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WNP-2 CYCLE 3 PLANT TRANSIENT ANALYSIS

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1.0. INTRODUCTION

This report presents the results of the Advanced Nuclear Fuels Corporation (ANF) evaluation of system transient events for the Supply System Nuclear Project Number 2 (WNP-2) during Cycle 3 operation. For this analysis the Cycle 3 core was assumed to contain 276 ANF 8x8 and 488 GE P8x8R fuel assemblies.

This evaluation together with core transient events[1] determines the necessary thermal margin (MCPR limits) to protect against the occurrence of boiling transition during the most limiting anticipated transient. The evaluation also demonstrates the vessel integrity for the most limiting pressurization event. This evaluation is applicable to core flows up to the maximum attainable with the recirculation flow control valve in its fully open position which is 106 percent of the rated core flow value at 100% power. The methodology for these system transient analyses is detailed in References 2 and 3.

2.0 SUMMARY

The Minimum Critical Power Ratios (MCPR) for potentially limiting plant system transient events at increased core flow* are shown in Table 2.1 for powers that bound allowable values (47 to 104% power) at increased core flow. The system transient MCPR values of Table 2.1 for the load rejection without bypass (LRWB) and feedwater controller failure (FWCF) transients were obtained using a scram time based on WNP-2 measured values. The loss of feedwater heating (LOFH) transient results shown in Table 2.1 were obtained from a generic analysis which is discussed in Section 3.2.3. The limiting MCPR values for the cases of Table 2.1 are 1.32 for NSSS vendor and 1.30 for ANF fuels.

Also, analyses were performed for LRWB and FWCF events at a cycle exposure of EOC -2000 MWD/MTU when a large number of control blades are still inserted in the core. These analyses showed that system transients were insignificant relative to the CRWE event (Reference 1). Thus, plant operating limits can be based on CRWE event for cycle exposures up to EOC -2000 MWD/MTU. For exposures beyond EOC -2000 MWD/MTU the limits in Table 2.1 are applicable.

Additional transient analyses were performed assuming the recirculation pump trip (RPT) out of service and assuming technical specification scram speed (TSSS). The delta CPR results for these events are presented in Section 3.

Maximum system pressure was calculated for the containment isolation event, which is a rapid closure of all main steam isolation valves, using the scenario as specified by the ASME Pressure Vessel Code. This analysis shows that for WNP-2 Cycle 3 operation the safety valves have sufficient capacity and performance to prevent the pressure from reaching the established

*The Cycle 2 transient events analyzed at the design basis power condition with increased core flow were found to bound the same transients analyzed at the design basis power and flow condition for WNP-2 Cycle 2. These results are shown in Reference 4.

transient pressure safety limit of 110% of design pressure. The maximum system pressures predicted during the event are below the ASME limit of 1375 psig (110% of design pressure) and are shown in Table 2.1. The analysis conservatively assumed six safety relief valves out of service.

The applicability of the Cycle 2 MCPR safety limit of 1.06 for all fuel types in Cycle 3 was determined using the methodology of Reference 5.

TABLE 2.1 THERMAL MARGIN SUMMARY FOR CYCLE 3

Transient	% Power/% Flow	Delta CPR/MCPR*	
		GE Fuel	ANF Fuel
Load Rejection** Without Bypass	104/106	0.25/1.31	0.23/1.29
Feedwater Controller** Failure	47/106	0.26/1.32	0.24/1.30
Loss of Feedwater*** Heating	Not Applicable	0.09/1.15	0.09/1.15

MAXIMUM VESSEL PRESSURE (PSIG)

Transient	Vessel Dome	Vessel Lower Plenum	Steam Line
MSIV Closure	1285	1313	1287

*MCPR value using the 1.06 safety limit justified herein.

**These transients were evaluated with normal scram speed.

***Generic analysis bounding value, Reference 9..

3.0 TRANSIENT ANALYSIS FOR THERMAL MARGIN

3.1 Design Basis

System transient analyses to determine the most limiting type of thermal margin transient were performed at the increased core flow condition of 106%. As shown in Reference 4, system transients from the increased core flow condition bound thermal margin analyses transients from the nominal (100%) flow condition. Analysis of load rejection without bypass (LRWB) was performed at the rated design 104% power/106% flow point. Since feedwater controller failure (FWCF) transients are more severe at reduced power because of the larger change in feedwater flow, the FWCF transient was performed at the minimum power (47%) allowed for increased core flow. The initial conditions used in the analysis for transients at the 104% power/106% flow point are as shown in Table 3.1. The most limiting exposure in cycle was determined to be at end of full power capability when control rods are fully withdrawn from the core; the thermal margin limit established for end of full power conditions is conservative in relation to cases where control rods are partially inserted.

The calculational models used to determine thermal margin include the ANF plant transient and core thermal-hydraulic codes as described in previous documentation[2,3,5,6]. Fuel pellet-to-clad gap conductances used in the analyses are based on calculations with RODEX2[7]. Recirculation pump trip (RPT) coastdown was input based on measured WNP-2 startup test data, and the COTRANSA system transient model for WNP-2 was benchmarked to appropriate WNP-2 startup test data. The hot channel performance is evaluated with XCOBRA-T[3] using COTRANSA supplied boundary conditions. Table 3.2 summarizes the values used for important parameters in the analysis.

3.2 Anticipated Transients

ANF considers eight categories of potential system transient occurrences for Jet Pump BWRs in XN-NF-79-71(2). The three most limiting transients are described here in detail to show the thermal margin for Cycle 3 of WNP-2. These transients are:

- Load Rejection Without Bypass (LRWB)
- Feedwater Controller Failure (FWCF)
- Loss of Feedwater Heating (LOFH)

A summary of the transient analyses is shown in Table 3.3. Other plant transient events are inherently nonlimiting or clearly bounded by one of the above events.

3.2.1 Load Rejection Without Bypass

This event is the most limiting of the class of transients characterized by rapid vessel pressurization. The generator load rejection causes a turbine control valve trip, which initiates a reactor scram and a recirculation pump trip (RPT). The compression wave produced by the fast turbine control valve closure travels through the steam lines into the vessel and pressurizes the reactor vessel and core. Bypass flow to the condenser, which would mitigate the pressurization effect, is conservatively not allowed. The excursion of core power due to void collapse is primarily terminated by reactor scram and void growth due to RPT. Figures 3.1 through 3.10 depict the time variance of critical reactor and plant parameters from the analysis of the load rejection transient from the design basis power and increased core flow point for a matrix of cases which involve normal scram speed, technical specification scram speed, and recirculation pump trip (RPT) in service and out of service.

Analysis assumptions are:

- Control rod insertion time based on WNP-2 measured data (normal scram speed) and technical specification scram speed.

- Integral power to the hot channel was increased by 10% for the pressurization transient, consistent with Reference 8.

Table 3.3 shows delta CPR values for a matrix of LRWB transients with the RPT out of service with both normal scram speed (NSS) and technical specification scram speed (TSSS).

Because a significant number of control rods are inserted into the core at exposures less than end-of-cycle (EOC) minus 2000 MWD/MTU, the system transients are expected to be insignificant for cycle exposures less than this value. To confirm this, the LRWB was analyzed at the same 104% power/106% flow condition point for the end-of-cycle (EOC) minus 2000 MWD/MTU exposure condition for the bounding case of the RPT inoperable with TSSS. The respective delta CPR values for the NSSS vendor and ANF fuels for this EOC minus 2000 MWD/MTU case are 0.11 and 0.12. These delta CPR values are also shown in Table 3.3 and are about half of the delta CPR values for the control rod withdrawal error (CRWE) event reported in Reference 1. This shows that the delta CPR for the CRWE bounds plant operation up to EOC minus 2000 MWD/MTU. For Cycle 3 exposures greater than EOC minus 2000 MWD/MTU, the other MCPR values defined in Table 3.3 are applicable.

3.2.2 Feedwater Controller Failure

Failure of the feedwater control system is postulated to lead to a maximum increase in feedwater flow into the vessel. As the excessive feedwater flow subcools the recirculating water returning to the reactor core, the core power will rise and attain a new equilibrium if no other action is taken. Eventually, the inventory of water in the downcomer will rise until the high

vessel level setting is exceeded. To protect against wet steam entering the turbine, the turbine trips upon reaching the high level setting, closing the turbine stop valves. The compression wave that is created, though mitigated by bypass flow, pressurizes the core and causes a power excursion. The power increase is terminated by reactor scram, RPT, and pressure relief from the bypass valves opening. The evaluation of this event was performed using the scram and integral power assumptions discussed in 3.2.1. Sensitivity results have shown that the calculated delta CPR is insensitive to the rate of feedwater flow increase, that EOC conditions are bounding because rods are inserted for lower cycle exposure, and that high flows are bounding because of higher axials in the core.

Because the total change in feedwater flow is the greatest from reduced power condition, the FWCF is more severe from reduced power conditions. The FWCF transient event was analyzed from the lowest allowed power (47%) at increased core flow. Figures 3.11 through 3.16 present key variables. The delta CPR values for the co-resident fuel types for these three 47% power/106% flow transients are shown in Table 3.3.

A FWCF transient (47% power/106% flow) was also performed at EOC -2000 MWD/MTU which confirmed that the CRWE event is limiting for cycle exposures less than EOC -2000 MWD/MTU. As with the LRWB, partial insertion of the rods substantially reduced the change in critical power during this transient.

3.2.3 Loss Of Feedwater Heating

The Loss of Feedwater Heating (LOFH) transient has been analyzed on a generic basis for a wide cross section of BWR configurations. This generic analysis is documented in Reference 9.

The Reference 9 analysis provides a statistical evaluation of the consequences of the LOFH transient for BWR/4, BWR/5, and BWR/6 plant configurations under conditions which cover the operating power flow map including increased core

flow conditions. Rather than use the 95:95 value in the reference report, a bounding value was used.

The generic conclusions, when using a bounding value, support a MCPR operating limit of 1.15 for plants with a MCPR safety limit of 1.06, indicating a delta CPR of 0.09. As noted in Section 2.0 of this report, the WNP-2 MCPR safety limit for Cycle 3 continues to be 1.06; hence the LOFH transient requires a MCPR operating limit of 1.15 for WNP-2.

3.3 Calculational Model

The plant transient code used to evaluate the pressurization transients (generator load rejection and feedwater flow increase) was the ANF advanced code COTRANSA[2] and XCOBRA-T[3]. This axial one-dimensional model predicted reactor power shifts toward the core middle and top as pressurization occurred. This was accounted for explicitly in determining thermal margin changes in the transient. All pressurization transients were analyzed on a bounding basis using COTRANSA in conjunction with the XCOBRA-T hot channel model.

3.4 Safety Limit

The MCPR safety limit is the minimum value of the critical power ratio (CPR) at which the fuel could be operated where the expected number of rods in boiling transition would not exceed 0.1% of the fuel rods in the core. The operating limit MCPR is established such that in the event the most limiting anticipated operational transient occurs, the safety limit will not be violated.

The safety limit for all fuel types in WNP-2 Cycle 3 was confirmed by the methodology presented in Reference 4 to have the Cycle 2 value of 1.06. The input parameters and uncertainties used to establish the safety limit are presented in Appendix A of this report.

TABLE 3.1 DESIGN REACTOR AND PLANT CONDITIONS FOR WNP-2

Reactor Thermal Power (104%)	3464 MWt
Total Recirculating Flow (106%)	115.0 Mlb/hr
Core Channel Flow	101.8 Mlb/hr
Core Bypass Flow	13.2 Mlb/hr
Core Inlet Enthalpy	529.15 BTU/lbm
Vessel Pressures	
Steam Dome	1035. psia
Upper Plenum	1045. psia
Core	1052. psia
Lower Plenum	1068. psia
Turbine Pressure	974. psia
Feedwater/Steam Flow	15.0 Mlb/hr
Feedwater Enthalpy	403.5 BTU/lbm
Recirculating Pump Flow (per pump)	17.26 Mlb/hr

TABLE 3.2 SIGNIFICANT PARAMETER VALUES USED IN ANALYSIS FOR WNP-2

High Neutron Flux Trip	126.2%
Void Reactivity Feedback	10% above nominal*
Time to Deenergized Pilot Scram Solenoid Valves	200 msec
Time to Sense Fast Turbine Control Valve Closure	80 msec
Time from High Neutron Flux Time to Control Rod Motion	290 msec
Scram Insertion Times (normal)**	0.404 sec to Notch 45
	0.660 sec to Notch 39
	1.504 sec to Notch 25
	2.624 sec to Notch 5
Turbine Stop Valve Stroke Time	100 msec
Turbine Stop Valve Position Trip	90% open
Turbine Control Valve Stroke Time (Total)	150 msec
Fuel/Cladding Gap Conductance Core Average (Constant)	556. BTU/hr-ft2-F
Safety/Relief Valve Performance Settings	Technical Specifications
Relief Valve Capacity	228.2 lbm/sec (1091 psig)
Pilot Operated Valve Delay/Stroke	400/100 msec

*For rapid pressurization transients a 10% multiplier on integral power is used; see Reference 8 for methodology description.

**Slowest measured average control rod insertion time to specified notches for each group of 4 control rods arranged in a 2x2 array.

TABLE 3.2 SIGNIFICANT PARAMETER VALUES USED IN ANALYSIS FOR WNP-2 (Continued)

MSIV Stroke Time	3.0 sec
MSIV Position Trip Setpoint	85% open
Condenser Bypass Valve Performance	
Total Capacity	990. lbm/sec
Delay to Opening (80% open)	300 msec
Fraction of Energy Generated in Fuel	0.965
Vessel Water Level (above Separator Skirt)	
High Level Trip (L8)	73 in
Normal	49.5 in
Low Level Trip (L3)	21 in
Maximum Feedwater Runout Flow	
Two Pumps	5799. lbm/sec
Recirculating Pump Trip Setpoint	1170 psig Vessel Pressure

TABLE 3.2 SIGNIFICANT PARAMETER VALUES USED IN ANALYSIS FOR WNP-2 (Continued)

Control Characteristics

Sensor Time Constants	
Steam Flow	1.0 sec
Pressure	500 msec
Others	250 msec
Feedwater Control Mode	Three-Element
Feedwater 100% Mismatch	
Water Level Error	48 in
Steam Flow Equiv.	100%
Flow Control Mode	Manual
Pressure Regulator Settings	
Lead	3.0 sec
Lag	7.0 sec
Gain	3.3%/psid

TABLE 3.3 RESULTS OF SYSTEM PLANT TRANSIENT ANALYSES

Event	Maximum Neutron Flux (% Rated)	Maximum Core Average Heat Flux (% Rated)	Maximum System Pressure (psig)	Delta CPR GE Fuel	Delta CPR ANF Fuel
LRWB RPT Operable, NSS*	295	115	1165	0.25	0.23
LRWB RPT Inoperable, NSS	390	121	1175	0.31	0.28
LRWB RPT Operable, TSSS**	370	121	1170	0.33	0.29
LRWB RPT Inoperable, TSSS	440	127	1183	0.37	0.33
LRWB EOC -2000 MWD/MTU RPT Inoperable, TSSS	304	112	1167	0.11	0.12
FWCF (47% Power/106% Flow), NSS RPT Operable	156	54	1015	0.26	0.24
FWCF (47% Power/106% Flow), NSS RPT Inoperable	205	57	1020	0.31	0.29
FWCF (47% Power/106% Flow), TSSS RPT Operable	172	56	1020	0.30	0.27
MSIV Closure With Flux Scram	668	130	1313	N/A	

NOTE: All results are for the design power and increased flow point (104% power/106% flow) unless otherwise noted.

*Normal Scram Speed (NSS)

**Technical Specification Scram Speed (TSSS)

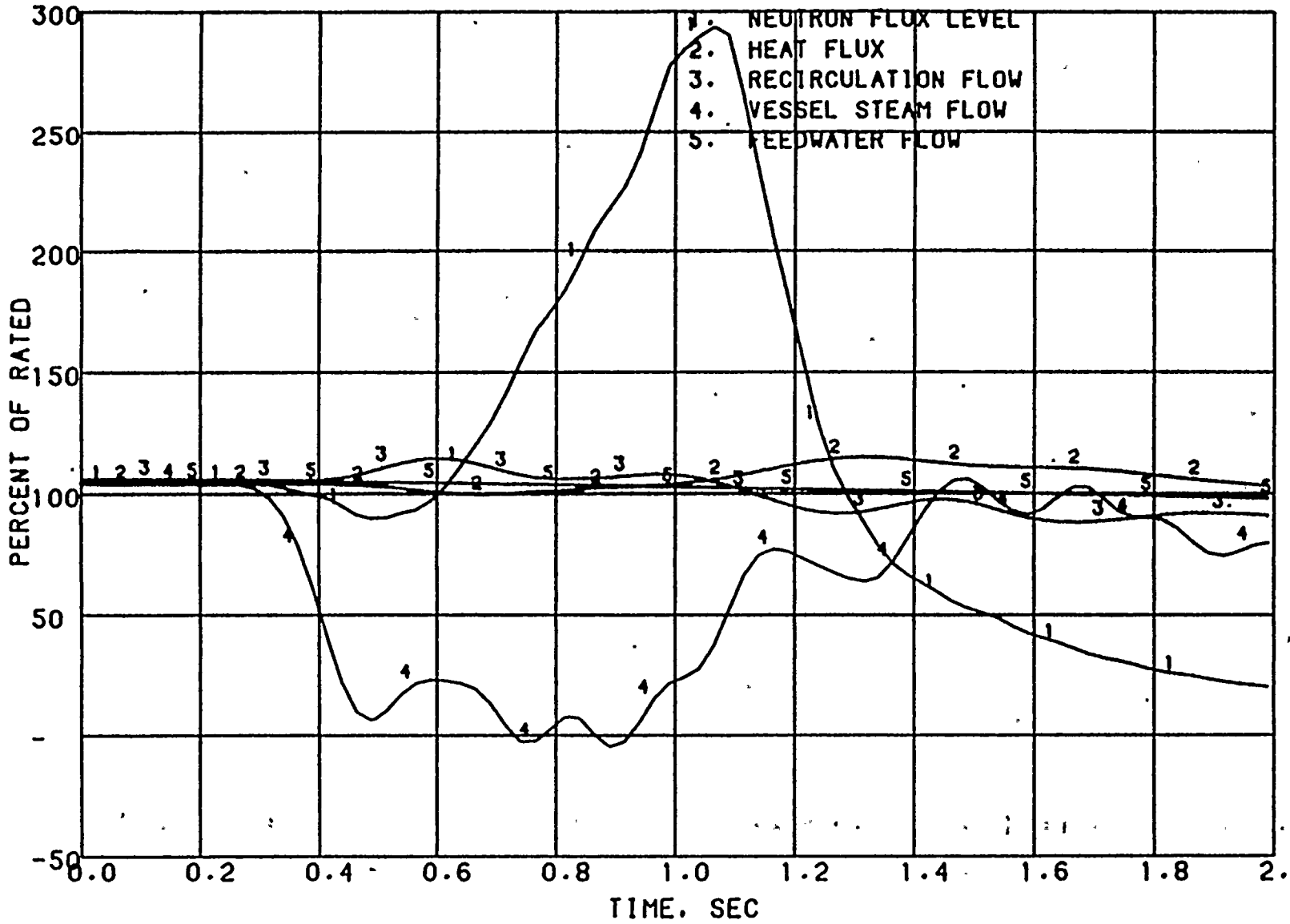

Figure 3.1 Load Rejection Without Bypass Results, RPT Operable, Normal Scram Speed

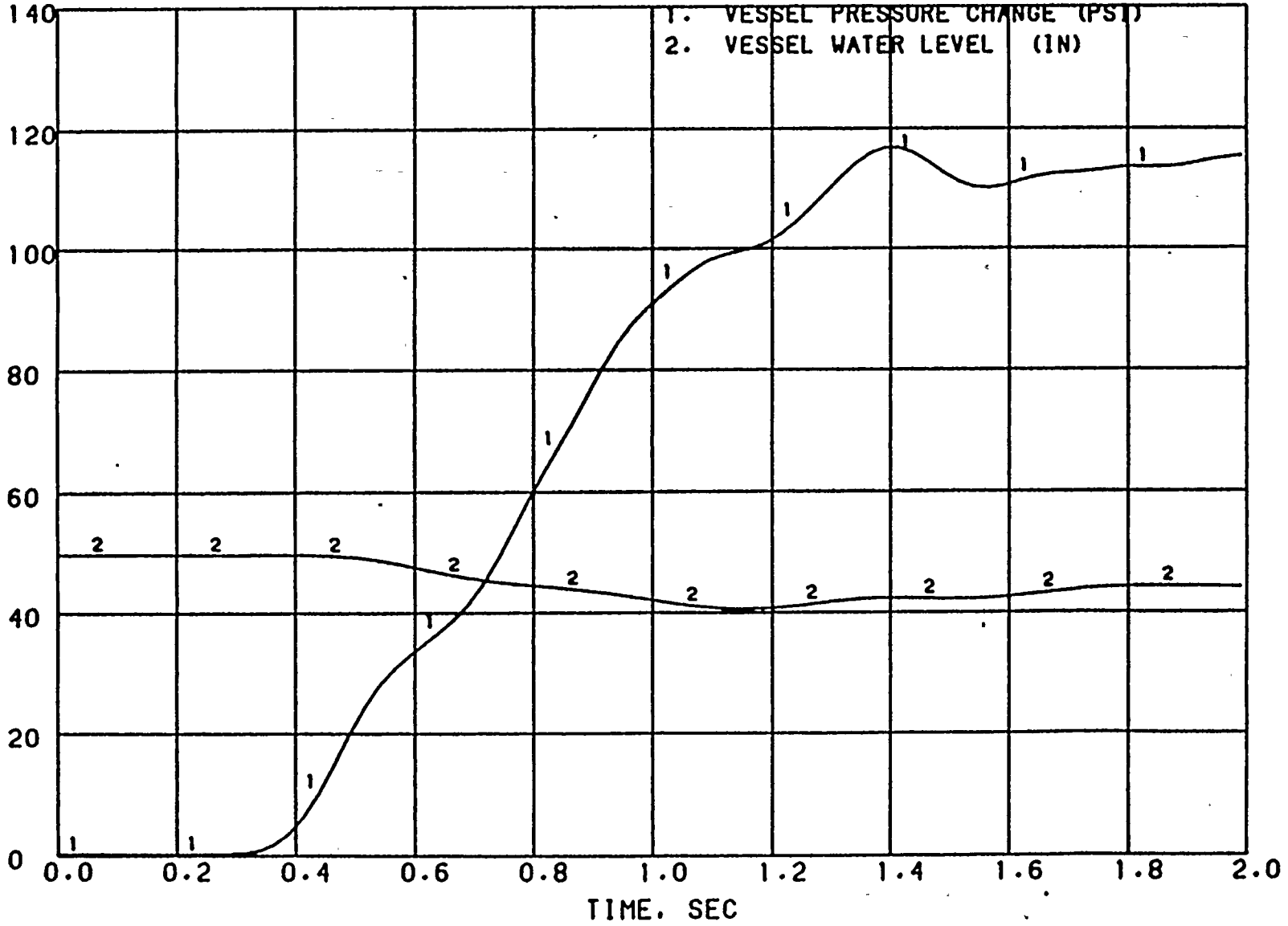

Figure 3.2 Load Rejection Without Bypass Results, RPT Operable, Normal Scram Speed

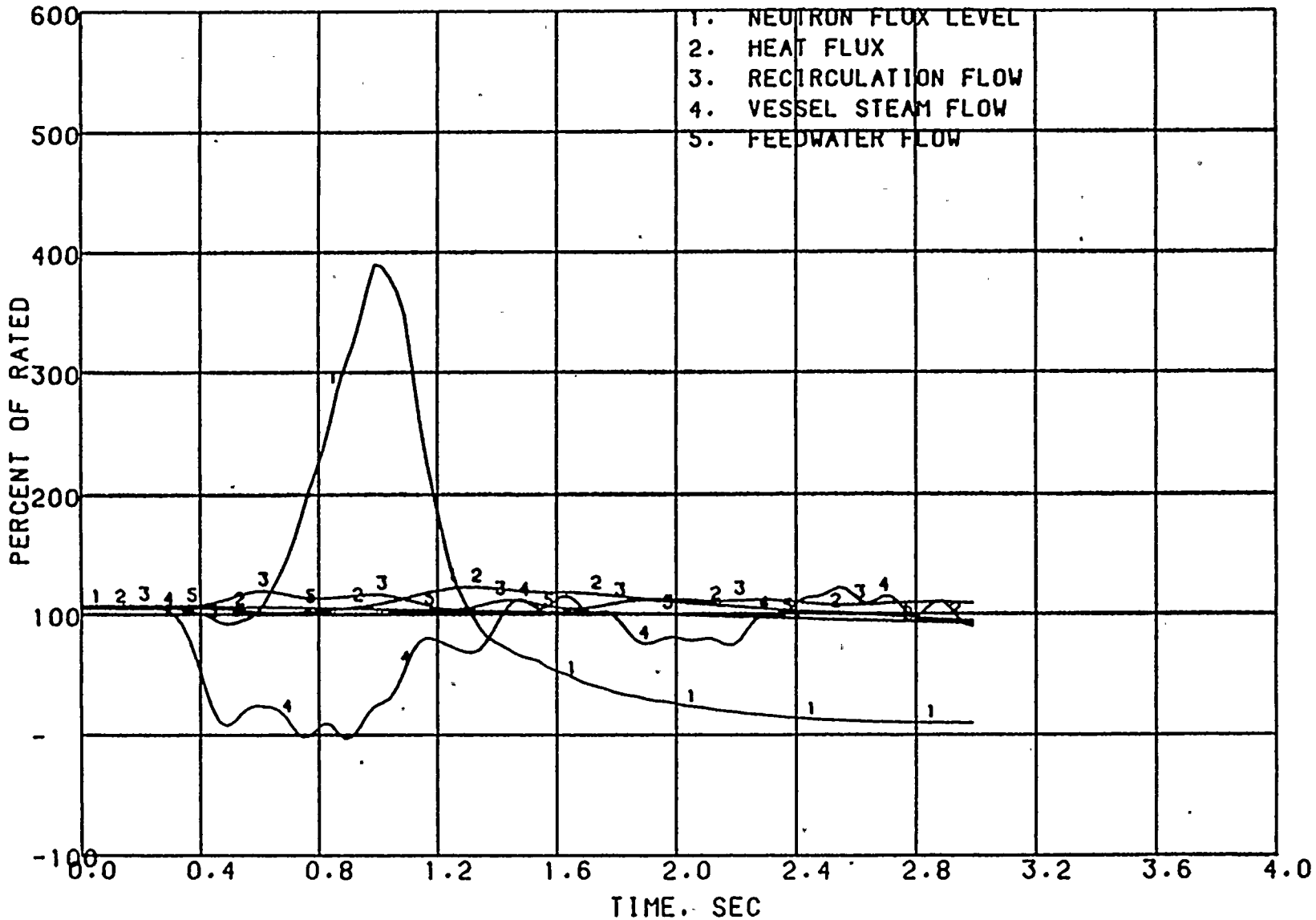

Figure 3.3 Load Rejection Without Bypass Results, RPT Inoperable, Normal Scram Speed

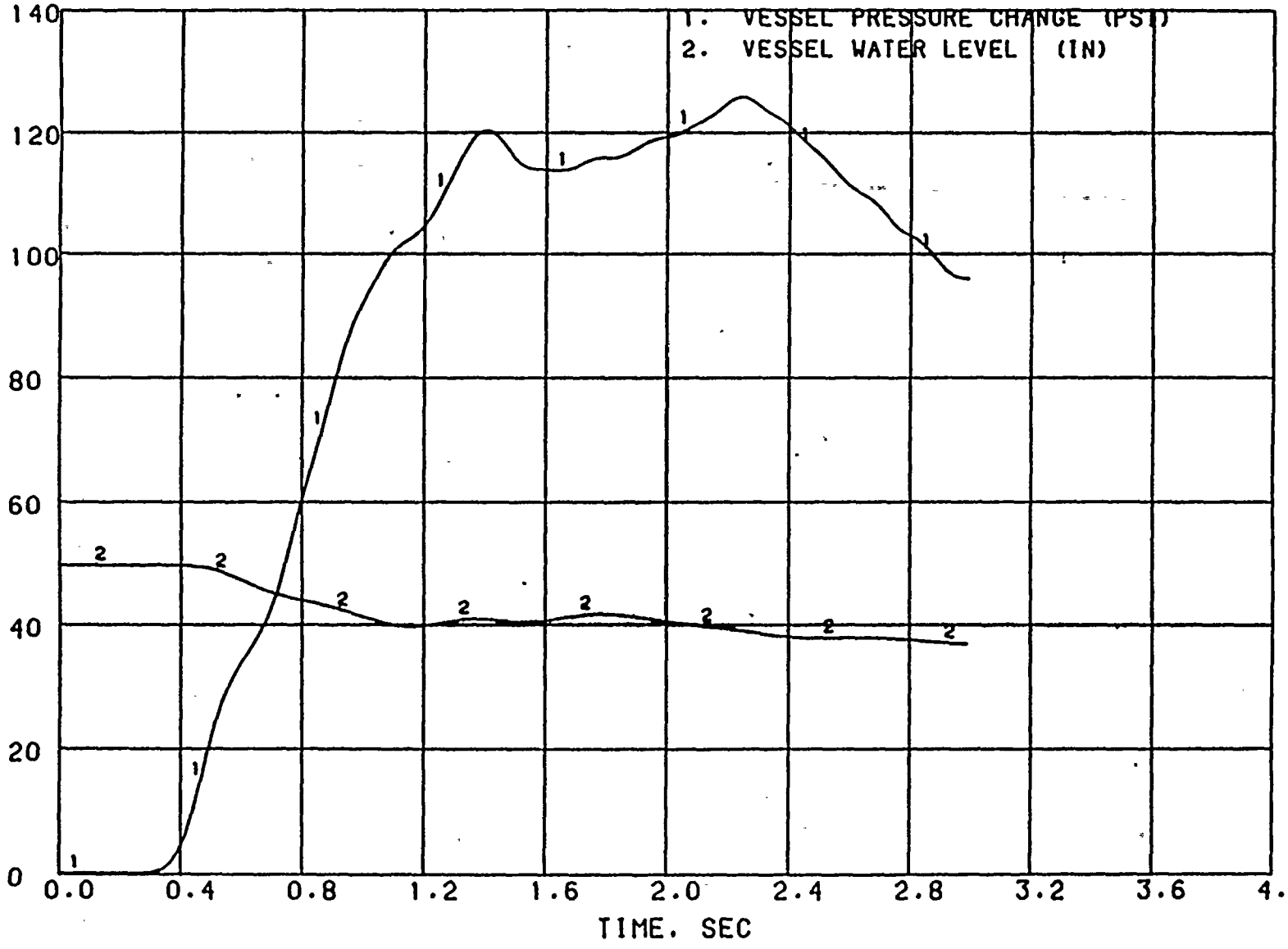

Figure 3.4 Load Rejection Without Bypass Results, RPT Inoperable, Normal Scram Speed

