

AEOD ENGINEERING EVALUATION REPORT\*

UNITS: Dresden 2  
Quad Cities  
DOCKET NOS.: 50-237  
50-254  
LICENSEES: Commonwealth Edison  
NSSS/AE: GE/Sargent & Lundy  
SUBJECT: MOTOR OPERATED VALVE FAILURES DUE TO HAMMERING PROBLEM.  
REFERENCES: 1. Commonwealth Edison, LER 84-003 Rev. 1,  
Docket, No. 50-237, dated September 19, 1984.  
2. Commonwealth Edison, LER 84-014.  
Docket No. 50-254, dated August 14, 1984.  
3. IE Information Notice No. 82-10:  
"Following Up Symptomatic Repairs to  
Assure Resolution of Problem."

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\* This document supports ongoing AEOD and NRC activities and does not represent the positions or requirements of the responsible NRC program office.

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## SUMMARY

In the AEOD screening of Licensee Event Reports LER 50-237/84-003 and LER 50-254/84-014 were identified as significant events that required additional follow-up action based on the generic implications of the failure mode experienced by motor operated valves at Dresden 2 and Quad Cities 1. These LERs described events that occurred at these plants involving mechanical failure of MOVs due partially to what is termed as "hammering effect." Hammering effect is that phenomenon experienced by MOVs when the valve is subjected to repeated closing attempts after the valve has already reached the fully closed position. Investigations by the licensees have found that the repeated closing attempts experienced by the MOVs were the result of the design of the control circuit of the valve. Based on these events a detailed review of the design of a typical MOV control circuit was conducted by AEOD. Our review concluded that the problem could be generic to MOVs that are designed to close on mechanical torque and have a control circuit design similar to the one used at Dresden and Quad Cities. Our review also concluded that this problem would likely be applicable to MOVs at many operating reactor units. The consequences of such failures of MOVs in safety related systems are that the safety function of the system in which they are located can be impaired.

To verify this conclusion, a search of the Sequence Coding and Search System (SCSS) for the period 1983-1984 was conducted for events involving failures of MOVs specifically attributed to the hammering problem. Surprisingly, none was found. A further analysis of the hammering problem was performed to identify the symptoms of failures of MOVs due to hammering. Failure and damage due to mechanical overloading, overheating of valve operator motor, repeated cycling and failures of starter contactors, thermal overloading, circuit breaker trips, valve seat jamming, etc. could be at least in part, caused by the hammering problem. On a review of the 179 LERs obtained from the SCSS, 47 LERs were found which had one or more of these kinds of failures. Based on the review and evaluation of operational experience and the design of the control systems of MOVs, it was concluded that licensees in their investigation of MOV failures have not consistently identified the root cause of failure, but only the symptomatic ones. This has already been the subject of an IE Information Notice (IE IN 82-10); however, IE IN 82-10 did not specifically identify the hammering problem nor its correlation to valve control design. It should be noted that "hammering" can only be detected by observation at the valve or at the starter cubicle, thus it is not surprising that failures due to "hammering" are not generally identified as such. Hence, it is recommended that (1) the report be used as a basis for issuing a revision to IE IN 82-10 or to develop a new Information Notice, and (2) the details in this report be included in a forthcoming issue of Power Reactor Events (Section 1). The licensees at Dresden and Quad Cities plants have already initiated certain design changes to affected valves' control circuitry to eliminate the hammering problem. This report has included information regarding similar modifications.

## INTRODUCTION

LER 50-237/84-003 describes an event at Dresden 2 involving the failure of a core spray system motor operated valve during the performance of a valve operability test. Investigation by the licensee found the valve's breaker thermal overload tripped and the valve itself had a cracked bearing race, and gear housing. Metallurgical analysis of the damaged parts showed that the valve gear housing failed due to mechanical overload. The licensee has concluded that the probable cause for the overload is the valve control circuit design that allows the valve to attempt to repeatedly close after already being closed. The repeated closing attempts created a hammering effect on the valve and operator causing an overload and subsequent damage. The licensee plans to modify the valve control circuit of applicable valves for Dresden Unit 2 and 3.

LER 50-254/84-014 relates the failure to open of both low pressure coolant injection system (LPCI) injection valves at Quad Cities 1. These failures were also attributed to the hammering of the valves due to the design of valve control circuit.

These two events showed a common cause of failure of MOVs to operate when needed. To determine the generic applicability of the problem as it applies to motor operated valves used in other operating nuclear plants, a review of the control circuit of the MOVs was conducted. The details of the review are discussed later in this report. Early in the review it was concluded that the design of the control circuit of the affected valves is typical of others in operating plants and that the problem appears to be generically applicable to MOVs at other operating units. This being the case, a search was made to find out whether similar failures may have occurred at other plants. A search of the Sequence Coding and Search System (SCSS) LER data base was conducted. The search was limited to events that occurred in 1983 and early 1984. The search was focused on events involving valve operators within eighteen safety-related systems. The search found 179 LERs. A review of the abstracts of these LERs did not identify any other event where the hammering effect was specifically identified as the cause of failure of a valve or valve operator. However, based on results of failures due to this problem, a further review found 47 LERs which might well have been caused, at least in part, by the hammering problem. (Appendix A lists these and the referenced LERs with their abstracts). The details of the review are discussed below. The findings, conclusions and recommendations derived from the evaluation of these operational events and the analysis of the control circuit of typical MOVs are also documented later in this report.



## DISCUSSION

To understand the problem which caused failure of the motor operated valves (MOV) at Quad Cities 1 and Dresden 2, a detailed review of the control circuit of a typical MOV, which is designed to mechanically torque the valve tightly closed, is necessary. Figure 1, and 2 show the elementary wiring diagram for such an MOV. (Figure 1 is for an MOV where a momentary control switch is used for valve control and Figure 2 is for a control scheme where a maintained control switch is used). Figure 1, sheet 1, shows the 3 phase valve motor operator connected to a 480 volt motor control center (MCC) through a circuit breaker (52) and through a set of reversing contactors (42/O and 42/C) and thermal overload elements (49). When contactors 42/O close, the valve motor rotates in a direction to open the valve, and closure of 42/C will cause the motor to close the valve. Connected to the 480 volt feeder, downstream of the circuit breaker 52, is a 480/120v control transformer which provides the necessary control power to the valve control circuitry. The control circuit consists of basically three sections -- 1) the opening control circuit, 2) the closing control circuit, and 3) the indication circuit. The opening and closing control circuits utilize series and series - parallel combinations of valve limit switches (LS), torque switches (TS), valve contactor interlocks (42/O and 42/C), main control switch contacts (CS/C and CS/O), local push button contacts (PB), thermal overloads contact (49), and valve contactor coils (42/O and 42/C). The indication circuit utilizes limit switches and red and green indicating lights and alarm relay (74). The valve operator limit switch contact development, torque switch designations and other details are shown in sheet 2 of Figure 1. The limit switch and torque switch details shown are for a Limitorque valve operator; however, the basic control scheme and operational characteristics apply to other vendors, such as Rotork, as well.

The problem encountered at the Quad Cities and Dresden units is directly attributed to the operation of the close control circuit of the valve operator. As shown in Figure 1, the close control circuit has limit switch LS-1 in parallel with torque switch TS-17 in series with a parallel combination of control switch and PB close contacts, a seal-in 42/C contact and the auto-close signal X contact. (Examples of auto-close signal are: containment isolation, feed water system isolation, steam line rupture isolation, safety features actuation, loop selection logic actuation, high reactor pressure interlock, etc. In many cases these signals persist even after the valves have closed.) This combination of series-parallel contacts is connected to the closing contactor coil 42/C through a 42/O interlock contact (the 42/O interlock is provided to prevent the closing contactor coil being energized while the opening contactor coil is energized). The closing control circuit is completed through the thermal overload contact to the control transformer grounded lead. Consider this circuit with the valve fully open. LS-1 is closed since the valve is open and TS-17 is closed since there is no torque on the valve. When a valve closing signal is given either by the closure of the control switch CS/C or PB/close contacts or by closure of auto-close X contact, the closing circuit contactor 42/C is energized and seals in through 42/C contact in parallel with CS/C contact. The 42/C contactor will close its main

contacts in the 3 phase motor circuit and will energize the motor operator to drive the valve towards the closed position. Initially, the motor will apply a high breakaway torque to the valve to drive it off the open position. This will cause TS-17 to open, however, LS-1 in parallel will keep circuit continuity. Once the valve comes off the open position, TS-17 will reset and LS-1 will open. Contactor coil 42/C remains energized till the valve operator experiences a high closing torque again. This would normally occur when the valve is fully seated (closed). When the high torque set point is reached, TS-17 will open, interrupting the close control circuit, deenergizing the contactor coil 42/C, and stopping the drive motor. When the motor stops, the torque on the drive shaft will relax and TS-17 will reset. If at this point the closing signal is still present, i.e., if CS/C, PB/close or X contact is still closed, then 42/C will once again energize and the motor operator will attempt to close the valve still further. High torque will again interrupt the circuit by opening TS-17. This cyclic operation will continue until the close signal is removed. Continued attempts to close an already closed valve resulted in the hammering effect experienced by the valves at Quad Cities 1 and Dresden 2.

The open control circuit operates in a similar manner with the exception that the circuit is interrupted by the limit switch LS-3 with the torque switch TS-18 providing valve protection from an overtorque condition. With this circuit configuration, a cyclic operation is not possible since LS-3 remains open once the valve is fully open.

The indication provided by the valve control circuit does not alert the control room operator to this cyclic operation of the valve operator. Valve position indication is provided by red and green indicating lights in series with LS-7 and LS-4 respectively. When the valve is in the fully open position, the red light will be energized. As the valve moves from the open to close position, both the green and red lights remain illuminated. Once the valve reaches the closed position, the red light will go off and only the green light will be on. Thus, the indication lights only monitor the valve position limit switches; they do not monitor the operation of the valve motor or the operation of the open and close 42 contactors.

The hammering caused by such a closing control circuit operation could have varying damaging effects on the valve, its operator motor, and electrical circuits. The repeated blows could cause valve and valve stem damage and depending on the number of closing blows experienced by the valve, the damage could result in a variety of valve failures. (The number and severity of the hammering operation depends on the length of time the closing signal is present, the torque switch setting, the valve motor circuit thermal overload setting, etc.). Such failures were experienced by both the LPCI injection valves at Quad Cities 1 (Reference 2). The damage suffered by the stems of both these valves was such that the valves would no longer fully open.

The mechanical overloading on the valve and operator by the hammering action could cause damage as severe as that which occurred at Dresden 2 where the valve operator had a cracked gear housing and bearing race. The valve motor had also tripped on thermal overload. The repeated closing attempt could

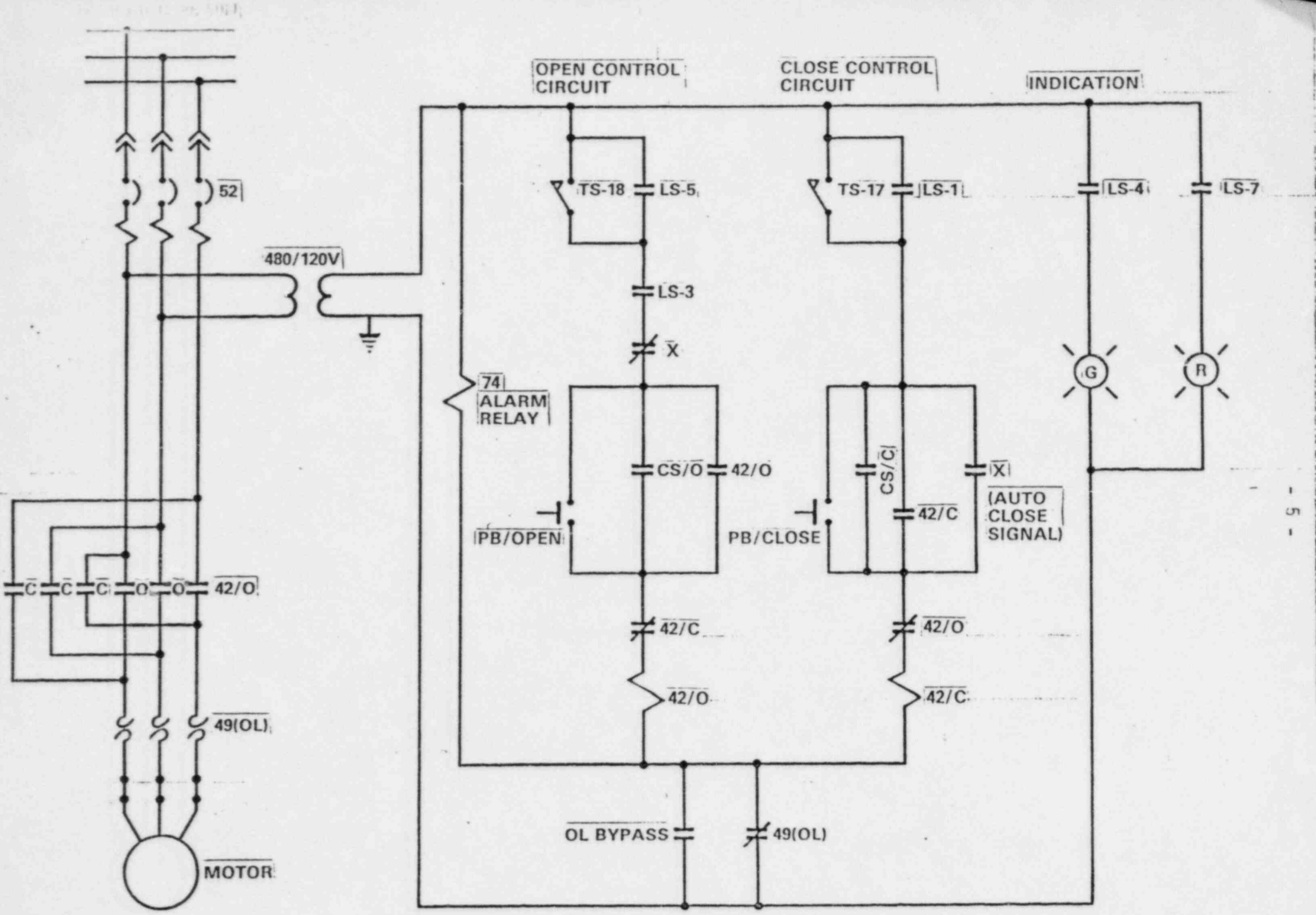


FIGURE 1  
ELEMENTARY DIAGRAM FOR MOTOR OPERATED VALVE

FOR LEGEND, SEE SHEET 2

CONTACT NUMBER	VALVE POSITION		FUNCTION
	FULL OPEN	FULL CLOSED	
LS-1	-----	-----	BY-PASS TS-17
LS-2	-----	-----	SPARE
LS-3	-----	-----	OPEN LIMIT
LS-4	-----	-----	INDICATING LIGHT
LS-5	-----	-----	BY-PASS TS-18
LS-6	-----	-----	SPARE
LS-7	-----	-----	INDICATING LIGHT
LS-8	-----	-----	SPARE
LS-9	-----	-----	SPARE
LS-10	-----	-----	SPARE
LS-11	-----	-----	SPARE
LS-12	-----	-----	SPARE
LS-13	-----	-----	SPARE
LS-14	-----	-----	SPARE
LS-15	-----	-----	SPARE
LS-16	-----	-----	SPARE



TS-17 --- CLOSING TORQUE SWITCH INTERRUPTS CLOSE CONTROL CIRCUIT IF MECHANICAL OVERLOAD OCCURS DURING CLOSING CYCLE OR VALVE IS FULLY CLOSED

TS-18 --- OPENING TORQUE SWITCH INTERRUPTS OPEN CONTROL CIRCUIT IF MECHANICAL OVERLOAD OCCURS DURING OPENING CYCLE

52 --- CIRCUIT BREAKER

42 --- MOTOR STARTER CONTACTOR AND AUXILIARY CONTACTS (O. . . OPEN; C. . . CLOSE)

49 --- THERMAL OVERLOAD ELEMENTS AND CONTACT

PB --- LOCAL PUSHBUTTON

CS --- CONTROL SWITCH - SPRING RETURN TO NEUTRAL

X --- AUTO CLOSE SIGNAL CONTACTS (N.O. CONTACT CLOSSES AND N.C. CONTACT OPENS ON AUTO CLOSE DEMAND)





drive the valve into its seat so tightly that on a subsequent opening attempt the valve would not be able to open because the high torque required to move the valve off its seat is beyond the capability of the valve operator. In such a case, manually moving the valve off its seat would permit subsequent remote operation of the valve.

