFACTURE NAME	PACKING SIZE	LIVELOAD OR STATIC
CD-082228	CD-0134	4"	PACIFIC	1-1/2 X 2-1/4 X 3/8	STATIC
X CD-152804	CD-0604	4"	PACIFIC	1 X 1-1/2 X 1/4	STATIC
CD-152835	N2CD-TV-7413	2"	FISHER	1/2 X 1 X 1/4	STATIC
ES-106445	ES-MOV-0063	16"	PACIFIC	1-7/8 X 2-5/8 X 3/8	STATIC
FW-130571	FW-0518	14"	PACIFIC	2-3/4 X 3-3/4 X 1/2	STATIC
FW-152806	FW-0187	8"	PACIFIC	1-7/8 X 2-5/8 X 3/8	STATIC
GS-067774	GS-0015	4"	CRANE	1-1/4 X 1-7/8 X 5/16	STATIC
HD-085616	HD-0619	3/4		5/8 X 1 X 3/16	STATIC
HD-104277	ZC-0326	1/2"	KEROTEST	1/2 X 7/8 X 3/16	STATIC
HD-116933	HD-LV-7282	6"	FISHER	1/2 X 1 X 1/4	STATIC
HD-116948	HD-0209	8"	PACIFIC	1-5/8 X 2-3/8 X 3/8	STATIC
HD-130570	HD-0445	1"	KEROTEST	5/8 X 1-3/8 X 3/8	STATIC
X HD-130633	HD-0243	8"	PACIFIC	1-5/8 X 2-3/8 X 3/8	STATIC
HD-131177	HD-0206	8"	PACIFIC	1-5/8 X 2-3/8 X 3/8	STATIC
HD-131627	HD-MOV-0371	6"	PACIFIC	1-3/8 X 2-1/8 X 3/8	STATIC
HD-132327	HD-LV-7357	6"	FISHER	3/4 X 1-3/8 X 5/16	STATIC
HD-132328	HD-LV-7361	6"	FISHER	3/4 X 1-3/8 X 5/16	STATIC
HD-132971	HD-MOV-0366	6"	PACIFIC	1-3/8 X 2-1/8 X 1/4	STATIC
HD-133427	HD-0047	3"	PACIFIC	1 X 1-1/2 X 1/4	STATIC
HV-139805	HV-0003	1-1/2"	HANCOCK	9/16 X 15/16 X 3/16	STATIC
HY-105813	HY-0038	1"	DRESSER	7/16 X 3/4 X 5/32	STATIC
HY-115629	HY-0036	1/2"	DRESSER	3/8 X 5/8 X 1/8	STATIC
HY-115639	HY-0037	1/2"	DRESSER	3/8 X 5/8 X 1/8	STATIC
MD-104378	MD-0440	1 1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-105537	MD-0479	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC

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NNI --- CRESTERTON --- STP
VALVE REPACK PROGRAM-2RE02

WR NUMBER	TPNS NUMBER	VALVE SIZE	MANUFACTURE NAME	PACKING SIZE	LIVELOAD OR STATIC
MD-112513	MD-LV-7923	2"	FISHER	1/2 X 1 X 1/4	STATIC
MD-116858	MD-0496	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-130485	MD-PV-6158	2"	FISHER	3/4 X 1-3/8 X 5/16	STATIC
MD-130543	MD-0436	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-130563	MD-0549	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-130585	MD-0438	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-133438	MD-0432	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-133439	MD-0430	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-133440	MD-0434	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MD-133441	MD-0789	1-1/2"	KEROTEST	25/32 X 1-5/16 X 1/4	STATIC
MS-105596	MS-0253	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-112531	MS-0297	1"	KEROTEST	5/8 X 1-1/16 X .219	STATIC
MS-112532	MS-0301	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-112534	MS-0248	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-112535	MS-0285	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-115914	MS-MOV-0083	1"	HANCOCK	11/16 X 1-5/8 X 1/2	STATIC
MS-118569	MS-0293	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-118570	MS-0281	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-130518	MS-0225	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-130520	MS-0265	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-130521	MS-0264	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-130522	MS-0273	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-130523	MS-0277	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-130524	MS-0255	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-131174	MS-0371	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
MS-132162	MS-0426	1"	KEROTEST	5/8 X 1 X 3/16	STATIC

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NNS --- CHESTERTON --- STP
VALVE REPACK PROGRAM-2RE02

WR NUMBER	TPNS NUMBER	VALVE SIZE	MANUFACTURE NAME	PACKING SIZE	LIVELOAD OR STATIC
SB-112539	SB-0214	2"	KEROTEST	29/32 X 1-27/64 X 1/4	STATIC
SB-112545	SB-0213	2"	KEROTEST	29/32 X 1-27/64 X 1/4	STATIC
SD-118047	SD-002A	1"	VOGT	1/2 X 3/4 X 1/8	STATIC
ZM-116360	ZM-0541/0543	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
ZM-130413	ZM-0395	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
ZM-131812	ZM-0409	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
ZM-131815	ZM-0429	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
ZM-131819	ZM-0462	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
ZM-132097	ZM-0392	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
ZM-151506	ZM-0397	1"	KEROTEST	5/8 X 1 X 3/16	STATIC
ZN-112544	ZN-0059	2"	DRESSER	1-1/16 X 2-3/16 X 9/16	STATIC
ZN-131811	ZN-0181	2"	KEROTEST	5/8 X 1 X 3/16	STATIC

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