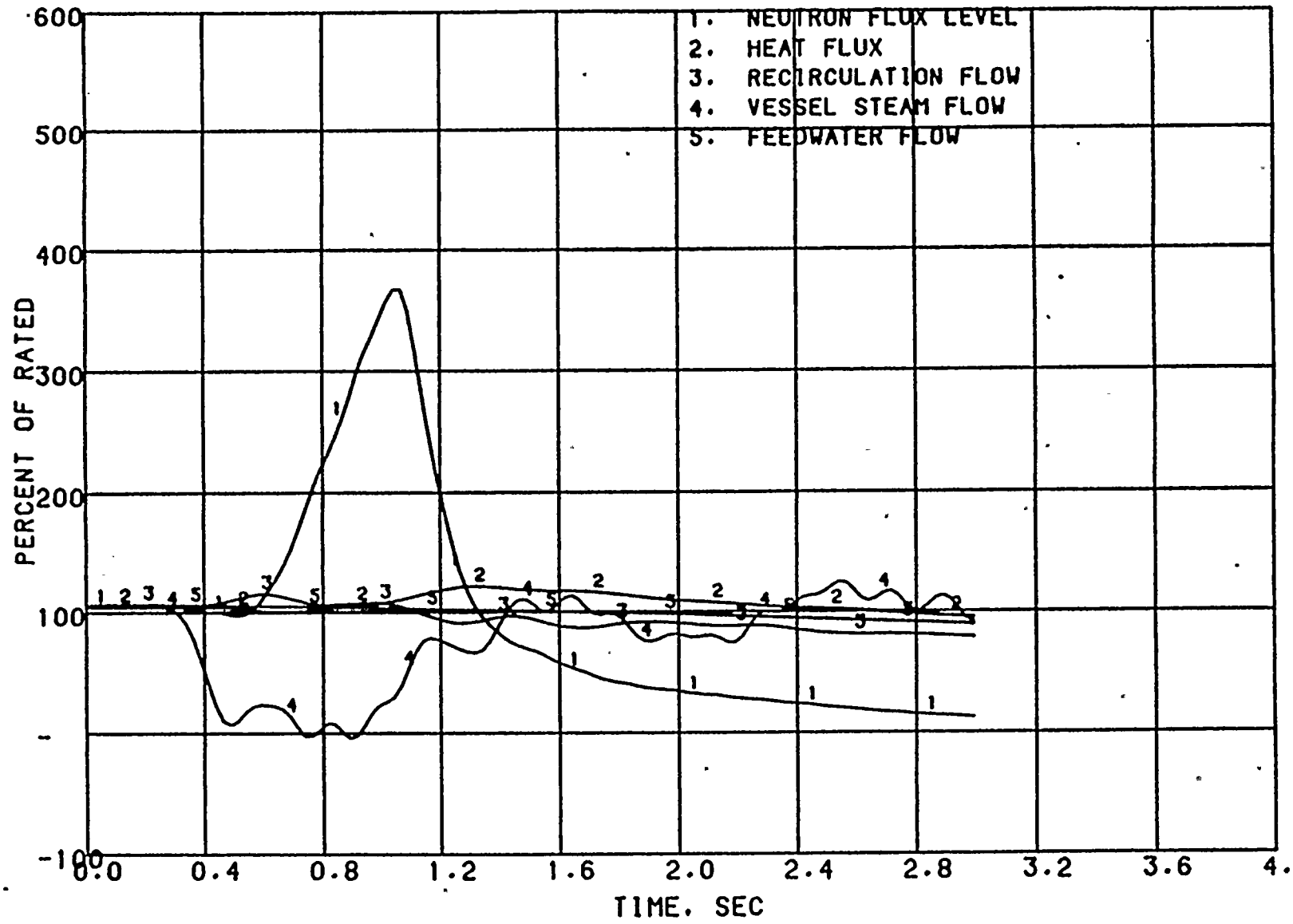

Figure 3.5 Load Rejection Without Bypass Results, RPT Operable, Tech. Spec. Scram Speed

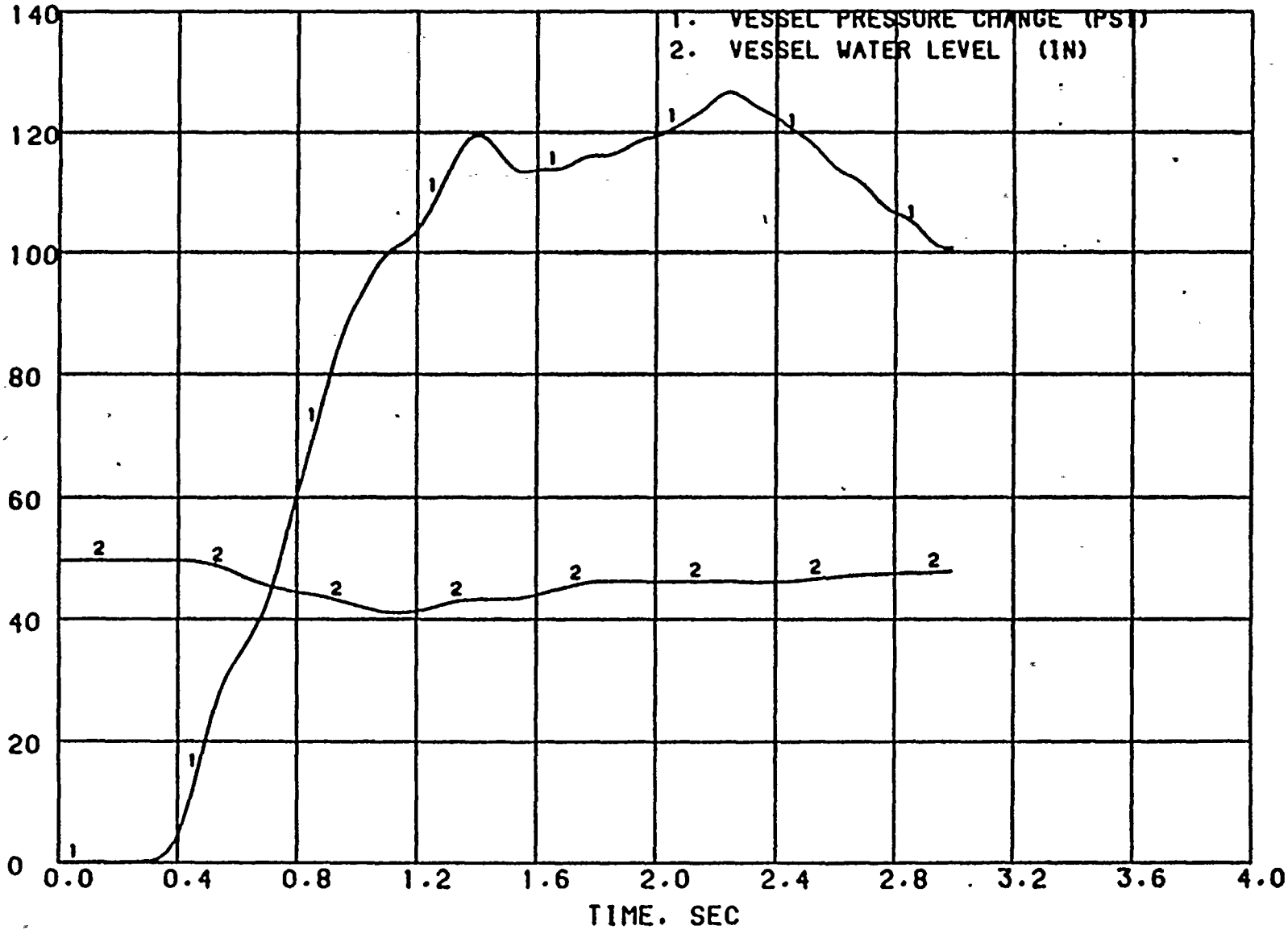

Figure 3.6 Load Rejection Without Bypass Results, RPT Operable, Tech. Spec. Scram Speed

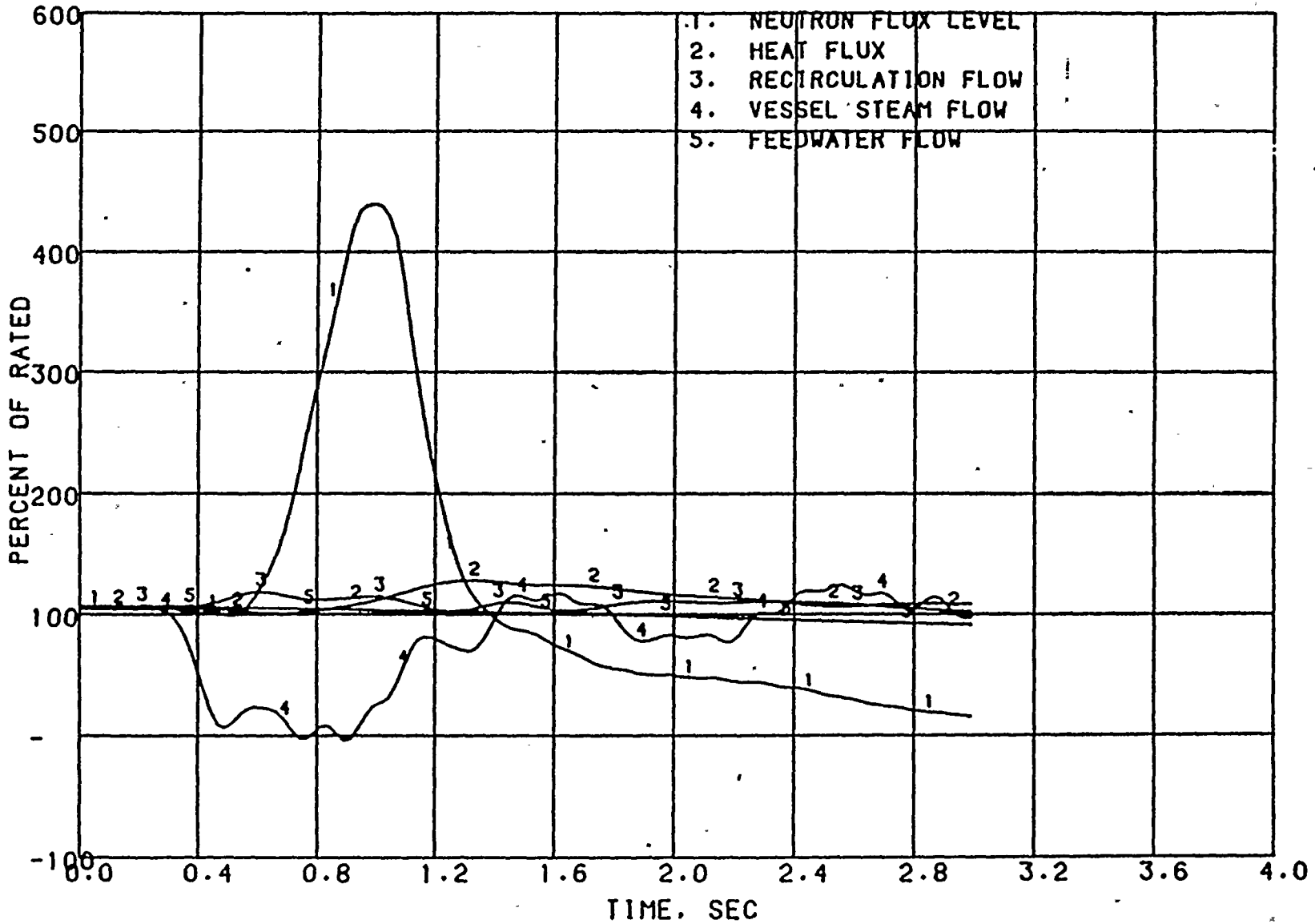

Figure 3.7 Load Rejection Without Bypass Results, RPT Inoperable, Tech. Spec. Scram Speed

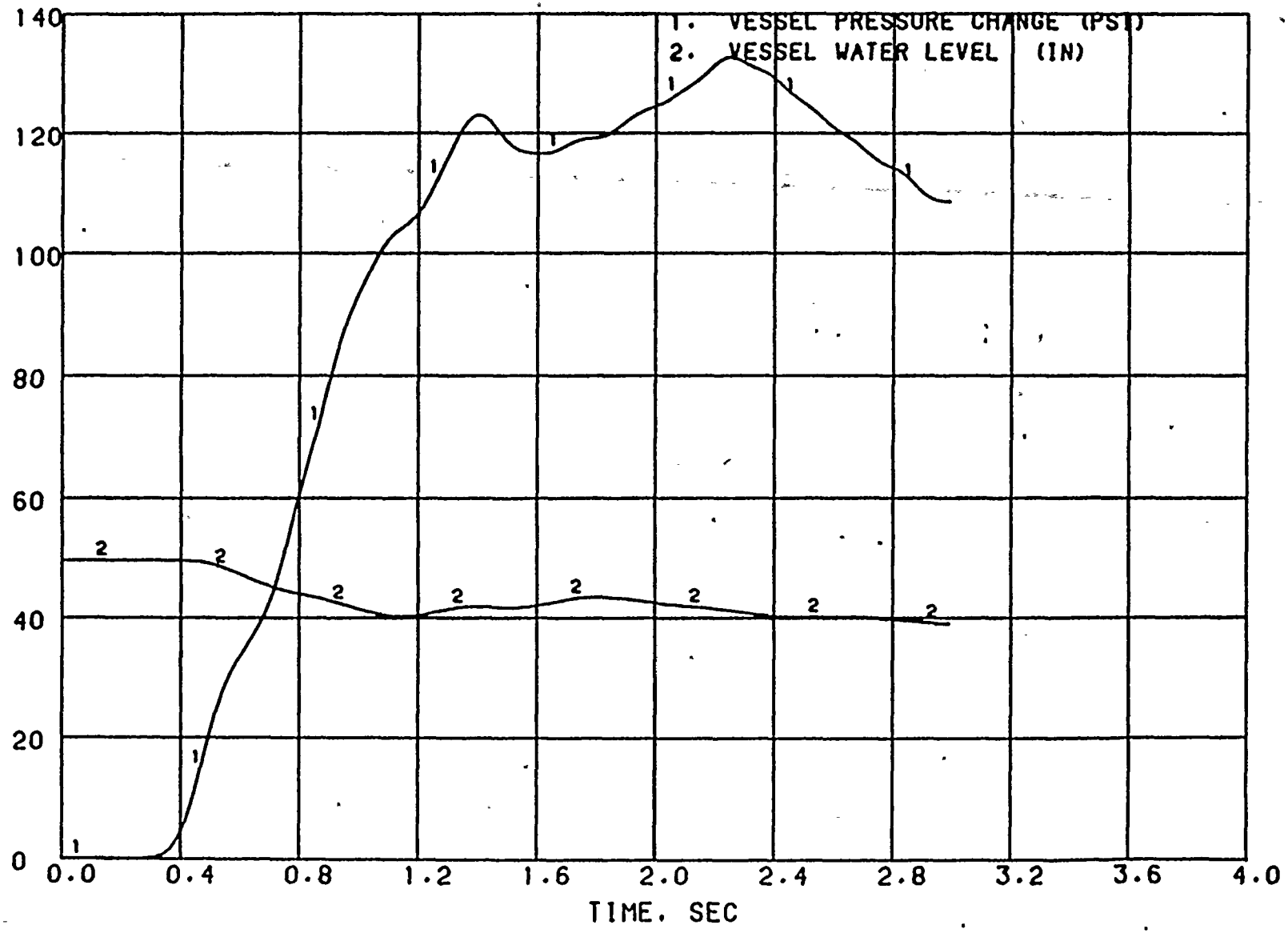

Figure 3.8 Load Rejection Without Bypass Results, RPT Inoperable, Tech. Spec. Scram Speed

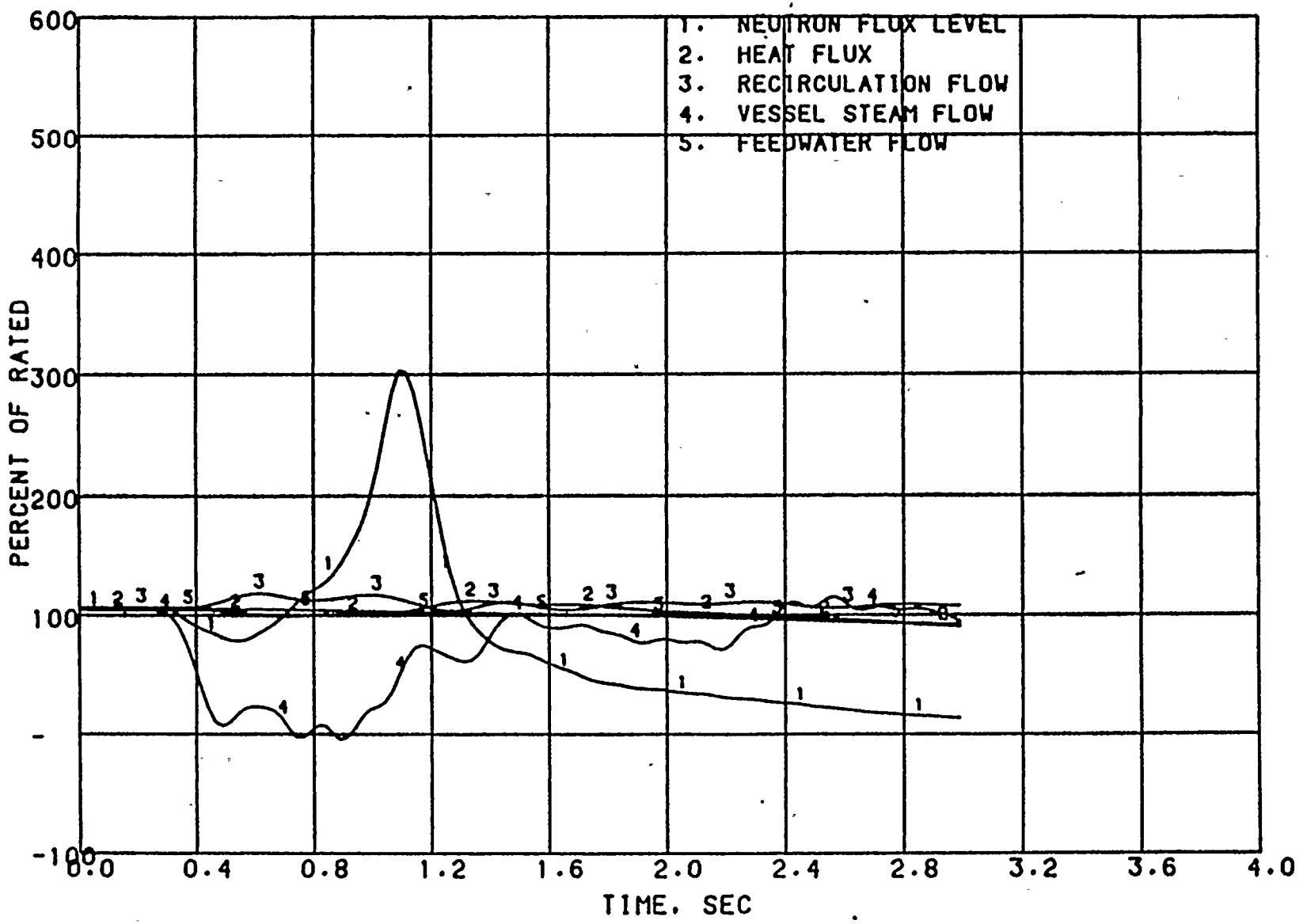

Figure 3.9 Load Rejection Without Bypass Results, End-Of-Cycle Minus 2000 MWD/MTU Exposure, RPT Inoperable, Tech. Spec. Scram Speed

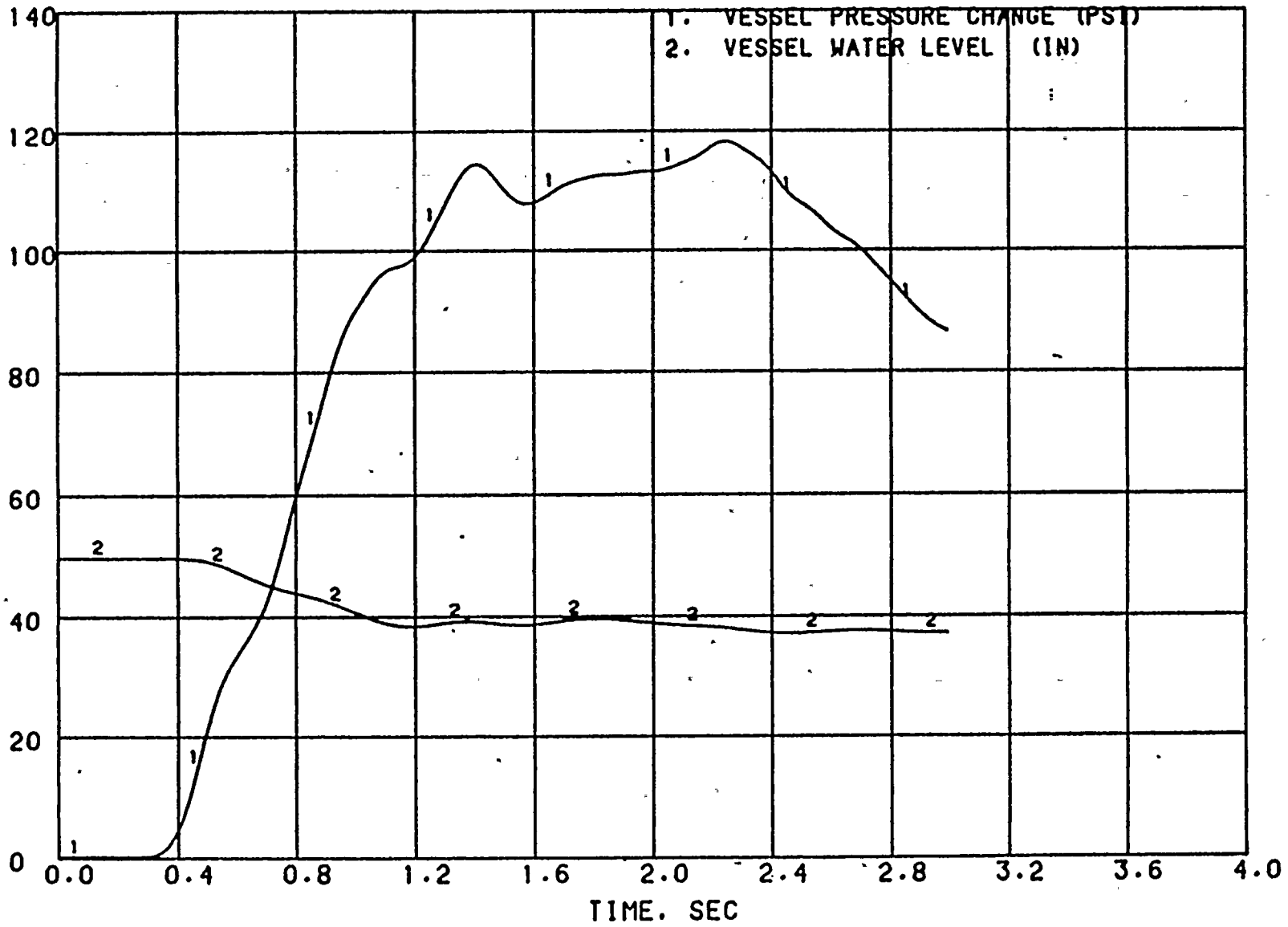

Figure 3.10 Load Rejection Without Bypass Results, End-Of-Cycle Minus 2000 MWD/MTU Exposure, RPT Inoperable, Tech. Spec. Scram Speed

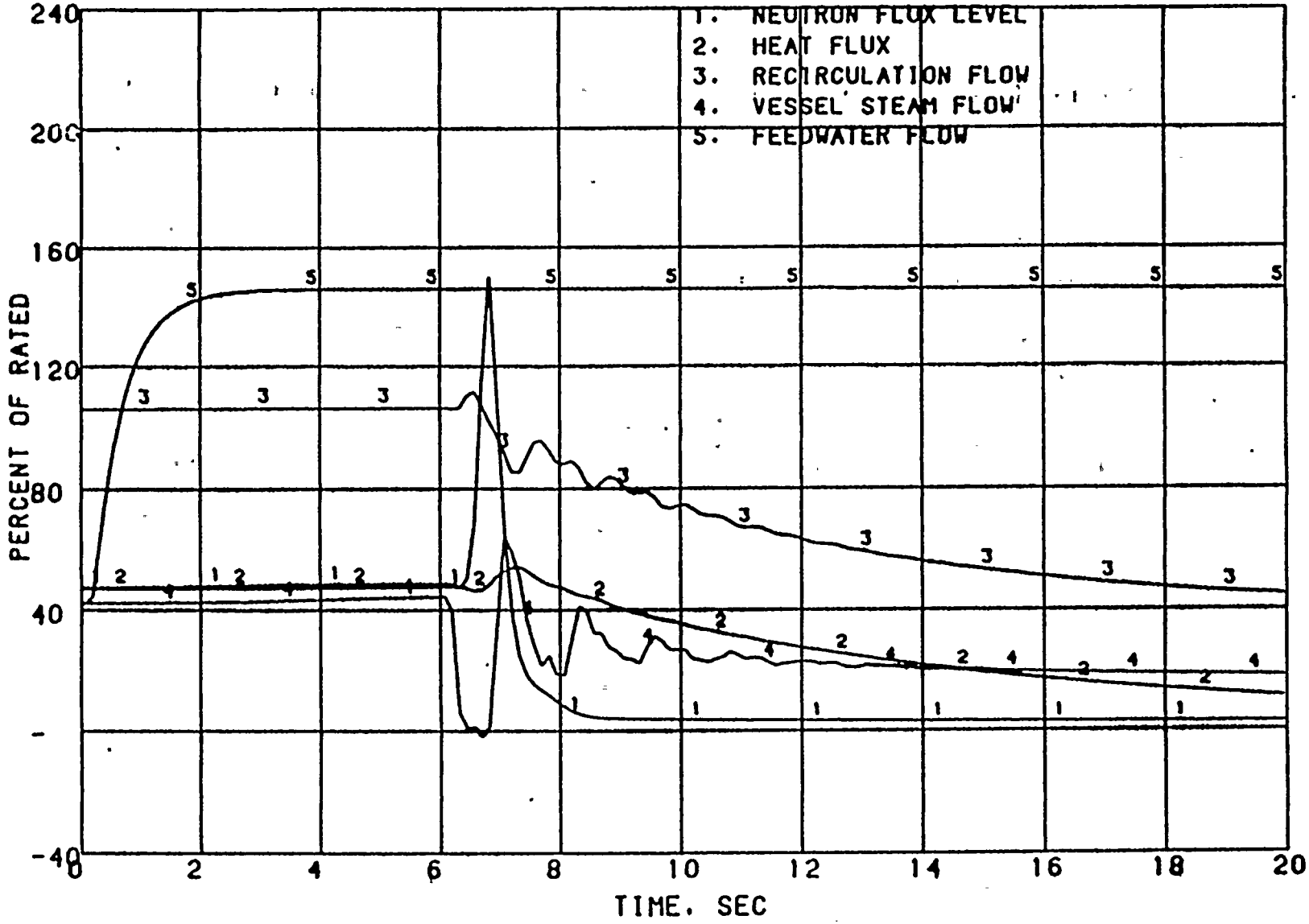

Figure 3.11 Feedwater Controller Failure Results For 47% Power And 106% Flow With Normal Scram Speed