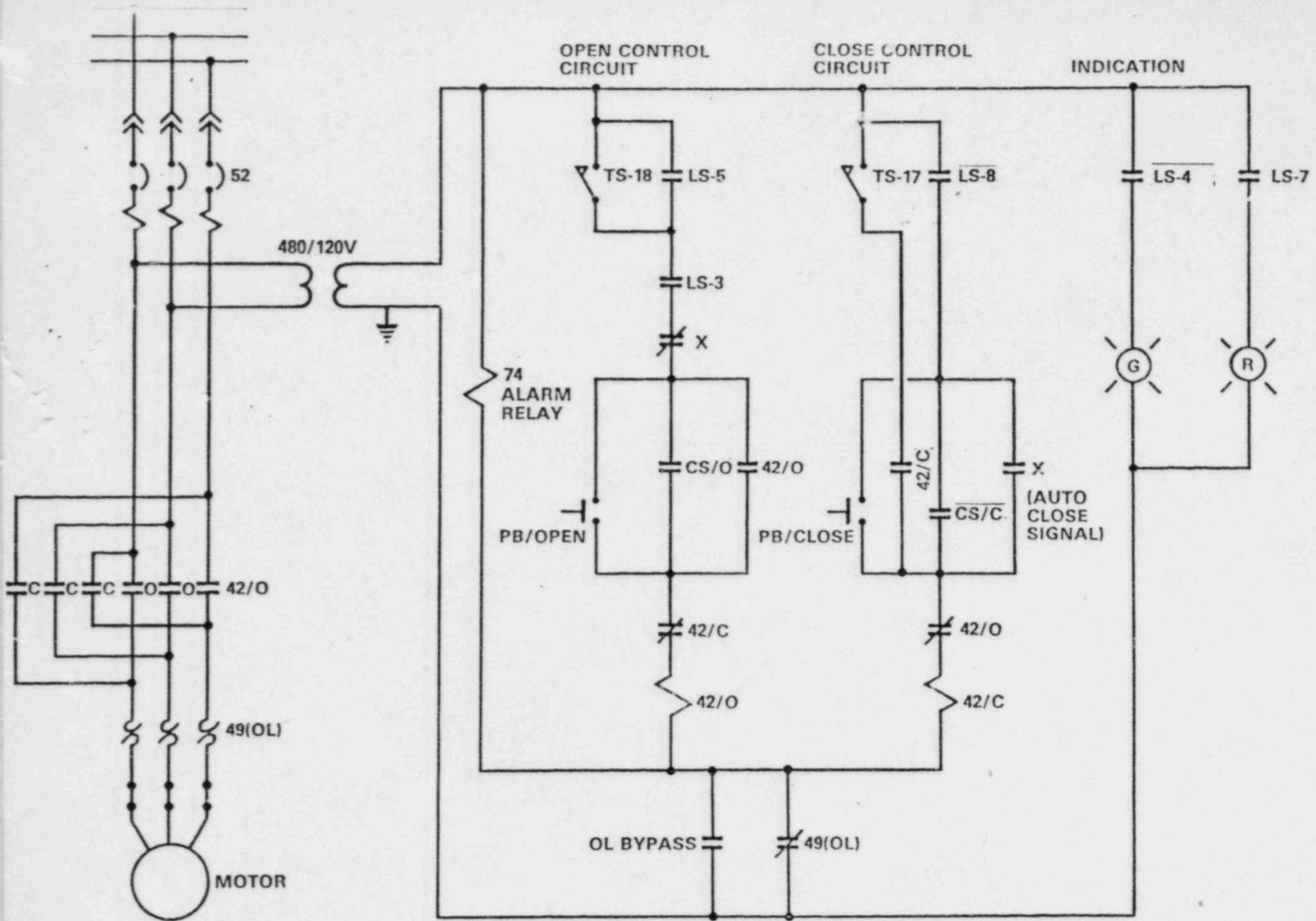
The motors provided to operate these types of valves are typically momentary duty motors and are not designed for repeated starts and stops. Thus, valve motors subjected to repeated closure attempts could overheat and cause damage to the motor winding and insulation. This could lead to tripping of the thermal overload of the motor, or in the extreme case, short circuit of the motor and tripping of the associated circuit breaker; and consequent failure of the valve to perform its function.

Motor operated valves (MOVs) that are designed to be torqued closed are utilized in several safety-related systems in both BWR and PWR units. The majority of these valves use motor operators manufactured by Limitorque and Rotork. Examples of valves that require the torque closing feature are: containment isolation valves, valves in the injection lines of the emergency core cooling (ECCS), safety injection (SI) and emergency safety features (ESF) systems, steam inlet valves of the auxiliary feedwater (AFW), high pressure core injection (HPCI), and reactor core isolation cooling (RCIC) systems, suction valves in the residual heat removal (RHR) system and certain valves in the service water system. For such valves, if the design scheme of the closing control circuit is similar to that shown in Figure 1 and 2, there exists the potential for the valves to be subjected to the hammering effect described above. In particular, those valves that have an automatic close signal present in the control circuit for extended periods have the potential for such an effect and consequent damage. (Examples of such valves are RHR suction valves which during normal reactor operation have a high reactor pressure close signal present and HPCI injection valves which have a close signal from an interlock of the steam inlet valve). MOVs which have maintained control switches in their control circuits or where operators continue to hold momentary control switches in the closed position even after the valves have reached the full closed position, also have the possibility of being subjected to the hammering effect.

Since MOVs with the torque closing feature are used at many nuclear power plants and since the typical design shown in Figures 1 and 2 could be present at several plants, we would expect to find similar events involving hammering at many of the operating nuclear plants. To verify this assumption, a search of the Sequence Coding and Search System (SCSS) LER data base was conducted. The search was limited to events that occurred in 1983 and early 1984. The search was based on events involving failures of motor operated valves. This search strategy identified one hundred and seventy nine (179) LERs. The abstract of these 179 LERs were reviewed to identify events in which hammering of the valve was stated to be a cause or effect of failure.

Except for the two referenced LERs, no other event was found. This was unexpected, as we expected to see several more such events. It was concluded that licensees at other nuclear plants could have overlooked such a phenomenon in determining the cause of failure of MOVs, since repeated attempts at closing an already closed MOV can only be observed at the valve itself or at the starter cubicle where repeated cycling of the starter contactor occurs. A further review of the abstracts of the 179 LERs was performed to identify events which involved failures that might have resulted at least in part from hammering, such as thermal overload trip, valve motor burnout or short circuiting, circuit breaker trip, valve and/or operator mechanical damage, valve seat jamming and valve not opening on demand, and contactor coil failure. This review found forty seven (47) LERs. The 47 LERs, plus the two referenced LERs, and their abstracts are listed in Appendix A. Table 1. in the appendix shows the breakdown of the LERs based on the types of failure. Since the schematic and wiring diagrams of the valves involved in these 47 LERs are not available to us, we were unable to ascertain whether the valves that failed have their close control circuit design similar to the typical ones shown in Figures 1 and 2. This can only be done by the licensees whose valves are involved.

In 1982, IE Information Notice 82-10 entitled "Following Up Symptomatic Repairs to Assure Resolution of the Problem" was issued, recommending that licensees of operating nuclear plants identify and resolve the underlying problem that cause failure of MOVs rather than just correct the symptoms of failure. The problem of valve hammering described in this report is likely the underlying cause of failures that have occurred at several nuclear plants; however, as seen by reviewing the 47 LERs, only the various failure results are evident. Hence, licensees in their review of the applicability of IE IN 82-10 to their facilities should consider the details provided in this report in determining possible underlying causes of some of the MOV failures experienced. At the Dresden and Quad Cities plants, the licensees had concluded after investigating the MOV failures described in LER 50-217/84-003 and LER 50-254/84-014, that the hammering experienced by the valves caused by the design of the valve's close control circuit, was a major contributor to those particular failures. At Dresden 2 and 3, and Quad Cities 1 and 2, the licensees have initiated design changes of the close control circuit of all applicable valves to eliminate the potential hammering problem. The modified design used is similar to the one shown in Figure 3, Modified Elementary Diagram for Motor Operated Valve. The modification consists of connecting the closing contactor seal-in interlock 42/C, in series with closing torque switch TS-17 and using limit switch LS-8 instead of LS-1. (The changes can be seen by comparing Figure 1 with Figure 3). This modified design scheme now assures that on a valve close demand, once the valve reaches the torqued close position and trips (open) TS-17, the closing contactor 42/C de-energizes and remains deenergized, even if an auto-close signal or a control switch contact demands further closure after TS-17 resets (closes.) Figures 4 and 5 show other modified elementary diagrams for MOVs using



FOR LEGEND, SEE FIGURE 1, SHEET 2

FIGURE 3  
MODIFIED ELEMENTARY DIAGRAM FOR MOTOR OPERATED VALVE

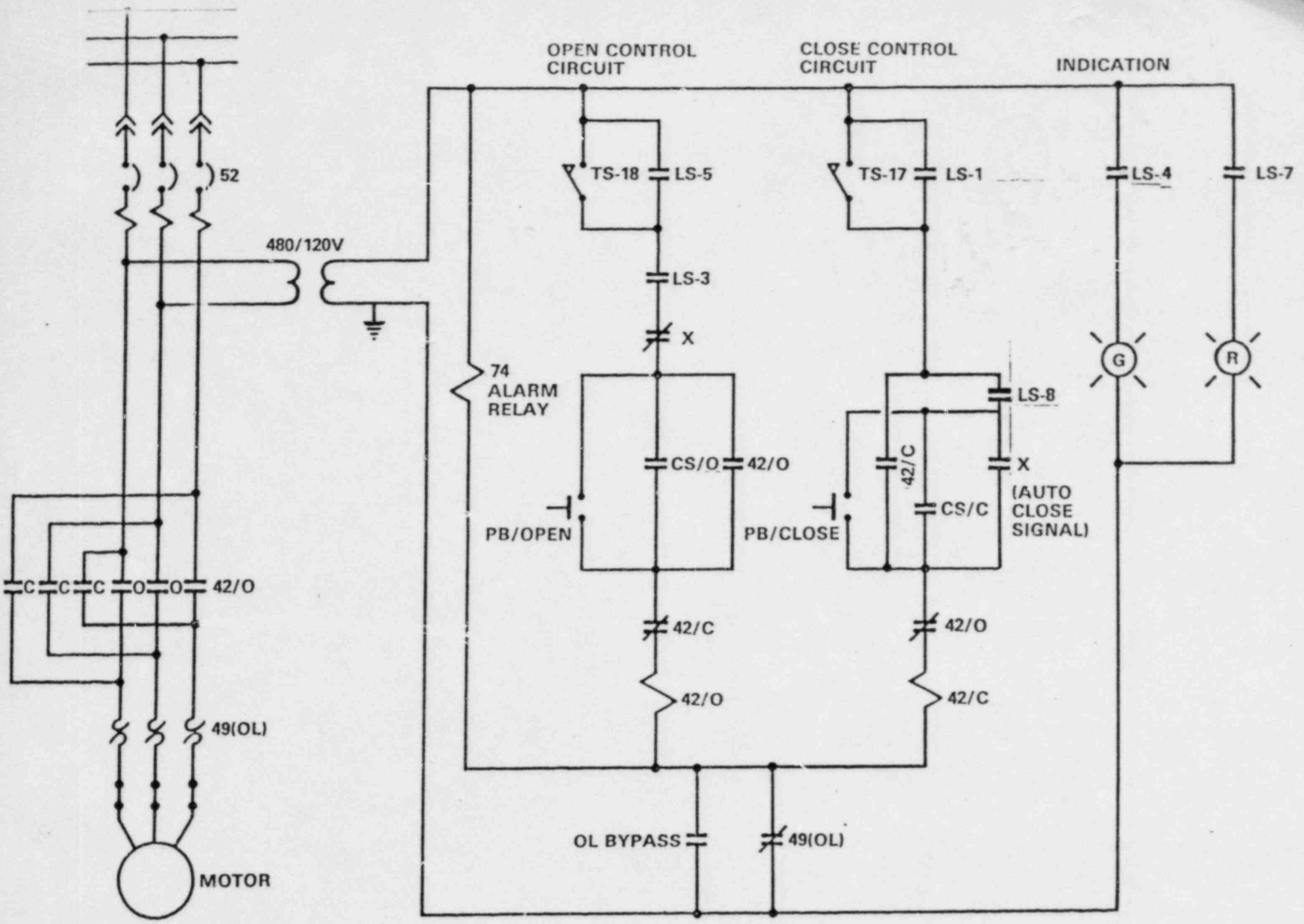
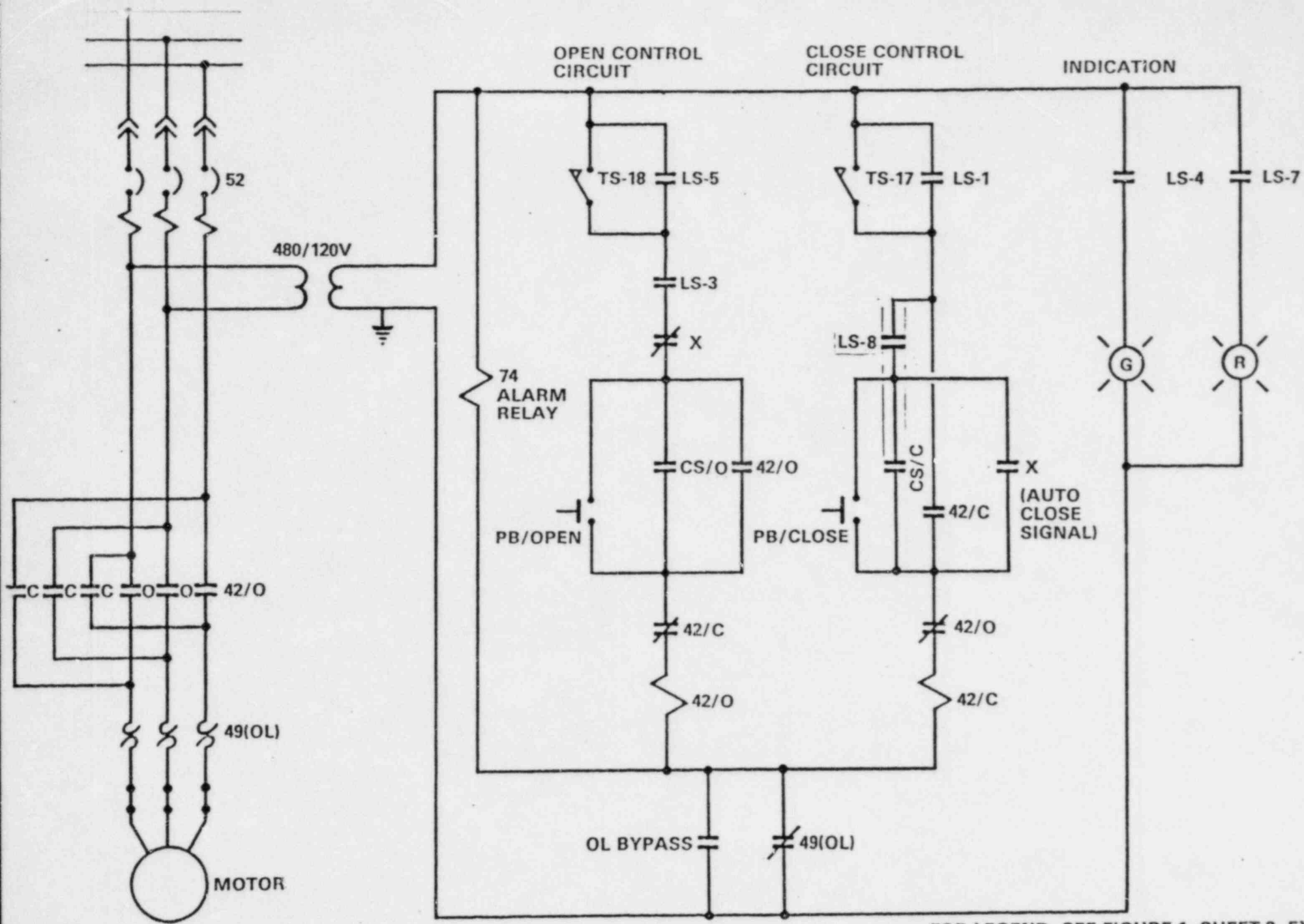


FIGURE 4  
 MODIFIED ELEMENTARY DIAGRAM FOR MOTOR OPERATED VALVE

FOR LEGEND, SEE FIGURE 1, SHEET 2



FOR LEGEND, SEE FIGURE 1, SHEET 2, EXCEPT CS AND PB ARE MAINTAINED SWITCHES

FIGURE 5  
 MODIFIED ELEMENTARY DIAGRAM FOR MOTOR OPERATED VALVE  
 (WITH MAINTAINED CONTROL SWITCHES)



limit switch LS-8 in series with the close demand signals to achieve the same result -- that of preventing cyclic reenergization of the closing contactors and corresponding repetitive closing attempts by the MOV once the valve has been torqued closed.

#### FINDINGS AND CONCLUSION

The following findings were derived from our review of operational experiences and control circuit design of MOVs.

1. A core spray valve at Dresden 2 failed during performance of the valve operability test. The valve had suffered mechanical damage and the thermal overload had also tripped. The valve is one that is designed to be torqued closed.
2. Two LPCI injection valves at Quad Cities 1 failed to open when required. Both valve stems were found damaged. These valves are also designed to be torqued closed. The control circuit of these valves also experiences a continuous close signal during periodic surveillance testing.
3. MOVs that are designed to be torqued closed are utilized in various safety-related systems in both BWRs and PWRs and failures of these valves can impair the safety function of the safety system in which they are applied.
4. The typical control circuit for these MOVs is such that it would permit repeated closing attempts by the valve even after the valve has reached the fully closed position. These repeated attempts at closing cause mechanical hammering on the valve and its operator and can cause mechanical overload on the valve and operator, electrical overheating of valve motor and starter contactor, thermal overload trip, motor insulation and winding faults, etc.
5. Indication provided at the control switch of the valve cannot detect the repeated cycling of the valve operator or the starter contactor. The repeated energization of the valve motor and starter can only be observed at the valve or at the starter cubicle.
6. A review of 179 LERs related to MOV failures obtained from a search of the SCSS LER data base for 1983-1984, did not reveal any other event where hammering of the valve and operator was specifically identified as a cause of valve failure. However, based on the valve failures which are likely to have been caused at least in part by hammering (Finding 4), 47 LERs were identified.
7. At the Dresden and Quad Cities plants, the licensees have initiated design changes to the valve control circuit of all applicable MOVs to eliminate the features that cause valve hammering.

The following conclusions were reached in the review above.

1. MOVs that are designed to close on torque, have valve control circuitry that is fairly typical to the design of MOVs that failed at Dresden 2 and Quad Cities 1. Hence, the hammering effects experienced by the valves at these units, are quite likely being experienced by valves at other operating nuclear plants.
2. Since the review of recent operating experience of MOVs did not reveal any other MOV failures identified as being due to hammering, it was concluded that licensees in investigating MOV failures may be focusing on the symptoms of failure without establishing the underlying root cause of failure.
3. All MOVs (including those with Limitorque or Rotork Operators) that are designed to torque close and whose close control circuit is similar to the typical wiring diagram shown in Figures 1 and 2, could be susceptible to repeated closing attempts and the consequential hammering problem. However, many factors affect the extent of damage that can be caused. Variables such as torque switch setting, closing signal duration, valve operator capacity, thermal overload protection, etc., have varying effect on the damage due to hammering. Valves which experience a continuous close signal (automatic close signal or maintained control switch) are more susceptible to the problem.

#### RECOMMENDATION

IE Information Notice 82-10 issued on March 31, 1982 addressed the subject of symptomatic repairs and identification of underlying problem associated with MOV failures. The problem of hammering of MOVs described in this report was not specifically identified in IE IN 82-10. Hence, we believe that licensees of operating nuclear plants should, in their IE IN 82-10 follow up effort, consider the hammering of MOVs as an underlying root cause which could be applicable to valves at their facility. The information regarding control circuit designs detailed in this report would be extremely helpful to the licensees in understanding the problem and its possible solutions. We recommend that this report be used as a basis for issuing a revision to IE IN 82-10, or to develop a new IE Information Notice. The information notice should direct licensees of operating reactors to 1) review the circuit design of MOVs to identify valves that are subject to the potential problem, 2) examine the identified valves, their operators, motors and starters for damage, and 3) modify the valve control circuit to eliminate the problem. We also recommend that this report with the control circuit design details be included in a forthcoming issue of Power Reactor Events.

APPENDIX A

LERs INVOLVING MOV FAILURES WHICH ARE POTENTIAL  
SYMPTOMATIC FAILURES DUE TO HAMMERING

(Data obtained from search of SCSS for 1983 and  
early 1984)

FORM 1 LER SCSS DATA 12-11-84

\*\*\*\*\*  
DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
237 1983 024 0 8305060422 182637 4-3-1983

COMMENTS  
STEP 1 EFFECT DX - DEGRADED INSULATION

DOCKET:237 DRESDEN 2 TYPE:BWR  
REGION: 3 NSSS:GE  
ARCHITECTURAL ENGINEER: SLXX  
FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
SYMBOL: CWE

ABSTRACT  
DURING REFUELING OUTAGE WHILE PERFORMING CORE SPRAY OPERABILITY TEST, TEST VALVE MD 1402-4A FAILED TO OPEN. AFTER SEVERAL ATTEMPTS TO OPEN THE VALVE, THE THERMAL OVERLOAD CONTACTS TRIPPED. THIS EVENT IS OF MINIMAL SAFETY SIGNIFICANCE SINCE THE VALVE IS NOT REQUIRED FOR SAFETY INJECTION. NO PAST OCCURRENCES REPORTED. THE CAUSE OF THE EVENT WAS DUE TO A BURNED OUT MOTOR. (LIMITORQUE TYPE - P). A GROUND, DUE TO A BREAKDOWN IN THE INSULATION PROBABLY CAUSED IT. IT WAS REPLACED WITH A LIKE FOR LIKE; THE VALVE WAS SATISFACTORILY CYCLED 3 TIMES TO VERIFY OPERABILITY.

FORM 2 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
237 1984 003 0 8403260260 189090 2-21-1984

COMMENTS  
STEP 2: COMP MEI = GEAR HOUSING

DOCKET:237 DRESDEN 2 TYPE:BWR  
REGION: 3 NSSS:GE  
ARCHITECTURAL ENGINEER: SLXX  
FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
SYMBOL: CWE

WATCH-LIST CODES FOR THIS LER ARE:  
913 UPDATE NEEDED

REPORTABILITY CODES FOR THIS LER ARE:  
10 10 CFR 50.73(a)(2)(i): Shutdowns or technical specification violations.

ABSTRACT  
POWER LEVEL - 098%. DURING NORMAL OPERATION, CORE SPRAY VALVE MD2-1402-25A FAILED TO OPERATE FROM THE CONTROL ROOM. SAFETY SIGNIFICANCE WAS MINIMAL SINCE THE REDUNDANT CORE SPRAY 'B' LOOP WAS OPERABLE TO PROVIDE CORE COOLING. THE EXACT CAUSE OF THE EVENT IS UNDER INVESTIGATION. THE GEAR HOUSING OF THE VALVE WAS FOUND CRACKED. A POSSIBLE CONTRIBUTING FACTOR TO THIS EVENT IS THE VALVE CONTROL CIRCUITRY WHICH CAN ALLOW THE VALVE DISC TO REPEATEDLY ATTEMPT TO CLOSE AFTER ALREADY BEING CLOSED. THIS CREATES A HAMMERING EFFECT ON THE VALVE AND OPERATOR. WORK REQUESTS HAVE BEEN WRITTEN TO MODIFY THE CIRCUITRY TO PREVENT THIS HAMMERING EFFECT. A REVIEW OF OTHER SAFETY RELATED MOTOR OPERATED VALVES HAS BEEN MADE TO ENSURE THAT A SIMILAR VALVE CONTROL CIRCUITRY PROBLEM DOES NOT EXIST ELSEWHERE. ALSO A SECTION OF THE GEAR HOUSING AND THE OUTER BEARING RACE ARE BEING SENT TO THE OPERATIONAL ANALYSIS DEPARTMENT FOR METALLURGICAL ANALYSIS. A

SUPPLEMENTAL REPORT WILL BE SUBMITTED TO PROVIDE RESULTS OF THE ANALYSIS AND OUR ADDITIONAL INVESTIGATION. THE HOUSING AND BEARING RACE WERE REPLACED. FINALLY AS INTERIM CORRECTIVE ACTION UNTIL THE VALVE CONTROL CIRCUITRY IS MODIFIED, CAUTION CARDS WERE PUT ON THE 1402-25A AND B VALVES FOR BOTH UNITS 2 AND 3. THESE CAUTION CARDS WILL WARN THE OPERATOR NOT TO HOLD ONTO THE CONTROL SWITCH WHEN CLOSING THESE VALVES IN ORDER TO LIMIT ANY HAMMERING EFFECT.

FORM 3 LER SCSS DATA 12-11-84  
\*\*\*\*\*  
DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
244 1984 002 0 8404170304 189207 3-3-1984

DOCKET:244 GINNA TYPE:PWR  
REGION: 1 NSSS:WE  
ARCHITECTURAL ENGINEER: GLBT  
FACILITY OPERATOR: ROCHESTER GAS & ELECTRIC CORP.  
SYMBOL: RGE

WATCH-LIST CODES FOR THIS LER ARE:  
913 UPDATE NEEDED

REPORTABILITY CODES FOR THIS LER ARE:  
15 10 CFR 50.73(a)(2)(vii): Single failure criteria.

#### ABSTRACT

POWER LEVEL - 000%. ON MARCH 3, 1984, WHILE COOLING DOWN THE REACTOR COOLANT SYSTEM (RCS) TO COLD SHUTDOWN CONDITION FOR THE ANNUAL REFUELING AND MAINTENANCE OUTAGE, PERIODIC TEST PT-2.4.1 "COLD/REFUELING MOTOR OPERATED VALVE SURVEILLANCE (RHR SYSTEM - 700 VALVES)" WAS IN PROGRESS. MOV-700 (RCS LOOP A RESIDUAL HEAT REMOVAL SUCTION STOP VALVE) FAILED TO STROKE TO THE OPEN POSITION WHEN ACTUATED FROM THE CONTROL ROOM. FOLLOWING MANUAL UNSEATING OF THE VALVE, THE VALVE WAS RETESTED AND STROKING TIMES WERE VERIFIED ACCEPTABLE (TIMED TWICE, FULL CYCLE). TWO MOST PROBABLE CAUSES OF FAILURE COULD BE EITHER A DRY VALVE STEM, OR A LIGHT TORQUE SWITCH SETTING. FIELD TECHNICIANS INVOLVED IN PT-2.4.1, REPORTED THAT MOV-700 HAD AN EXTREMELY DRY OPERATING SHAFT. THIS LACK OF LUBRICATION PROBABLY CONTRIBUTED TO MOV-700 FAILURE TO STROKE TO THE OPEN POSITION. THE TORQUE SWITCH SETTING WILL BE VERIFIED AND INCREASED IF NECESSARY. THE VALVE STEM AND PACKING WILL BE INSPECTED. THE TORQUE SWITCH BYPASS SETPOINT WILL ALSO BE VERIFIED AND CORRECTED IF NECESSARY.

FORM 4 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
244 1984 005 0 8406190244 190355 5-14-1984

#### COMMENTS

STEP 1: COMPONENT CODE MSC-PACKING GLAND FLANGE

DOCKET:244 GINNA TYPE:PWR  
REGION: 1 NSSS:WE  
ARCHITECTURAL ENGINEER: GLBT  
FACILITY OPERATOR: ROCHESTER GAS & ELECTRIC CORP.  
SYMBOL: RGE

REPORTABILITY CODES FOR THIS LER ARE:  
15 10 CFR 50.73(a)(2)(vii): Single failure criteria.

#### ABSTRACT

POWER LEVEL - 000%. ON MAY 14, 1984 WHILE COOLING DOWN THE REACTOR



COOLANT SYSTEM (RCS) TO THE COLD SHUTDOWN CONDITION FOR SLUDGE LANCING AND CREVICE CLEANING, MOV-700 (RCS LOOP-A RESIDUAL HEAT REMOVAL SUCTION VALVE) FAILED TO STROKE TO THE OPEN POSITION WHEN ACTUATED FROM THE CONTROL ROOM. FOLLOWING MANUAL UNSEATING OF THE VALVE, MAINTENANCE PERSONNEL PERFORMED AN INSPECTION OF THE VALVE EXTERIOR. THIS INSPECTION REVEALED THAT THE PACKING GLAND FLANGE HAD SHIFTED OUT OF THE VERTICAL POSITION TO A POINT WHERE THE FLANGE WAS IN CONTACT WITH THE VALVE STEM. THIS COULD HAVE CAUSED A MECHANICAL BINDING IN THE STEM AND TORQUE-OUT OF VALVE OPERATOR. THE VALVE WAS THEN STROKED MANUALLY TO VERIFY NO MECHANICAL BINDING. THE VALVE WAS THEN STROKED TWICE ELECTRICALLY. THE VALVE FUNCTIONED SATISFACTORILY WITH PROPER MOTOR CURRENT READINGS, AND ACCEPTABLE OPENING AND CLOSING TIMES, INDICATING NO MECHANICAL BINDING.

FORM 5 LER SCSS DATA 12-11-84

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DOCKET	YEAR	LER NUMBER	REVISION	DCS NUMBER	NSIC	EVENT DATE
245	1984	015	0	8408090340	190790	7-9-1984

DOCKET:245 MILLSTONE 1 TYPE:BWR  
 REGION: 1 NSSS:GE  
 ARCHITECTURAL ENGINEER: EBAS  
 FACILITY OPERATOR: NORTHEAST NUCLEAR ENERGY CO.  
 SYMBOL: NNE

REPORTABILITY CODES FOR THIS LER ARE:

14 10 CFR 50.73(a)(2)(v): Event that could have prevented fulfillment of a safety function.

ABSTRACT

POWER LEVEL - 100%. ON 7-9-84, AT 1315 HRS, WHILE RESTORING THE ISOLATION CONDENSER VALVE LINEUP FOLLOWING AN ISOLATION CONDENSER FUNCTIONAL AND CALIBRATION TEST, THE ISOLATION CONDENSER CONTAINMENT ISOLATION VALVE MOTOR OVERLOAD AND 125V DC GROUND ALARM ANNUNCIATED IN THE CONTROL ROOM. OPERATIONS IMMEDIATELY ASCERTAINED 1-IC-3 (THE OUTBOARD CONDENSATE RETURN VALVE) TO BE INOPERATIVE AND PLACED 1-IC-4 (THE REDUNDANT ISOLATION VALVE FOR 1-IC-3) IN THE CLOSED POSITION. THE ISOLATION CONDENSER WAS DECLARED INOPERABLE AND AN INVESTIGATION INITIATED. INSPECTION OF 1-IC-3 REVEALED AN OUT OF ADJUSTMENT LIMIT SWITCH CAUSED THE MOTOR TO CONTINUE TO RUN BEYOND THE FULL CLOSED POSITION AND OVERHEAT. THIS DAMAGED THE MOTOR EXTENSIVELY AND SUBSEQUENTLY FAILED 1-IC-3 IN THE FULL CLOSED POSITION. THE MOTOR/CIRCUIT BREAKER FOR 1-IC-3 WAS REPLACED AND ALL LIMIT SWITCHES AND POSITION SWITCHES READJUSTED. THE VALVE WAS SATISFACTORILY RETESTED AND THE ISOLATION CONDENSER PLACED BACK INTO SERVICE.