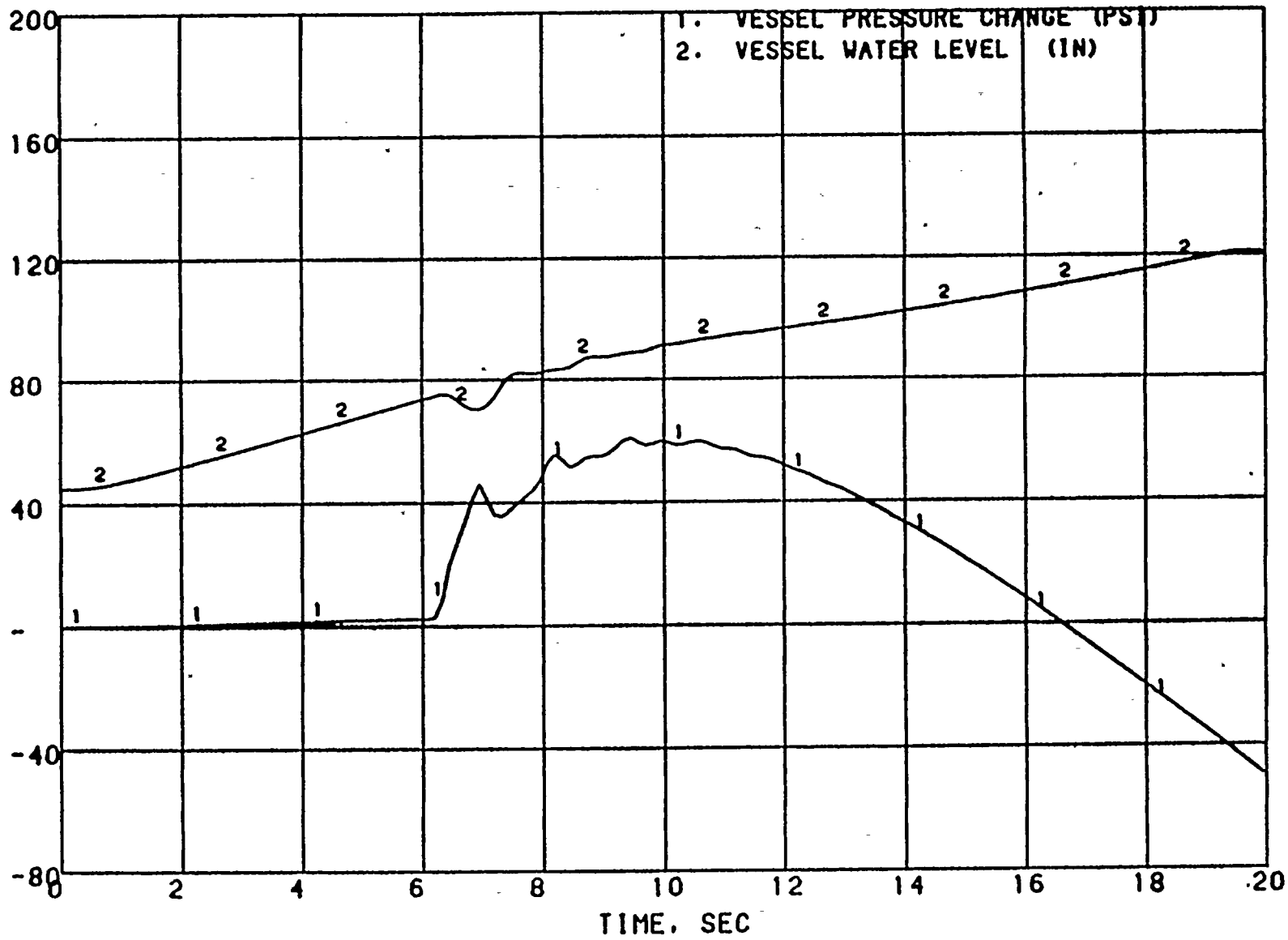

Figure 3.12 Feedwater Controller Failure Results For 47% Power And 106% Flow With Normal Scram Speed

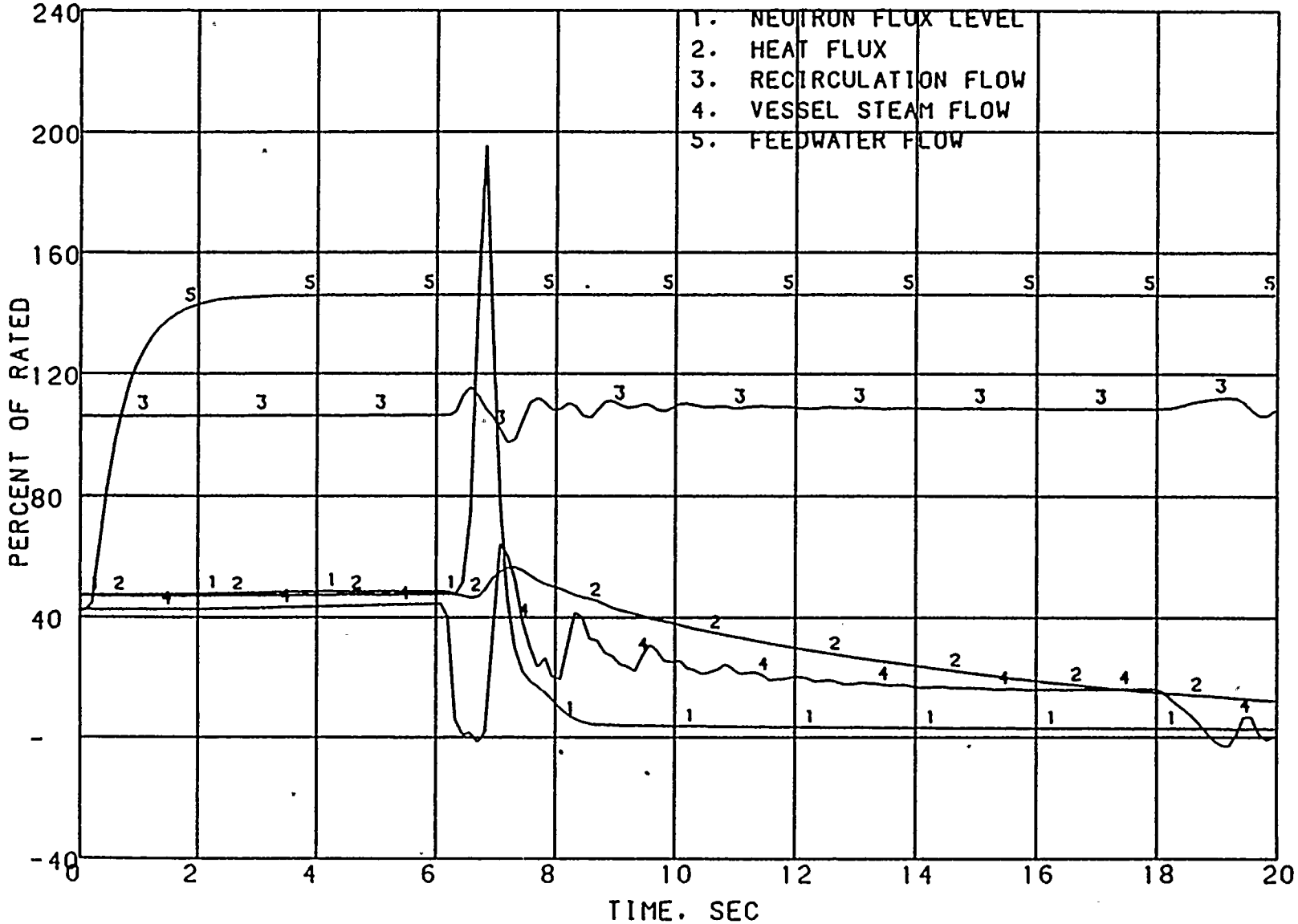

Figure 3.13 Feedwater Controller Failure Results, RPT Inoperable, Normal Scram Speed

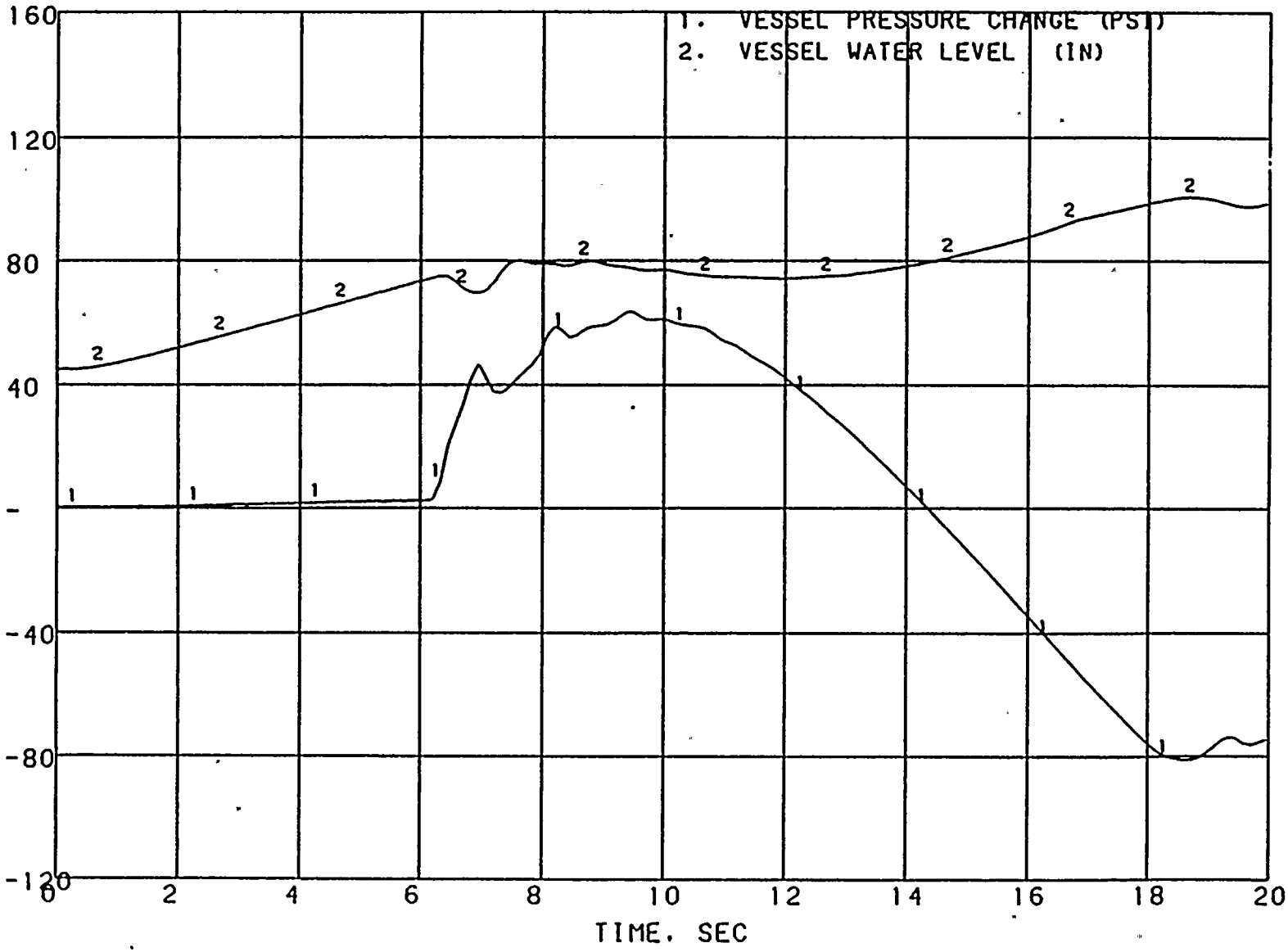

Figure 3.14 Feedwater Controller Failure Results, RPT Inoperable, Normal Scram Speed

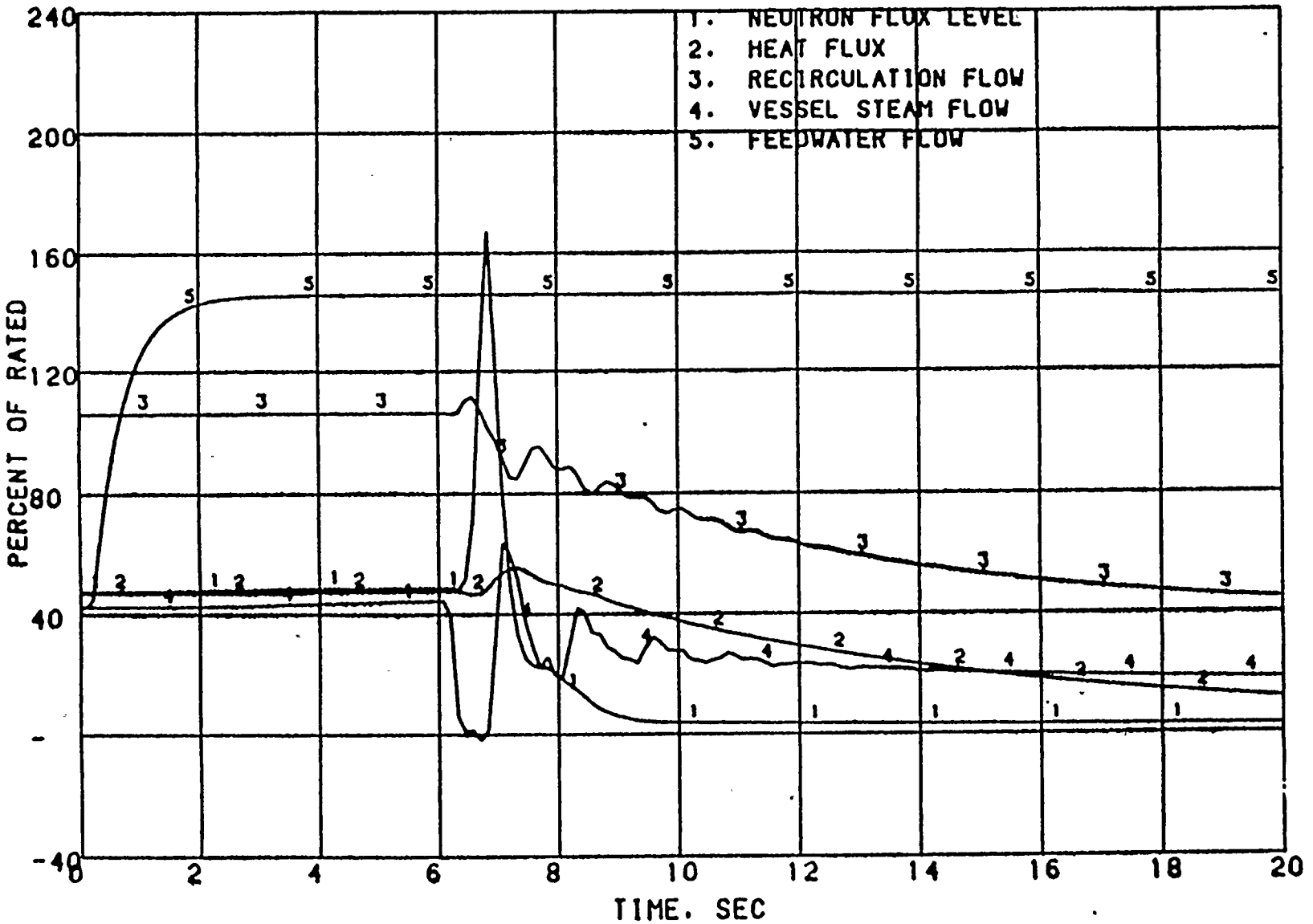

Figure 3.15 Feedwater Controller Failure Results For 47% Power And 106% Flow With Tech. Spec. Scram Speed

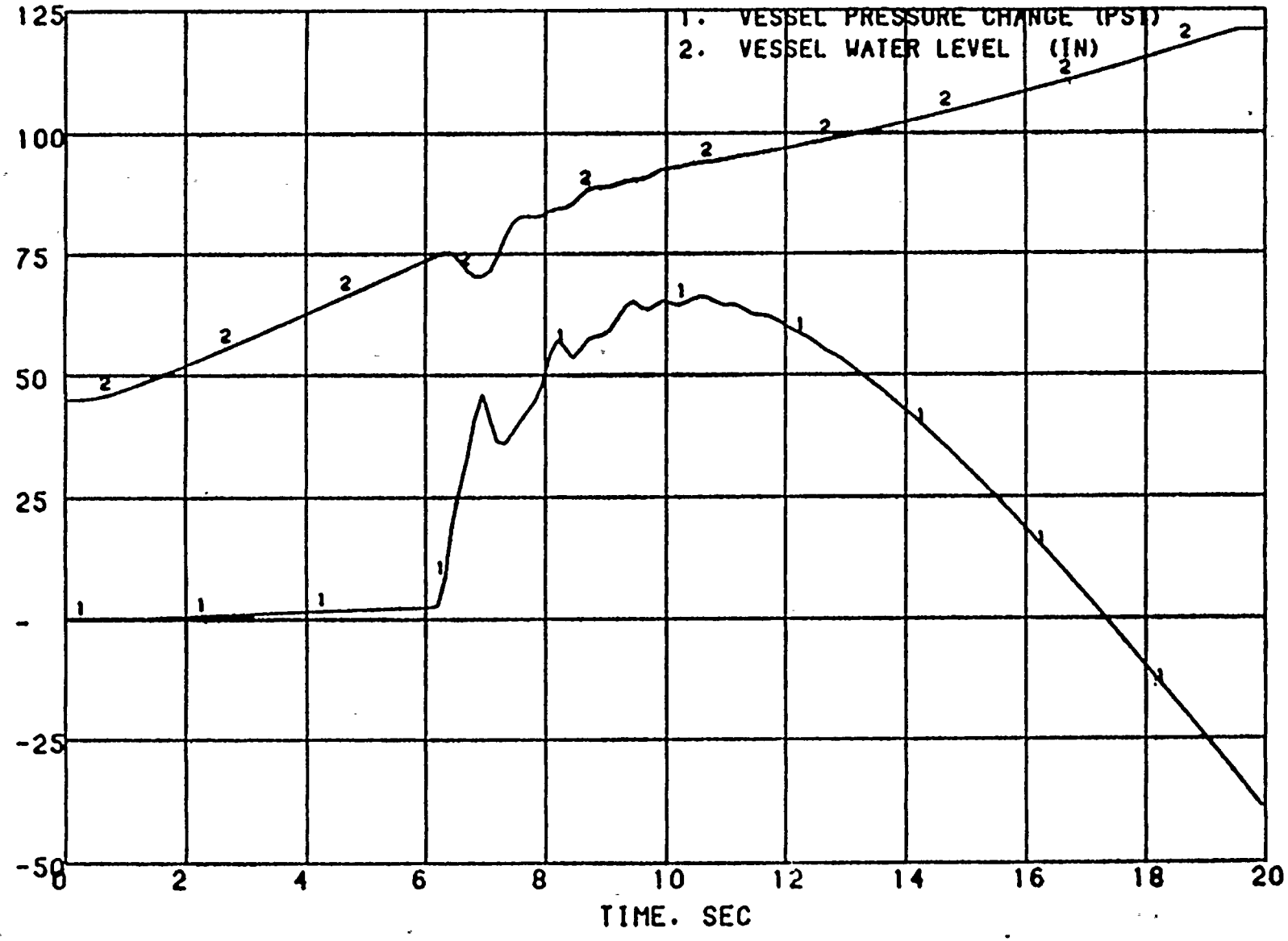

Figure 3.16 Feedwater Controller Failure Results For 47% Power And 106% Flow With Tech. Spec. Scram Speed

4.0 MAXIMUM OVERPRESSURIZATION

Maximum system pressure has been calculated for the containment isolation event (rapid closure of all main steam isolation valves) with an adverse scenario as specified by the ASME Pressure Vessel Code. This analysis showed that the safety valves of WNP-2 have sufficient capacity and performance to prevent pressure from reaching the established transient pressure safety limit of 110% of the design pressure. The maximum system pressures predicted during the event are shown in Table 2.1. This analysis also assumed six safety relief valves out of service.

4.1 Design Bases

The reactor conditions used in the evaluation of the maximum pressurization event are those shown in Table 3.1. The most critical active component (scram on MSIV closure) was assumed to fail during the transient. The calculation was performed with the ANF advanced plant simulator code COTRANSA[2], which includes an axial one-dimensional neutronics model.

4.2 Pressurization Transients

ANF has evaluated several pressurization events and has determined that closure of all main steam isolation valves (MSIVs) without direct scram is the most limiting. Since the MSIVs are closer to the reactor vessel than the turbine stop or turbine control valves, significantly less volume is available to absorb the pressurization phenomena when the MSIVs are closed than when turbine valves are closed. The closure rate of the MSIVs is substantially slower than the turbine stop valves or turbine control valves. The impact of this smaller volume is more important to this event than the slower closure speed of the MSIV valves relative to turbine valves. Calculations have determined that the overall result is to cause MSIV closures to be more limiting than turbine isolations.

4.3 Closure Of All Main Steam Isolation Valves

This calculation also assumed that six relief valves were out of service and that all four main steam isolation valves were isolated at the containment boundary within 3 seconds. At about 3.3 seconds, the reactor scram is initiated by reaching the high flux trip setpoints. Pressures reach the recirculation pump trip setpoint (1170 psig) before the pressurization has been reversed. Loss of coolant flow leads to enhanced steam production as less subcooled water is available to absorb core thermal power. The maximum pressure calculated in the steam lines was 1287 psig occurring near the vessel at about 5 seconds. The maximum vessel pressure was 1313 psig occurring in the lower plenum at about 5 seconds. These results are presented in Table 2.1 and 3.3 for the design basis point.

5.0 RECIRCULATION FLOW RUN-UP

The MCPR full flow operating limit is established through evaluation of anticipated transients at the design basis state. Due to the potential for large reactor power increases should an uncontrolled recirculation flow increase occur from a less than rated core flow state, the need exists for an augmentation of the operating limit MCPR (full flow) for operation at lower flow conditions.

Advanced Nuclear Fuels Corporation determined the required reduced flow MCPR operating limit by evaluating a bounding slow flow increase event. The calculations assume the event was initiated from the 104% rod line at minimum flow and terminate at 120% power at 103% flow (flow control valve wide open). This power flow relationship bounds that calculated for a constant xenon assumption. It was conservatively assumed that the event was quasi-steady and a flow biased scram does not occur.

The power distribution was chosen such that the MCPR equals the safety limit at the final power/flow run-up point. The reduced flow MCPRs were then calculated by XCOBRA[5] at discrete flow points.

The recirculation flow run-up analysis performed for WNP-2 Cycle 2 was reviewed, and the assumptions and conditions used for Cycle 2 are applicable to Cycle 3. Thus, the reduced flow MCPR operating limit for WNP-2 Cycle 2 is applicable to Cycle 3. This reduced flow MCPR operating limit is presented in Figure 5.1 and tabulated in Table 5.1. The MCPR operating limit for WNP-2 shall be the maximum of this reduced flow MCPR operating limit and the full flow MCPR operating limit as summarized in Reference 1.

TABLE 5.1 REDUCED FLOW MCPR OPERATING LIMIT FOR WNP-2

Core Flow (% Rated)	Reduced Flow MCPR Operating Limit
100	1.07
90	1.12
80	1.17
70	1.23
60	1.32
50	1.42
40	1.55

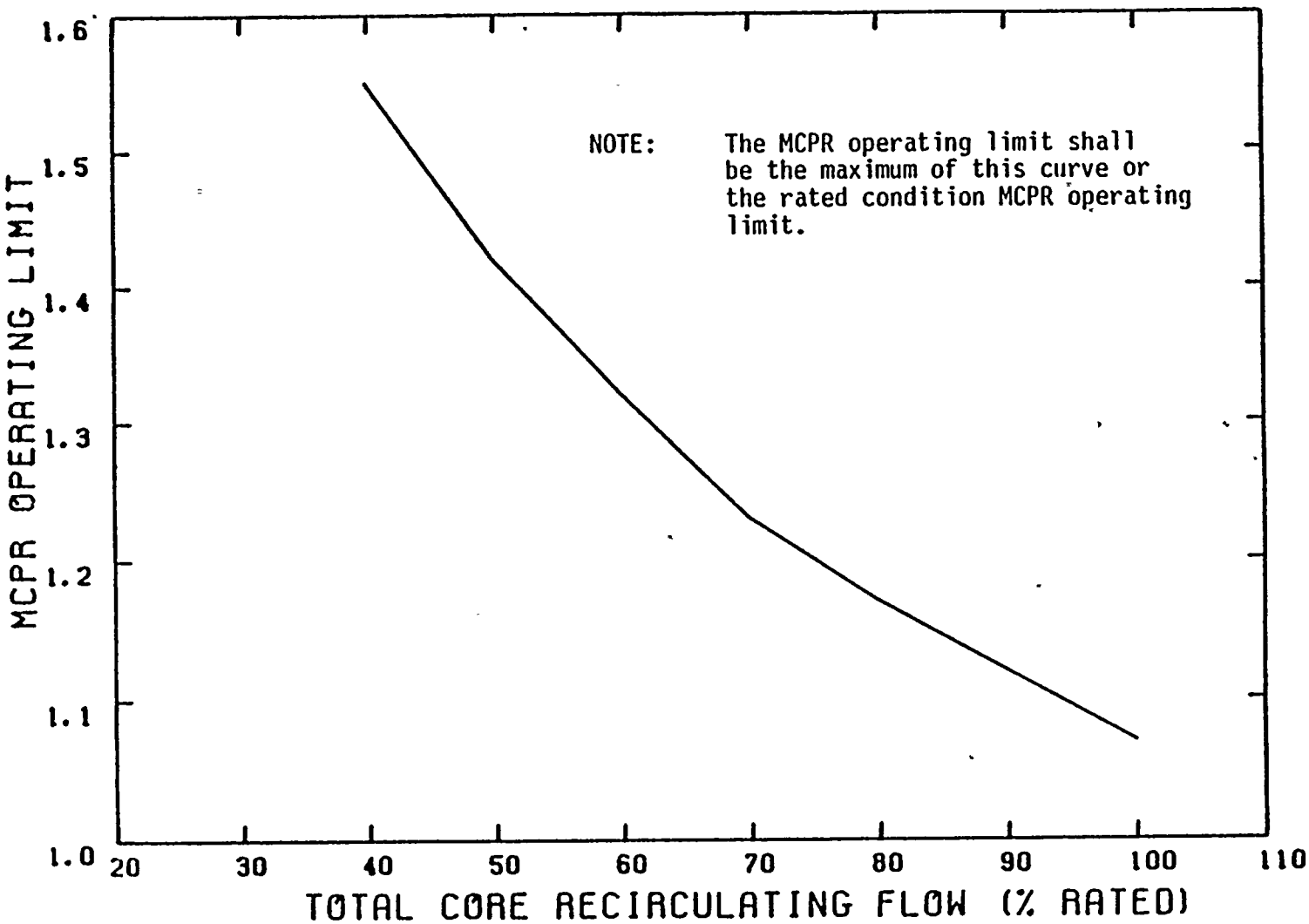

Figure 5.1 Reduced Flow MCPR Operating Limit

6.0 REFERENCES

1. J. E. Krajicek, "Supply System Nuclear Project Number 2 (WNP-2) Cycle 3 Reload Analysis," XN-NF-87-25, Advanced Nuclear Fuels Corporation, Richland, WA 99352, March 1987.

2. R. H. Kelley, "Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors," XN-NF-79-71(P), Revision 2 (as supplemented), Exxon Nuclear Company, Inc., Richland, WA 99352, November 1981.

3. M. J. Ades, "XCOBRA-T: A Computer Code for BWR Transient Thermal-Hydraulic Core Analysis," XN-NF-84-105(A), Volume 1, Volume 1 Supplement 1, Volume 1 Supplement 2, Advanced Nuclear Fuels Corporation, Richland, WA 99352, February 1987.

4. J. B. Edgar, Letter to WPPSS, Supplemental Licensing Analysis Results, ENWP-86-0067, Exxon Nuclear Company, Inc., Richland, WA 99352, April 15, 1986.

5. T. W. Patten, "Exxon Nuclear Critical Power Methodology for Boiling Water Reactors," XN-NF-524(A), Revision 1, Exxon Nuclear Company, Inc., Richland, WA 99352, November 1983.

6. T. L. Krysinski and J. C. Chandler, "Exxon Nuclear Methodology for Boiling Water Reactors; THERMEX Thermal Limits Methodology; Summary Description," XN-NF-80-19(A), Volume 3, Revision 2, Exxon Nuclear Company, Inc., Richland, WA 99352, January 1987.

7. K. R. Merckx, "RODEX2 Fuel Rod Mechanical Response Evaluation Model," XN-NF-81-58(A), Revision 2, Exxon Nuclear Company, Inc., Richland, WA 99352, March 1984.

8. S. E. Jensen, "Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors: Revised Methodology for Including Code Uncertainties in Determining Operating Limits for Rapid Pressurization Transients in BWRs," XN-NF-79-71(A), Revision 2, Supplements 1, 2, and 3, Exxon Nuclear Company, Inc., Richland, WA 99352, March 1986.

9. R. G. Grummer, "A Generic Analysis of the Loss of Feedwater Heating Transient for Boiling Water Reactors," XN-NF-900(P), Exxon Nuclear Company, Inc., Richland, WA 99352, February 1986.

APPENDIX A

MCPR SAFETY LIMIT

A.1 INTRODUCTION

Bundle power limits in a boiling water reactor (BWR) are determined through evaluation of critical heat flux phenomena. The basic criterion used in establishing critical power ratio (CPR) limits is that at least 99.9% of the fuel rods in the core will be expected to avoid boiling transition (critical heat flux) during normal operation and anticipated operational occurrences. Operating margins are defined by establishing a minimum margin to the onset of boiling transition condition for steady state operation and calculating a transient effects allowance, thereby assuring that the steady state limit is protected during anticipated off-normal conditions. This appendix addresses the calculation of the minimum margin to the steady state boiling transition condition, which is implemented as the MCPR safety limit in the plant technical specifications. The transient effects allowance, or the limiting transient change in CPR (i.e., delta CPR), is treated in the body of this report.

The MCPR safety limit is established through statistical consideration of measurement and calculational uncertainties associated with the thermal hydraulic state of the reactor using design basis radial, axial, and local power distributions. Some of the calculational uncertainties, including those introduced by the critical power correlation, power peaking, and core coolant distribution, are fuel related. When ANF fuel is introduced into a core where it will reside with another supplier's fuel types, the appropriate value of the MCPR safety limit is calculated based on fuel-dependent parameters associated with the mixed core. Similarly, when an ANF-fabricated reload batch is used to replace a group of dissimilar fuel assemblies, the core average fuel dependent parameters change because of the difference in the

relative number of each type of bundle in the core, and the MCPR safety limit is again reevaluated.

The design basis power distribution is made up of components corresponding to representative radial, axial, and local peaking factors. Where such data are appropriately available from previous cycles, these factors are determined through examination of operating data for previous cycles and predictions of operating conditions during the cycle being evaluated for the MCPR safety limit. If operating data are not available, either because the reactor has not been operated or because appropriate data cannot be supplied to ANF, the safety limit power distribution is determined strictly from the predicted operating conditions during the cycle being evaluated. Operating data for WNP-2 during Cycle 1 operation was not evaluated because it is not considered typical of later cycle operation. Operating data for WNP-2 during Cycle 2 and the predicted operating conditions for Cycle 3 were evaluated to identify the design basis power distributions used in the Cycle 3 MCPR safety limit analysis.