FORM 6 LER SCSS DATA 12-11-84

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DOCKET	YEAR	LER NUMBER	REVISION	DCS NUMBER	NSIC	EVENT DATE
249	1983	011	0	8304040514	183104	3-14-1983

DOCKET:249 DRESDEN 3 TYPE:BWR  
 REGION: 3 NSSS:GE  
 ARCHITECTURAL ENGINEER: SLXX  
 FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
 SYMBOL: CWE

ABSTRACT

DURING NORMAL OPERATION, WITH DOS 1500-1 (LPCI SYSTEM VALVE OPERABILITY TEST) IN PROGRESS, LPCI PUMP SUCTION VALVE MO 3-1501-5A FAILED TO CLOSE. (TECH SPEC 3.5.A.4). A GSEP UNUSUAL EVENT WAS DECLARED SINCE THE UNIT 2/3 DIESEL GENERATOR WAS OUT OF SERVICE. SAFETY SIGNIFICANCE WAS MINIMAL SINCE THE OTHER THREE LPCI PUMPS WERE

OPERABLE TO PROVIDE THE REQUIRED FLOW. FIRST OCCURRENCE OF THIS TYPE. CAUSE OF THE EVENT IS DUE TO MECHANICAL OVERLOAD WHICH BROKE THE MANUAL OPERATOR HOUSING. THE EXACT CAUSE OF THE MECHANICAL OVERLOAD COULD NOT BE DETERMINED. THE VALVE MOTOR AND MANUAL OPERATOR HOUSING WERE REPLACED AND THE VALVE WAS SUBSEQUENTLY OPERATED AND RETURNED TO SERVICE. GSEP UNUSUAL EVENT WAS THEN TERMINATED. DOS 1500-1 WILL CONTINUE TO BE PERFORMED MONTHLY.

FORM 7 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
254 1983 038 0 8311170341 186903 10-6-1983

DOCKET:254 QUAD CITIES 1 TYPE:BWR  
REGION: 3 NSSS:GE  
ARCHITECTURAL ENGINEER: SLXX  
FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
SYMBOL: CWE

ABSTRACT

ON OCTOBER 6, 1983, WHILE PERFORMING THE HIGH PRESSURE COOLANT INJECTION (HPCI) MONTHLY VALVE OPERABILITY TEST, QOS 2300-3, THE HPCI TURBINE STEAM SUPPLY VALVE, MO 1-2301-3, FAILED TO OPEN. THE HPCI SYSTEM WAS DECLARED INOPERABLE, AND THE REQUIRED SURVEILLANCES WERE INITIATED AS REQUIRED BY TECH SPEC 4.5.C.2. ALL OF THE REMAINING ECCS SYSTEMS WERE OPERABLE AT THE TIME OF THE OCCURRENCE. DUE TO CHANGING TORQUE CHARACTERISTICS OF THE VALVE, THE LIMIT SWITCH CONTACT, WHICH BYPASSES THE TORQUE SWITCH, OPENED PREMATURELY. THIS PREVENTED THE VALVE FROM OPENING. BEFORE THE REQUIRED SURVEILLANCES COULD BE COMPLETED, THE LIMIT SWITCH WAS READJUSTED, THE VALVE OPERATING CURRENTS WERE CHECKED, AND THE VALVE WAS SUCCESSFULLY TESTED.

FORM 8 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
254 1984 014 0 8408230496 191044 8-8-1984

COMMENTS

STEP 1: MODIFICATION TO STOP HAMMERING INCORRECTLY MADE. STEP 3: CAUSE CX = HAMMERING, EFFECT DX = DAMAGED.

DOCKET:254 QUAD CITIES 1 TYPE:BWR  
REGION: 3 NSSS:GE  
ARCHITECTURAL ENGINEER: SLXX  
FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
SYMBOL: CWE

REPORTABILITY CODES FOR THIS LER ARE:

14 10 CFR 50.73(a)(2)(v): Event that could have prevented fulfillment of a safety function.

ABSTRACT

POWER LEVEL - 000%. DURING THE CYCLE 7 REFUELING OUTAGE, ON AUG 8, 1984, AT 4:25 PM, IT WAS DISCOVERED THAT BOTH THE 1-1001-29A AND 1-1001-29B LOW PRESSURE COOLANT INJECTION VALVES WOULD NOT OPEN. THIS WAS DISCOVERED AS THE OPERATOR WAS IN THE PROCESS OF STARTING THE SHUTDOWN COOLING MODE OF THE RESIDUAL HEAT REMOVAL SYSTEM. THE CORE SPRAY AND FEEDWATER SYSTEMS WERE AVAILABLE TO MAINTAIN LEVEL. RESIDUAL HEAT REMOVAL COULD BE ACCOMPLISHED USING THE REACTOR WATER CLEAN-UP SYSTEM AND THE RESIDUAL HEAT REMOVAL SYSTEM WITH THE 1-1001-29B VALVE STILL 25% OPEN.

FORM 9 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
259 1984 012 0 3403130205 189386 2-14-1984

COMMENTS

STEP 1: COMPONENT CODE MSC - MOTOR WINDING

DOCKET:259 BROWNS FERRY 1 TYPE:BWR  
REGION: 2 NSSS:GE  
ARCHITECTURAL ENGINEER: TVAX  
FACILITY OPERATOR: TENNESSEE VALLEY AUTHORITY  
SYMBOL: TVA

WATCH-LIST CODES FOR THIS LER ARE:

- 913 UPDATE NEEDED
- 975 POSSIBLE SIGNIFICANT EVENT

REPORTABILITY CODES FOR THIS LER ARE:

- 21 OTHER: Voluntary report, special report, Part 21 report, etc.

REFERENCE LERS:

- 1 259/84-013

ABSTRACT

POWER LEVEL - 000%. ON FEBRUARY 14, 1984, WHILE BRINGING UNITS 1 AND 2 TO COLD SHUTDOWN BECAUSE OF THE RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM AIR RELEASE VALVES NOT BEING PROPERLY CERTIFIED FOR THE DESIGN PRESSURE (REFERENCE BFR0-50-259/84013), RESIDUAL HEAT REMOVAL (RHR) VALVE FCV-1-74-48 ON UNIT 1 FAILED TO OPEN, MAKING IT IMPOSSIBLE TO ACHIEVE COLD SHUTDOWN USING NORMAL METHODS. AN ALERT WAS DECLARED PER THE RADIOLOGICAL EMERGENCY PLAN. THE PLANT WAS BROUGHT TO COLD SHUTDOWN THROUGH ALTERNATE MEANS AND THE ALERT WAS CANCELLED AFTER THE VALVE WAS OPENED MANUALLY AND SHUTDOWN COOLING RESTORED. AN INVESTIGATION OF THIS EVENT REVEALED THAT THE "B" PHASE WINDING OF THE MOTOR ON VALVE FCV-74-48 FAILED. AT THIS TIME IT IS NOT KNOWN IF THE FAILURE OF VALVE FCV-74-48 TO OPEN WAS A RESULT OF THE FAILURE OF "B" PHASE MOTOR WINDING OR IF THE MOTOR FAILED AS A RESULT OF OTHER CAUSES. INVESTIGATION OF THE CAUSE OF MOTOR FAILURE IS CONTINUING AND A FOLLOW-UP REPORT WILL BE SUBMITTED BY SEPTEMBER 1, 1984 PROVIDING DETAILS OF THIS INVESTIGATION.

UNABLE TO LOCATE DATA FOR:

DOCKET:270  
YEAR:83  
LER NUMBER:003

FORM 11 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
271 1983 020 0 3309260217 188842 8-26-1983

COMMENTS

STEP 1 COMP RLY - STOPPING RELAY

DOCKET:271 VERMONT YANKEE TYPE:BWR  
REGION: 1 NSSS:GE  
ARCHITECTURAL ENGINEER: EBAS  
FACILITY OPERATOR: VERMONT YANKEE NUCLEAR POWER CORP.  
SYMBOL: VYC

ABSTRACT

WHILE PERFORMING EMERGENCY DIESEL GENERATOR SURVEILLANCE, THE "B" DIESEL GENERATOR FAILED TO START AS REQUIRED BY TECH SPEC 3.10.0.1.



ALTERNATE SURVEILLANCE TESTING WAS STARTED PER TECH SPEC 4.5.H.1. DURING ALTERNATE TESTING, CORE SPRAY VALVE CS-7B FAILED TO STROKE. REACTOR SHUTDOWN WAS IMMEDIATELY INITIATED PER TECH SPEC 3.5.A.6 AND AN UNUSUAL EVENT DECLARED. THERE HAVE BEEN NO SIMILAR OCCURRENCES OF THIS TYPE REPORTED IN THE LAST FIVE YEARS. THE CAUSE OF THIS EVENT WAS ATTRIBUTED TO TWO FAILURES: 1) THE DIESEL STOPPING RELAY SOLENOID FAILED AND INTERRUPTED FUEL FLOW TO THE DG. IT WAS SUBSEQUENTLY REPLACED. 2) THE CS-7B VALVE BREAKER TRIPPED ON HIGH STARTING TORQUE. THE BREAKER WAS SUBSEQUENTLY REPLACED, AND THE CS-7B VALVE WAS CYCLED AND DECLARED OPERABLE.

FORM 12 LER SCSS DATA 12-11-84  
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 DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 277 1984 001 0 8403010358 188960 1-17-1984

COMMENTS

STEP 1: COMP MEI = CORE HOUSING

DOCKET:277 PEACH BOTTOM 2 TYPE:BWR  
 REGION: 1 NSSS:GE  
 ARCHITECTURAL ENGINEER: BECH  
 FACILITY OPERATOR: PHILADELPHIA ELECTRIC CO.  
 SYMBOL: PEC

REPORTABILITY CODES FOR THIS LER ARE:

15 10 CFR 50.73(a)(2)(vii): Single failure criteria.

ABSTRACT

POWER LEVEL - 100%. DURING SURVEILLANCE TESTING OF THE 'B' RHR INJECTION VALVE MO 2-10-154B, THE VALVE FAILED TO REOPEN AFTER BEING CLOSED. THIS SURVEILLANCE TEST WAS PERFORMED WHILE PBAPS UNIT 2 WAS AT POWER BEFORE A PLANNED DIESEL GENERATOR OUTAGE. THE 'B' RHR SYSTEM WAS THEN DECLARED INOPERABLE. BOTH CORE SPRAY SYSTEMS AND THE REDUNDANT RHR SYSTEM WERE TESTED SATISFACTORILY AS REQUIRED BY TECH SPEC 3.5.A.5. AN INVESTIGATION REVEALED THAT A CUTLER-HAMMER MOTOR CONTACTOR (NEMA SIZE 3 CATALOG NO. A50EN0) HAD STUCK IN THE CLOSED POSITION WHICH ULTIMATELY RESULTED IN THE BURNING OPEN OF ONE PHASE OF THE 3 PHASE FEED TO THE MOTOR AND THE TRIPPING OF THE VALVE MOTOR CIRCUIT BREAKER. THIS EVENT ALSO DAMAGED THE CUTLER-HAMMER THERMAL OVERLOAD DEVICE (NEMA SIZE 3 CATALOG NO. C300EN03) WHEN A HEATER IN THE OVERLOAD DEVICE MELTED. THE CONTACTOR AND THE THERMAL OVERLOAD DEVICE WERE REPLACED AND THE 'B' RHR SYSTEM SURVEILLANCE TESTED SATISFACTORILY.

FORM 13 LER SCSS DATA 12-11-84  
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 DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 280 1983 003 0 8303010469 182406 2-9-1983

DOCKET:280 SURRY 1 TYPE:PWR  
 REGION: 2 NSSS:WE  
 ARCHITECTURAL ENGINEER: SWXX  
 FACILITY OPERATOR: VIRGINIA ELECTRIC & POWER CO.  
 SYMBOL: VEP

WATCH-LIST CODES FOR THIS LER ARE:

975 POSSIBLE SIGNIFICANT EVENT

ABSTRACT

UNIT 1 LESS THAN 350 F/450 PSIG AND UNIT 2 AT 100%, IT WAS DISCOVERED THAT MOV-SW-103A, B, C, AND D AND MOV-SW-203A, C, AND D FAILED TO OPEN UPON DEMAND FROM THE CONTROL ROOM. THESE EVENTS ARE

CONTRARY TO TECH SPEC 3.4.A.2 AND IS REPORTABLE PER TECH SPEC 6.6.2.A(1). THE VALVES ARE READILY ACCESSIBLE AND WERE CAPABLE OF BEING OPENED MANUALLY, AND THE CONTAINMENT SPRAY SYSTEM REMAINED OPERABLE. THE MOTORS OF MOV-SW-103C AND 203C HAD FAILED DUE TO CORROSION. THE TORQUE SWITCH OF VALVE MOV-SW-103B HAD FAILED DUE TO CORROSION. THE OTHER VALVES, MOV-SW-103A, D, AND 203A, D OPERATED SATISFACTORILY AFTER BEING MANUALLY LIFTED OFF THE SEAT. THE UNIT 2 VALVES WERE REPAIRED AND RETURNED TO SERVICE. THESE VALVES WILL BE CYCLED ON A MORE FREQUENT BASIS.

FORM 14 LER SCSS DATA 12-11-84  
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DOCKET YEAR LFR NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
280 1983 013 0 8303240510 182495 2-15-1983

COMMENTS

STEPS 4 AND 7: MSC = MOTOR ENGAGE MECHANISM.

DOCKET:280 SURRY 1 TYPE:PWR  
REGION: 2 NSSS:WE  
ARCHITECTURAL ENGINEER: SWXX  
FACILITY OPERATOR: VIRGINIA ELECTRIC & POWER CO.  
SYMBOL: VEP

ABSTRACT

WITH UNIT 1 AT COLD SHUTDOWN AND UNIT 2 AT 100%, IT WAS DISCOVERED THAT MOV-SW-102B WOULD NOT CYCLE. ON 2/20/83 AND 2/22/83, ROUTINE TESTING REVEALED THE MOV-SW-102A WOULD NOT RESPOND TO DEMAND. INOPERABILITY OF THESE VALVES IS CONTRARY TO TECH SPEC 3.4.A.5 AND IS REPORTABLE BY TECH SPEC 6.6.2.B.(2). THE VALVES WERE PLACED UNDER ADMINISTRATIVE CONTROL AND ALL EMERGENCY SERVICE WATER EQUIPMENT REMAINED OPERABLE. MOV-SW-102B FAILED DUE TO DAMAGED GEARS LINKING THE MOTOR TO THE VALVE ACTUATOR. THE GEARS WERE REPLACED AND THE VALVE RETURNED TO SERVICE. FAILURE OF MOV-SW-102A WAS CAUSED BY A FAULTY MOTOR ENGAGE MECHANISM. THIS WAS REPAIRED, THE VALVE TESTED AND RETURNED TO OPERABLE STATUS.

FORM 15 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
293 1983 044 0 8309060140 185285 7-25-1983

COMMENTS

STEP 1 COMPONENT MEI = SPRING PACK

DOCKET:293 PILGRIM 1 TYPE:BWR  
REGION: 1 NSSS:GE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: BOSTON EDISON CO.  
SYMBOL: BEC

ABSTRACT

ON 7/25/83, DURING A RCIC OPERABILITY SURVEILLANCE TEST, (8.5.5.4) THE INBOARD MOV-1301-16 DID NOT CLOSE. THE OUTBOARD ISOLATION VALVE WAS CLOSED AND THE SYSTEM DECLARED INOPERABLE. APPROPRIATE SURVEILLANCES REQUIRED BY TECH SPEC WERE IMMEDIATELY INITIATED. ON 7/29/83 THE PLANT WAS SHUT DOWN FOR A DRYWELL ENTRY TO DETERMINE CAUSE AND MAKE REPAIRS. A DEFECTIVE BELLEVILLE SPRING PACK CAUSED THE WORM GEAR OF THE LIMITORQUE MOTOR OPERATOR TO BE SUBJECTED TO ABNORMAL FORCES LEADING TO EVENTUAL FAILURE OF THE GEAR. THIS IS THE FIRST KNOWN FAILURE OF THIS TYPE AT THIS FACILITY. THE MOTOR OPERATOR WAS REBUILT, TESTED SATISFACTORILY, AND THE VALVE RETURNED TO SERVICE.