A.2 ASSUMPTIONS

A.2.1 Design Basis Power Distribution

The local, radial, and axial power distributions which were determined to be conservative for use in the safety limit analysis are shown in Figures A-1 through A-3.

A.2.2 Hydraulic Demand Curve

Hydraulic demand curves based on calculations with XCOBRA were used in the safety limit analysis. The XCOBRA calculation is described in ANF topical reports XN-NF-79-59(A), "Methodology for Calculation of Pressure Drop in BWR Fuel Assemblies," and XN-NF-512(A), "The XN-3 Critical Power Correlation."

A.2.3 System Uncertainties

System measurement uncertainties are not fuel dependent. The values reported by the NSSS supplier for these parameters remain valid for the insertion of ANF fuel. The values used in the safety limit analysis are tabulated in the topical report XN-NF-524(A), "Exxon Nuclear Critical Power Methodology for Boiling Water Reactors."

A.2.4 Fuel Related Uncertainties

Fuel related uncertainties include power measurement uncertainty and core flow distribution uncertainty. The values used in the safety limit analysis are tabulated in the topical report XN-NF-524(A), "Exxon Nuclear Critical Power Methodology for Boiling Water Reactors." Power measurement uncertainties are established in the topical report XN-NF-80-19(A), Volume 1, "Exxon Nuclear Methodology for Boiling Water Rectors; Neutronics Methods for Design and Analysis."

A.3 SAFETY LIMIT CALCULATION

A statistical analysis for the number of fuel rods in boiling transition was performed using the methodology described in ANF topical report XN-NF-524(A), "Exxon Nuclear Critical Power Methodology for Boiling Water Reactors." With 500 Monte Carlo trials it was determined that for a minimum CPR value of 1.06 at least 99.9% of the fuel rods in the core would be expected to avoid boiling transition with a confidence level of 95%.

LL 0.91	L 0.95	ML 1.01	M 1.05	M 1.05	ML 1.01	L 0.95	LL 0.91
L 0.95	ML 0.97	H 1.07	ML* 0.89	H 1.04	H 1.07	M 1.03	L 0.95
ML 1.01	H 1.07	H 1.02	H 1.01	H 0.99	H 1.01	ML* 0.91	ML 1.01
M 1.05	ML* 0.89	H 1.01	W 0.00	M 0.91	H 0.99	H 1.04	M 1.05
M 1.05	H 1.04	H 0.99	M 0.91	W 0.00	H 1.00	M 0.95	M 1.04
ML 1.01	H 1.07	H 1.01	H 0.99	H 1.00	H 1.01	H 1.07	M 1.07
L 0.95	M 1.03	ML* 0.91	H 1.04	M 0.95	H 1.07	ML* 0.97	ML 1.05
LL 0.91	L 0.95	ML 1.01	M 1.05	M 1.04	M 1.07	ML 1.05	L 1.01

XN-CH-0551

Figure A.1 WNP-2 Cycle 3 Safety Limit Local Peaking Factors (ANF Fuel)

LL 1.03	L 1.00	ML 0.99	M 0.99	M 0.99	ML 0.99	L 1.00	LL 1.03
L 1.00	M 0.99	H 1.03	H 1.02	MH 0.99	MH 0.99	ML 0.97	L 1.00
ML 0.99	H 1.03	L* 0.91	H 1.02	H 1.01	MH 0.98	MH 0.99	ML 0.99
M 0.99	H 1.03	H 1.02	W 0.00	H 1.02	H 1.01	MH 0.99	M 0.99
M 0.99	H 1.02	H 1.01	L* 0.91	W 0.00	H 1.02	H 1.02	M 0.99
ML 0.99	MH 0.99	H 1.02	H 1.01	H 1.02	L* 0.91	H 1.03	ML 0.99
L 1.00	ML 0.97	MH 0.99	H 1.02	H 1.03	H 1.03	M 0.99	L 1.00
LL 1.03	L 1.00	ML 0.99	M 0.99	M 0.99	ML 0.99	L 1.00	LL 1.03

XN-CH-0523

Figure A.2 WNP-2 Cycle 3 Safety Limit Local Peaking Factors (G. E. Fuel)

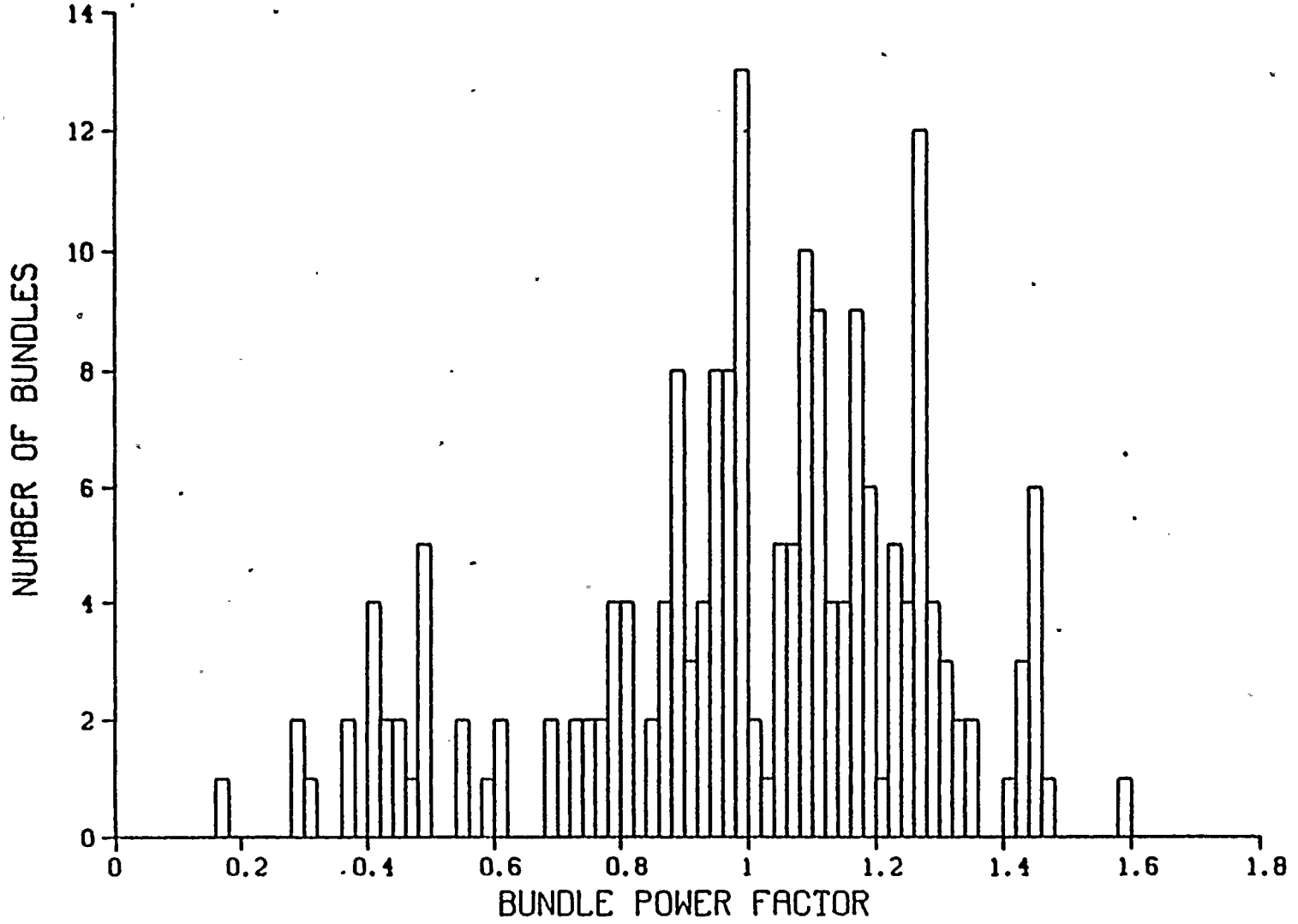

Figure A.3 Radial Power Histogram For 1/4 Core Safety Limit Model

XN-NF-87-24
Issue Date: 3/26/87

WNP-2 CYCLE 3 PLANT TRANSIENT ANALYSIS

Distribution:

R. E. Collingham
J. G. Ingham
S. E. Jensen
T. H. Keheley
J. E. Krajicek
T. L. Krysinski
J. L. Maryott
J. N. Morgan
G. L. Ritter
G. N. Ward
H. E. Williamson

J. B. Edgar/WPPSS (50)
Document Control (5)

CNR

8705120286

ORIGINAL

(PTL # 13996)

Washington Public Power Supply System
PLANT DEFICIENCY REPORT/NONCONFORMANCE REPORT

NCR Number 286-011
PDR Number

[X] Safety Related, QC I
[ ] Non-safety Related QC II, G
[ ] Non-Installed Eqpt.
[X] Other Than Non-Inst.
[ ] Security System
[ ] Fire Protection
[ ] Essential
Radwaste

Originator: J C Scheck	Date: 1/10/85	Validated By: for [signature] 1/13/85	Date
Item/EPN: CMS-RA-27C, D	System No. 025.0	PO/Spec/Procedure: QID 270101-E	

Full Description of Problem — # of Hold Tags ____ — Vital MWR # ____

Environmental Qualification of the safety related items for operation without the thermoelectric cooler is not adequately documented. The equipment is not likely to fail to perform it's intended safety function.

[X] Not Reportable [ ] Reportable + — NONE (Requirement) — [signature] (Evaluator) — 1/13/85 (Date)

Event Date: 1/1/85 — Plant Mode: 1 — % Power: 72% — + NRC [ ] Yes [X] No

+Immediate Disposition [X] Use-As-Is [ ] Reject [ ] Rework [ ] Repair [ ] ASME [X] Other

DOCUMENTATION DEFICIENCY (SEE ATTACHED). & INSTALLATION DEFICIENCIES PREVIOUSLY ADDRESSED VIA PMR 02-84-0824-0. USE INSTALLED EQUIPMENT AS IS PENDING RESULTS OF ENVIRONMENTAL TESTING BY EQG. ~~FINAL DISPOSITION TO BE PROVIDED BY PMR 02-84-0824-0~~ WK

EQG / ENG — Implementing Organization

Cause/Effect:

INADEQUATE DOCUMENTATION RESULTING IN QUESTIONABLE ENVIRONMENTAL QUALIFICATION.

Corrective Action:

~~FINAL CORRECTIVE ACTION FOR DEF ASSOCIATED WITH PMR 02-84-0824-0~~ WK ~~NO OTHER CORRECTIVE ACTION REQ'D.~~ WK PERFORM ENVIRONMENTAL QUALIFICATION TESTING ON CMS-RA-27C+D WITHOUT USE OF THERMIONIC COOLERS. 6/4

[signature] — Dispositioner — 3-20-86 (Date) — Site Design Engineering (Implementing Organization)

Approval: +Required for 4 hr or less reportables prior to return to service

+PTM [signature]	5/21/86	Signature	Date
+PM Signature	Date	Signature	Date
QA [signature]	6/20/86	ANI Signature	Date

Implementation: IOM SS2-PE-86-715 ~~84-0824 (...5400)~~ WK — Implementing Document — [signature] 5/21/86 Implementing Manager/Date

QA Review: [signature] 6/20/86 Signature/Date

Sm 7-11-86

PROCEDURE NUMBER	REVISION NUMBER	PAGE NUMBER
1.3.12	8	1.3.12-16 of 25

WP-596 R1 (9-83)

CMS-RA-27C and -27D are preamplifiers mounted on thermoelectric coolers, which are disconnected. The equipment must be capable of operating in the event of a LOCA during which it would experience an environmental temperature of 128°F. Qualification documentation does not demonstrate capability of performing at 128°F, although an examination of the subcomponents provides a basis for judging that the equipment is not likely to fail to perform its safety function, the deficiency is a documentation deficiency.

K. R. Wise 1/21/86

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

INTEROFFICE MEMORANDUM

SS2-PE-86-715

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- ☐ WNP-4 FILE
- ☐ WNP-5 FILE
- ☐ HGP FILE
- ☐ PKWD FILE
- ☐ LEGAL FILE
- ☐ ADMIN FILE

RA Call 981F
[redacted]
DW Porter 520
NS Porter 981C
JE Rhoads 981F
KR Wise 981F
RAC/Lb 981F
LTH/Lb 994E

DATE: June 3, 1986

TO: K. D. Cowan, Manager, WNP-2 Technical - 988U

FROM: L. T. Harrold, Assistant Director, Generation Engineering - 994E

SUBJECT: NCR 286-011, QUALIFICATION OF PREAMPLIFIERS CMS-RA-27C AND -27D WITHOUT THERMOELECTRIC COOLERS

REFERENCE:

A test was run to verify the environmental qualification of preamplifiers CMS-RA-27C and -27D without their thermoelectric coolers. The test results verified the preamplifiers are qualified without their thermoelectric coolers. The test results are documented in QID 270101E. This completes the resolution of NCR 286-011.

RAC/ssm

WP-102 R4 (7-82)

(NR)

ORIGINAL

Washington Public Power Supply System
PLANT DEFICIENCY REPORT/NONCONFORMANCE REPORT 14208

NCR Number 236-042
PDR Number

Safety Related, QC I	Non-Installed Eqpt.	Security System	Essential
Non-safety Related QC II, G	Other Than Non-Inst.	Fire Protection	Radwaste

Originator: J.E. Rhoads Date 2-14-86 | Validated By: J.E. Rhoads Date 2-14-86

Item/EPN Solenoid/Valves/PSR-V-X73/2, -X80/2, X83/1 & /2, -X84/1 & 2/Cntmt. Isolation | System No. | PO/Spec/Procedure

Full Description of Problem # of Hold Tags ____ Vital MWR # ____

The subject solenoid valves are heat traced with thermal insulation around the valves' solenoid coil assembly. The solenoid operator assembly consists of an electrical housing assembly (i.e., rectifier, terminal block, position switches, etc.) and a solenoid coil assembly (i.e., coil, magnet, bobbin, etc.). Conversations with a manufacturer representative and field inspections have determined:

(Continued on Page 2 of 2)

[✓] Not Reportable [ ] Reportable + ____ Requirement ____ Evaluator 2-14-86 Date

Event Date ____ Plant Mode ____ % Power ____ + NRC [ ] Yes [ ] No

Immediate Disposition [X] Use-As-Is [ ] Reject [ ] Rework [ ] Repair [ ] ASME [ ] Other

Use as is, EQE has qualified the subject valves until R2 based on actual field data (TP 8.3.37), Valcor test (QR 526-6042-1A) & the Leak Rate Testing Data (PPM 7.4.6.1.2.4).

TECH
Implementing Organization

Cause/Effect:

It was determined by EQE that the subject valves were not qualified to perform there R.G. 1.97, Cat. 1 function, based on information from a manafacturer representative and field inspections.

The valves are still qualified to perform their isolation functions. However the R.G. 1.97, Cat. 1 function qualification can not be demonstrated.

Corrective Action: GO2-86-411 (5/8/86)

Rework thermal insulation and remove heat trace from the coil section of the valves.
Due to the attached letter heat trace & insulation is no longer required.
The only corrective action will be to revise the Leak Testing Program to reflect yearly testing. If leakage exceeds (approx. 200 SCCM), the EPR o-ring near the valve seat should be replaced with a silicone o-ring if repair is not possible.

Dispositioner ____ Date | TECH Implementing Organization

Approval: +Required for 4 hr or less reportables prior to return to service

+PTM ____ 5/24/86
Signature Date | Signature Date

+PM
Signature Date | Signature Date

QA M. C. Bartlett 5/27/86 | ANI
Signature Date | Signature Date

Implementation: MWR AQ4791 | QA Review
NCR 02-86-0088-0 ____ 5/24/86 | MWR (KIC) 7/1/86 | ____ 11-14-86
Implementing Document | Implementing Manager/Date | Signature/Date

ORIGINAL

Washington Public Power Supply System
PLANT DEFICIENCY REPORT/NONCONFORMANCE REPORT

NCR Number 286-042
PDR Number

Problem Statement (Cont'd) (Continuation Sheet)

1) Insulation of the coil assembly results in insufficient coil heat dissipation, which results in high coil operating temperatures with coil burn-out and/or rectifier failure probable after operating for any significant duration.

2) Because installed solenoid valves have occasionally been operated in the present configuration for greater than a two year period, the likelihood that the valves can be reasonably expected to operate throughout a postulated six-month DBE accident is remote. If opened during accident conditions, the valve is expected to close due to the spring return-to-close feature of the valve.

3) Thermal degradation due to constant energization of the heat tracing strips and/or occasional energization of the solenoid coil has accelerate aged the valve seat (ethylene polypropylene) "O"-ring seals. Continued operation in this manner will increase the likelihood of valve leakage.

4) Post accident safety function (Regulatory Guide 1.97, Category 1) is to provide valve position indication. Lead wires (tefzel) from internal position/reed switches are being heated beyond their design rating. Field wiring to the upper valve internals may also be degrading (Ref. IEN 84-68) due to the heat retaining aspects of these insulated valves Assurance of post accident position indication can not be demonstrated.

Therefore, it is concluded that the subject valves are likely to fail to remain operable and ition indication could be lost. They are also likely to leak through degraded seat "O"-rin ls.

The valves are still qualifiable to perform their containment isolation function. However, the Regulatory Guide 1.97, Category 1 function qualification can not be demonstrated. Corrective action to rework the thermal insulation and assess degradation of the limit switch lead wire and field hook up wire is required to establish Regulatory Guide 1.97 safety functio qualification.

FILE COPY

Internal Distribution

HL Aeschliman - 956B
JP Burn - 580
KD Cowan - 988U
WS Davison - 988U
LT Harrold - 994E
CR Hexum - 994E
JF Peters - 927S
PL Powell - 956B
JE Rhoads - 981F
SI Stevens - 956B
Docket File - 956B
PL2/LB - 956B
CMP/LB - 927M
GCS/LB - 520
WNP-2 Files - 964Y
MR Wuestefeld - 988U
Plant Files - 1300.2 - 927S

bcc: WG Conn - B&R - 994E
RG Graybeal - 927S
LD Sharp - 981C
KR Wise - 981F
RJ Barbee - 988U

May 8, 1986
G02-86-411

Docket 50-397

Director of Nuclear Reactor Regulation
Attn: Ms E. G. Adensam, Project Director
BWR Project Directorate No. 3
Division of BWR Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Ms. Adensam

Subject: NUCLEAR PLANT NO. 2
OPERATING LICENSE NPF-21, REQUEST FOR AMENDMENT TO OPERATING LICENSE, LICENSE CONDITION 16, ATTACHMENT 2, ITEM 3(a), PASS VALVE DEFERMENT, WITHDRAWAL OF

Reference 1) Letter, G02-86-282, G.C. Sorensen (SS) to E.G. Adensam (NRC), same subject, dated March 28, 1986

2) Letter, D.B. Vasallo (NRC) to R.W. Capstick (VY NPC), NUREG-0737, Item II.B.3, dated January 14, 1985

3) Letter, J.R. Miller (NRC) to W.G. Counsil (Northwest Nuclear Energy Co.), NUREG-0737, Item II.B.3 Evaluation of Post-Accident Sampling Capabilities, dated June 14, 1984

Reference 1) requested a deferral of a licensing condition requiring fully qualified components meeting Regulatory Guide 1.97, Revision 2 requirements for six (6) PSR valves utilized in obtaining containment atmosphere samples, post accident. The components theoretically fail environmental qualification when exposed to post accident environmental conditions added to service conditions resulting from heat tracing and insulating of the valves.

AUTHOR:	DI Powell	5/11/86	FOR SIGNATURE OF:	GC Sorensen	
SECTION					
FOR APPROVAL OF	RJ Barbee	KD Cowan	MR Wuestefeld	RG Graybeal	LD Sharp
APPROVED		Cowan 5/12/86			
DATE	5/12/86	CW Powers	5-2-86		

In a subsequent phone conversation between Messrs J.O. Bradfute and F. Witt of your staff and P.L. Powell, H.L. Aeschliman, R. Barbee, and L. Sharp of the Supply System on April 24, 1986, it was stated by the NRC that heat tracing and insulating of the lines and valves related to obtaining containment atmosphere samples for estimating core damage are not necessary. This is based on the fact that the basic requirement is to obtain a core damage estimate by measuring the noble gases in the containment atmosphere, which are not susceptible to plating out in the sample lines. The insulating and heat tracing was installed to prevent plateout. By the nature of the targeted isotopes to be analyzed, plateout cannot occur and there is no longer a need to provide insulation and heat tracing. Accordingly, the Supply System is revising the Post Accident Sample System to eliminate the requirements for heat tracing and insulating on the subject sample lines and valves. References 2 and 3 were provided by the staff to document this position.

Additionally, reference 1) identified that a reanalysis effort and inspection program would be conducted to verify the valves had not actually suffered degradation sufficient to render them not capable of surviving a potential accident exposure. That program has been completed and the actual service condition resulting from heat tracing is significantly lower than the conservative values assumed in the original qualification assessment. Coupled with the removal of the requirement for heat tracing and the lower actual to date service conditions the valves contain sufficient estimated life to remain inservice.

With this revision the requested deferment is no longer necessary; removal of heat tracing and insulation requirements resulting in elimination of the higher service temperature will allow the valves to meet qualification requirements. Hence the request to defer qualification of the six PSR valves until the second refueling outage is withdrawn and the proposed amendment to License Condition 16 is to be revised accordingly.

It is requested that the staff provide confirmation of this position to the Supply System similar to that provided by references 2 and 3. Should you have any further questions please contact Mr. P. L. Powell, Manager, WNP-2 Licensing.

Very truly yours,

GC Sorensen

G. C. Sorensen, Manager
Regulatory Programs

PLP/bk

cc: JO Bradfute - NRC
C Eschels - EFSEC
JB Martin - NRC RV
E Revell - BPA
NS Reynolds - BLCP&R
NRC Site Inspector

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

INTEROFFICE MEMORANDUM

SS2-PE-86-606

DISTRIBUTION: MAIL DROP

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- ☐ HGP FILE
- ☐ PKWD FILE
- ☐ LEGAL FILE
- ☐ ADMIN FILE

MJ Meyer	981F
DW Porter	520
NS Porter	981C
JE Rhoads	981F
KR Wise	981F
KRW/Lb	981F
LTH/Lb	994E
EQE Files	981F
C Hexum	994E
QID 361014E	981F

DATE: May 2, 1986

TO: ~~K D Cowan, Manager, WNP-2 Technical - 988U~~ L T Harrold

FROM: L. T. Harrold, Assistant Director, Generation Engineering - 994E

SUBJECT: NCR #286-042 (INSUFFICIENT INSULATION ON VALCOR SOLENOID VALVES)

REFERENCE:
1) Valcor Engineering Corporation Test Report No. QR526-6042-1A, dated 9/83
2) Procedure Number TP 8.3.37, "Temperature Testing of PSR Valves"
3) PPM 7.4.6.1.2.4, "Containment Isolation Valve and Penetration Leak Test Program"
4) Supply System Calculations: EQ-02-86-02, EQ-02-86-03, and EQ-02-86-12

The purpose of this letter is to close out NCR #286-042. This NCR was issued on six Valcor solenoid valves because insulation on the coil housing did not provide sufficient heat dissipation.

EQE has qualified the subject valves until R-2 based on current vendor test reports (Reference 1), field measured temperatures (Reference 2), and leak testing (Reference 3). Supply System calculations (Reference 4) have been prepared to support a preliminary qualification.

QID 361014E will require revision to finalize qualification and determine qualified life beyond R-2.

In support of this qualification, the plant leak testing program shall be revised to reflect yearly tests and the insulation shall be removed from the coil region on all six valves. No hardware changes are required. However, when valve leakage becomes excessive (approximately 200 SCCM), the EPR O-ring near the valve seat should be replaced with a silicone O-ring.

A PMR is attached for your approval to authorize Engineering to revise the design data base to reflect the above.

MJM/ssm

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

PLANT MODIFICATION RECORD

PMR u u y y x x x x r

1a) ORIGINATING DOCUMENT: NCR 286-042

1b) SYSTEM NO.:

PTL NO.:

1c) STRUCTURE/COMPONENT/EQUIPMENT:

2) QUALITY CLASS:

3) SAFETY RELATED: YES ____ NO ____

INITIATION

4a) PROBLEMS AND PROPOSED SOLUTION

NCR 286-042 was issued because thermal insulation on 6 Valcor solenoid valves (PSR-V-X73/2, -X80/2, -X83/1, -X83/2, -X84/1, -X84/2) prevented adequate heat dissipation from the coils, thus reducing the qualified life of these safety-related components. Equipment Qualification has qualified these solenoids until R2 subject to the following

(1) thermal insulation be removed from these solenoids
(2) the plant leak testing program be revised to require annual leak tests
(3) the EPR O-rings in the valves be replaced with silicone O-rings when the leak tests indicate unacceptable leakage

Engineering is requested to revise the thermal insulations specification if required to delete the requirement for coverage of the solenoid coils

Engineering is requested to prepare a procurement specification for solenoids with silicone O-rings, to provide for future spares procurement.

4b) ORIGINATOR/DATE:

4c) ORIGINATOR SUPERVISOR/DATE:

5) ASSIGNED PLANT SYSTEM ENGINEER _____ RETURN DATE _____

6) TECHNICAL MERIT YES ____ NO ____ PLANT SYSTEM ENGINEER/DATE _____

7) CONCEPTUAL DESIGN AUTHORIZATION _____
TECHNICAL SUPERVISOR/DATE

8) FINAL DESIGN AUTHORIZATION _____
TECHNICAL SUPERVISOR/DATE

PLANT REVIEW/AUTHORIZATION

9a) DCP NO. _____ 9b) HP ALARA REVIEW _____
MANAGER HP/CHEMISTRY

10) PLANT SYSTEM ENGINEER/DATE _____

11) TECHNICAL GROUP SUPERVISOR/DATE _____

12) PLANT TECHNICAL MANAGER REVIEW REQUIRED YES ____ NO ____

13) PLANT TECHNICAL MANAGER/DATE _____

14) POC REQUIRED YES ____ NO ____ MTG. NO. _____
PROPOSED IMPLEMENTATION DATE _____ PRIORITY _____

15) PMR APPROVED YES ____ NO ____ _____
PLANT MANAGER/DATE

IMPLEMENTATION

16) MWR NO(S) _____ _____ _____ _____ _____

17) FCR'S INITIATED? YES ____ NO ____ (IF YES LIST ON CONTINUATION SHEET)

18) INSTALLATION AND STATIC TESTING COMPLETE _____
PLANT SYSTEM ENGINEER/DATE

19) CONTROL ROOM OPERATING PROCEDURE AND TOP TIER DRAWINGS UPDATED, MODIFICATION COMPLETE, SYSTEM OPERABILITY TESTING COMPLETED.

_____
SHIFT MANAGER/DATE

CLOSEOUT

20) DCS REVISED, PLANT DESIGN DOCUMENTS UPDATED AND PROCEDURE REVISIONS INITIATED, PTL UPDATED, MEL INPUT SHEETS TRANSMITTED AND MEL UPDATED.

_____
PLANT ADMINISTRATIVE MANAGER/DATE

21a) CONTINUATION SHEET YES ____ NO ____

AMENDMENT NO. 17
July 1981

APPENDIX B

WNP-2 RESPONSE TO REGULATORY ISSUES RESULTING FROM TMI-2

II.B.3 POST-ACCIDENT SAMPLING CAPABILITY

Position

A design and operational review of the reactor coolant and containment atmosphere sampling line systems shall be performed to determine the capability of personnel to promptly obtain (less than 1 hour) a sample under accident conditions without incurring a radiation exposure to any individual in excess of 3 and 18-3/4 rem to the whole body or extremities, respectively. Accident conditions should assume a Regulatory Guide 1.3 or 1.4 release of fission products. If the review indicates that personnel could not promptly and safely obtain the samples, additional design features or shielding should be provided to meet the criteria.

A design and operational review of the radiological spectrum analysis facilities shall be performed to determine the capability to promptly quantify (in less than 2 hours) certain radionuclides that are indicators of the degree of core damage. Such radionuclides are noble gases (which indicate cladding failure), iodines and cesiums (which indicate high fuel temperatures), and nonvolatile isotopes (which indicate fuel melting). The initial reactor coolant spectrum should correspond to a Regulatory Guide 1.3 or 1.4 release. The review should also consider the effects of direct radiation from piping and components in the auxiliary building and possible contamination and direct radiation from airborne effluents. If the review indicates that the analyses required cannot be performed in a prompt manner with existing equipment, then design modifications or equipment procurement shall be undertaken to meet the criteria.

In addition to the radiological analyses, certain chemical analyses are necessary for monitoring reactor conditions. Procedures shall be provided to perform boron and chloride chemical analyses assuming a highly radioactive initial sample (Regulatory Guide 1.3 or 1.4 source term). Both analyses shall be capable of being completed promptly (i.e., the boron sample analysis within an hour and the chloride sample analysis within a shift).

Clarification

The following items are clarifications of requirements identified in NUREG-0578, NUREG-0660, or the September 13 and October 30, 1979 clarification letters.

a. The licensee shall have the capability to promptly obtain reactor coolant samples and containment

atmosphere samples. The combined time allotted for sampling and analysis should be 3 hours or less from the time a decision is made to take a sample

b. The licensee shall establish an onsite radiological and chemical analysis capability to provide, within the 3-hour time frame established above, quantification of the following:

1. certain radionuclides in the reactor coolant and containment atmosphere that may be indicators of the degree of core damage (e.g., noble gases, iodines and cesiums, and non-volatile isotopes);

2. hydrogen levels in the containment atmosphere;

3. dissolved gases (e.g., H_2), chloride (time allotted for analysis subject to discussion below), and boron concentration of liquids.

4. alternatively, have inline monitoring capabilities to perform all or part of the above analyses.

c. Reactor coolant and containment atmosphere sampling during post-accident conditions shall not require an isolated auxiliary system (e.g., the letdown system, reactor water cleanup system (RWCS)) to be placed in operation in order to use the sampling system.

d. Pressurized reactor coolant samples are not required if the licensee can quantify the amount of dissolved gases with unpressurized reactor coolant samples. The measurement of either total dissolved gases or H_2 gas in reactor coolant samples is considered adequate. Measuring the O_2 concentration is recommended, but is not mandatory.

e. The time for a chloride analysis to be performed is dependent upon two factors: (1) if the plant's coolant water is seawater or brackish water, and (2) if there is only a single barrier between primary containment systems and the cooling water. Under both of the above con-

ditions the licensee shall provide for a chloride analysis within 24 hours of the sample being taken. For all other cases, the licensee shall provide for the analysis to be completed within 4 days. The chloride analysis does not have to be done onsite.

f. The design basis for plant equipment for reactor coolant and containment atmosphere sampling and analysis must assume that it is possible to obtain and analyze a sample without radiation exposures to any individual exceeding the criteria of GDC 19 (Appendix A, 10 CFR Part 50) (i.e., 5 rem whole body, 75 rem extremities). (Note that the design and operational review criterion was changed from the operational limits of 10 CFR Part 20 (NUREG-0578) to the GDC 19 criterion (October 30, 1979 letter from H. R. Denton to all licensees.))

g. The analysis of primary coolant samples for boron is required for PWRs. (Note that Revision 2 of Regulatory Guide 1.97, when issued, will likely specify the need for primary coolant boron analysis capability at BWR plants.)

h. If inline monitoring is used for any sampling and analytical capability specified herein, the licensee shall provide backup sampling through grab samples, and shall demonstrate the capability of analyzing the samples. Established planning for analysis at offsite facilities is acceptable. Equipment provided for backup sampling shall be capable of providing at least one sample per day for 7 days following onset of the accident and at least one sample per week until the accident condition no longer exists.

i. The licensee's radiological and chemical sample analysis capability shall include provisions to:

   1. Identify and quantify the isotopes of the nuclide categories discussed above to levels corresponding to the source terms given in Regulatory Guides 1.3 or 1.4 and 1.7. Where necessary and practicable, the ability to dilute samples to provide capability for measurement and reduction of personnel exposure should be provided. Sensitivity of onsite liquid sample analysis capability

should be such as to permit measurement of nuclide concentration in the range from approximately 1 μCi/g to 10 Ci/g.

2. Restrict background levels of radiation in the radiological and chemical analysis facility from sources such that the sample analysis will provide results with an acceptably small error (approximately a factor of 2). This can be accomplished through the use of sufficient shielding around samples and outside sources, and by the use of ventilation system design which will control the presence of airborne radioactivity.

j. Accuracy, range, and sensitivity shall be adequate to provide pertinent data to the operator in order to describe radiological and chemical status of the reactor coolant systems.

k. In the design of the post-accident sampling and analysis capability, consideration should be given to the following items:

1. Provisions for purging sample lines, for reducinng plateout in sample lines, for minimizing sample loss or distortion, for preventing blockage of sample lines by loose material in the RCS or containment, for appropriate disposal of the samples, and for flow restrictions to limit reactor coolant loss from a rupture of the sample line. The post-accident reactor coolant and containment atmosphere samples should be representative of the reactor coolant in the core area and the containment atmosphere following a transient or accident. The sample lines should be as short as possible to minimize the volume of fluid to be taken from containment. The residues of sample collection should be returned to containment or to a closed system.

2. The ventilation exhaust from the sampling station should be filtered with charcoal adsorbers and high-efficiency particulate air (HEPA) filters.

3. Guidelines for analytical or instrumentation range are given in Table II.B.3-1.

WNP-2 Position

WNP-2 is using a General Electric post-accident sampling system which will be capable of sampling the primary containment and reactor building atmosphere and of obtaining liquid samples from the reactor, RHR loops, and various reactor building sumps. This system is designed to obtain grab samples which may be analyzed on site or transported to offsite facilities for more detailed analysis if necessary. The sample station is located in the radwaste building and is shielded to reduce radiation exposure rates to the operator. All remote-operated valves are controlled from this area. Lead pigs are provided for radiation protection when transporting samples either to onsite facilities or off site. A more detailed description follows.

Gas samples will be obtained from locations in the drywell, the suppression pool atmosphere, and from the secondary containment atmosphere. The sample system is designed to operate at pressures ranging from subatmospheric to maximum design pressures of the primary and secondary containment. Heat-traced sample lines are used outside the primary containment to prevent precipitation of moisture and resultant loss of particulates and iodines in the sample lines. The gas samples may be passed through a particulate filter and silver zeolite cartridge for determination of particulate activity and iodine activity by subsequent analysis of the samples on a gamma spectrometer system. Alternately, the sample flow bypasses the particulate/iodine sampler, is chilled to remove moisture, and a 15-milliliter grab sample can be taken for determination of gaseous radioactivity and for gas composition by gas chromatography. This size sample vial has been adopted for all gas samples to be consistent with present off-gas sample vial counting factors.

Reactor coolant samples will be obtained from two points in the jet pump pressure instrument system when the reactor is at pressure. The jet pump pressure system has been determined to be an optimum sample point for accident conditions. The pressure taps are well protected from damage and debris. If the recirculation pumps are secured, the water level will be raised about 18" above normal. This provides natural circulation of the bulk coolant past the taps. Also, the pressure taps are located sufficiently low to permit sampling at a reactor water level even below the lower core support plate.

A single sample line is also connected to both loops in the RHR system. This provides a means of obtaining a reactor coolant sample when the reactor is depressurized and at least one of the RHR loops is operated in the shutdown cooling mode. Similarly, a suppression pool liquid sample can be obtained from the RHR loop lined up in the suppression pool cooling mode. Samples from the five drain sumps in the reactor building are also available.

The sample system isolation valves are controlled from the local control panel. The sample system is designed for a purge flow of one gpm, which is sufficient to maintain turbulent flow in the sample line. Purge flow is returned to the suppression pool. The high flush flow also serves to alleviate cross-contamination of the samples when switching from one sample point to another.

All liquid samples are taken into septum bottles mounted on sampling needles. The sample station is basically a bypass loop on the sample purge line. In the normal lineup, the sample flows through a conductivity cell (readable range 0.1 to 1000 micromhos/cm) and then through a ball valve bored out to 0.10-milliliter volume. Flow through the sample panel is established, the valve is rotated 90°, and a syringe is used to flush the sample plus a measured volume of diluent (generally 100 milliliters) through the valve and into the sample bottle. This provides a dilution of 100:1 to the sample. Alternately, the valve sampling sequence can be repeated 10 times to provide a 1 ml sample diluted 10:1. The sample is transported to the laboratory for further dilution and subsequent analysis. Alternately, the sample flow can be diverted through a 70-milliliter bomb to obtain a large pressurized volume. This 70-milliliter volume can be circulated and depressurized into a known volume gas expansion chamber. The pressure change in this chamber will be used to calculate the Total Dissolved Gases in the reactor coolant. A grab sample of these gases may be taken through a septum port for subsequent analysis. Ten-milliliter aliquots of this degassed liquid can also be taken for on or offsite chemical analyses requiring a relatively large sample. A radiation monitor in the liquid sample enclosure monitors liquid flow from the sample station to provide immediate assessement of the sample activity level. This monitor also provides information as to the effectiveness of the demineralized water flushing of the sample system following sample operation. The control instrumentation is installed in two 2' x 2' x 6' high standard cabinet control panels. One panel contains the conductivity and radiation level readouts. Another control panel contains the flow, pressure and temperature indicators, and the various control valves and switches.

A graphic display panel, installed directly below the main control panel, shows the staus of the pumps and valves at all times. The panel also indicates the relative position of the pressure gauges and other items of concern to the operator. The use of this panel will improve operator comprehension and assist in trouble-shooting operation.

Appropriate sample handling tools, a gas sampler vial positioner and gas vial cask are available to the operator at the sampling station. The gas vial is installed and removed by use of the vial positioner through the front of the gas sampler. The vial is then manually placed down in the cask with the positioner which allows the vial to be maintained about 3 feet from the individual performing the operation.

The small-volume (10 ml) liquid sample is remotely obtained through the bottom of the sample station by use of the small-volume cask and cask positioner. The cask positioner holds the cask and positions the cask directly under the liquid sampler. The sample vial is manually raised within the cask to engage the hypodermic needles. When the sample vial has been filled, the bottle is manually withdrawn into the cask. The sample vial is always contained within lead shielding during this operation. The cask is then lowered and sealed prior to transport to the laboratory.

A large-volume cask and cask positioner is available for transporting large liquid samples. A 27 milliliter bottle is contained within a lead shielded cask. This sample bottle is raised from its location in the cask to the sample station needles for bottle filling. The sample station will only deliver 10 milliliters to this sample bottle. When filled, the bottle is withdrawn into the cask. The sample bottle is always shielded by 5 to 6 inches of lead when in position under the sample station and during the fill and withdraw cycles, thus preventing operator exposure.

The cask is transported to the required position under the sample station by a dolly cask positioner. When in position this cask is hydraulically elevated approximately 1.5 inches by a small hand pump for contact with the sample station shielding under the liquid sample enclosure floor. The sample bottle is raised, held, and lowered by a simple push/pull cable. The cask is sealed by a threaded top plug that inserts above the sample bottle. The weight of this large-volume cask is approximately 700 pounds.

The particulate filters and iodine cartridges are removed via a drawer arrangement. The quantity of activity which is accumulated on the cartridges is controlled by a combination of flow orificing and time sequence control of the flow valve opening. In addition, the deposition of iodine is monitored during sampling using a radiation detector installed adjacent to the cartridge. These samples will hence be limited to activity levels which will normally not require shielded sample carriers to transport the samples to the laboratory.

The power supply to the sample station and all associated equipment will not be shed during accident conditions. The system design is such that a sample can be drawn and analyzed within the required 3 hours, after a one hour preparation time.

The post-accident sampling station will provide conductivity measurements in line as an indicator of liquid chemical concentrations and changing chemical conditions. The system allows collection of grab samples for gas analysis of O_2, N_2, H_2, and direct gamma spectrometric determination of aliquots of gas samples. The system also allows collection of iodine samples on a silver zeolite cartridge to minimize noble gas interference in the determination of iodine isotopic content. Liquid samples will be analyzed for pH using a semi micro pH electrode and additionally analyzed for boron and chloride using ion chromotography. An aliquot of the sample may also be analyzed for gross activity or isotopic content by gamma ray spectrometry. All laboratory analysis meet Regulatory Guide 1.97 requirements for sensitivity and range, with the exception of the range for dissolved gases. However, the analytical capability for dissolved gases is consistent with the maximum dissolved gas concentrations expected for BWRs.

The post-accident sampling system will be used to perform periodic reactor coolant sample analyses for gamma isotopic content, chloride, conductivity, pH, and total dissolved gas. Every six months, for training and operability testing, a liquid grab sample will be drawn, transported, and analyzed in the Hot Lab for gamma isotopic content. This sample will be handled as a postaccident highly radioactive sample. In addition, every six months, a containment air sample will be analyzed for hydrogen, oxygen, and gamma isotopic content. Classroom training will also be provided on system operation and proper handling of highly radioactive samples.

Based on information developed by General Electric, the Supply System has developed plant specific procedures for the determination of the extent of core damage under accident conditions. The procedures provide for distinguishing between fuel cladding failure and fuel melt based on isotopes present and concentration. The extent of damage is based on concentrations present of isotopic mixture of Xe, Kr, I, and Cs.

The estimated maximum potential whole body dose to retrieve a reactor coolant sample under worst case accident conditions is 0.36 rem; the source being airborne noble gas activity in the radwaste building from effluent releases. Lapsed time is about one hour.

The maximum dose rate from a 0.1 ml reactor coolant sample (1 hour decay) in a 4" thick lead transport cask is less than 5 mR/hr at one foot. Exposure to analyze a sample is expected to be less than 100 mR.

All valves used are fully qualified for the environment in which they are located inside and outside reactor containment.

Power for the post accident sampling equipment is supplied from ~~either~~ Division 1 or Division 2 critical power sources and will be available during accident conditions.

The staff review of this position in NUREG-0892, dated December 1982, recognized several issues requiring resolution and consolidated them in Licensing Condition 9. Subsequent Supply System submittals, primarily Amendment 23 to the FSAR, resulted in the staff finding the Post Accident Sampling System acceptable in Supplement 4 NUREG-0892, secton 9.3.2.4. A requirement to have the system completed and operable prior to exceeding 5% power was made a condition to the license (NPF-21 issued December 20, 1983). Supply System letter G02-84-272 dated April 27, 1984 reported the system completed and operable thus satisfying the licensing condition.

PAGE 1 OF 2

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

NONCONFORMANCE REPORT

(SEE INSTRUCTIONS ON REVERSE SIDE)

1. NCR NO.

2. DATE: February 11, 1986

3. QUALITY CLASS/ASME CLASS: I

4. SUPPLY SYSTEM PROJECT/PLANT/DEPT.: WNP-2

5. PHYSICAL LOCATION OF NONCONFORMANCE: Reactor Building

6. ORIGINATOR: M. Meyer/J. Costello 2-14-86 2-14-86

7. ORGANIZATION/DEPARTMENT: Equipment Qualification Engineering

8. VALIDATED BY: 2-14-86

9. ORGANIZATION/DEPARTMENT:

10. REQUIREMENT SOURCE: WNP-2 FSAR Appendix B, Amendment 36, Dec. 1985

11. SUPPLIER NAME/P.O. NO./CONTRACT NO.: Valcor Eng. Corp./P19576/220

12. HARDWARE/SOFTWARE ITEM NO./DESCRIPTION: PASS System
Solenoid Valves/PSR-V-X73/2, -X80/2, -X83/1 & /2, -X84/1 & 2/Cntmt. Isolation

13. FULL DESCRIPTION OF NONCONFORMANCE:

The subject solenoid valves are heat traced with thermal insulation around the valves' solenoid coil assembly. The solenoid operator assembly consists of an electrical housing assembly (i.e., rectifier, terminal block, position switches, etc.) and a solenoid coil assembly (i.e., coil, magnet, bobbin, etc.). Conversations with a manufacturer representative and field inspections have determined:

1) Insulation of the coil assembly results in insufficient coil heat dissipation, which results in high coil operating temperatures with coil burn-out and/or rectifier failure probable after operating for any significant duration.

Continued on page 2 of 2.

PROBLEM IDENTIFICATION

14. REVIEWED FOR REPORTABILITY PER 10CFR21 AND/OR 50.55(e)

☐ REPORTABLE ☐ NOT REPORTABLE _____ EVALUATOR _____ DATE

DISPOSITION/APPROVAL

15. DISPOSITION: ☐ REWORK ☐ REJECT ☐ *REPAIR ☐ * USE-AS-IS ☐ OTHER (SPECIFY)

* ROUTE TO ANI FOR CONCURRENCE (ASME ONLY)

16.

QA _____ (SIGNATURE) (TITLE) (DATE) _____ (SIGNATURE) (TITLE) (DATE)

ENGRG _____ (SIGNATURE) (TITLE) (DATE) ANI _____ (SIGNATURE) (TITLE) (DATE)

RESOLUTION/CLOSE OUT

17. DISPOSITION RESOLUTION (ACTION TAKEN)/VERIFICATION: ☐ ACCEPT ☐ REJECT

REINSPECTION, RETESTING VERIFIED BY:

_____ (SIGNATURE) (TITLE) (DATE)

18. ATTACHMENT: _____ TOTAL PAGES WAS NEW NCR INITIATED? _____ NUMBER PAGE ____ OF ____

WP-311 R7

2) Because installed solenoid valves have occasionally been operated in the present configuration for greater than a two year period, the likelihood that the valves can be reasonably expected to operate throughout a postulated six-month DBE accident is remote. If opened during accident conditions, the valve is expected to close due to the spring return-to-close feature of the valve.

3) Thermal degradation due to constant energization of the heat tracing strips and/or occasional energization of the solenoid coil has accelerate aged the valve seat (ethylene polypropylene) "O"-ring seals. Continued operation in this manner will increase the likelihood of valve leakage.

4) Post accident safety function (Regulatory Guide 1.97, Category 1) is to provide valve position indication. Lead wires (tefzel) from internal position/reed switches are being heated beyond their design rating. Field wiring to the upper valve internals may also be degrading (Ref. IEN 84-68) due to the heat retaining aspects of these insulated valves. Assurance of post accident position indication can not be demonstrated.

Therefore, it is concluded that the subject valves are likely to fail to remain operable and position indication could be lost. They are also likely to leak through degraded seat "O"-ring seals.

The valves are still qualifiable to perform their containment isolation function. However, the Regulatory Guide 1.97, Catagory 1 function qualification can not be demonstrated. Corrective action to rework the thermal insulation and assess degradation of the limit switch lead wire and field hook up wire is required to establish Regulatory Guide 1.97 safety function qualification.

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

WNP-2 MAINTENANCE WORK REQUEST

I

WBS/WO NO. M600 88 | ☒ NORMAL | ☐ SHOP | ☐ STANDING | MWR NO. AL4791

UNIT 02 | EQUIPMENT PIECE NO. ~~H-515~~ PSR-V-X73/2, X80/2, X84/1 | INITIATING DOCUMENT PMR-86-0088-0

EQUIPMENT DESCRIPTION/LOCATION: PSR-V-X73/2 PSR-V-X80/2 PSR-V-X84/1 REACTOR BLDG

PROBLEM/WORK REQUESTED: Supply AN I&C TECH AND AN INSULATOR TO Support THE TEMPERATURE TESTING OF THE ABOVE VALVES PER PPM-8.3.377 (YET TO BE APPROVED)

MAINT P/S: KU | ☐ CONT'D

ID TAGS HUNG ☐ YES ☒ NO | LOCATION | ORIGINATOR (PRINT) D.N. COOK 2104 | VALIDATED BY | MO/DA/YR

CLEARANCE ☐ YES ☒ NO | NUMBER JUN 09 1986 | RWP ☒ YES ☐ NO | NUMBER

TECH SPEC ☐ YES ☒ NO | NUMBER WNP-2 OPS FILE | NPRDS ☐ YES ☒ NO | DURATION UNK 1 2 3 4 5 6 7 8 9 10

TECH SPEC REQUIREMENTS

PLANT CONDITION 1 2 3 (4) (5) 6 7 8 9 | PRIORITY 1 (2) 3 4 5 6 | SYSTEM 1 2 (3) | COMPONENT 1 2 (3) 4 5 6 | WORK INSTRUCTION Roenigs

FIRE PROTECTION PERMIT ☐ YES ☒ NO | NUMBER | CONFINED SPACE WORK PLACE PERMIT ☐ YES ☒ NO | NUMBER

SAFETY RELATED ☐ YES ☒ NO | LEAKAGE RELATED ☐ YES ☒ NO | QUALITY CLASS 1 (2) G | ASME ☐ YES ☒ NO

WORK INSTRUCTIONS / PROCEDURE NO. PPM 8.3.37T | PTL ☒ YES ☒ NO | NUMBER | MAINT P/S SK

ENVIRONMENTALLY QUALIFIED EQUIPMENT

Craft to set up 2-24 channel recording graphs set up for type T thermocouple. Recorders shall be calibrated and each thermocouple used for ~~the~~ test shall be tested at 250°F, 300°F and 350°F except for 2 thermocouples which shall be tested at 65°F, 85°F as well as the above temperatures. Total thermocouples involved in the test ~~XXXXX~~ SHOULD BE 12.

☐ CONT'D

PREPARED BY (PRINT) D.N. COOK X2104 | DATE 4/3/86 | APPROVAL [signature] | DATE 4-4-86

REVIEWED BY (PREPARER'S SUPR) [signature] | DATE 4/3/86 | SHIFT MGR APPROVAL [signature] | DATE 4/7/86

QC REQ'D ☐ YES ☒ NO | NAME E&Q [signature] 4/4/86 | QC NOTIFIED / NAME | TIME / DATE / INITIALS

WORK PERFORMED

COMPLETED TESTING OF PSR-VX80/2 & PSR-V-X84/1 AS PER D. COOK AND ABOVE WORK INSTRUCTIONS.

Met requirements for work performed - [signature]

INFORMATION ONLY

PARTS / MATERIAL USED? ☒ YES ☐ NO; IF YES, LIST PARTS AND ACCEPT TAG/P.R./P.O. NO.:

MAINT P/S [initials] | ☐ CONT'D | ☐ ID TAGS REMOVED

COMPLETED BY Walter Thurlow | DATE 5-28-86 | REVIEWED BY [signature] | DATE

☐ RETEST HOLD | EQUIPMENT OPERABLE DATE 6/3/86 | TIME 1230 | BY [signature]

-25-88-

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

PLANT MODIFICATION RECORD

PMR
U U Y Y X X X X

1a) ORIGINATING DOCUMENT: NCR 286-042

1b) SYSTEM NO.:

PTL NO.:

1c) STRUCTURE/COMPONENT/EQUIPMENT:

2) QUALITY CLASS:

3) SAFETY RELATED: YES ____ NO ____

INITIATION

4a) PROBLEMS AND PROPOSED SOLUTION

NCR 286-042 was issued because thermal insulation on 6 Valcor solenoid valves (PSR-V-X73/2, -X80/2, -X83/1, -X83/2, -X84/1, -X84/2) prevented adequate heat dissipation from the coils, thus reducing the qualified life of these safety-related components. Equipment Qualification has qualified these solenoids until R2 subject to the following

(1) thermal insulation be removed from these solenoids
(2) the plant leak testing program be revised to require annual leak tests
(3) the EPR O-rings in the valves be replaced with silicone O-rings when the leak tests indicate unacceptable leakage

Engineering is requested to revise the thermal insulations specification if required to delete the requirement for coverage of the solenoid coils

Engineering is requested to prepare a procurement specification for solenoids with silicone O-rings, to provide for future spares procurement.

4b) ORIGINATOR/DATE:

4c) ORIGINATOR SUPERVISOR/DATE:

5) ASSIGNED PLANT SYSTEM ENGINEER _____ RETURN DATE _____

6) TECHNICAL MERIT YES ____ NO ____ PLANT SYSTEM ENGINEER/DATE _____

7) CONCEPTUAL DESIGN AUTHORIZATION _____
TECHNICAL SUPERVISOR/DATE

8) FINAL DESIGN AUTHORIZATION _____
TECHNICAL SUPERVISOR/DATE

PLANT REVIEW/AUTHORIZATION

9a) DCP NO. _____ 9b) HP ALARA REVIEW _____
MANAGER HP/CHEMISTRY

10) PLANT SYSTEM ENGINEER/DATE _____

11) TECHNICAL GROUP SUPERVISOR/DATE _____

12) PLANT TECHNICAL MANAGER REVIEW REQUIRED YES ____ NO ____

13) PLANT TECHNICAL MANAGER/DATE _____

14) POC REQUIRED YES ____ NO ____ MTG. NO. _____
PROPOSED IMPLEMENTATION DATE _____ PRIORITY _____

15) PMR APPROVED YES ____ NO ____ _____
PLANT MANAGER/DATE

IMPLEMENTATION

16) MWR NO(S) _____ _____ _____ _____ _____

17) FCR'S INITIATED? YES ____ NO ____ (IF YES LIST ON CONTINUATION SHEET)

18) INSTALLATION AND STATIC TESTING COMPLETE _____
PLANT SYSTEM ENGINEER/DATE

19) CONTROL ROOM OPERATING PROCEDURE AND TOP TIER DRAWINGS UPDATED, MODIFICATION COMPLETE, SYSTEM OPERABILITY TESTING COMPLETED.

_____
SHIFT MANAGER/DATE

CLOSEOUT

20) DCS REVISED, PLANT DESIGN DOCUMENTS UPDATED AND PROCEDURE REVISIONS INITIATED, PTL UPDATED, MEL INPUT SHEETS TRANSMITTED AND MEL UPDATED.

_____
PLANT ADMINISTRATIVE MANAGER/DATE

21a) CONTINUATION SHEET YES ____ NO ____

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

WNP-2 MAINTENANCE WORK REQUEST

MWR NO. AL4791

WBS/WO NO. MC0088 | ☒ NORMAL | ☐ SHOP | ☐ STANDING

UNIT 02 | EQUIPMENT PIECE NO. PSR-V-X73/2, X80/2, X84/1 | INITIATING DOCUMENT PMR-86-0088-0

ORIGIN

EQUIPMENT DESCRIPTION/LOCATION: PSR-V-X73/2 PSR-V-X80/2 PSR-V-X84/1 REACTOR BLDG

PROBLEM/WORK REQUESTED: SUPPLY AN I&C TECH AND AN INSULATOR TO SUPPORT THE TEMPERATURE TESTING OF THE ABOVE VALVES PER PPM-8.3.377 (YET TO BE APPROVED)

MAINT P/S: KM | ☐ CONT'D

ID TAGS HUNG ☐ YES ☒ NO | LOCATION | ORIGINATOR (PRINT) D.N. COOK 2104 | VALIDATED BY | MO/DA/YR

DSG

CLEARANCE ☐ YES ☒ NO | NUMBER JUN 09 1986 | RWP ☒ YES ☐ NO | NUMBER

TECH SPEC ☐ YES ☒ NO | NUMBER | NFRDS ☐ YES ☒ NO | DURATION

WNP-2 OPS FILE

TECH SPEC REQUIREMENTS

PLANT CONDITION 1, 2, 3, (4), (5), 6, 7, 8, 9 | PRIORITY 1, (2), 3, 4, 5, 6 | SYSTEM 1, 2, (3) | COMPONENT 1, 2, (3), 4, 5, 6 | WORK INSTRUCTION

FIRE PROTECTION PERMIT ☐ YES ☒ NO | NUMBER | CONFINED SPACE WORK PLACE PERMIT ☐ YES ☒ NO | NUMBER

MAINT/SYS ENG

SAFETY RELATED ☐ YES ☒ NO | LEAKAGE RELATED ☐ YES ☒ NO | QUALITY CLASS 1, (2), G | ASME ☐ YES ☒ NO

WORK INSTRUCTIONS / PROCEDURE NO. PPM 8.3.377 | PTL ☒ YES ☒ NO | NUMBER | MAINT P/S SK

ENVIRONMENTALLY QUALIFIED EQUIPMENT

Craft to set up 2 - 24 channel recording graphs set up for type T thermocouples. Recorders shall be calibrated and each thermocouple used for the test shall be tested at 250°F 300°F and 350°F except for 2 thermocouples which shall be tested at 65°F, 85°F as well as the above temperatures. Total thermocouples involved in the test XXXXXX SHOULD BE 12.

☐ CONT'D

SUPR

PREPARED BY (PRINT) D.N. COOK 2104 | DATE 4/3/86 | APPROVAL | DATE 4-4-86

REVIEWED BY (PREPARER'S SUPR) | DATE 4/3/86 | SHIFT MGR APPROVAL | DATE 4/7/86

QC REQ'D ☐ YES ☒ NO | NAME 4/4/86 | QC NOTIFIED | NAME | TIME / DATE / INITIALS

CRAFTS MAN / SUPR

WORK PERFORMED

COMPLETED TESTING OF PSR-V-X80/2 & PSR-V-X84/1 AS PER D. COOK AND ABOVE WORK INSTRUCTIONS.

No QC requirements for work performed - [illegible]

INFORMATION ONLY

PARTS / MATERIAL USED? ☒ YES ☐ NO: IF YES, LIST PARTS AND ACCEPT TAG/P.R./P.O. NO.:

MAINT P/S | ☐ CONT'D | ☐ ID TAGS REMOVED

REVIEW

COMPLETED BY | DATE 5-28-86 | REVIEWED BY | DATE

☐ RETEST HOLD | EQUIPMENT OPERABLE DATE 6/3/86 | TIME 1230 | BY

Washington Public Power Supply System ORIGINAL
PLANT DEFICIENCY REPORT/NONCONFORMANCE REPORT

NCR Number 286-153
PDR Number
14704

	Safety Related, QC I		Non-installed Eqpt.		Security System		Essential
	Safety Related QC II, G	X	Other Than Non-Inst.		Fire Protection		Radwaste

Originator: J. V. Costello — Date: 4-22-86 — Validated By — Date: 4/23/86

Item/EPN: ROA-SPV-10, -11, -12, -13, -14, -15, & -17 — System No.: 81.0 — PO/Spec/Procedure: 071950/C#2808-216/ N/A

Full Description of Problem — # of Hold Tags — Vital MWR #

Qualified commercial grade ASCO solenoid pilot valves tagged as ROA-SPV-10, -11, -12, -13, -14, -15, and -17 were qualified by means of engineering analyses supported by separate materials test data. These components operate the ROA system HVAC air dampers that isolate the Motor Control Center Rooms in the Reactor Building during postulated accidents so as to ensure that the rooms' "mild environment" classification status is not compromised. However, these (continued on page 2 of 2)

| X | Not Reportable | | Reportable + 10CFR50.49 Requirement | Evaluator | 4/25/86 Date |

Event Date: 4/22/86 — Plant Mode: 5 — % Power: 0% — + NRC | | Yes | ✓ | No

Immediate Disposition | | Use-As-Is | | Reject | XX | Rework | | Repair | | ASME | ✓ | Other

See C/A below — Technical — Implementing Organization

Cause/Effect:

Cause: Equipment Class upgrade from "passive" to "active" ~~via DCP 84-1390-OAR~~ on MEL without direction in same DCP (84-1390-OAR) to change out plant installed equipments 4-25-86

Effect: Qualification of the equipment to the new required safety classification parameter cannot be demonstrated. Also see second paragraph of "Full Description of Problem. MOK

Corrective Action: for the above EPN's
1) Replace installed ASCO HBX8320A1 and B1 models with ASCO Nuclear Service "NP Series" models. ASCO Model NP8320A172E has been procured via Supply System P.O. #071950 for the specific application stated (Attachment 2). Attachment 3 indicates that the replacement (continued on page 2 of 2) Ref. PMR 02-86-0156-0 MOK

John V. Costello 4-25-86 — 4-25-86 — Technical
Dispositioner — Date — Implementing Organization

Approval: +Required for 4 hr or less reportables prior to return to service

+ 5/5/86 — 5/2/86
Signature — Date — Signature — Date
+PM
Signature — Date — Signature — Date
QA M C Bartlett 5/27/86 — ANI
Signature — Date — Signature — Date

Implementation: MWR AU 5269 W/L 5-23-86 — QA Review
PMR 02-860156-0 — 5/24/86 — 5-23-86 — PDR #14704
Implementing Document — Implementing Manager/Date — Signature/Date

PROCEDURE NUMBER	REVISION NUMBER	PAGE NUMBER
1.3.12	8	1.3.12-16 of 25

Washington Public Power Supply System
PLANT DEFICIENCY REPORT/NONCONFORMANCE REPORT

NCR Number 286-133
PDR Number

(Continuation Sheet)

Full Description of Problem (Continued)

components have had their Equipment Classification upgraded from "passive" to "active" via DCP 84-1390-OAR, pages 015 and 016 (Attachment 1), invalidating their current qualification. As these components are exposed to steam environments during postulated HELB accidents for which they are required to actively operate (i.e., isolate when de-energized as a result of manual initiation or receipt of a F, A, or Z signal), qualification of these components can no longer be assured in the absence of test data.