FORM 16 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
293 1983 052 0 8311010105 186803 9-23-1983

DOCKET:293 PILGRIM 1 TYPE:BWR  
REGION: 1 NSSS:GE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: BOSTON EDISON CO.  
SYMBOL: BEC

ABSTRACT

DURING STEADY STATE OPERATION ON 9/23/83, WHILE PERFORMING A MONTHLY HPCI SURVEILLANCE, THE HPCI VALVE MO 2301-3 FAILED TO OPEN. THE HPCI SYSTEM WAS DECLARED INOPERABLE PER TECH SPEC SECTION 3.5.C. OPERABILITY OF REDUNDANT SAFETY SYSTEMS (ECCS) WAS PROVEN PER TECH SPEC 4.5.C.2 AND A 3 DAY LCO WAS ENTERED AS REQUIRED BY THE IGSCC ORDER DATED 8/26/83. CAUSE OF THE VALVE NOT OPENING WAS DETERMINED TO BE A GROUNDED ARMATURE IN THE MOTOR OF THE VALVE OPERATOR. THE MOTOR AND CIRCUIT BREAKER WERE REPLACED. THE FAILED MOTOR WAS MANUFACTURED BY THE RELIANCE ELECTRIC COMPANY AND WAS ATTACHED TO A LIMITORQUE CORPORATION MOTOR OPERATOR. THE HPCI SYSTEM WAS SUCCESSFULLY TESTED AND DECLARED OPERABLE ON 9/25/83.

FORM 17 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
293 1983 053 0 8311180112 186914 10-7-1983

DOCKET:293 PILGRIM 1 TYPE:BWR  
REGION: 1 NSSS:GE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: BOSTON EDISON CO.  
SYMBOL: BEC

ABSTRACT

ON 10/7/83 WHILE SHUTTING DOWN THE REACTOR FOR A PLANNED OUTAGE, A REACTOR SCRAM OCCURRED CAUSING A GROUP 1 CONTAINMENT ISOLATION (MSIV AND MAIN STEAM LINE DRAINS). AFTER THE ISOLATION SIGNAL CLEARED, THE MO-220-2 COULD NOT BE OPENED. THE PLANT WAS PLACED IN COLD SHUTDOWN, AS PREVIOUSLY PLANNED, WITHIN 24 HOURS THUS SATISFYING THE REQUIREMENTS OF TECH SPEC 3.7.D.3. CAUSE OF THIS EVENT WAS DETERMINED TO BE GROUNDED ARMATURE IN THE MOTOR OPERATOR. THE MOTOR WAS REPLACED AND THE VALVE WAS RETURNED TO SERVICE ON 10/8/83. THE FAILED MOTOR WAS MANUFACTURED BY PEERLESS ELEC. CO. AND WAS MOUNTED ON A LIMITORQUE SMB-000 MOTOR OPERATOR. A SEARCH OF RECORDS INDICATES NO PREVIOUS OCCURRENCES OF A SIMILAR NATURE FOR THIS COMPONENT.

FORM 18 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
296 1983 035 0 8307260552 184021 6-20-1983

COMMENTS

STEP 1 COMPONENT MSC - ARMATURE WINDING

DOCKET:296 BROWNS FERRY 3 TYPE:BWR  
REGION: 2 NSSS:GE  
ARCHITECTURAL ENGINEER: TVAX  
FACILITY OPERATOR: TENNESSEE VALLEY AUTHORITY  
SYMBOL: TVA

WATCH-LIST CODES FOR THIS LER ARE:

## ABSTRACT

WITH UNIT 3 OPERATING NORMALLY, WHILE PERFORMING SI 4.7.D.1.B-1, PRIMARY CONTAINMENT ISOLATION VALVES OPERABILITY TEST, VALVE FCV-69-2 WOULD NOT FULLY CLOSE (TECH SPEC 3.7.D.1). VALVE FCV-69-1 WAS CLOSED PER TECH SPEC 3.7.D.2. FCV-69-2 WAS INOPERABLE FOR 4 DAYS AND 13.5 HOURS. TECH SPEC 3.7.D.2 ALLOWS CONTINUOUS OPERATION WITH REDUNDANT VALVE FCV-69-1 CLOSED. VALVE FCV-69-2 WOULD NOT CLOSE DUE TO THE VALVE OPERATOR MOTOR BREAKER TRIPPING. BREAKER TRIPPED DUE TO ARMATURE WINDING FAILURE IN LIMITORQUE MOTOR (PORTER S/N EZ28903, DK56H FRAME. 1.8 HP, 250V DC, 5 MIN. DUTY, 7.5 AMPS, 1900 RPM). MOTOR WAS REPLACED. THIS IS CONSIDERED A RANDOM FAILURE AND NO RECURRENCE CONTROL IS REQUIRED.

FORM 19 LER SCSS DATA 12-11-84  
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 DOCKET YEAR LFR NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 302 1983 009 0 8304010305 183041 2-22-1983

## COMMENTS

NINETEENTH EVENT UNDER T.S.3.7.1.2

DOCKET:302 CRYSTAL RIVER 3 TYPE:PWR  
 REGION: 2 NSSS:BW  
 ARCHITECTURAL ENGINEER: GLBT  
 FACILITY OPERATOR: FLORIDA POWER CORPORATION  
 SYMBOL: FPC

## ABSTRACT

AT 1400 WHILE PERFORMING SURVEILLANCE PROCEDURE SP-349, EMERGENCY FEEDWATER PUMP OPERABILITY, AUXILIARY STEAM VALVE ASV-5 FAILED TO OPEN, CAUSING EMERGENCY FEEDWATER PUMP EFP-2 TO BE INOPERABLE. THIS EVENT IS REPORTABLE UNDER TECH SPEC 3.7.1.2(B). REDUNDANCY WAS PROVIDED BY THE MOTOR-DRIVEN EMERGENCY FEEDWATER PUMP (EFP-1). MAINTENANCE WAS INITIATED AND OPERABILITY RESTORED AT 2045. THIS IS THE FIRST OCCURRENCE FOR ASV-5 AND THE NINETEENTH EVENT REPORTED UNDER TECH SPEC 3.7.1.2. EMERGENCY FEEDWATER PUMP EFP-2 WAS DECLARED INOPERABLE DUE TO FAILURE OF ASV-5. A FAILED TORQUE SWITCH CAUSED THE ASV-5 MOTOR OPERATOR TO BURN UP. THE VALVE OPERATOR AND TORQUE SWITCH WERE REPLACED. ASV-5 WAS STROKED AND TESTED SATISFACTORILY. AN ENGINEERING INVESTIGATION IS IN PROGRESS TO DETERMINE WHY THERE WAS NOT ADEQUATE THERMAL OVERLOAD PROTECTION.

FORM 20 LER SCSS DATA 12-11-84  
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 DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 302 1983 037 0 8310140233 185936 9- 7-1983

DOCKET:302 CRYSTAL RIVER 3 TYPE:PWR  
 REGION: 2 NSSS:BW  
 ARCHITECTURAL ENGINEER: GLBT  
 FACILITY OPERATOR: FLORIDA POWER CORPORATION  
 SYMBOL: FPC

## REFERENCE LERS:

1 302/81-016

## ABSTRACT

AT 0600 ON SEPTEMBER 7, 1983, DURING PERFORMANCE OF SURVEILLANCE PROCEDURE SP-340, ECCS PUMP OPERABILITY, DHV-110, "A" DECAY HEAT PUMP DISCHARGE THROTTLE VALVE, BREAKER TRIPPED WHILE CYCLING THE VALVE FROM OPEN TO CLOSED (TECH SPEC 3.5.2). THE REQUIRED ACTION OF

SPECIFICATION 3.5.2 WAS ALREADY BEING PERFORMED. THIS WAS THE SECOND TIME THAT THE BREAKER FOR DHV-110 TRIPPED. THIS EVENT IS BEING REPORTED AS SUGGESTED BY REGULATORY GUIDE 1.16 BECAUSE TECH SPEC 3.5.2 "ACTION STATEMENT" WAS IN EFFECT PRIOR TO THIS OCCURRENCE. THE CAUSE OF THE BREAKER TRIP IS UNKNOWN. THE BREAKER WAS MANUALLY RESET WITHIN APPROXIMATELY THREE MINUTES AND DHV-110 WAS CYCLED SUCCESSFULLY. ON SEPTEMBER 22, 1983, THE BREAKER FOR DHV-110 WAS REPLACED IN ACCORDANCE WITH PREVENTATIVE MAINTENANCE PRACTICES.

FORM 21 LER SCSS DATA 12-11-84  
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 DOCKET YEAR LFR NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 302 1983 042 0 8311020252 186998 9-27-1983

DOCKET:302 CRYSTAL RIVER 3 TYPE:PWR  
 REGION: 2 NSSS:BW  
 ARCHITECTURAL ENGINEER: GLBT  
 FACILITY OPERATOR: FLORIDA POWER CORPORATION  
 SYMBOL: FPC

ABSTRACT

AT 1155 ON SEPTEMBER 27, 1983, DURING SURVEILLANCE TESTING, THE MOTOR OPERATOR FOR ASV-5 (STEAM SUPPLY VALVE FOR EMERGENCY FEEDWATER PUMP 2, EFP-2) BURNED UP, REPORTABLE UNDER TECH SPEC 3.7.1.2. REDUNDANCY WAS AVAILABLE, IF NEEDED, AS EFP-1 WAS OPERABLE. THIS IS THE SECOND FAILURE OF THE ASV-5 MOTOR OPERATOR AND THE TWENTY-SECOND REPORT UNDER TECH SPEC 3.7.1.2. THE MOTOR OPERATOR FOR ASV-5 BURNED UP DUE TO A FAULTY TORQUE SWITCH. THE MOTOR AND TORQUE SWITCH WERE REPLACED. THE VALVE WAS FUNCTIONALLY TESTED SATISFACTORILY ON SEPTEMBER 28, 1983, AT 0140. FURTHER INVESTIGATIONS ARE UNDERWAY TO DETERMINE THE CAUSE OF THE TORQUE SWITCH FAILURE.

FORM 22 LER SCSS DATA 12-11-84  
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 DOCKET YEAR LFR NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 302 1983 057 0 8401030236 188324 11-22-1983

COMMENTS

TWENTY SIXTH REPORT

DOCKET:302 CRYSTAL RIVER 3 TYPE:PWR  
 REGION: 2 NSSS:BW  
 ARCHITECTURAL ENGINEER: GLBT  
 FACILITY OPERATOR: FLORIDA POWER CORPORATION  
 SYMBOL: FPC

ABSTRACT

AT 1200 ON NOV. 22, 1983, WHILE PERFORMING SURVEILLANCE PROCEDURE SP-349B, EMERGENCY FEEDWATER SYSTEM OPERABILITY DEMONSTRATION, THE MOTOR ACTUATOR FOR THE TURBINE DRIVEN EMERGENCY FEEDWATER PUMP (EFP-2) STEAM ADMISSION VALVE (ASV-5) WAS DISCOVERED INOPERABLE. THE ACTUATOR WAS REPAIRED, TESTED, AND RETURNED TO SERVICE AT 1830 ON NOV. 22, 1983. THIS IS THE FIRST OCCURRENCE OF THIS TYPE AND THE TWENTY-SIXTH REPORT UNDER TECH SPEC 3.7.1.2. THE FAILURE OF THE MOTOR ACTUATOR ON ASV-5 WAS DUE TO A CONTACT FAILURE. THE ACTUATOR WAS REPAIRED, TESTED, AND RETURNED TO SERVICE. AN ENGINEERING EVALUATION TO DETERMINE THE CAUSE OF THE CONTACT FAILURE IS UNDERWAY.

FORM 23 LER SCSS DATA 12-11-84  
 \*\*\*\*\*  
 DOCKET YEAR LFR NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 305 1983 015 0 8307110277 184023 6-6-1983



COMMENTS

STEP 2: MSC = CAM

DOCKET:305 KEWAUNEE TYPE:PWR  
 REGION: 3 NSSS:WE  
 ARCHITECTURAL ENGINEER: FLPR  
 FACILITY OPERATOR: WISCONSIN PUBLIC SERVICE CORP.  
 SYMBOL: WPS

ABSTRACT

DURING FULL POWER OPERATION, AFTER ADJUSTING THE PACKING ON MS-100B ON MAIN STEAM HEADER 1B TO THE TDAFW PUMP, A VALVE TIMING TEST WAS ATTEMPTED. THE VALVE CYCLED CLOSED BUT FAILED TO OPEN UNTIL IT WAS MANUALLY CYCLED OFF ITS SEAT. THIS REQUIRED THE VALVE TO BE TAKEN OUT OF SERVICE TO PERFORM CORRECTIVE MAINTENANCE. THIS PLACED THE PLANT IN AN LCO PER TECH SPEC 3.4.B AND IS REPORTABLE PER TECH SPEC 6.9.2.B(2). STEAM WAS AVAILABLE TO THE TDAFW PUMP VIA MAIN STEAM HEADER 1A. FAILURE OF THE VALVE TO OPEN ELECTRICALLY WAS DUE TO A FAULTY TORQUE SWITCH AND THE TRIPPER CAM BEING OUT OF ADJUSTMENT. THE VALVE OPERATOR WAS REBUILT, THE TRIPPER CAM RESET, AND THE TORQUE SWITCH REPLACED. THE VALVE OPERATOR WAS THEN REINSTALLED, TESTED, AND RETURNED TO OPERATION WITHIN TECH SPEC TIME LIMITS. NO FURTHER ACTION IS REQUIRED.

FORM 24 LER SCSS DATA 12-11-84  
 \*\*\*\*\*  
 DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 305 1983 033 0 8401120378 188402 12- 5-1983

COMMENTS

STEP 1: COMPONENT CODE MSC - FINGER

DOCKET:305 KEWAUNEE TYPE:PWR  
 REGION: 3 NSSS:WE  
 ARCHITECTURAL ENGINEER: FLPR  
 FACILITY OPERATOR: WISCONSIN PUBLIC SERVICE CORP.  
 SYMBOL: WPS

ABSTRACT

DURING FULL POWER OPERATION, THE MOTOR OPERATED ISOLATION VALVE SI-2A IN THE BORIC ACID SUCTION LINE TO THE SI PUMPS FAILED TO OPEN AS REQUIRED DURING ITS MONTHLY SURVEILLANCE TEST. HOWEVER, IT COULD BE OPENED MANUALLY AND CYCLED CLOSED FROM THE CONTROL ROOM. THIS PLACED THE PLANT IN AN LCO PER TECH SPEC 3.3.A.2.D WHICH ALLOWS A VALVE REQUIRED TO FUNCTION DURING ACCIDENT CONDITIONS TO BE OUT OF SERVICE FOR 24 HOURS AND IS REPORTABLE PER TECH SPEC 6.9.2.B.(2). THE REDUNDANT VALVE, SI-2B, WAS DEMONSTRATED OPERABLE. FAILURE OF THE VALVE TO OPEN WAS DUE TO A BROKEN FINGER ON THE OPEN CONTACT IN THE AUXILIARY CONTACT BLOCK. THE AUXILIARY CONTACT BLOCK WAS REPLACED AND THE VALVE TESTED SATISFACTORILY. A REVIEW OF PAST WORK REQUESTS FOR SI-2A AND SI-2B SHOWED THAT THIS IS THE FIRST TIME A CONTACT HAS BROKEN. SI-2A IS CYCLED MONTHLY AND RECEIVES A BREAKER INSPECTION ANNUALLY, HENCE, NO FURTHER ACTION IS REQUIRED.

FORM 25 LER SCSS DATA 12-11-84  
 \*\*\*\*\*  
 DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 309 1983 017 0 8306170430 183248 5- 9-1983

DOCKET:309 MAINE YANKEE TYPE:PWR  
 REGION: 1 NSSS:CE  
 ARCHITECTURAL ENGINEER: SWXX  
 FACILITY OPERATOR: MAINE YANKEE ATOMIC POWER CO.

## ABSTRACT

ON MAY 9, 1983, DURING STEADY-STATE FULL POWER OPERATION, AND AGAIN ON MAY 17 AND 18, PCC-M-43, A COOLING WATER OUTLET STOP VALVE TO THE RESIDUAL HEAT REMOVAL (RHR) HEAT EXCHANGER FAILED TO OPEN FROM THE MAIN CONTROL BOARD (MCB) DURING QUARTERLY VALVE TESTS. THE VALVE IS NORMALLY CLOSED AND OPENS ON A RECIRCULATION ACTUATION SIGNAL (RAS) TO ALLOW PRIMARY COMPONENT COOLING FLOW THROUGH E-3A, THE A TRAIN (SUBSYSTEM) RHR HEAT EXCHANGER. WITHIN 20 MINUTES THE VALVE WAS MANUALLY OPENED ONE QUARTER TURN AND SUCCESSFULLY OPERATED FROM THE MCB. ON MAY 17, 1983, PCC-M-43 AGAIN FAILED TO OPEN REMOTELY UNTIL IT WAS MANUALLY AIDED. ECCS TRAIN A WAS AGAIN DETERMINED TO BE INOPERABLE. ON MAY 18, 1983, PCC-M-43 AGAIN FAILED TO OPEN REMOTELY FROM THE MCB. MISADJUSTED VALVE MOTOR OPERATOR TORQUE SETTINGS WERE DETERMINED TO BE THE CAUSE OF THE REPEATED VALVE FAILURES. DURING REPAIR OF PCC-M-43, IT WAS FOUND THAT THE CLOSING TORQUE SETTING WAS SIGNIFICANTLY GREATER THAN THE OPENING TORQUE SETTING. WHEN THE VALVE CLOSED, THE WEDGE SEATED SUCH THAT AFTER SEVERAL HOURS OF INACTIVITY, THE OPENING TORQUE SETTING WAS NOT ENOUGH TO UNSEAT THE VALVE.

FORM 26 LER SCSS DATA 12-11-84  
 \*\*\*\*\*  
 DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 312 1983 037 1 8401160240 188330 10-8-1983

DOCKET:312 RANCHO SECO TYPE:PWR  
 REGION: 5 NSSS:BW  
 ARCHITECTURAL ENGINEER: BECH  
 FACILITY OPERATOR: SACRAMENTO MUNICIPAL UTIL. DISTRICT  
 SYMBOL: SMU

## REFERENCE LERS:

1 312/76-002 2 312/76-015

## ABSTRACT

ON OCTOBER 8, 1983 WHILE PERFORMING SURVEILLANCE TEST SP 203.06A, VALVE HV-26105 MOTOR OPERATOR TORQUED OUT AND WOULD NOT OPEN THE VALVE. THIS VALVE IS THE A DECAY HEAT TRAIN EMERGENCY SUMP VALVE. THE B DECAY HEAT TRAIN VALVE REMAINED OPERABLE. THE DISTRICT HAS INVESTIGATED THIS EVENT AND HAS CONCLUDED THAT NO PROBLEMS EXIST WITH THE VALVE ITSELF. THE MOST LIKELY CAUSE IS A COMBINATION OF A LOW TORQUE SWITCH SETTING, BYPASS SWITCH SETTING, AND A POSSIBLE SEAL FORMED BETWEEN THE DISC AND ITS SEAT DUE TO CONTACT WITH BORATED WATER ON ONE SIDE OF THE VALVE. THE SWITCHES WERE READJUSTED AND THE VALVE WILL BE STROKED MONTHLY UNTIL ITS NEXT REGULARLY SCHEDULED QUARTERLY SURVEILLANCE.

FORM 27 LER SCSS DATA 12-11-84  
 \*\*\*\*\*  
 DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
 313 1983 015 0 8307150271 184102 6-16-1983

DOCKET:313 ARKANSAS NUCLEAR 1 TYPE:PWR  
 REGION: 4 NSSS:BW  
 ARCHITECTURAL ENGINEER: BECH  
 FACILITY OPERATOR: ARKANSAS POWER AND LIGHT CO.  
 SYMBOL: APL

## REFERENCE LERS:

1 313/79-021 2 313/80-013 3 313/80-033 4 313/81-011  
 5 313/82-002 6 313/79-010 7 313/79-021 8 313/80-001  
 9 313/80-002 10 313/80-003 11 313/80-033 12 313/81-009



ABSTRACT

ON 6/16/83, WHILE IN HOT SHUTDOWN AFTER A REACTOR TRIP, HIGH PRESSURE INJECTION (HPI) CONTROL VALVE CV-1219 FAILED TO OPEN ON DEMAND FROM THE CONTROL ROOM. THE VALVE WAS BEING OPENED TO ALLOW ADDITIONAL MAKEUP FLOW FOR INVENTORY CONTROL FOLLOWING THE REACTOR TRIP. CV-1219 IS THE BLOCK VALVE FOR THE HPI TO THE COLD LEG CONTAINING REACTOR COOLANT PUMP F-320. REDUNDANT HPI VALVES CV-1220, CV-1227, AND CV-1228 WERE AVAILABLE AND OPERABLE. THIS OCCURRENCE IS REPORTABLE PER TECH SPEC 6.12.3.2.B. MAKEUP SYSTEM LIMITORQUE VALVE OPERATOR PROBLEMS WERE REPORTED IN LER'S (50-313) 79-021, 80-013, 80-033, 81-011 AND 82-002. TORQUE SWITCH PROBLEMS OF LIMITORQUE OPERATORS WERE REPORTED IN LER'S (50-313) 79-010, 79-021, 80-001, 80-002, 80-003, 80-033, 81-009, 81-011 AND 82-002. IMMEDIATE ACTIONS WERE TO USE A REDUNDANT VALVE FOR HPI AND TO MANUALLY OPEN CV-1219. THE ROOT CAUSE COULD NOT BE DETERMINED SINCE THE TRUE AS-FAILED CONDITIONS WERE ALTERED BY IMMEDIATE ACTIONS. SUBSEQUENT VALVE TESTING COULD NOT DUPLICATE THE FAILURE. TROUBLESHOOTING FOUND THE CONTACTS ON THE TORQUE SWITCH TO BE SOMEWHAT CORRODED, BUT INVESTIGATION OF THE CIRCUIT INDICATED THAT THIS SHOULD NOT HAVE PREVENTED CV-1219 FROM OPENING. THE OPERATOR AND THE SWITCHES WERE VISUALLY INSPECTED. SWITCH SETTINGS WERE CHECKED. NO PROBLEMS WERE FOUND. CV-1219 WAS TESTED SATISFACTORILY AND RETURNED TO SERVICE. THE OPERATOR FOR CV-1219 IS A TYPE SMB-00 MANUFACTURED BY LIMITORQUE.

FORM 28 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
317 1983 002 2 8307010076 185653 1-6-1983

DOCKET:317 CALVERT CLIFFS 1 TYPE:PWR  
REGION: 1 NSSS:CE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: BALTIMORE GAS & ELECTRIC CO.  
SYMBOL: BGE

ABSTRACT

AT 2335, IT WAS DISCOVERED THAT CONTAINMENT SUMP VALVE MOV-5462 WOULD NOT OPERATE (TECH SPEC 3.6.4.1). THE REDUNDANT ISOLATION VALVE MOV-5463 WAS SHUT AND DEENERGIZED AT 0321. AT 0430, THE CONTAINMENT SUMP LEVEL ALARM WAS DECLARED INOPERABLE DUE TO THE INABILITY TO DRAIN (TECH SPEC 3.4.6.1). THE CONTAINMENT SUMP VALVES WERE RETURNED TO SERVICE AT 1750 ON 1/7/83. THE CONTAINMENT PARTICULATE AND GASEOUS RADIOACTIVE MONITORING SYSTEMS REMAINED OPERABLE DURING THIS EVENT. SIMILAR EVENTS: NONE. THE FAILED OPERATOR WAS DISASSEMBLED. THE WORM GEAR WAS FOUND TO BE EXCESSIVELY WORN AND WAS REPLACED. THIS OPERATOR HAS BEEN IN SERVICE FOR SEVERAL YEARS. THIS IS A NORMAL END OF LIFE FAILURE. TO PREVENT ANOTHER WORM GEAR FAILURE THE FREQUENCY OF PREVENTIVE MAINTENANCE HAS BEEN INCREASED TO EVERY REFUELING OUTAGE.

FORM 29 LER SCSS DATA 12-11-84  
\*\*\*\*\*  
DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
321 1983 023 1 8310030304 186710 2-24-1983

COMMENTS

FIRST AND SECOND EVENTS OCCURRED ON 2/24 AND 2/25, RESPECTIVELY.

DOCKET:321 HATCH 1 TYPE:BWR  
REGION: 2 NSSS:GE  
ARCHITECTURAL ENGINEER: BESS  
FACILITY OPERATOR: GEORGIA POWER CO.

## ABSTRACT

ON 2/24/83, REACTOR WATER CLEANUP SYSTEM (RWCS) INBOARD ISOLATION VALVE (G31-F001) FAILED TO CLOSE AND ON 2/25/83, WHEN ATTEMPTING TO RETURN RWCU TO OPERABLE STATUS, THE RWCU OUTBOARD ISOLATION VALVE (G31-F004) FAILED TO OPEN. PRIOR TO THE IMPLEMENTATION OF THE SCHEDULED CORRECTIVE ACTION FOR THE FIRST EVENT, THE G31-F001 FAILED TO CLOSE IN TECH SPEC TABLE 3.7-1 TIME LIMIT. THESE EVENTS ARE CONTRARY TO THE REQUIREMENTS OF TECH SPECS SECTION 3.7.D.1. AN INVESTIGATION REVEALED THAT G31-F001 FAILED TO CLOSE DUE TO LIMIT SWITCH LS-1 BEING OUT OF ADJUSTMENT, AND THAT G31-F004 FAILED DUE TO A BURNED UP MOTOR. THE OPEN INDICATION LIMIT SWITCH WAS PARALLELED WITH A TORQUE SWITCH TO PERMIT G31-F001 TO OPERATE AND THE G31-F004'S VALVE MOTOR WAS REPLACED.

FORM	30	LER SCSS DATA				12-11-84
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DOCKET	YEAR	LER NUMBER	REVISION	DCS NUMBER	NSIC	EVENT DATE
321	1983	041	0	8305110434	182817	3-29-1983

DOCKET:321 HATCH 1 TYPE:BWR  
 REGION: 2 NSSS:GE  
 ARCHITECTURAL ENGINEER: BESS  
 FACILITY OPERATOR: GEORGIA POWER CO.  
 SYMBOL: GPC

REFERENCE LERS:  
 1 321/83-023

## ABSTRACT

FOLLOWING A GROUP 5 ISOLATION, PERSONNEL OPENING RWCU INBOARD AND OUTBOARD RWCU ISOLATION VALVES IN ORDER TO PLACE RWCU IN SERVICE FOUND THAT THE OUTBOARD RWCU ISOLATION VALVE, G31-F004, FAILED TO OPEN. PERSONNEL NOT ABLE TO MEET TECH SPECS SECTION 3.7.D.1 REQUIREMENTS PLACED PLANT INTO A LCO WITH THE RWCU INBOARD ISOLATION VALVE ISOLATED AS REQUIRED BY SECTION 3.7.D.2. THIS IS A REPETITIVE EVENT AS LAST REPORTED ON LFR 50-321/1983-023. THE CAUSE OF THIS EVENT WAS ATTRIBUTED TO COMPONENT FAILURE. AN INVESTIGATION REVEALED THAT THE D-C MOTOR ON VALVE OPERATOR FOR G31-F004 HAD OVERHEATED AND FAILED. THE FAILED D-C DRIVE MOTOR WAS REPLACED WITH AN ENVIRONMENTALLY QUALIFIED 79-01B D-C DRIVE MOTOR, PER DCR #31-98. THE G31-F004 WAS FUNCTIONALLY TESTED AND RETURNED TO SERVICE.

FORM	31	LER SCSS DATA				12-11-84
*****						
DOCKET	YEAR	LER NUMBER	REVISION	DCS NUMBER	NSIC	EVENT DATE
324	1983	088	0	8311010058	186857	9-27-1983

DOCKET:324 BRUNSWICK 2 TYPE:BWR  
 REGION: 2 NSSS:GE  
 ARCHITECTURAL ENGINEER: UECX  
 FACILITY OPERATOR: CAROLINA POWER & LIGHT CO.  
 SYMBOL: CPL

## ABSTRACT

DURING UNIT POWER OPERATION, IT WAS DISCOVERED THAT THE B RESIDUAL HEAT REMOVAL (RHR) SUBSYSTEM HEAT EXCHANGER OUTLET ISOLATION VALVE 2-E11-F003B WOULD NOT OPEN USING THE VALVE MOTOR OPERATOR. THE VALVE WAS DECLARED INOPERABLE PER TECH SPECS AND WAS THEN MANUALLY OPENED. THE AUXILIARY CONTACT OF THE VALVE MOTOR CLOSING CIRCUITRY CONTACTOR 42/C WAS MECHANICALLY STUCK OPEN, PREVENTING THE VALVE MOTOR OPENING CIRCUITRY CONTACTOR 42/O FROM ENGAGING TO OPEN THE VALVE. THE

AUXILIARY CONTACT, PART NO. CR205X, WAS REPLACED AND F003B WAS SATISFACTORILY CYCLED USING THE VALVE MOTOR. INVESTIGATIVE EFFORTS WERE INCONCLUSIVE IN DETERMINING THE CAUSE OF THIS EVENT; THEREFORE, NO FURTHER ACTION IS PLANNED.

FORM 32 LER SCSS DATA 12-11-84  
\*\*\*\*\*  
DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
334 1983 011 0 8305230527 183339 4-9-1983

DOCKET:334 BEAVER VALLEY 1 TYPE:PWR  
REGION: 1 NSSS:WE  
ARCHITECTURAL ENGINEER: SWXX  
FACILITY OPERATOR: DUQUESNE LIGHT CO.  
SYMBOL: DUQ

ABSTRACT

ON 4/9/83, WHILE PERFORMING THE SAFEGUARDS PROTECTION SYSTEM TRAIN A TEST, THE MOTOR THERMAL OVERLOAD RELAY FOR THE CONTAINMENT SUMP TO 1A LHSI PUMP SUCTION VALVE (MOV-SI-860A) WAS FOUND TRIPPED, DISABLING THE MOTOR. AFTER RESETTNG THE RELAY, THE VALVE WAS STROKED SATISFACTORILY. ELECTRICAL MAINTENANCE TESTING OF THE VALVE MOTOR OPERATOR AND OVERLOAD HEATER RELAY FOLLOWING THE INCIDENT ON 4/9/83 YIELDED SATISFACTORY RESULTS AS DID SUBSEQUENT STROKE TESTS OF THE VALVE. NO CAUSE FOR THE RELAY ACTUATION WAS DETERMINED THROUGH THESE TESTS. THE STATION WILL RE-EVALUATE THIS INCIDENT IN THE EVENT OF SIMILAR FUTURE PROBLEMS WITH THIS VALVE.

FORM 33 LER SCSS DATA 12-11-84  
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DOCKET YEAR LFR NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
334 1983 030 1 8312130317 187809 10-3-1983

DOCKET:334 BEAVER VALLEY 1 TYPE:PWR  
REGION: 1 NSSS:WE  
ARCHITECTURAL ENGINEER: SWXX  
FACILITY OPERATOR: DUQUESNE LIGHT CO.  
SYMBOL: DUQ

ABSTRACT

AT 0045 HOURS, CHARGING HEADER ISOLATION VALVE (MOV-CH-289) FAILED TO RE-OPEN AFTER BEING STROKED CLOSED FOR OST 1.11.10. NORMAL CHARGING AND LETDOWN WERE SECURED AND EXCESS LETDOWN WAS PLACED INTO SERVICE. AT 0310 HOURS (MOV-CH-310) WAS CLOSED AND DE-ENERGIZED TO SECURE THE EFFECTED PENETRATION. AT 0410 HOURS, THE VALVE WAS RETURNED TO SERVICE AS PER TECH SPEC 3.1.2.2. THE REDUNDANT BORON INJECTION FLOW PATH FROM THE RWST REMAINED OPERABLE. THE MECHANICAL INTERLOCK (WHICH PREVENTS SIMULTANEOUS ENERGIZATION OF BOTH FORWARD AND REVERSE COILS) ON THE VALVE'S LINESTARTER FAILED DUE TO BINDING. THIS PREVENTED FORWARD CONTACTOR TRAVEL CAUSING THE COIL TO OVERHEAT. THE VALVE WAS RETURNED TO SERVICE AFTER THE LINKAGE WAS OILED AND THE COIL WAS REPLACED. A PROCEDURE IS BEING WRITTEN TO INSPECT LINESTARTERS.