Although qualification of the equipment cannot be demonstrated, an engineering review and evaluation has determined that the equipment is "not likely to fail" to perform their required safety function or fail to mitigate a postulated design basis accident. This determination is primarily based upon the fact that the subject solenoid pilot valves, when de-energized, return to a "fail safe" position due to their spring return feature to the closed position. This results in isolation of the ROA system HVAC air dampers.

Additionally, in accordance with the provisions of 10 CFR 50, Section 50.49, any replacements for the subject components are required to satisfy the requirements of NUREG-0588, Category I (refer to NCR 286-137).

The root problem involved here is that equipment qualification ~~Status~~ was changed in MEL but that some DCP did not change the installed plant equipment.

Corrective Action (Continued)

"NP Series" components are readily available for installation in the plant during the current refueling/maintenance outage.

2) For the EPNs and application stated, establish qualification documentation for the replacement models.

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

KIPPES

PLANT MODIFICATION RECORD

ORIGINAL

PMR 02-86-0156-0

1a) ORIGINATING DOCUMENT: NCR-286-0137 0153

1b) SYSTEM NO: 81

1c) STRUCTURE/COMPONENT/EQUIPMENT: PDA-SPV-10, 11, 12, 13, 14, 15, 17

2) QUALITY CLASS: I

3) SAFETY RELATED: YES ✓ NO ___

INITIATION

4a) PROBLEMS AND PROPOSED SOLUTION

Based on letter 552-PE-85-30 existing ASCO HBX8320- SPV's were replaced with identical units. NCR 286-0137 indicates these SPV's should have been replaced with ASCO NP 8320 and NCR 286-153 indicates that all of the above SPV's should be replaced with ASCO NP-8320's.

MEL sheets are required do allow replacement of units and possible drawing change to show 1/4 x 1/8 bushing needed do adapt NP's do HBX tubing.

4b) ORIGINATOR/DATE: [signature] 4-24-86

4c) ORIGINATOR SUPERVISOR/DATE: R L Wilson 4/24/86

5) ASSIGNED PLANT SYSTEM ENGINEER: KIPPES RETURN DATE: 4/24/86

6) TECHNICAL MERIT YES ✓ NO ___ PLANT SYSTEM ENGINEER/DATE: [signature] 4-24-86

7) CONCEPTUAL DESIGN AUTHORIZATION: N/A
TECHNICAL SUPERVISOR/DATE

FINAL DESIGN AUTHORIZATION: [signature] 4/24/86
TECHNICAL SUPERVISOR/DATE

PLANT REVIEW/AUTHORIZATION

8a) DCP NO. ___ 8b) NP ALARA REVIEW ___
MANAGER NP/CHEMISTRY

10) PLANT SYSTEM ENGINEER/DATE ___

11) TECHNICAL GROUP SUPERVISOR/DATE ___

12) PLANT TECHNICAL MANAGER REVIEW REQUIRED YES ___ NO ___

13) PLANT TECHNICAL MANAGER/DATE ___

14) POC REQUIRED YES ___ NO ___ MTG. NO. ___
PROPOSED IMPLEMENTATION DATE ___ PRIORITY ___

15) PMR APPROVED YES ___ NO ___
PLANT MANAGER/DATE

IMPLEMENTATION

16) MWR NO(S) ___

17) FCR'S INITIATED? YES ___ NO ___ (IF YES LIST ON CONTINUATION SHEET)

18) INSTALLATION AND STATIC TESTING COMPLETE ___
PLANT SYSTEM ENGINEER/DATE

19) CONTROL ROOM OPERATING PROCEDURE AND TOP TIER DRAWINGS UPDATED, MODIFICATION COMPLETE, SYSTEM OPERABILITY TESTING COMPLETED.
SHIFT MANAGER/DATE

CLOSEOUT

20) AS REVISED, PLANT DESIGN DOCUMENTS UPDATED AND PROCEDURE REVISIONS INITIATED, PTL UPDATED, MEL INPUT SHEETS TRANSMITTED AND MEL UPDATED.
PLANT ADMINISTRATIVE MANAGER/DATE

21a) CONTINUATION SHEET YES ___ NO ___

SEY SYSTEM | MEL. MIA SHEET 2.35 | DCP PAGE NO. 84-1396 NR-015

- ☐ Add a new EPN and information to MEL
- ☒ Modify existing EPN information on MEL
- ☐ Delete existing EPN from MEL (equipment no longer exists in the plant)
- ☐ Delete existing EPN from CIE/SRM fields (equipment no longer safety-related, but still exists Note: Place a "#" in field No. 30 and draw a line through fields 31 through 45 with the notation "Delete all data in fields 30 through 45")

NOTES: 1. Place a # symbol in any field that is not applicable. Leave blank if data is unavailable.
2. Instructions for completing the numbered fields below are given in EI 2.35.

GENERAL MEL INPUT DATA

FOR AFFECTED EPN'S, SEE PAGE 016 OF THIS DCP

1. EPN | 2. NSSS | 3. SYS
4. DESC
5. MFG | 6. MODEL
7. S/N | 8. LOC. DETAIL
9. REF DWG/ZONE / | 10. BLDG | 11. ELEV/ZONE /
12. CVI | 13. PWR/OUT | 14. VEND | 15. QC
16. CONT/EXP | 17. CONN/ASM | 18. IEEE | 19. CODE
20. ELEM | 21. SEIS | 22. CLEAN
23. FP1 | 24. MANUAL
26. FP2 | 27. CEPN | 25. FSTOT
28. FS1 | 29. FS2

CIE/SRM FIELDS ONLY

30. FLAG (C,S,#,OR Q) | 31. CONTRACT | 32. LEVEL | 33. EQUIP CLASS A | 34. USE 1/0
35. HOURS | 36. SAFETY FUNCTION J | 37. ACCURACY | 38. RM

EQUIPMENT QUALIFICATION FIELDS ONLY

SEISMIC QUAL: 39. HYDRO LOADS | 40. TEST | 41. ANALYSIS
42. QUALIFICATION STATUS - SEISMIC | ENV | 43. TM | 44. FREQ | 45. QID

84-1396-OAE-015

PREPARED BY	DATE	CHECKED BY	DATE
R Van Eem	1/7/86	D Brastad	1/20/86

SUPPLY SYSTEM

DCP PLATE

3. DESCRIPTION OF CHANGE

EPN'S AFFECTED BY CHANGES ON PAGE 015 OF THIS DCP

EPN

ROA-SPV-10
ROA-SPV-11
ROA-SPV-12
ROA-SPV-13
ROA-SPV-14
ROA-SPV-15
ROA-SPV-17

2. SUPERSEDES PREVIOUSLY APPROVED DCP Page: ____ - ____ - ____ - ____

1. DCP Page: 84 - 1390 - 0AR - 016

Revises NA ☐ AE Drawing ☐ CVI Document ☐ Spec / Criteria

Drawing / Document No.: Zone: Revision:

4. PREPARED BY	5. CHECKED BY	6. SCALE	7. DRAWING OR DOCUMENT TITLE
Al Van Oren	G Brastad	~	MEL

966-12596 (6-84)

1

ATTACHMENT 2

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O Box 968 • Richland, WA 99352 - 0968

PURCHASE ORDER

P.O. DATE	PURCHASE ORDER NO.
02/20/85	071950
VENDOR CODE	
A0680	

PAGES	TERMS	☐ ORIGINAL ORDER	☒ CONFIRMING ORDER	☐ CHANGE * ORDER
1 of 1	1% 10 DAYS 30			

SUPPLIER: AUTOMATIC SWITCH CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3286
SPOKANE WA 98202

ATTENTION: Harry Maccarato
PHONE: (509) 535-1504

SHIP TO: WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

BUYER	CODE	The Buyer is subject to payment of Washington State sales tax	QUALITY CLASS
BRYANT, P J /ODE	PW55		Q1
PHONE	MAIL DROP	☒ INSPECTION REQ'D	☐ QQA ☐ R.I.P. REQ'D
(509)377-8420	976F		

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
03/04/85	03/01/85	SEE BELOW	SHIP. PT.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	QTY REC'D	BIN LOCATIO
0911222			CONFIRMING ORDER-DO NOT DUPLICATE SPARE PARTS OS THE FOLLOWING ARE SPARE PARTS FOR EQUIPMENT SUPPLIED PER CONTRACT 2800-216. STARTUP SYSTEM: 81 EPN: ROA-SPV-10 - 15 AND 17			
001	13	EA.	54501580 VALVE SOLENOID 3-WAY 1/4" X 1/16" ORIFICE WITH 120 VAC COIL WATERTIGHT ENCLOSURE ASCO P/N NP8320A172E VENDOR TO PROVIDE C OF C STATING THAT ASCO TEST REPORT ACR07368, REV. 0 "REPORT ON QUALIFICATION OF AUTOMATIC SWITCH CO. NP-1 SOLENOID VALVES FOR SAFETY RELATED APPLICATIONS IN NUCLEAR POWER GENERATING STATIONS" DATED 03/02/82 APPLIES TO SUPPLIED PARTS. DROP SHIP TO SUPPLY SYSTEM NO MERCURY WETTED RELAYS ALLOWED.		13 [illegible]	6-21-85

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055-
P.O. Box 968, Richland, WA 99352 - 0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

[illegible] 2.21.85

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POW
SUPPLY SYSTEM

RECEIVING

WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
P.O Box 968 • Richland, WA 99352-0968

PURCHASE ORDER

P.O. DATE: 0?/??/85
PURCHASE ORDER NO.: 071950
VENDOR CODE: 10680

PAGES: 6
TERMS: 1% 10 NET 30

ORIGINAL ORDER / CONFIRMING ORDER / CHANGE * ORDER

SUPPLIER: AUTOMATIC SWITCH CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3286
SPOKANE WA 98202

ATTENTION:
PHONE: (509) 535-1504

SHIP TO: WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

BUYER: HEYBART, P J
CODE:
PHONE: (509)377-8470
MAIL DROP: 0760

The Buyer is subject to payment of Washington State sales tax
QUALITY CLASS: 01

INSPECTION REQ'D / OQA / R.I.P. REQ'D

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
0?/04/8?	0?/04/85	SEE BELOW	ORIG ??

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUNT
			CERTIFICATE OF CONFORMANCE: THE SUPPLIER SHALL PROVIDE THE SUPPLY SYSTEM WITH A SIGNED CERTIFICATE OF CONFORMANCE, STATING THAT MATERIAL, PARTS, COMPONENTS, OR SERVICES: 1) MEET OR EXCEED THE QUALITY REQUIREMENTS ESTABLISHED BY THE REFERENCES, SPECIFICATIONS IN THIS ORDER; 2) MEET THE SUPPLIER'S APPLICABLE QUALITY REQUIREMENTS FOR NUCLEAR GRADE APPLICATION; 3) ALL PARTS ARE INTERCHANGEABLE AS TO FIT, FORM, AND FUNCTION OF THE DESCRIBED EQUIPMENT FOR WHICH THESE PARTS ARE INTENDED; 4) ALL ITEMS ARE IDENTIFIED BY THE SUPPLY SYSTEM PURCHASE ORDER NUMBER AND LATEST REVISION; AND 5) IDENTIFIES APPROVED NONCONFORMANCES. THE CERTIFICATION SHALL BEAR THE SIGNATURE AND TITLE OF THE SUPPLIER'S REPRESENTATIVE RESPONSIBLE FOR THIS QUALITY ASSURANCE FUNCTION AND WHOSE FUNCTION AND POSITION ARE DESCRIBED IN THE SUPPLIER'S			

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352-0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

2 2 2 2 9 0 2

965-18561 (7-84) PAGE 4

PURCHASING FILE

WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

P.O Box 968 • Richland, WA 99352 - 0968

PURCHASE ORDER

P.O. DATE	PURCHASE ORDER NO.
02/20/85	071950
VENDOR CODE	
A0669	

PAGES	TERMS			
6	1% 10 NET 30	☐ ORIGINAL ORDER	☒ CONFIRMING ORDER	☐ CHANGE * ORDER

SUPPLIER: ACCURATE SPRING CO.
C/O LEACHE INDUSTRIAL
401 N. HELENA
P.O. BOX 3260
SPOKANE WA 99202

ATTENTION:
PHONE: (509) 535-1904

SHIP TO: WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

BUYER	CODE	The Buyer is subject to payment of Washington State sales tax	QUALITY CLASS
ENGLAND, P J	PE6R		Q1
PHONE	MAIL DROP	☒ INSPECTION REQ'D ☐ OQA ☐ R.I.P. REQ'D	
(509)377-8430	9/65		

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
03/04/85	03/01/85	BEST BOLOW	ORIG. DEST.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUNT
			QUALITY ASSURANCE PROGRAM.			
			RIGHT OF ACCESS:			
			SUPPLY SYSTEM PERSONNEL OR AUTHORIZED AGENT SHALL BE PERMITTED ACCESS TO THE SUPPLIER'S SUBTIER VENDOR'S PREMISES FOR THE PURPOSE OF AUDITING IMPLEMENTATION OF THE SUPPLIER'S QA PROGRAM AND/OR SURVEILLANCE/INSPECTION PERTINENT TO ITEM(S) ORDERED HEREIN. NOTICE OF SUCH AUDIT, SURVEILLANCE/INSPECTION WILL BE COMMUNICATED TO THE SUPPLIER BY WRITTEN REQUEST OR TELEPHONE AT LEAST SEVEN (7) DAYS PRIOR TO ARRIVAL.			
			QUALITY ASSURANCE PROGRAM SUBMITTAL:			
			THIS SUPPLIER'S QUALITY ASSURANCE PROGRAM HAS BEEN PREVIOUSLY APPROVED BY ONE SUPPLY SYSTEM OR AN AGENT AND DOES NOT HAVE TO BE SUBMITTED. THE PROGRAM MUST BE REFERENCED STATING WHEN SUBMITTED AND DATE APPROVED. ANY CHANGES TO THE PREVIOUSLY APPROVED PROGRAM			

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352 - 0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement.

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

PURCHASING FILE

WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
P.O Box 968 • Richland, WA 99352 - 0968

PURCHASE ORDER

P.O. DATE: 03/20/85
PURCHASE ORDER NO.: 071950
VENDOR CODE: 30680

PAGES: 4
TERMS: 1% 10 NET 30

[ ] ORIGINAL ORDER [ ] CONFIRMING ORDER [ ] CHANGE * ORDER

SUPPLIER:
AUTOMATIC SWITCH CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3286
SPOKANE WA 99202

SHIP TO:
WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE 1
RICHLAND WA 99352

ATTENTION:
PHONE: (509) 535-1504

BUYER	CODE		QUALITY CLASS
EHYHART, P J	PP55	The Buyer is subject to payment of Washington State sales tax	01

PHONE	MAIL DROP			
(509)377-8420	976T	[X] INSPECTION REQ'D	[ ] DQA	[ ] R.I.P. REQ'D

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
07/04/85	05/01/85	SEE BELOW	SITE, PR.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUNT
			THAT AFFECT SPECIFIC ITEMS REFERENCED ON THIS PURCHASE ORDER SHALL BE SUBMITTED WITH THE BID/QUOTATION. REPORTING OF DEFECTS AND NONCONFORMANCES (10CFR21) BIDDER/SUPPLIER ACKNOWLEDGES THE REQUIREMENT OF THE U. S. NUCLEAR REGULATORY COMMISSION (NRC), RULES AND REGULATIONS, RULE 10, CODE OF FEDERAL REGULATION WHEN PROVIDING QUALITY CLASS I HARDWARE, SECURITY AND/OR FIRE PROTECTION SYSTEMS/SERVICES (EXCLUDING CONSTRUCTION PHASE SECURITY AND FIRE PROTECTION SYSTEMS/SERVICES), OR QUALITY AFFECTING SERVICES. BIDDER WILL NOTIFY ANY SUBCONTRACTOR (INCLUDING CONSULTANTS) AND/OR VENDORS OF THE REQUIREMENT. (PARAGRAPH 21.31 NRC 10CFR PART 21, EFFECTIVE JANUARY 6, 1978) ANY NOTIFICATIONS TO THE WASHINGTON PUBLIC POWER SUPPLY SYSTEM (WPPSS) WHICH ARE REQUIRED PURSUANT TO PARAGRAPH 21.21, NRC 10CFR PART 21, SHALL BE DIRECTED TO THE BUYER AS IDENTIFIED ON PAGE			

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352 - 0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O Box 968 • Richland, WA 99352 - 0968

PURCHASE ORDER

P.O. DATE: 09/20/85

PURCHASE ORDER NO.: 071950

VENDOR CODE: A0686

PAGES: 5 of 5

TERMS: 1 10 NET 30

[ ] ORIGINAL ORDER [XX] CONFIRMING ORDER [ ] CHANGE * ORDER

SUPPLIER: AUTOMATIC BRAKE CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3286
SPOKANE WA 99202

SHIP TO: WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

ATTENTION:

PHONE: (509) 535-1502

BUYER	CODE	The Buyer is subject to payment of Washington State sales tax	QUALITY CLASS
DUNBAR, P J	P895		Q1

PHONE	MAIL DROP			
(509)377-4420	07W3	[XX] INSPECTION REQ'D	[ ] DOA	[ ] R.I.P. REQ'D

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
02/04/86	01/01/86	NRI BELOW	SHIP. PT.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUNT
0093			1 OF THE REQUEST FOR QUOTATION/ PURCHASE ORDER. LEGIBILITY: DOCUMENTATION DRAWINGS AND RECORDS SUBMITTED AS REQUIRED BY THE QUOTATION/PURCHASE ORDER MUST BE OF SUFFICIENT CLARITY THAT EVERY LINE, NUMBER, LETTER AND CHARACTER DATA MUST BE CLEARLY LEGIBLE AND READABLE. THEY MUST BE LEGIBLE AND REPRODUCIBLE USING NORMAL COPY METHODS. QUALITY ASSURANCE PROGRAM: ALL ITEMS (MATERIALS, PARTS, COMPONENTS, SERVICES) SHALL BE SUPPLIED IN ACCORDANCE WITH THE SUPPLIERS DOCUMENTED QUALITY ASSURANCE PROGRAM WHICH: MEETS THE REQUIREMENTS OF FEDERAL REGULATION 10CFR50, APPENDIX B AS APPROPRIATE TO THE SCOPE OF WORK. PROVIDES FOR EXTENDING APPLICABLE REQUIREMENTS TO BOTH TIER AND SUBCONTRACTORS AND SUPPLIERS.			

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352 - 0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POWER SUPPLY SYSTEM

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O Box 968 • Richland, WA 99352 - 0968

PURCHASE ORDER

P.O. DATE	PURCHASE ORDER NO.
02/20/85	071950
VENDOR CODE	
A0680	

PAGES	TERMS			
6	6	1% 10 NET 30	☐ ORIGINAL ORDER	☒ CONFIRMING ORDER ☐ CHANGE * ORDER

SUPPLIER: AUTOMATIC SWITCH CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3286
SPOKANE WA 98202

ATTENTION:

PHONE: (509) 535-1504

SHIP TO: WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

BUYER	CODE	The Buyer is subject to payment of Washington State sales tax	QUALITY CLASS
BRYDART, P J	P885		01
PHONE	MAIL DROP	☒ INSPECTION REQ'D ☐ QQA ☐ R.I.P. REQ'D	
(509)377-8420	9767		

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
03/04/85	03/01/85	SEE BELOW	SHIP P. PT.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUN
0001			ASSURES COMPLIANCE BY SUBTIER CONTRACTORS AND SUPPLIERS WITH APPLICABLE REQUIREMENTS. MUST BE APPROVED BY THE SUPPLY SYSTEM OR AUTHORIZED AGENT. TAGGING: EACH ITEM SHALL BE TAGGED OR MARKED FOR SHIPMENT WITH THE FOLLOWING: SUPPLY SYSTEM PURCHASE ORDER NUMBER SUPPLY SYSTEM PURCHASE ORDER ITEM NUMBER CAT./PART NO./DRAWING NO. WHEN THE ABOVE DESIGNATED MARKINGS ARE NOT POSSIBLE, PROVISIONS MUST BE MADE TO IDENTIFY ORDERED ITEMS BY SOME OTHER MEANS; WHICH SHALL BE COMMUNICATED TO THE BUYER PRIOR TO SHIPMENT. CHANGES/EXCEPTIONS: ANY CHANGES/DEVIATIONS OR			

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352 - 0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POWER SUPPLY SYSTEM

WASHINGTON PU[illegible]IC POWER
SUPPLY SYSTEM
P.O Box 968 • Richland, WA 99352 - 0968

PURCHASE ORDER

P.O. DATE	PURCHASE ORDER NO.
02/20/85	071950
VENDOR CODE	
A0689	

PAGES	TERMS
7 6	1% 10 NET 30

☐ ORIGINAL ORDER ☒ CONFIRMING ORDER ☐ CHANGE * ORDER

SUPPLIER: AUTOMATIC SWITCH CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3288
SPOKANE WA 99202

SHIP TO: WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

ATTENTION:
PHONE: (509) 535-1504

BUYER	CODE	The Buyer is subject to payment of Washington State sales tax	QUALITY CLASS
ELYNARD, P J	PPRL		Q1

PHONE	MAIL DROP			
(509)377-8420	970C	☒ INSPECTION REQ'D	☐ DQA	☐ R.I.P. REQ'D

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
03/04/85	03/11/85	SEE BELOW	SHIP. PT.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUNT
			EXCEPTIONS MADE TO THE PROVISIONS OF THE AGREED TO ORDER/CONTRACT SHALL BE IDENTIFIED, DOCUMENTED, AND SUBMITTED ALONG WITH A RECOMMENDED DISPOSITION, FOR APPROVAL BY THE SUPPLY SYSTEM IN WRITING BEFORE PROCEEDING WITH SUCH CHANGES/ DEVIATIONS OR EXCEPTIONS.			
			PACKAGING, SHIPPING, STORAGE AND HANDLING:			
			ALL ITEMS SHALL BE PACKAGED AND SHIPPED TO ADEQUATE REQUIREMENTS TO ASSURE THE INTEGRITY, OPERABILITY, AND WARRANTY OF THE EQUIPMENT IS NOT DEGRADED.			
			SPECIAL HANDLING AND/OR STORAGE REQUIREMENTS NECESSARY TO PRESERVE THE INTEGRITY, OPERABILITY, AND WARRANTY OF THE EQUIPMENT SHALL BE FORWARDED TO THE SUPPLY SYSTEM PRIOR TO OR WITH SHIPMENT.			
			DOCUMENT(S) SUBMITTAL:			
			ALL CERTIFICATES OF COMPLIANCE OR CONFORMANCE AND OTHER DOCUMENTATION			

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352 - 0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POWE
SUPPLY SYSTEN

968-12561 (7-84) PAGE 4

PURCHASING FILE

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O Box 968 • Richland, WA 99352 - 0968

PURCHASE ORDER

P.O. DATE	PURCHASE ORDER NO.
02/20/85	071950
VENDOR CODE	
A0689	

PAGES	TERMS	
2 of 9	1% 10 NET 30	☐ ORIGINAL ORDER ☒ CONFIRMING ORDER ☐ CHANGE ORDER

SUPPLIER: AUTOMATIC SWITCH CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3286
SPOKANE WA 99202

ATTENTION:

PHONE: (509) 535-1504

SHIP TO: WASHINGTON PUBLIC POWER SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

BUYER	CODE	The Buyer is subject to payment of Washington State sales tax	QUALITY CLASS
ENYEART, P J	PP55		01

PHONE	MAIL DROP			
(509)377-8420	976T	☒ INSPECTION REQ'D	☐ DQA	☐ R.I.P. REQ'D

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
03/04/85	03/01/85	SEE BELOW	SHIP. PT.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUN
5			COPY ACCOMPANIED THE ITEMS ORDERED HEREIN SHALL BE SUBMITTED AS FOLLOWS:			
0			1. ONE (1) COPY TO BE PLACED IN THE SHIPPING CONTAINER ATTACHED TO THE PACKING LIST.			
3			2. ONE (1) COPY TO BE MAILED TO THE BUYER AS FOLLOWS:			
0			WASHINGTON PUBLIC POWER SUPPLY SYSTEM P.O. BOX 968 RICHLAND, WA 99352			
2			ATTN: P. J. ENYEART MAIL DROP: 976T			
2			SHELF LIFE:			
			THE SHELF LIFE OF ITEMS BEING QUOTED OR SUPPLIED SHALL BE INDICATED. MANUFACTURER'S RECOMMENDED STORAGE REQUIREMENTS FOR MAXIMUM SHELF LIFE SHALL ALSO BE INCLUDED. AT TIME OF SHIPMENT, ITEMS WITH PREDETERMINED SHELF LIFE SHALL HAVE MANUFACTURING DATE SHOWN AND THE SHELF LIFE			

CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352 - 0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

BUYERS REPRESENTATIVE
WASHINGTON PUBLIC POWER SUPPLY SYSTEM

PURCHASING FILE

WASHINGTON PU IC POWER

SUPPLY SYSTEM

P.O Box 968 • Richland, WA 99352-0968

PURCHASE ORDER

P.O. DATE	PURCHASE ORDER NO.
02/20/85	071956
VENDOR CODE	
A0C80	

PAGES	TERMS	ORIGINAL ORDER	CONFIRMING ORDER	CHANGE* ORDER
6	1% 10 NET 30			

SUPPLIER: AUTOMATIC SWITCH CO
C/O BLACKS INDUSTRIAL
401 N HELENA
P.O. BOX 3286
SPOKANE WA 98202

ATTENTION:

PHONE: (509) 535-1504

SHIP TO: WASHINGTON PUBLIC POWER
SUPPLY SYSTEM
WNP-2 SITE, WAREHOUSE #1
RICHLAND WA 99352

BUYER	CODE	The Buyer is subject to payment of Washington State sales tax	QUALITY CLASS
ENYDAHL, P J	PL55		01

PHONE	MAIL DROP	INSPECTION REQ'D	OQA	R.I.P. REQ'D
(509)377-8420	9767	X		

DATE REQUIRED	SUPPLIERS COMMITTED SHIP DATE	SHIP VIA	FOB
02/04/85	03/01/85	SEE BELOW	SHIP. PT.

ITEM	QTY. ORD.	U/M	STOCK NO. / DESCRIPTION	TC	UNIT PRICE	TOTAL AMOUNT
			INDICATED. NO ITEMS WILL BE ACCEPTED WITH LESS THAN 80 PERCENT OF SHELF LIFE REMAINING.			
			SHIP VIA:			
			UNITED PARCEL SERVICE, DECLARE FULL VALUE. SHIP PREPAID AND SHOW TRANSPORTATION AND VALUATION CHARGES AS A SEPARATE ITEM ON YOUR INVOICE.			
			FOB FLORHAM PARK, NJ			
			A PACKING LIST MUST ACCOMPANY EACH SHIPMENT SHOWING THE PURCHASE ORDER NUMBER, ITEM NUMBER, QUANTITY AND BRIEF DESCRIPTION OF THE MATERIAL BEING SHIPPED.			
			SHIP DATE:			
			2 EA RECULOTED 03/01/85 ON ALFP			
			BALANCE TO SHIP 8 TO 12 WEEKS ARO			
			INTERNAL DATA:			
			BH: ALLMAND?/9273/2639			
			PR 126799			

* CHANGE:

SPECIAL INSTRUCTIONS: Submit invoices in duplicate to:
Attn: ACCOUNTS PAYABLE M.D. 055
P.O. Box 968, Richland, WA 99352-0968

NO EXCESS QUANTITIES OR ADVANCE SHIPMENTS OTHER THAN THOSE AUTHORIZED WILL BE ACCEPTED.

PURCHASE ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, DOCUMENTS AND CORRESPONDENCE.

100% on schedule quality performance is not a desirable goal — it is a requirement

BUYERS REPRESENTATIVE

WASHINGTON PUBLIC POWER
SUPPLY SYSTEM

PURCHASING FILE

MATERIAL RECEIVING REPORT

P.O./CONTRACT | REL. | RECEIVING NO.

SITE: ☐ CENTRAL ☐ SITE 1 ☐ SITE 2 ☐ SITE 3 — WHSE 1

STOCK LOC: ☐ A ☐ B ☐ C ☐ D

SHIPPER/ORIGIN: AUTOMATIC SWITCH CO. | P.O. VENDOR: SAME 906.89 | SHT 1 of 1

CARRIER: UPS | DELIVERY DATE: 6-21-85 | CONTROL NO.: 28 | TRAFFIC DAMAGE REPORT | RECEIVING DATE: 6-21-85

FREIGHT BILL NO.: 068-881 | PCS.: 1 | WGT.: 05 | RECEIVED BY: [signature] | BADGE NO.: 1279 | BUYER: PESS

PACKING LIST: 50644594 | INSPECTED BY: [signature] | DATE: 6-24-85 | IR NUMBER: 2-95-9-85

☐ PARTIAL ☒ COMPLETE ☐ DIRECT PURCHASE ☒ STORE STOCK | OS&D NO. | NCR NO. | LOCATION AREA

ITEM	QTY ORD	QTY REC	U/M	Q/C	O*	S*	D*	OTH*	DESCRIPTION/COMMENTS	QTY ACC	QTY HOLD
1	13	13	EA	I					54501580 P/N NP830A12JE	13	

DOCUMENTATION	RECEIVED	SATISFACTORY	NOT SATISFACTORY
C of C	☐ YES ☐ NO	[signature]	
	☐ YES ☐ NO		
	☐ YES ☐ NO	0 1 6	0

*LEGEND: O - OVER, S - SHORT, D - DAMAGE, OTH - OTHER

5721

CC: WHITE - ACCOUNTING COPY, GREEN - P.O. COPY, YELLOW - DATA ENTRY COPY, PINK - [illegible] COPY, GOLDENROD - [illegible] COPY

880-15194 R3

Automatic Switch Co.