FORM 34 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
336 1983 017 0 8305270239 183262 4-18-1983

DOCKET:336 MILI STONE 2 TYPE:PWR  
REGION: 1 NSSS:CE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: NORTHEAST NUCLEAR ENERGY CO.  
SYMBOL: NNE



WATCH-LIST CODES FOR THIS LER ARE:  
914 INADEQUACIES OF INFORMATION

ABSTRACT

DURING ROUTINE POWER OPERATION, 2-SI-616 WAS TAKEN OUT OF SERVICE TO PERFORM MAINTENANCE ON THE VALVE. THE UNIT OPERATED UNDER TECH SPECS ACTION STATEMENT 3.5.2.A FOR FOUR HOURS AND FIFTEEN MINUTES. SIMILAR LER'S: NONE. INSPECTION OF THE VALVE OPERATION SHOWED CRACKING IN THE OPERATOR CASING. THE CAUSE IS CURRENTLY UNDER INVESTIGATION BY LIMITORQUE AND WILL BE REPAIRED WHEN PARTS ARE AVAILABLE. THE VALVE WAS PLACED IN ITS THROTTLED POSITION AND RETURNED TO SERVICE.

FORM 35 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
344 1983 022 0 8402130340 188780 1-3-1984

COMMENTS

STEP 4: COMPONENT CODE XVZ - TURBINE TRIP AND THROTTLE VALVE

DOCKET:344 TROJAN TYPE:PWR  
REGION: 5 NSSS:WE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: PORTLAND GENERAL ELECTRIC CO.  
SYMBOL: PGC

ABSTRACT

FOLLOWING MAINTENANCE AN OPERABILITY TEST WAS RUN ON THE 'A' TRAIN, STEAM-DRIVEN AUXILIARY FEEDWATER PUMP. THE PUMP FAILED TO START DUE TO AN INOPERABLE TRIP AND THROTTLE VALVE. SUBSEQUENT INVESTIGATION INDICATED THAT THE VALVE WAS NOT CAPABLE OF BEING OPERATED REMOTELY. THIS SITUATION EXISTED SINCE THE PUMP WAS PREVIOUSLY SHUT DOWN ON NOVEMBER 23, 1983. THIS OCCURRENCE WAS DUE TO COMPONENT FAILURE CAUSED BY EXCESSIVE GREASE BUILDUP ON THE TORQUE SWITCH FOR THE TURBINE TRIP AND THROTTLE VALVE MO-3071 WHICH ALLOWED THE PROTECTIVE OVERLOAD CONTACTS TO OPEN FOLLOWING THE VALVE CLOSURE. IMMEDIATE CORRECTIVE ACTION WAS TO CLEAN AND TEST THE VALVE. FOLLOWUP CORRECTIVE ACTION WILL INSPECT THE VALVE EVERY THREE YEARS AND IMPLEMENT A DESIGN CHANGE TO ALARM IN CONTROL ROOM THE TRIPPED THERMAL OVERLOAD CONTACTS.

FORM 36 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
361 1983 038 0 8305270243 183271 4-26-1983

DOCKET:361 SAN ONOFRE 2 TYPE:PWR  
REGION: 5 NSSS:CE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: SOUTHERN CALIFORNIA EDISON CO.  
SYMBOL: SCE

ABSTRACT

AT APPROXIMATELY 1830 WITH THE UNIT IN MODE 4 AND PREPARATIONS IN PROGRESS FOR MODE 3 ENTRY, SHUTDOWN COOLING SYSTEM (SDCS) HEAT EXCHANGER ISOLATION VALVES 2HV2150, 2HV2152 AND 2HV2153 COULD NOT BE REMOTELY OPENED FROM THE CONTROL ROOM. SINCE THESE VALVES ARE REQUIRED TO BE REMOTELY OPERATED FROM THE CONTROL ROOM UPON INITIATION OF SHUTDOWN COOLING TO AVOID PERSONNEL RADIATION EXPOSURE FROM LOCAL OPERATION, A MODE 3 RESTRAINT WAS IMPOSED ON THE UNIT. THE INABILITY OF THE VALVES TO REMOTELY OPEN WAS ATTRIBUTED TO INCORRECT OPEN SEQUENCE TORQUE AND LIMIT SWITCH SETTINGS. THE INCORRECT SETTINGS

CAUSED THE MOTOR ON THE VALVES TO STOP BEFORE THE VALVES HAD COME OFF THEIR SEATS. THE LIMIT AND OPEN SEQUENCE TORQUE SWITCH SETTINGS WERE ADJUSTED AND THE VALVES SUCCESSFULLY STROKE TESTED FROM THE CONTROL ROOM ON APRIL 26, 1983. THESE VALVES WILL BE INCLUDED IN A CURRENT TASK FORCE INVESTIGATION ADDRESSING PROBLEMS ASSOCIATED WITH THEIR MAINTENANCE AND OPERATION. A CERTIFICATION PROGRAM FOR PERSONNEL WORKING ON SUCH LIMIT AND POSITION SWITCHES HAS ALSO BEEN ESTABLISHED. THE SDCS VALVES WILL BE REPLACED DURING THE FIRST REFUELING OUTAGE.

FORM 37 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
362 1983 018 1 8407190397 190970 1-24-1983

DOCKET:362 SAN ONOFRE 3 TYPE:PWR  
REGION: 5 NSSS:CE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: SOUTHERN CALIFORNIA EDISON CO.  
SYMBOL: SCE

#### ABSTRACT

WHILE IN MODE 3 AT 1200, STEAM DRIVEN AFW PUMP 3P-140 FAILED TO RUN AT RATED SPEED DURING ISI TESTING AND WAS DECLARED INOPERABLE. ACTION STATEMENT 'A' OF LCO 3.7.1.2 WAS INVOKED AND COOLDOWN TO MODE 4 WAS COMMENCED AT 1200 ON 1/27/83, SINCE THE PUMP COULD NOT BE RETURNED TO OPERABLE STATUS WITHIN 72 HRS. ANY ONE OF THE TWO REMAINING AFW OPERABLE PUMPS (EACH ABLE TO PROVIDE 100% OF REQUIRED CAPACITY) WOULD HAVE PERFORMED THE NECESSARY DECAY HEAT REMOVAL FUNCTION. PUMP INOPERABILITY WAS ATTRIBUTABLE TO VALVE BINDING WHICH DAMAGED THE MOTOR ON THE LIMITORQUEF VALVE OPERATOR FOR STOP VALVE 3HV-4716. THE MOTOR WAS REPLACED AND THE VALVE WAS REPAIRED. THE PUMP SUCCESSFULLY PASSED ISI TESTING AT 1646 ON 1/27/83 AND MODE 4 COOLDOWN WAS HALTED.

FORM 38 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
362 1983 058 0 8309260319 185763 8-12-1983

DOCKET:362 SAN ONOFRE 3 TYPE:PWR  
REGION: 5 NSSS:CE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: SOUTHERN CALIFORNIA EDISON CO.  
SYMBOL: SCE

WATCH-LIST CODES FOR THIS LER ARE:  
914 INADEQUACIES OF INFORMATION

#### ABSTRACT

WITH THE UNIT IN MODE 3 AND DURING VALVE TESTING IN ACCORDANCE WITH PROCEDURE S023-3.30, CONTAINMENT ISOLATION VALVE 3HV-0512 GAVE A DUAL INDICATION OF ITS POSITION FOLLOWING A DEMAND TO CLOSE. THE VALVE WAS DECLARED INOPERABLE AT 1459 AND LCO 3.6.3, ACTION STATEMENT 'B' WAS INVOKED. AS REQUIRED BY THIS ACTION STATEMENT, THE AFFECTED PENETRATION WAS ISOLATED BY SECURING THE REDUNDANT VALVE 3HV-0513 IN THE CLOSED POSITION AT 1501. INVESTIGATION REVEALED THAT THE VALVE WAS STUCK IN ITS MID-POSITION. THE VALVE'S 3-AMP BREAKER WAS FOUND TO BE TRIPPED. INVESTIGATION FAILED TO IDENTIFY THE CAUSE OF THE BREAKER TRIP. AFTER MEGGERING THE VALVE'S MOTOR AND RESETTING THE BREAKER, 3HV-0512 WAS CYCLED SUCCESSFULLY AND DECLARED OPERABLE IN ACCORDANCE WITH S023-3-3.30 AT 1156 ON AUGUST 14, 1983. NO FURTHER ACTION IS PLANNED.

FORM 39 LER SCSS DATA 12-11-84



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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
364 1983 068 0 8402060448 188805 12-30-1983

DOCKET:364 FARLEY 2 TYPE:PWR  
REGION: 2 NSSS:WE  
ARCHITECTURAL ENGINEER: BESS  
FACILITY OPERATOR: ALABAMA POWER CO.  
SYMBOL: APC

ABSTRACT

AT 1400 ON 12/30/83, THE 2B DIESEL GENERATOR WAS DECLARED INOPERABLE WHEN IT WAS DETERMINED THAT VALVE Q2P16V536 (B TRAIN SERVICE WATER RETURN FROM THE DIESEL BUILDING) WAS CLOSED. TECH SPEC 3.8.1.1, IN PART, REQUIRES THIS DIESEL GENERATOR TO BE OPERABLE. THIS EVENT WAS CAUSED BY THE MOTOR OPERATOR FOR VALVE Q2P16V536 DRAWING EXCESSIVE CURRENT, WHICH RESULTED IN ITS POWER SUPPLY BREAKER TRIPPING OPEN WHILE THE VALVE WAS BEING REOPENED FOLLOWING A TIMED STROKE. THE VALVE WAS DISCOVERED CLOSED APPROXIMATELY 22 HOURS AFTER IT WAS STROKED. THAT THE VALVE WAS NOT OPEN WAS NOT IMMEDIATELY APPARENT BECAUSE OF A LACK OF INDEPENDENT MAIN CONTROL BOARD POSITION INDICATION AND A PLANT OPERATOR FAILING TO PERFORM A REQUIRED VERIFICATION.

FORM 40 LER SCSS DATA 12-11-84  
\*\*\*\*\*  
DOCKET YEAR LFR NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
366 1983 056 0 8308220065 185094 7-15-1983

COMMENTS

STEP 1 CAUSE XX - MOTOR BURNED OL .

DOCKET:366 HATCH 2 TYPE:BWR  
REGION: 2 NSSS:GE  
ARCHITECTURAL ENGINEER: BESS  
FACILITY OPERATOR: GEORGIA POWER CO.  
SYMBOL: GPC

ABSTRACT

ON 07/15/83, WHILE PLACING THE 'A' LOOP OF RESIDUAL HEAT REMOVAL (RHR) IN THE SHUTDOWN COOLING MODE TO ACHIEVE A COLD SHUTDOWN CONDITION, THE 'A' LOOP HEAT EXCHANGER OUTLET VALVE (2E11-F003A) FAILED TO OPEN. THIS EVENT IS CONTRARY TO THE REQUIREMENTS OF TECH SPECS SECTION 3.7.1.1.B. THE 'B' LOOP OF RHR REMAINED OPERATIONAL DURING THIS EVENT. THE PLANT WAS TAKEN TO A COLD SHUTDOWN CONDITION. THIS EVENT IS THE RESULT OF THE 'A' LOOP'S 2E11-F003A FAILING TO OPEN DUE TO THE VALVE'S MOTOR BURNING OUT. THE MOTOR WAS REPLACED. THE REPLACEMENT MOTOR WAS PREPARED FOR OPERATION (I.E., SETTING LIMIT SW ITCHES, CHECKING MOTOR FOR CORRECT ROTATION, ETC.). THE 2E11-F003A WAS THEN FUNCTIONALLY TESTED SATISFACTORILY AND RETURNED TO SERVICE ON 07/15/83.

FORM 41 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
366 1983 084 0 8309230350 185811 8-17-1983

DOCKET:366 HATCH 2 TYPE:BWR  
REGION: 2 NSSS:GE  
ARCHITECTURAL ENGINEER: BESS  
FACILITY OPERATOR: GEORGIA POWER CO.  
SYMBOL: GPC

REFERENCE LERS:  
1 366/83-056

ABSTRACT

DURING PERFORMANCE OF "RESIDUAL HEAT REMOVAL-SHUTDOWN COOLING MODE" PROCEDURE (HNP-2-1114) ON "A" LOOP OF RHR, THE "A" LOOP HEAT EXCHANGER OUTLET VALVE (2E11-F003A) FAILED TO OPEN. THE PLANT WAS UNABLE TO MEET REQUIREMENTS OF TECH SPEC SECTION 3.6.2.2. THE "B" LOOP OF RHR WAS OPERABLE AND WAS USED TO BRING THE UNIT FROM HOT SHUTDOWN TO COLD SHUTDOWN. THIS REPETITIVE EVENT WAS LAST REPORTED ON LER 50-366/1983-056. THE CAUSE OF THIS EVENT WAS ATTRIBUTED TO COMPONENT FAILURE. THE INVESTIGATION ON 2E11-F003A FAILING TO OPEN REVEALED THAT THE VALVE MOTOR BURNED UP WHEN PERSONNEL TRIED TO OPEN IT. THE VALVE MOTOR WAS REPLACED, AND THE VALVE'S TORQUE SWITCH SETTING WAS LOWERED. THE VALVE WAS RETURNED TO SERVICE ON 08/18/83.

FORM 42 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
366 1983 096 0 8310170509 186074 9-6-1983

DOCKET:366 HATCH 2 TYPE:BWR  
REGION: 2 NSSS:GE  
ARCHITECTURAL ENGINEER: BESS  
FACILITY OPERATOR: GEORGIA POWER CO.  
SYMBOL: GPC

ABSTRACT

ON 9/6/83 WHILE PERFORMING THE "MSIV LEAKAGE CONTROL SYSTEM VALVE OPERABILITY" PROCEDURE (HNP-2-3113), PLANT PERSONNEL DETERMINED THAT THE 2E32-F001F VALVE WOULD NOT OPEN WHEN THE KEY LOCK CONTROL SWITCH WAS PLACED TO THE TEST POSITION. UNIT 2 WAS PLACED IN 30 DAY LCO AS REQUIRED BY TECH SPEC SECTION 3.6.1.4, ACTION A. THE REDUNDANT OUTBOARD MSIV LEAKAGE CONTROL SUB-SYSTEM WAS OPERABLE. THIS IS A NON-REPETITIVE EVENT. THE CAUSE OF THIS EVENT IS COMPONENT FAILURE. THE INVESTIGATION REVEALED A BURNED UP MOTOR. ON 9/23/83, THE VALVE MOTOR WAS REPLACED. THE VALVE WAS THEN SATISFACTORILY FUNCTIONALLY TESTED PER THE "MSIV LEAKAGE CONTROL SYSTEM VALVE OPERABILITY" PROCEDURE (HNP-2-3113) AND RETURNED TO OPERABLE STATUS ON 9/24/83.