Manufacturers of
DEPENDABLE CONTROL
Since 1888

ASCO

FLORHAM PARK, NEW JERSEY 07932 • N.J.-(201) 966-2000 / N.Y.-(212) 344-3765

CERTIFICATE OF COMPLIANCE

Date June 12, 1985

Customer P.O. No. 107053

ASCO Shop Order No. 64459N

ASCO Part No. NP8320A172E Quantity 13

Consignee: Washington Public Power Supply Syste
Consignee P.O. No. 071950

This is to certify that the work has been completed in accordance with the requirements on the purchase order and referenced drawings. We further certify that the material has been manufactured free of mercury contamination.

Material supplied meets or exceeds the quality requirements established by the references, specifications in the above purchase order.

VERIFIED & ACCEPTED [signature] 6-24-85
6 PAGES R.I. Inspector Date

STATE OF NEW JERSEY)
COUNTY OF MORRIS) s.s.

SWORN TO AND SUBSCRIBED BEFORE ME
THIS 12th DAY OF June, 19 85

[signature]
Notary Public

AUTOMATIC SWITCH COMPANY
Company

[signature]
Authorized Signature
L. OLSEN
QUALITY CONTROL MANAGER

Form Q.C. 2458 R1

Automatic Switch Co.

Manufacturers of
DEPENDABLE CONTROL
Since 1888

FLORHAM PARK, NEW JERSEY 07932 • N.J.-(201) 966-2000 / N.Y.-(212) 344-3765

CERTIFICATE OF COMPLIANCE

Customer Name BLACKS-INDUSTRIAL, INC.

Customer P.O. No. 107053

Consignee WASHINGTON PUBLIC POWER

Consignee P.O. No. 071950

ASCO Shop Order No. 64459N

ASCO Part No. NP8320A172E Quantity 13

Voltage 120/60 Eng. Job No.

This is to certify that the subject valve(s) meet the performance requirements of IEEE-323-1974, IEEE-344-1975, IEEE-382-1980 (Revision of IEEE-382-1972) and IEEE-627-1980, as substantiated by testing valves of generically equal design in accordance with ASCO Qualification Specification AQS-21680/Rev. C, dated July 13, 1981. The following test levels were included in this qualification test program:

I. Aging Simulation Phases:

A. Thermal Aging Simulation - 250°F for 18¼ days. These aging parameters were determined by Arrhenius calculations to simulate a minimum of 8 years in a 140°F continuous ambient. Refer to Figure 1 for additional information regarding service periods for elastomeric components and Figure 2 for additional information regarding service periods for solenoid coils.

B. Wear Aging Simulation - 20,000 operations at maximum operating pressure differential and nominal voltage. Ten percent of the wear aging simulation (2,000 cycles) was conducted concurrently with the thermal aging simulation.

C. Pressurization Aging Simulation - 15 ambient pressure excursions from atmospheric pressure to 80 psig to simulate the expected periodic pressurization of the containment for leak testing during the life of the plant.

D. Radiation Aging Simulation - 20 megarads of gamma radiation at a rate not exceeding 1 megarad per hour to simulate expected non-accident radiation exposure.

E. Vibration Aging Simulation - Continuous sinusoidal sweeps from 5 to 200 to 5 Hz at a rate of 2 octaves per minute, with a minimum peak acceleration level of 0.75g (except at low frequencies where the acceleration level was reduced such that the displacement did not exceed 0.025" double amplitude), for a minimum of 90 minutes in each of three orthogonal axes. The test valves were alternately de-energized or energized every 15 minutes during this exposure. The valves were attached to the shaker table by rigid test fixtures using the standard valve mounting provisions with the solenoids (Solenoid 'A' for NP8323 valves) vertical and upright. Flexible hoses were used on all ports; therefore, the set-up did not affect the rigidity or mass of the valves being tested.

F. Seismic Aging (OBE) Simulation and Resonance Testing - The valves were mounted to the shaker table as described for the vibration aging simulation and were exposed to two sinusoidal sweeps from 1 to 35 to 1 Hz, with a peak acceleration level (within machine limits) of 3g, in each of three orthogonal axes at a rate of not more than 1 octave per minute. One sweep in each axis was conducted with the valves energized and the other with the valves de-energized. These sinusoidal sweeps are considered to provide the equivalent dynamic effect of 5 OBE's. During this testing, accelerometers were attached to the solenoids of the test valves to determine if the valves exhibited any resonance. Resonance is defined as a response with a magnitude of acceleration at least twice as great as the input acceleration. No valve resonances were detected.

ASCO SHOP ORDER NO. 64459N

II. Design Basis Event (DBE) Phases:

A. Seismic DBE (SSE) Simulation - The valves were mounted to the shaker table as described for the vibration aging simulation and were exposed to a series of single-frequency, single-axis sine-beat tests at 37 test frequencies between 1 and 35 Hz. The excitation was in the form of a continuous series of sine beats, with 12-15 oscillations per beat, for a minimum duration of 15 seconds at each test frequency. The successive beats were phased such that any superposition of response motion was additive. At each test frequency, the peak input acceleration was increased (up to 15g maximum) and the g-levels were recorded at which the cylinder port pressure (zero when de-energized and full inlet pressure when energized for a normally closed valve. opposite for a normally open valve) differed from the nominal by 0%, 5% and 10% of inlet pressure. The valves are considered to function properly up to a 10% change in cylinder port pressure. This level was selected as being sufficiently low to prevent spurious shifting of the customer's main valve or other equipment. Motion was applied at the same frequency and acceleration limits in each of the three orthogonal axes separately. Based on this testing and/or additional testing conducted by ASCO using single-frequency continuous sinusoidal inputs (after consideration of margin as suggested in IEEE-323-1974), the following acceptable maximum acceleration levels have been determined:

9.0g

B. Radiation DBE Simulation - 180 megarads of gamma radiation at a rate not exceeding 1 megarad per hour to simulate (after consideration of margin as suggested in IEEE-323-1974) at least 163 megarads of accident radiation exposure.

C. Environmental DBE Simulation - The valves were installed in a pressure vessel and subjected to a 30-day exposure to steam, chemical spray and clear water spray simulating a combined loss-of-coolant accident/high-energy-line-break event and post event cool-down. The peak ambient temperature of the simulation was 420°F and the peak ambient pressure was 70 psig. The valves were pressurized to maximum operating pressure and continuously energized for 4 hours prior to the first transient (to produce thermal saturation of the solenoid coils). They were de-energized when the temperature of the first transient reached 420°F (to demonstrate the ability to perform a typical safety function) and were normally de-energized but were cycled periodically during the 30-day exposure to demonstrate the ability to operate on demand. The qualified temperature profile demonstrated by this simulation (after consideration of margin as suggested in IEEE-323-1974) is shown in Figure 3.

Test Report AQR-67368 is on file at Automatic Switch Company in Florham Park, N.J., and is available for customer perusal.

Dated JUNE 12, 1985 Authorized Signature

QUALITY CONTROL MANAGER

NP-1 VALVES SHOULD BE REBUILT USING THE APPROPRIATE SPARE PARTS WHENEVER INDICATED BY THE PERIODIC INSPECTION OF VALVE COMPONENTS OR WHENEVER ANY OF THE FOLLOWING LEVELS SIMULATED DURING QUALIFICATION TESTING, ARE REACHED:

1. WEAR AGING – 20,000 CYCLES;
2. RADIATION AGING – 2×10^7 RAD
3. THERMAL AGING – THE MAXIMUM SERVICE PERIOD INDICATED FOR THE APPLICABLE SERVICE AMBIENT TEMPERATURE.

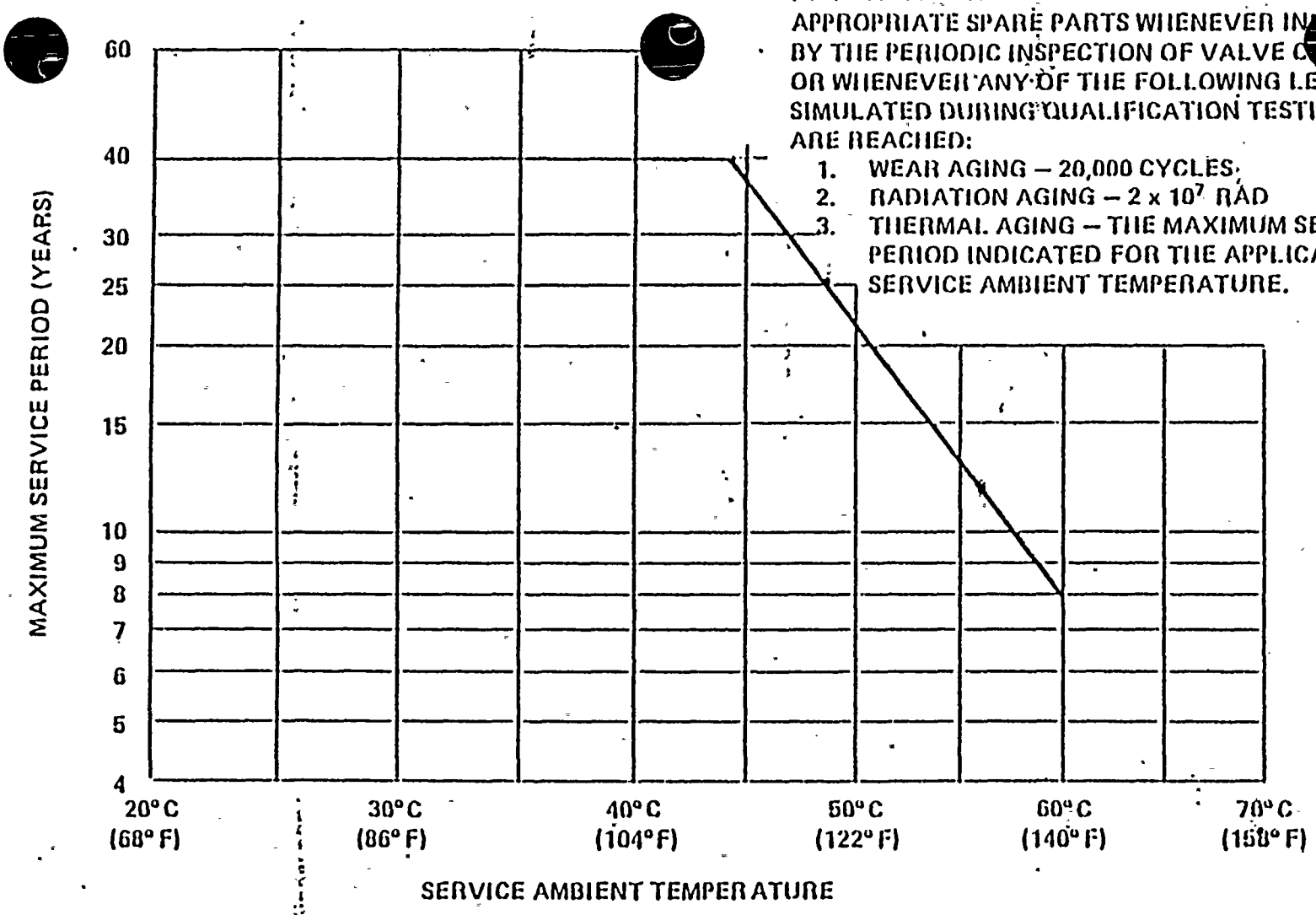

FIGURE 1

MAXIMUM SERVICE PERIODS FOR ELASTOMERIC COMPONENTS IN ASCO CATALOG NP-1 VALVES

Form V6 123981

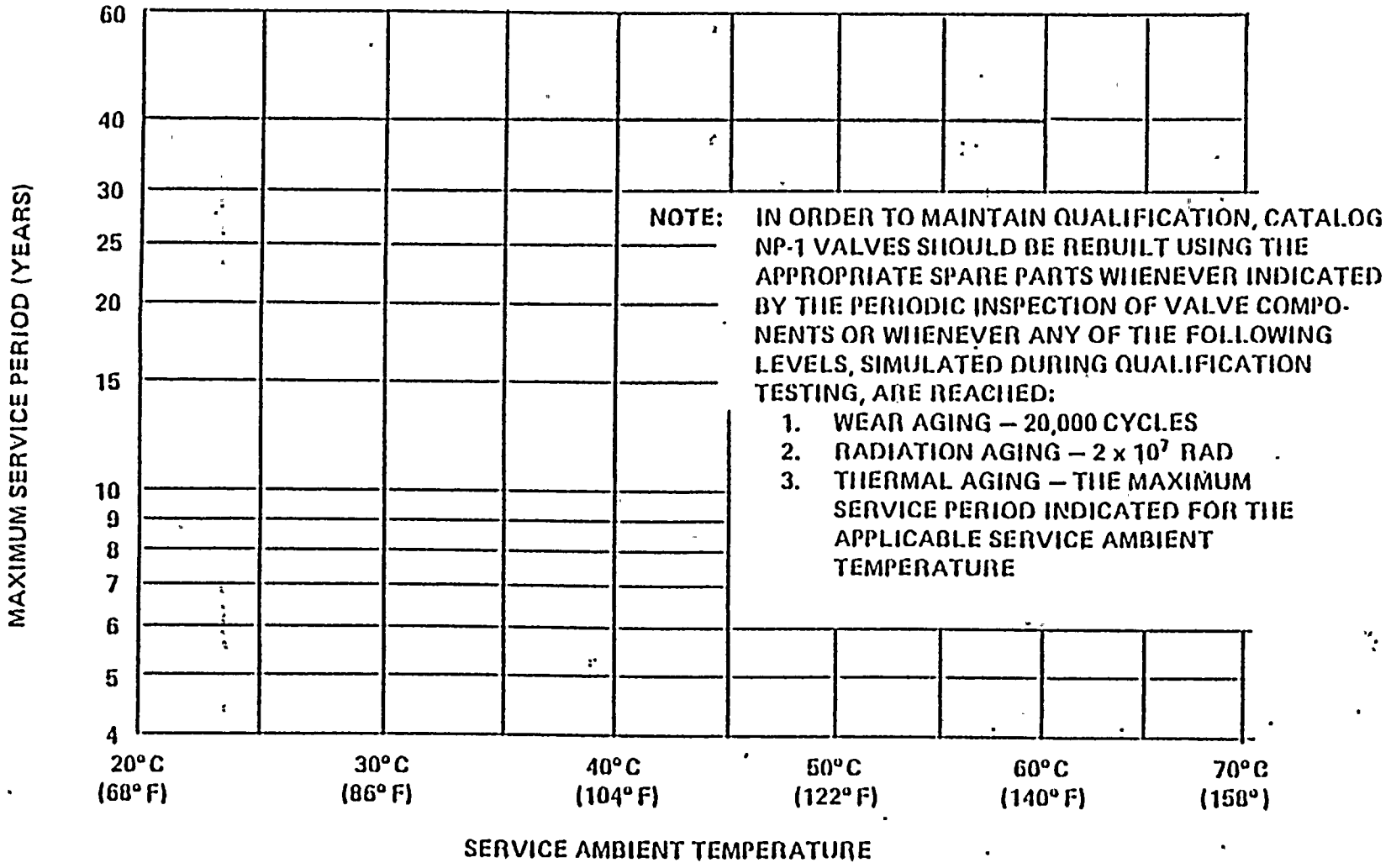

FIGURE 2

MAXIMUM SERVICE PERIODS FOR SOLENOID COILS IN ASCO CATALOG NP-1 VALVES

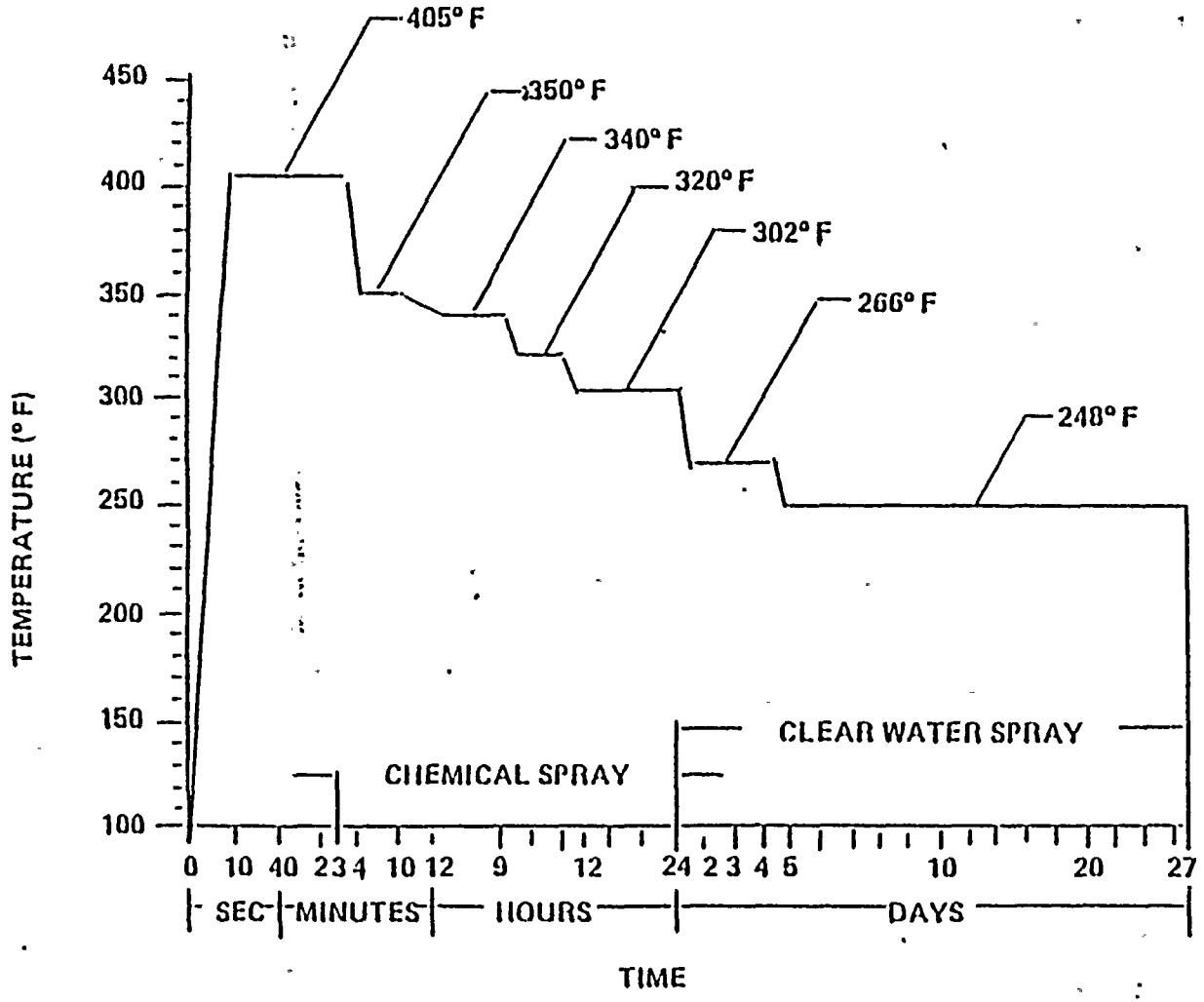

FIGURE 3

QUALIFIED AMBIENT TEMPERATURE PROFILE DEMONSTRATED BY THE COMBINED LOSS-OF-COOLANT ACCIDENT (LOCA)/HIGH-ENERGY-LINE BREAK (HELB) SIMULATION (AFTER APPLICATION OF ALL MARGIN SUGGESTED IN IEEE 323-1974)

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

RECEIVING INSPECTION REPORT

WHSE	MAIN	NO. 1	NO. 2	NO. 3
		✓		

SUPPLIER: AUTOMATIC SWITCH CO. | RIR NO. 2-959-85 | DATE 6-24-85 | CONT. NO. 1950 | QUALITY CLASS I | ASME CODE CLASS N/A | PAGE 1 OF 1

S - SATISFACTORY U - UNSATISFACTORY N/A - NOT APPLICABLE

P.O. ITEM NO.	QTY	U/M	QTY REC'D.	ITEM DESCRIPTION	ID AND MARKING	PROT. COVERS AND SEALS	INERT GAS BLANKET	DESICCANT	PHYSICAL DAMAGE	CLEAN.	COATING/ PRESERV.	DIMENSION	WELD PREP.	WORK-MANSHIP	LUB/OILS	ELEC. INSUL.		ACCEPT. DATE
1	13	EA	13	VALVE, SOLENOID 3-WAY P/N NP8320A172E	S	NA	NA	N/A	S	S	NA	S	NA	S	NA	NA		6-24-85

A

P.O. ITEM NO(S).	DOCUMENT (TITLE)	SAT.	UNSAT.	NOT RECEIVED	CHECKLIST REQ YES	CHECKLIST REQ NO	RESOLUTION (IF NO NCR REQUIRED)
1	C of C	✓				✓	

B

P.O. ITEM NO(S).	DISCREPANCY (AS NOTED IN A OR B)	NCR REQUIRED NUMBER	NCR REQUIRED YES	NCR REQUIRED NO	NCR DATE OPEN	NCR DATE CLOSED	DATE HOLD TAG ATTACHED	REINSPECTION SAT	REINSPECTION UNSAT	REINSPECTION DATE	RESOLUTION (IF NO NCR REQUIRED)
	N/A										

REMARKS (i.e., CONDITIONAL RELEASE, SPECIAL INSPECTION AMPLIFICATION)

N/A

RECEIVING INSP. OR [illegible] DATE: 24-85

C | NC
PREPAID
F.O.B. FLORHAM PARK, N. J. UNLESS SPECIFIED

CUST. ORDER NO. OR REQ'N. NO.: 107053

CONSIGNEE ORDER NO.: 071950

6/7
523

ORDERED BY

BLACKS-INDUSTRIAL, INC.

P O BOX 3286
SPOKANE WA 99202

SPECIAL INSTRUCTIONS

REFER SO TO QC DEPT TO SUPPLY 1
COPY OF C OF C FORM VE 3239 WITH
SHIPMENT.
SUPPLY Q.C. 2458 PER P.O.
LABEL PER NP-G-055

CUSTOMER REQUIRES | SHIP AT ONCE | UNLESS INDICATED
ON & NOT BEFORE

ASCO ITEM NO.	QUANTITY ORDERED	CATALOG NUMBER	PIPE SIZE	ORIF SIZE	CODE V	CODE G	VOLTAGE AND SERVICE	QUANTITY SHIPPED
1	13	NP 8320A172 E	1/4	1/16	1	1	120/60 AIR - INERT GAS 125 PSI	
		1. ALL PARTS SUBJECT TO Q.C. INSPECTION PRIOR TO ASSEMBLY 2. MAINTAIN TEST LOGS AND SEPARATE SERIAL NUMBERS SO 64459N 1 TO 13 INCL. - - - TEST PER TP-NP-0320 3. SHELF LIFE REQUIRED PER NP-G-055 4. NP-L-046 APPLIES x x x x x N U C L E A R x x x x x x						
1A	1	DATA PACKAGE				7	PER SPEC.INSTRU.ABOVE	

62185-28 (1) 25 F SCC

DELV. DATE 6-21-85 PO# 71950

CARRIER UPS VENDOR

PARTIAL NO.	ITEM NO.	QTY.	PRO NO.	CARTONS	ACKN.	CARRIER - VIA	SHIPPING CHG.
			068-881				1

REC'D BY [illegible] DATE 6-21-85

PACKING SLIP

FROM

AUTOMATIC SWITCH CO. FLORHAM PARK NEW JERSEY

DATE 04/21/86 -MMIS-. MATCODE DETAILED DATA SPT24
ACTION S PRINTER PRP

MATCODE: 54501580

VALVE SOLENOID 3-WAY 1/4"X 1/16" ORFICE WITH 120VAC COIL
WATERTIGHT ENCLOSURE ASCO NP8320A172E

CATEGORY CODE 08 STATUS CODE A QUALITY CLASS 1

SITE	WHSE	ON HAND	RE-SERVED	AVAIL-ABLE	MIN	MAX	BIN 1	BIN 2	BIN 3
02	17	7	0	7	3	6	A02L13C01		

MFG/SUPPLIER: ASCO PART: HBX8320B1
MODEL: DRAW:
DRAWING ITEM NO.: PRIORITY: 2
M305 INQUIRY COMPLETE

ATTACHMENT 3

SUPPLY SYSTEM | PLANT MODIFICATION RECORD | PMR 02-86-0156-0

1a) ORIGINATING DOCUMENT: NCR-286-0137 0153 | 1b) SYSTEM NO: 81 | NO.: 14705

1c) STRUCTURE/COMPONENT/EQUIPMENT: RCIC-SPV-10, 11, 12, 13, 14, 15, 17 | 2) QUALITY CLASS: I | 3) SAFETY RELATED: YES ✓ NO ___

INITIATION

4a) PROBLEMS AND PROPOSED SOLUTION

Based on letter SS2-PE-85-30 existing ASCO HBX8320- SPV's were replaced with identical units. NCR 286-0137 indicates these SPV's should have been replaced with ASCO NP 8320 and NCR 286-153 indicates that all of the above SPV's should be replaced with ASCO NP-8320's.

MEL sheets are required do allow replacement of units and possible drawing change to show 1/4 x 1/8 bushing needed do adapt NP's do HBX tubing.

4b) ORIGINATOR/DATE: [signature] 4-24-86 | 4c) ORIGNATOR SUPERVISOR/DATE: [signature] 4/24/86

5) ASSIGNED PLANT SYSTEM ENGINEER: KIPPES | RETURN DATE: 4/24/86

6) TECHNICAL MERIT YES ✓ NO ___ PLANT SYSTEM ENGINEER/DATE: [signature] 4-24-86

7) CONCEPTUAL DESIGN AUTHORIZATION: N/A
TECHNICAL SUPERVISOR/DATE

8) FINAL DESIGN AUTHORIZATION: [signature] 4/24/86
TECHNICAL SUPERVISOR/DATE

PLANT REVIEW/AUTHORIZATION

9a) DCP NO. 86-0156-0A | 9b) HP ALARA REVIEW
MANAGER HP/CHEMISTRY

10) PLANT SYSTEM ENGINEER/DATE: [signature] 5-6-86

11) TECHNICAL GROUP SUPERVISOR/DATE

12) PLANT TECHNICAL MANAGER REVIEW REQUIRED YES ___ NO ___

13) PLANT TECHNICAL MANAGER/DATE

14) POC REQUIRED YES ___ NO ___ MTG. NO. ___
PROPOSED IMPLEMENTATION DATE ___ PRIORITY ___

15) PMR APPROVED YES ___ NO ___
PLANT MANAGER/DATE

IMPLEMENTATION

16) MWR NO(S)

17) FCR'S INITIATED? YES ___ NO ___ (IF YES LIST ON CONTINUATION SHEET)

18) INSTALLATION AND STATIC TESTING COMPLETE
PLANT SYSTEM ENGINEER/DATE

19) CONTROL ROOM OPERATING PROCEDURE AND TOP TIER DRAWINGS UPDATED. MODIFICATION COMPLETE. SYSTEM OPERABILITY TESTING COMPLETED.
SHIFT MANAGER/DATE

CLOSEOUT

20) DCS REVISED, PLANT DESIGN DOCUMENTS UPDATED AND PROCEDURE REVISIONS INITIATED. PTL UPDATED. MEL INPUT SHEETS TRANSMITTED AND MEL UPDATED.
PLANT ADMINISTRATIVE MANAGER/DATE

21a) CONTINUATION SHEET YES ___ NO ___

Original Estimate $ 0 Total Cumulative PMR Value $ 610K (A – B)	WASHINGTON PUBLIC POWER SUPPLY SYSTEM ORIGINAL PMR WORK ORDER	PMR NO. 2-86-0156 Priority (Circle One) 1 2 3 4 5

Requesting Organization Code	Technical Supervisor	Mail Drop	Est. Start Date	Est. Completion
52400				

Project Title: REPLACE ROA-SPV-102,5,17

Project Description/Purpose

Evaluate replacement of ASCO HBX solenoid coils.

CAPITAL/EXPENSE CLASSIFIC...

[ ] New [X] Replacem...

81.0 (System #)

Circle One Classification:

Reactor (circled) RJW — Electr...

Misc. Systems (circled) — Struct...