FORM 43 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
366 1983 142 0 8401040544 188249 12-8-1983

DOCKET:366 HATCH 2 TYPE:BWR  
REGION: 2 NSSS:GE  
ARCHITECTURAL ENGINEER: BESS  
FACILITY OPERATOR: GEORGIA POWER CO.  
SYMBOL: GPC

ABSTRACT

DURING PERFORMANCE OF "MSIV LEAKAGE CONTROL SYSTEM OPERABILITY" PROCEDURE (HNP-2-3113) A "B" MSIV LEAKAGE CONTROL SYSTEM ISOLATION VALVE (2F32-F002F) FAILED TO COMPLETE A FULL OPERATING CYCLE. THUS, THE PLANT WAS UNABLE TO MEET THE REQUIREMENTS OF TECH SPEC SECTION 3.6.1.4. THE PLANT WAS PLACED INTO A 30-DAY LCO PER THE REQUIREMENTS OF TECH SPEC SECTION 3.6.1.4, ACTION A. THE 2E32-F002F'S FAILURE TO MAKE A COMPLETE OPERATING CYCLE WAS DUE TO A SHORT IN THE ELECTRIC MOTOR IN 2E32-F002F'S VALVE OPERATOR. THE DEFECTIVE ELECTRIC DRIVE MOTOR IN 2E32-F002F'S VALVE OPERATOR WAS REPLACED. THE 2E32-F002F WAS RETURNED TO SERVICE ON 12/13/83 FOLLOWING THE SUCCESSFUL COMPLETION OF HNP-2-3113.

FORM 44 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
369 1983 075 0 8310170384 186123 8-31-1983

DOCKET:369 MCGUIRE 1 TYPE:PWR  
REGION: 2 NSSS:WE  
ARCHITECTURAL ENGINEER: DUKE  
FACILITY OPERATOR: DUKE POWER CO.  
SYMBOL: DPC

REFERENCE LERS:  
1 369/81-150 2 369/81-152

ABSTRACT

WHILE ATTEMPTING TO OPEN VALVE 1NM-200B FOR STROKE TIMING DURING PERFORMANCE OF THE "NUCLEAR SAMPLING VALVE STROKE TIMING-QUARTERLY" PERIODIC TEST, THE VALVE FAILED TO OPEN (BUT THE OPERATOR AID COMPUTER INDICATED THE VALVE WAS IN AN INTERMEDIATE POSITION). THE VALVE (S/G B BLOWDOWN LINE SAMPLE CONTAINMENT ISOLATION INSIDE) WAS SUBSEQUENTLY DECLARED INOPERABLE. THIS CONSTITUTES A DEGRADATION OF CONTAINMENT ISOLATION VALVES (TECH SPEC 3.6.3) WHICH IS REPORTABLE PURSUANT TO TECH SPEC 6.9.1.11(D) AND SIMILAR TO RO'S 369/81-150 AND 81-152. REDUNDANT ISOLATION VALVE 1NM-201A WAS CAPABLE OF ISOLATING THE PENETRATION. A GROUND FAULT ALARM RECEIVED SIMULTANEOUSLY WITH THE VALVES FAILURE TO OPEN INDICATED PROBLEMS WITH THE VALVE ACTUATOR. INVESTIGATION DETERMINED THAT THE ACTUATOR (ROTORK 11NA1) WAS BURNED UP. THE REDUNDANT ISOLATION VALVE WAS CLOSED AND DEFENERGIZED IN ACCORDANCE WITH THE TECH SPEC ACTION STATEMENTS. SINCE THE VALVE IS LOCATED INSIDE CONTAINMENT THE ACTUATOR WILL BE REPLACED OR REPAIRED DURING AN UPCOMING OUTAGE.

FORM 45 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
373 1983 101 0 8009260390 185775 8-20-1983

DOCKET:373 LA SALLE 1 TYPE:BWR  
REGION: 3 NSSS:GE  
ARCHITECTURAL ENGINEER: SLXX  
FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
SYMBOL: CWE

ABSTRACT

ON AUGUST 20, 1983 AT 2200 HOURS, OPERATIONS ATTEMPTED TO CLOSE VALVE 1G33-F004, REACTOR WATER CLEANUP (RWCU) OUTBOARD ISOLATION VALVE BUT OBSERVED THAT EACH TIME THE HANDSWITCH WAS TAKEN TO CLOSE THE VALVE CONTROL BREAKER TRIPPED. AT THE TIME OF THE OCCURRENCE LASALLE UNIT 1 WAS IN PLANT CONDITION 3, HOT SHUTDOWN. PRIMARY CONTAINMENT INTEGRITY WAS MAINTAINED BY CLOSURE OF VALVE 1G33-F001, RWCU INBOARD ISOLATION. POOR RESPONSE TO A CLOSING SIGNAL WAS A RESULT OF VALVE MOTOR OPERATOR DAMAGE CAUSED BY EXCESSIVE PACKING AND LIMIT SWITCH HOUSING GASKET LEAKAGE. M.M. DEPT. REPAIRED THE VALVE OPERATOR MECHANICALLY UNDER W.R. L27005. E.M. DEPT. REPLACED A CONTROL TRANSFORMER, LIMIT SWITCH AND TORQUE SWITCH DAMAGED DUE TO THE WATER LEAKAGE. W.R. L27005 WAS COMPLETED AUGUST 31, 1983 WITH THE SUCCESSFUL CYCLING AND TIMING OF VALVE 1G33-F004, PER LOS-PC-Q2.

FORM 46 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
373 1983 117 1 8403120095 189264 9-30-1983



COMMENTS

STEP 1: EFFECT CODE DX - BURNT STEP 5 - COMP MSC - VALVE CAVITY

DOCKET:373 LA SALLE 1 TYPE:BWR  
REGION: 3 NSSS:GE  
ARCHITECTURAL ENGINEER: SLXX  
FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
SYMBOL: CWE

ABSTRACT

WITH UNIT ONE IN COLD SHUTDOWN, THE BH RHR HEAT EXCHANGER OUTLET VALVE FAILED TO OPEN VIA THE MOTOR OPERATOR OR MANUALLY. THE INOPERABILITY OF THIS VALVE, WHILE IN THE CLOSED POSITION, MADE B SHUTDOWN COOLING & B SUPPRESSION POOL COOLING INOPERATIVE. THE A SHUTDOWN COOLING LOOP WAS OPERABLE TO CONTROL DECAY HEAT. CONSERVATIVE CALCULATIONS ALSO INDICATED THE REACTOR WATER CLEANUP SYSTEM WAS CAPABLE OF REMOVING THE DECAY HEAT AT THE TIME OF THE EVENT. IT IS BELIEVED THAT THE VALVE CAN BECOME INOPERABLE IN THE CLOSE POSITION DUE TO WATER BEING TRAPPED IN THE BONNET CAVITY. SINCE THE BONNET CAVITY DOES NOT HAVE A MECHANISM TO VENT OFF THE ENTRAPPED WATER FOR VALVE OPENING, THE WEDGE IS HYDRAULICALLY LOCKED ON THE CLOSED POSITION. AT THE RECOMMENDATION OF ANCHOR DARLING, VALVE MFG., THE VALVE LIMIT SWITCHES WERE TEMPORARILY CHANGED SUCH THAT THE WEDGE TRAVEL IS STOPPED BY POSITION AND NOT BY TORQUE. THIS CHANGE SHOULD ALLOW THE ENTRAPPED WATER TO VENT OFF DURING VALVE OPENING.

FORM 47 LER SCSS DATA 12-11-84  
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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
373 1983 147 1 8404030253 189876 11-12-1983

COMMENTS

STEP 5: CAUSE FX = HYDRAULICALLY WEDGED

DOCKET:373 LA SALLE 1 TYPE:BWR  
REGION: 3 NSSS:GE  
ARCHITECTURAL ENGINEER: SLXX  
FACILITY OPERATOR: COMMONWEALTH EDISON CO.  
SYMBOL: CWE

REFERENCE LERS:

1 373/83-117

ABSTRACT

ON 11-12-83 AT 2215 WITH THE UNIT IN COLD SHUTDOWN, THE B RHR HEAT EXCHANGER OUTLET VALVE (1E12-F003B) FAILED TO OPEN VIA THE MOTOR OPERATOR OR MANUALLY. THE INOPERABILITY OF THIS VALVE, WHILE IN THE CLOSED POSITION, MADE B SHUTDOWN COOLING AND B SUPPRESSION POOL COOLING INOPERATIVE. THE A SHUTDOWN COOLING LOOP WAS OPERABLE TO CONTROL DECAY HEAT. A SECOND METHOD OF CONTROLLING DECAY HEAT WAS ALSO AVAILABLF. THIS SECOND METHOD UTILIZES THE RHR AND RCIC SYSTEMS. SAFE OPERATION OF THE PLANT WAS MAINTAIN'D. IT IS BELIEVED THAT THE VALVE CAN BECOME INOPERABLE IN THE CLOSE POSITION DUE TO WATER BEING TRAPPED IN THE BONNET CAVITY. SINCE THE BONNET CAVITY DOES NOT HAVE A MECHANISM TO VENT OFF THE ENTRAPPED WATER FOR VALVE OPENING, THE WEDGE IS HYDRAULICALLY LOCKED IN THE CLOSED POSITION. AT THE RECOMMENDATION OF ANCHOR DARLING VALVE MFG., THE VALVE LIMIT SWITCHES WERE TEMPORARILY CHANGED SUCH THAT THE WEDGE TRAVEL IS STOPPED BY POSITION AND NOT BY TORQUE. THIS CHANGE SHOULD ALLOW THE ENTRAPPED WATER TO VENT OFF DURING VALVE OPENING.

FORM 48 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
387 1983 111 0 8309130371 185598 8- 5-1983

COMMENTS

STEP 1: EFFECT DX - BREAKDOWN

DOCKET:387 SUSQUEHANNA 1 TYPE:BWR  
REGION: 1 NSSS:GE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: PENNSYLVANIA POWER & LIGHT CO.  
SYMBOL: PPL

REFERENCE LERS:

1 387/83-107

ABSTRACT

WITH THE UNIT IN STEADY STATE OPERATION AT 100% POWER, IT WAS FOUND THAT THE VALVE WHICH CONTROLS COOLING WATER FLOW TO THE HPCI LUBE OIL COOLER AND BAROMETRIC CONDENSER WOULD NOT CYCLE ELECTRICALLY. IT WAS IMMEDIATELY DETERMINED THAT THE VALVE STROKED FREELY WHEN OPERATED MANUALLY. THE VALVE COULD HAVE BEEN OPERATED MANUALLY, AND THE REMAINING ECCS SYSTEMS WERE AVAILABLE DURING THE TIME PERIOD IN QUESTION. VALVE ELECTRICAL INOPERABILITY WAS CAUSED BY VALVE MOTOR INSULATION BREAKDOWN WHICH LED TO BURNED FIELD WINDINGS. A REPLACEMENT MOTOR WAS INSTALLED. THE VALVE WAS STROKED ELECTRICALLY AND THE LCO CLEARED. THE INOPERABLE MOTOR WAS SHIPPED OFF-SITE FOR RE-WINDING AND CLEANING. NO FURTHER ACTIONS ARE REQUIRED.

FORM 49 LER SCSS DATA 12-11-84

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DOCKET YEAR LER NUMBER REVISION DCS NUMBER NSIC EVENT DATE  
387 1983 140 1 8404240311 189878 9-27-1983

COMMENTS

STEP 2: COMP MSC = WASHER. STEP 3 COMP MSC = SPRING PACK

DOCKET:387 SUSQUEHANNA 1 TYPE:BWR  
REGION: 1 NSSS:GE  
ARCHITECTURAL ENGINEER: BECH  
FACILITY OPERATOR: PENNSYLVANIA POWER & LIGHT CO.  
SYMBOL: PPL

ABSTRACT

DURING A HPCI OPERABILITY SURVEILLANCE, THE VALVE WHICH CONTROLS COOLING WATER FLOW TO THE HPCI LUBE OIL COOLER AND BAROMETRIC CONDENSER WOULD NOT CYCLE ELECTRICALLY. THE VALVE STROKED FREELY WHEN OPERATED MANUALLY. INVESTIGATION SHOWED THAT THE VALVE MOTOR'S OVERLOAD HEATERS HAD BURNED OPEN AND THAT THE VALVE OPERATOR MOTOR WAS DAMAGED. HPCI INITIATION CAPABILITY WAS NOT AFFECTED AND THE VALVE COULD HAVE BEEN OPERATED MANUALLY. THE REMAINING ECCS WERE AVAILABLE. VALVE ELECTRICAL INOPERABILITY RESULTED WHEN THE TORQUE SWITCH DID NOT ACTUATE DUE TO CONDITIONS IN THE SPRING PACK. THE SPRING PACK WAS CLEANED AND REASSEMBLED AND DAMAGED COMPONENTS REPLACED. THE VALVE WAS SUCCESSFULLY TESTED AND RETURNED TO SERVICE. AN INVESTIGATION WAS COMPLETED WHICH DETERMINED THAT THE CIRCUMSTANCES WHICH RESULTED IN THIS LER ARE UNIQUE. NO ADDITIONAL INVESTIGATIONS ARE PLANNED.

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DOCKET	YEAR	LER NUMBER	REVISION	DCS NUMBER	NSIC	EVENT DATE
270	1983	003	0	8304220491	188190	3-15-1983

COMMENTS

POSSIBLE GENERIC PROBLEM WITH VALVE OPERATORS ON PROCEDURES.

DOCKET:270 OCONEE 2 TYPE:PWR  
REGION: 2 NSSS:BW  
ARCHITECTURAL ENGINEER: DKBE  
FACILITY OPERATOR: DUKE POWER CO.  
SYMBOL: DPC

WATCH-LIST CODES FOR THIS LER ARE:  
975 POSSIBLE SIGNIFICANT EVENT

REFERENCE LERS:

1 270/83-004 2 269/83-008 3 269/82-019

ABSTRACT

ON MARCH 15, 1983, WHILE AT 59% FP, VALVE 2HP-24 FAILED TO OPEN DURING ITS FUNCTIONAL TEST, THUS MAKING IT AND ONE INDEPENDENT HIGH PRESSURE INJECTION (HPI) TRAIN INOPERABLE. THE VALVE WAS MANUALLY OPENED AND LOCKED IN ITS ENGINEERING SAFEGUARDS POSITION, AND WAS DECLARED OPERABLE. HAD AN ES EVENT OCCURRED, THE REDUNDANT VALVE 2HP-25 WOULD HAVE OPENED TO PROVIDE THE HP INJECTION PUMPS WITH SUCTION FROM THE BORATED WATER STORAGE TANK. THE CAUSE OF THIS INCIDENT WAS A BENT STEM VALVE, THUS, COMPONENT FAILURE. THE VALVE WAS "JACKED" OPEN AND MECHANICALLY CLAMPED. IT WILL BE REPLACED AT THE NEXT OUTAGE OF SUFFICIENT LENGTH. THE VALVE OPERATORS ON ALL HP-24 AND -25 VALVES WILL BE REPLACED, AND A PREVENTIVE MAINTENANCE PROGRAM WILL BE ESTABLISHED. VALVE DESIGN WILL BE EVALUATED.

APPENDIX A - TABLE 1

MOV FAILURE EVENTS CORRELATED TO TYPES  
OF FAILURE

<u>Types of Failure</u>	<u>LER NO.</u>
1. Thermal Overload Trip	50-237/83-024
	50-237/84-004
	50-245/84-015
	50-334/83-011
	50-344/83-022
2. Valve Motor Damaged, Short Circuited, or Burnt Up	50-237/84-004
	50-245/84-015
	50-259/84-012
	50-277/84-001
	50-293/83-052
	50-293/83-053
	50-296/83-035
	50-302/83-009
	50-302/83-042
	50-321/83-023
	50-321/83-041
	50-362/83-018
	50-366/83-056
	50-366/83-084
	50-366/83-096
	50-366/83-142
50-369/83-075	
50-387/83-140	
50-387/83-111	
3. Circuit Breaker Trip	50-271/83-020
	50-302/83-037
	50-362/83-058
	50-364/83-068
	50-373/83-101
4. Valve/Operator Mechanically Damaged	50-249/83-011
	50-254/84-014
	50-270/83-003
	50-280/83-013
	50-293/83-044
	50-317/83-002
50-336/83-017	

Types of Failure

LER NO.

5. Valve Seat Jammed

50-244/84-002  
50-244/84-005  
50-254/83-038  
50-280/83-003  
50-305/83-015  
50-309/83-017  
50-312/83-037  
50-313/83-015  
50-361/83-038  
50-371/83-117  
50-371/83-147

6. Contactor Failure

50-302/83-057  
50-305/83-033  
50-324/83-088  
50-334/83-030