Amount Identified in Capital Budget $ ____

Approved By Technical Supervisor: [signature] Date: 5/2/86 Phone: 2120

MATERIALS/INSTALLATION COSTS					SPECIFIC ENGINEERING/TECHNICAL COSTS				
Work Order No.	ESTIMATES ($000's)				Work Order No.	ESTIMATES ($000's)			
Level ____ D 10000 Ref. WBS ______	Prior Year	Current Year	Subsequent Year	Total	Level ____ No. E 90000 Ref. WBS 26241E	Prior Year	Current Year	Subsequent Year	T...
Manhours					Manhours				
Labor O/S	$	$	$	$	Labor O/S	$	$	$	$
Materials	$	$	$	$	Materials	$	$	$	$
Total Cost	$	$	$	$ 610K (A)	Total Costs	$	$	$	$

APPROVALS/CONCURRENCE

			Comments
All PMRs	Technical Manager	[signature]	
All PMRs	Maintenance Manager		
All PMRs	Operations Controller		
Over $10,000	Plant Manager		
Over $25,000	Asst. M.D. Operations		
Over $100,000* Planned Capital	Managing Director		

Installation by Contract	Installation Competitive Bid Required:	Work Completed:
Yes [ ] No [ ]	Yes [ ] No [ ]	Completion Date:
Reviewed By:	Reviewed By:	Approval:

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

INTEROFFICE MEMORANDUM

DISTRIBUTION: MAIL DROP

- ☐ WNP-1 FILE ____ ____
- ☐ WNP-2 FILE ____
- ☐ WNP-3 FILE ____
- ☐ WNP-4 FILE ____
- ☐ WNP-5 FILE ____
- ☐ HGP FILE ____
- ☐ PKWD FILE ____
- ☐ LEGAL FILE ____
- ☐ ADMIN FILE ____

DATE: April 28, 1986

TO: K. D. Cowan - 988U

FROM: L. T. Harrold - 994E J Tellefson

SUBJECT: ENGINEERING CAPITAL WORK ORDER EVALUATION FOR PMR 86-0156 (REPLACE ROA-SPO-10-15, 17)

REFERENCE:

In accordance with the Capital PMR Work Order approval process, the subject PMR has been evaluated and is dispositioned as follows:

____ Expense for implementation will be less than $10,000 -- Drawing Change/ Maintain Configuration Control only. Further approval for engineering to proceed is not required. Generation Engineering is continuing with preparation of a Design Change Package (DCP).

XXX Expense for implementation will be less than $10,000 -- may require material/ labor expenditures. Further approval for engineering to proceed is not required. Generation Engineering is continuing with evaluation and will disposition the PMR with appropriate documentation -- DCP, memo, etc.

____ Expense for implementation will be greater than $10,000 -- Engineering estimate attached. Further CWO approval required. Engineering is not proceeding with preparation of a Design Change Package (DCP) until an approved work order is returned (a design need date will have to be re-established at that time).

____ Other -

JGT:ch
Attachment: as stated

cc: wo/att

Engrg Mgr - NS Porter - 981C
Engineer - T. Miles - 981C
Tech Staff Engr - M. Kippes-988U
____ Preparer - (Tellefson)
~~CWO XXXXX~~ -
LTH/lb - 994E
WW Waddel - 982B

w/att

RJ Barbee - 988U
EP Divincenzo - 1035
RL Koenigs - 988U
S. Scammon - 988U
F. Walten - 927S
M. Wuestefeld - 988U
PMR Coordinator - 988U (Cowan's Copy)
PMR File - 994E

DESIGN CHANGE REVIEW CHECKLIST

ORIGINAL

PMR 02 - 86 - 0156 - 0

Design Change Package

A. Verify the following are included in the DCP (if applicable):

1.	Design ALARA review	✓
2.	FSAR change	N/A
3.	Fire Protection review	✓
4.	Industrial Safety review	✓
5.	Environmental impact review	✓
6.	10CFR50.59 reportability analysis	✓
7.	MEL Input Sheets	✓

PMR Package

B. Complete the following questions:

		Yes	NO
1.	CNSRB review required		✓
2.	NRC concurrence required		✓
3.	Plant Security affected		✓
4.	Technical Specification change required (if yes, attach markup)		✓
5.	Personnel training on change or modification to simulator (if yes, attach Training Checklist and route PMR Package to WNP-2 Nuclear License Trainging Manager		✓
6.	Special testing required (if yes, attach a list and/or description)		✓
7.	Any Plant Procedures or Control Room documents affected (attach Document List)		✓
8.	Materials required to be purchased (if yes, attach list) In stock	✓	
9.	Drawing/document change (no field work)		✓

When Complete Attach To PMR

[signature] 5-6-86
Plant System Engineer/Date

Attachment 2
Page 2 of 2

DOCUMENT LIST

PMR 02-86-0156-0

A. Plant Procedures

Number	Revison	Title
NONE		

Control Room copies of Plant procedures must be modified prior to the equipment or system being returned to service.

B. Instrument Master Data Sheets NONE

C. Vendor Operating and Maintenance Manuals NONE

D. Master Equipment List ~~not~~ not attached

Signature Plant System Engineer/Date 5-6-86

Attachment 4

PREP BY- Kipp
DATE- 4-28-86

1. What does modification accomplish: Replaces ASCO HBX 8320 SPU with qualified (for active function) ASCO NP8320's "Required Prior to Restart"

2. Description of modification: (enter "same" if description on PMR is correct and full adequate): Replaces ROF-SPU- 10, 11, 12, 13, 14, 15, 17

3. Specific justification for modification: (e.g. reliability, efficiency, labor/cost savings, safety, regulatory, etc). Cost benefit statement: EQ.

4. Safety significance (include tech. spec. involved or affected): See NCR 286-0137, 0153

5. Modification affect on system/plant:

   a. plant outage required: Yes (No)
   b. system outage required: (Yes) No (if "yes" identify)
   c. other systems affected: Yes (No) (identify)
   d. special limitations requiring attention to perform modification: Required Prior to Restart
   e. integrate/work this PMR with other related work:

6. Order of Magnitude Cost Estimate:

   Design - _____
   Mtl/Eqpt - _____
   Installation - _____
   Total - $10,000

   Capital Work Order Item: Yes (No)
   CWO # - _____

7. Schedule info: (include procurement, installation): As soon as PRIOR to Restart
   Recommended plant modification implementation date: _____ (basis) _____

8. Reference to related documents: (NCR)/PDR: 286-137, 157 MWR: _____
   LER: _____ PMR: _____
   Other: _____

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

DESIGN CHANGE PACKAGE

1. DCP NO. 86-0156-0A | 2. PAGE 001

RESERVED

SPECIAL DISTRIBUTION: T.L.MILES M/D 981C

3. REASON FOR DCP

THE PURPOSE OF THIS DCP IS TO PROVIDE ENGINEERING DIRECTION TO REMOVE EXISTING (NON-QUALIFIED ASCO MODEL No. HSX8320A1 & B1) SOLENOIDS VALVES ROA-SPV-10, 11, 12, 13, 14, 15 & 17 AND REPLACE WITH QUALIFIED (ASCO MODEL No. NP8320A172E) VALVES.

THIS IS NECESSARY TO UPGRADE THE EQUIPMENT FROM "PASSIVE" TO "ACTIVE" STATUS.

REFERENCE: NCR No. 286-153

3. PMR/FCR NO./SOURCE: 86-0156-0

4. SUBJECT: SOLENOID VALVE REPLACEMENT

5. LOCATION: REACTOR BLDG. — VARIOUS

6. SYSTEM NO.: 81.0 TITLE: R.BLDG. EMR HVAC

7. QUALITY CLASS: I

8. DESCRIPTION OF WORK

REFER TO PAGE 004 OF THIS DCP FOR INSTRUCTIONS.

☑ Field work required

☐ Drawing change only

☑ Revises DCP: 85-0022-0D-068

☐ Voids DCP:

9. WORK ON THIS DCP SHOULD BE COORDINATED WITH: 85-0022-0D

THIS DCP DEPENDS ON PRIOR INSTALLATION OF DCP: NONE

10. DESIGN CHANGE PACKAGE INDEX AND PAGE NUMBERING SEQUENCE

DCP Approval Form:	Page 001		MEL Input Data Sheets:	010	Through	016
10CFR50.59 Safety Evaluation:	Page 002		Installation/Test Req'mts:	017	Through	
DCS Input Sheets:	003	Through	ASME XI Section XI PCN:		Through	
DCP Plates:	004	Through 008	New Drawings:		Each	
FSAR/Tech Spec Chg Proposal:		Through	New Documents:		Each	
Procurement Specifications:		Through	Other:		Through	
Bill of Material:	009	Through	Design Backup/Rev. App:	018	Through	025

11. DESIGN REVIEW RECORD

ALARA: N/R	PENETRATIONS: N/R	ASME CODE COMPLIANCE: N/R	OTHER TECH. STAFF: T. MILES FOR M. Kimes PER TEL. CONV.
EMERGENCY PREPAREDNESS: N/R		EQUIPMENT QUALIFICATION: R L [signature] 4-30-86	
ENVIRONMENTAL: N/R		HUMAN FACTORS: N/R	
SECURITY: N/R		INDUSTRIAL SAFETY / FIRE PROTECTION: N/R	
CONTROL SYSTEM FAILURE: N/R		APPENDIX R/ELECTRICAL SEPARATION: N/R	
PIPE BREAK/MISSILE: N/R		OVERALL DESIGN VERIFICATION AND MEL COORD: B. Van Eren 4/30/86	

DCP APPROVALS

THIS DCP IS APPROVED FOR IMPLEMENTATION

ELECTRICAL/I&C SYSTEMS: [signature] APR 30 1986	MECHANICAL SYSTEMS: [signature] 4/30/86 [signature]	NUCLEAR SYSTEMS & ANALYSIS:
ENGINEER: Thomas L. Miles APRIL 25, 1986	OTHER:	GENERATION ENGINEERING: [signature] APR 30 1986

SUPPLY SYSTEM

10CFR50.59 SAFETY EVALUATION

1. DCP NO. / TFCR NO. 86-0156-DA 1 002
2. PROCEDURE NO.
3. SPECIAL TEST NO.

4. TECH. SPEC REFERENCE		
SECTION		PAGE

☑ Not Addressed in Tech. Spec.

5. *Does this Design Change, Procedure Revision, and/or Special Test constitute a change as described in the Final Safety Analysis Report?
☐ YES ☑ NO

6. *Is a change in Technical Specifications involved?
☐ YES ☑ NO

7. FSAR REFERENCE		
VOLUME	SECTION	PAGE

☑ Not Addressed in FSAR

IF YES

8. Complete Block No. 8 of this form Proceed to Block No. 7

9. Request and receive Nuclear Regulatory Commission authorization for change prior to implementation of the subject change. Refer to 10CFR50.90.

IF NO

E. UNREVIEWED SAFETY QUESTION EVALUATION: Answer the following questions with a "yes" or "no", and provide specific reasons justifying the decision:

A. Can the probability of occurrance or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report be increased?

☐ YES ☑ NO Because: THIS DESIGN CHANGE UPGRADES SOLENOID VALVES FROM "PASSIVE" TO "ACTIVE" STATUS BY REPLACEMENT WITH NUCLEAR QUALIFIED UNITS.

B. Can a possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report be created?

☐ YES ☑ NO Because: SHOULD RESULT IN IMPROVED EQUIPMENT RELIABILITY.

C. Is the margin of safety as defined in the basis for any technical specification reduced?

☐ YES ☑ NO Because: NOT SPECIFICALLY ADDRESSED IN TECH. SPEC.

Any Answer (8A, B, C) ☐ YES

☑ All Answers (8A, B, C) NO

AUTHORIZATION RECEIVED

Initiate Design Change, Procedure Change and/or Special Test implementation.

* If answer in Block No. 4 is YES, then the change is reportable under 10CFR50.59b and description of the change will be included in the Annual Report. The individual initiating the Design Change, Procedure Revision, and/or Special Test is responsible for submitting FSAR changes to the Plant Licensing Manager.

9. Thomas L. Miles — APRIL 28, 1986
PREPARED BY — DATE

10. [signature] — APR 30 1986
APPROVED BY — DATE

986-1678.2 R1 5-84

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

DCS INPUT SHEET

DCP Page No: 003

	DCP PLATE NO. / PMR NO. YR	NO.	REV PMR	REV DCP	REVISE	AFFECTED DOCUMENT	REVISION	DOC TYPE
1	86	0156	0A	007	Y	E53B-30VH-111	N1	D
2	86	0156	0A	008	Y	Z16-05,339	--	D
3				010	Y	315002-01	2	Q
4				011	Y	315002-01	2	Q
5				012	Y	315002-01	2	Q
6				013	Y	315002-01	2	Q
7				014	Y	315002-01	2	Q
8				015	Y	315002-01	2	Q
9	86	0156	0A	016	Y	315002-01	2	Q
10								
11								
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16								
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25								
26								
27								

SUPPLY SYSTEM

DCP PLATE

3 DESCRIPTION OF CHANGE

INSTRUCTIONS

REMOVE SOLENOID VALVES ROA-SPV-10,11,12,13,14,15 & 17 (ASCO MODEL NO. HBX8320A1 & B1) AND REPLACE WITH NUCLEAR QUALIFIED UNITS (ASCO MODEL NO. NP8320A172E), AS FOLLOWS.

1. REMOVE EXISTING SOLENOID VALVES (ASCO HXB8320A1 & B1) AND RETURN TO WAREHOUSE AS SPARES. RETAIN HARDWARE FOR LATER USE.
2. FABRICATE SEVEN (7) "UNIVERSAL MOUNTING BRACKET / ADAPTERS, AS SHOWN ON PAGE 006 OF THIS DCP.

   NOTE: DRILL MOUNTING HOLES IN L-SIDE OF BRACKETS TO MATCH EXISTING SUPPORT / HANGER HOLE CONFIGURATION FOR THE INDIVIDUAL SOLENOID VALVE INSTALLATIONS.
3. ATTACH THE UNIVERSAL MOUNTING BRACKET /ADAPTER TO THE REPLACEMENT SOLENOIDS VALVES (ASCO MODEL NO. NP8320A172E) USING SOCKET HEAD CAP SCREWS, AS SHOWN ON PAGE 005 OF THIS DCP.
4. INSTALL THE REPLACEMENT SOLENOID VALVES ON EXISTING SUPPORTS/ HANGERS USING HARDWARE REMOVED IN STEP 1. ORIENTATION OF VALVE SHALL BE THE SAME AS THAT FOR THE REMOVED NON-QUALIFIED VALVE.
5. RETERMINATE WIRING TO THE NEW SOLENOID VALVES IN ACCORDANCE WITH PPM 10.25.19.
6. RECONNECT TUBING TO THE NEW SOLENOID VALVES, USING SWAGLOK FRACTIONAL TUBE TO 1/4" NPT CONNECTORS, COMPRESSION TUBING UNIONS AND OTHER SWAGLOK QUALITY CLASS 1 COMPRESSIONS FITTINGS AS NECESSARY. SEE EXAMPLE ON PAGE 005 OF THIS DCP.
7. PERFORM VISUAL INSPECTION, WIRING CHECKS AND OPERATIONAL / FUNCTIONAL TEST AS INDICATED ON PAGE 017 OF THIS DCP.

NOTE: TERMINATION AND DETERMINATION SHALL BE IN ACCORDANCE WITH PPM 1.3.9

2. SUPERSEDES PREVIOUSLY APPROVED DCP Page: ____ - ____ - ____ - ____

1. DCP Page: 86 - 0156 - 0A - 004

4. Revises [ ] AE Drawing [ ] CVI Document [ ] Spec / Criteria

Drawing / Document No.: INFORMATION ONLY Zone: ____ Revision: ____

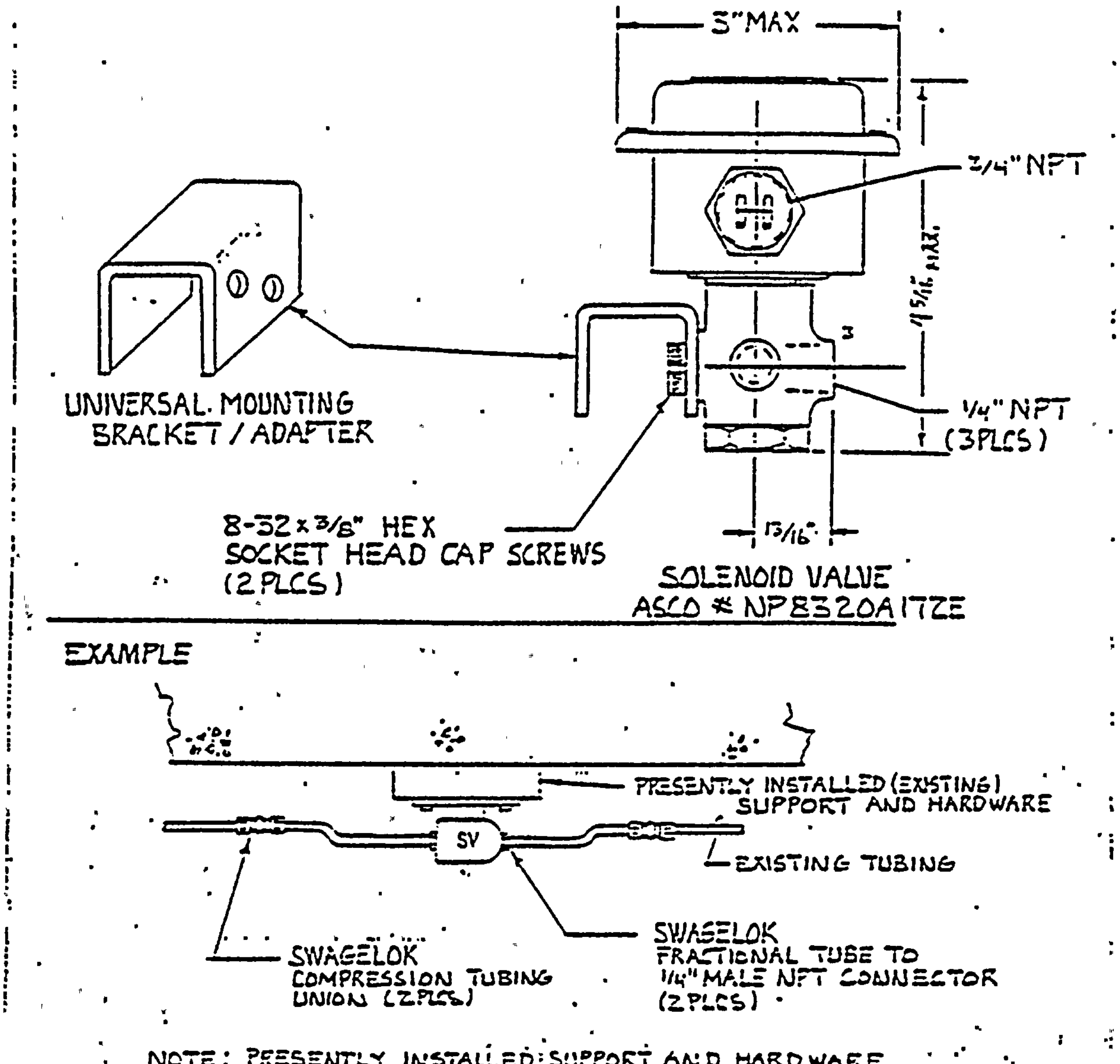
5. PREPARED BY		5. CHECKED BY	6. SCALE	7. DRAWING OR DOCUMENT TITLE
Thomas E. Nitos	APRIL 29, 1986	[signature]	NONE	INSTALLATION INSTRUCTIONS

966-12596 (6-84)

SUPPLY SYSTEM

DCP PLATE

3 DESCRIPTION OF CHANGE



NOTE: PRESENTLY INSTALLED SUPPORT AND HARDWARE CONFIGURATION MAY VARY FROM INSTALLATION TO INSTALLATION.

NOTE: REFER TO PAGE 006 OF THIS DCP FOR UNIVERSAL MOUNTING BRACKET FABRATION.

2. SUPERSEDES PREVIOUSLY APPROVED DCP Page: ___ - ___ - ___ - ___	3. DCP Page: 86 - 0156 - 0A - 005

Revises ☐ AE Drawing ☐ CVI Document ☐ Spec / Criteria

Drawing / Document No.: INFORMATION ONLY Zone: — Revision: ____

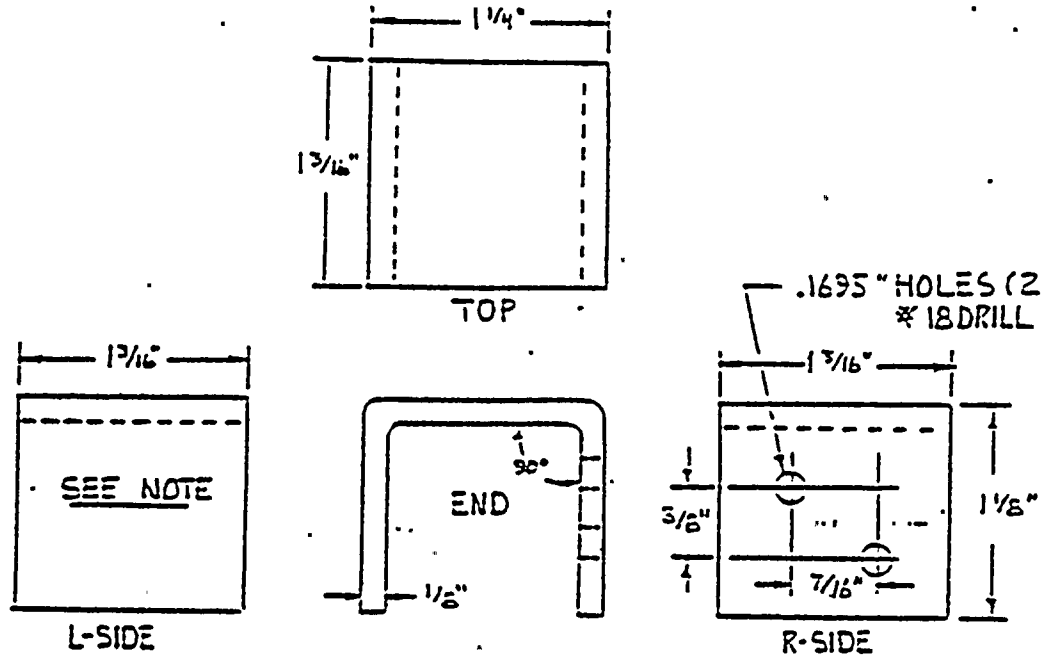
5. PREPARED BY / APRIL 29, 1986	5. CHECKED BY	6. SCALE	7. DRAWING OR DOCUMENT TITLE
[signature]	[signature]	NONE	MOUNTING INFORMATION

966-12596 (6-84)

SUPPLY SYSTEM

DCP PLATE

3 DESCRIPTION OF CHANGE



FABRICATE FROM 1/8" CARBON STEEL PLATE (A-36)

NOTE: DRILL MOUNTING HOLES IN L-SIDE OF BRACKET TO MATCH EXISTING SUPPORT / HANGER HOLE CONFIGURATION.

2. SUPERSEDES PREVIOUSLY APPROVED DCP Page: _____ - _____ - _____ - _____

DCP Page: 86 - 0156 - 0A - 006

Revises ☐ AE Drawing ☐ CVI Document ☐ Spec / Criteria

Drawing / Document No.: INFORMATION ONLY Zone: ____ Revision: ____

13. PREPARED BY	14. CHECKED BY	15. SCALE	16. DRAWING OR DOCUMENT TITLE
APRIL 29, 1986		NONE	UNIVERSAL MOUNTING BRACKET / ADAPTER

SEA-12558 (5-84)

SUPPLY SYSTEM

DCP PLATE

DESCRIPTION OF CHANGE

NUCLEAR SYSTEMS OPERATION

INSTRUMENT NO.	QTY	DESCRIPTION	SIZE RANGE OR RATING	MANUFACTURER PRODUCT NO.	BULLETIN
ROA-SPV-11 ROA-SPV-12 REA-SPV-15 ROA-SPV-10 ROA-SPV-13 ROA-SPV-14 ROA-SPV-15 ROA-SPV-17	8	3-Way General Purpose Solenoid Valves	120 VAC	ASCO NP8320A172E	NP8320
CEP-SPV-11 CEP-SPV-11	2	3-Way General Purpose Solenoid Valves	120 VAC	ASCO NP831664V	8316
RRA-TIS-4 ROA-TIS-51	2	Two-Stage Heating Thermostat	120 VAC 40-90°F	Penn T25A-1	T25
RRA-TIS-3 RRA-TIS-16	2	Cooling Room Thermostat	120 VAC 40-90°F	Penn T26S	T26
ROA-TIS-15 REA-TIS-3A1 REA-TIS-2B1	3	Duct Insertion Type T-Stat Two Stage	120 VAC 0-250°F	U.E. Type 802-6BS	800
ROA-TE-1 ROA-TE-2	2	Type "T" Thermocouple Dual Elements, Stainless	As Noted	Weed Instr. T-4A-250-U-12A	Weed
RRA-PI-7-1 RRA-PI-7-2	6	4½" Every Angle, Pressure Gauge. S.S. Tube ½" NPT	0-160psi	Ashcroft 1279	1200 P.4-6 12 . 1

SUPERSEDES PREVIOUSLY APPROVED DCP Page: 85 - 0022 - 00 - 068

Revises: AE Drawing ☑ CVI Document ☐ Spec / Criteria ☐

DCP Page: 86 - 0156 - 0A - 007

Drawing / Document No.: E538-30VH-11 Zone: — Revision: NI

Prepared by: [signature] April 25, 1986 Checked by: [signature]

Scale: NONE

Drawing or Document Title: EQUIPMENT LIST

5 SUPPLY SYSTEM	DCP PLATE ...

3 DESCRIPTION OF CHANGE

00-3617

ASCO MODEL 8X8320A-1
FOR FOLLOWING
INSTRUMENTS

1.	ROA-SPV-1A	13	ROA-SPV-3
2.	ROA-SPV-4	14	ROA-SPV-21
3.	ROA-SPV-22	15	REA-SPV-1B
4.	ROA-SPV-23	16	REA-SPV-2B
5.	ROA-SPV-31	17	REA-SPV-3B
6	REA-SPV-1A	18	CSP-SPV-11
7	REA-SPV-2A	19	REA-SPV-15
8	REA-SPV-3A	20	~~ROA-SPV-16~~
9	CEP-SPV-11	21	~~ROA-SPV-13~~
10	CEP-SPV-12	22	~~ROA-SPV-15~~
11.	ROA-SPV-1B	23	~~REA-SPV-14~~
12	ROA-SPV-2	24	~~REA-SPV-17~~

DELETE

H — CLASS H COIL.
B - BRASS BODY
X - STAINLESS STEEL DISC HOLDER (SPECIAL)

8320A-1 — MODEL NO.

2. SUPERSEDES PREVIOUSLY APPROVED DCP Page:		1. DCP Page: 86-0156-0A-005
Revises	AE Drawing	CVI Document: ☑ Spec / Criteria
Drawing / Document No.: 216-05,339	Zone:	Revision:
3. PREPARED BY: Thomas P. [illegible] APRIL 23, 1986	4. CHECKED BY: [illegible]	5. SCALE: NONE
6. DRAWING OR DOCUMENT TITLE: ASCO VALVE CAT. CUT		

568-15556 (6-84)

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

BILL OF MATERIALS

DCP PAGE NO. 86-0156-0A-009

ITEM NO.	NO. REQ'D	DESCRIPTION	QUAL CLASS	MATCODE NO.	~~ENGINEERING SPEC NO.~~ REFERENCE
1	7EA	NUCLEAL QUALIFIED SOLENOIDS VALVES ASCO MODEL NO. NP8320A172E	1	E4501580	P.O.# 071950
2	14	8-32 x 3/8" HEX SOCKET HEAD CAP SCREWS	1	STORE STOCK	—
3	AS REQ	1/8" CARBON STEEL PLATE (A-36)	1	STORE STOCK	—
4	AS REQ	SWAGLOK BRASS COMPRESSION FITTINGS 3/8" TUBE TO 1/4" NPT MALE B-600-1-4	1	52601794	—
5		UNION 3/8" TO 3/8" B-600-6	1	52022291	—
6		1/8" TUBE TO 1/4" NPT MALE B-400-1-4	1	52601766	—
7		UNION 1/4" TO 1/4" B-400-6	1	52602284	—
8	AS REQ	OTHERS	1	STORE STOCK	—

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

MEL INPUT DATA SHEET EI 2.35

DCP PAGE NO. 86-0156-0A-010

SUPERSEDES PREVIOUSLY APPROVED DCP PAGE:

CHECK ONE:

- [ ] Add a new EPN and Information to MEL
- [x] Modify existing EPN Information on MEL
- [ ] Delete existing EPN from MEL (equipment no longer exists in the plant)
- [ ] Blank-out CIE/SRM fields (equipment no longer safety-related, but still exists) Note: Place a "#" symbol or a O in Field No. 30: See EI 2.35 Instructions for Field No. 30
- [ ] Tag Change Only: Enter former EPN here 2-: Enter new EPN in Field # 1

GENERAL INSTRUCTIONS

1. Place a # symbol in any field that is not applicable
2. Place a * symbol in any field for which data is to be deleted
3. Leave field blank if data is to be entered, but is currently unavailable
4. Complete the numbered fields below per EI 2.35
5. Show numeric zero as Ø, and alphabetic "oh" as O, to avoid confusing the computer.
6. Left-hand justify all entries.

GENERAL MEL INPUT DATA

1. EPN 2-ROA-SPV-1O 2. NSSS 3. SYS
4. DESC
5. MFG 6. MODEL NP8320A112E
7. S/N 8. LOC. DETAIL
9. REF DWG/ZONE / 10. BLDG 11. ELEV/ZONE /
12. CVI X 13. PWR/OUT 14. VEND 15. QC
16. CONT/EXP. 17. CONN/ASM 18. IEEE 19. CODE
20. ELEM 21. SEIS 22. CLEAN
23. FP1 24. EQUIP DESCR. 25. PSTOT
26. FP2 27. CEPN 2-
28. PS1 2- 29. PS2 2-

EQ/CIE/SRM FIELDS ONLY

30. FLAG (C,S,#,OR O) 31. CONTRACT SS 32. LEVEL 33. EQUIP CLASS 34. USE
35. HOURS 36. SAFETY FUNCTION 37. ACCURACY 38. RM
SEISMIC QUAL: 39. HYDRO LOADS 40. TEST 41. ANALYSIS
42. QUALIFICATION STATUS - SEISMIC ENV 43. TM 44. FREQ 45. QID

PREPARED BY	DATE	CHECKED BY	DATE
[signature]	APRIL 28, 1986	[signature]	4/30/86

968 18118 03 (4/86)

SUPPLY SYSTEM

MEL INPUT DATA SHEET EI 2.35

DCP PAGE NO. 86-0156-01-011

SUPERSEDES PREVIOUSLY APPROVED DCP PAGE:

CHECK ONE:

[ ] Add a new EPN and Information to MEL

[X] Modify existing EPN Information on MEL

[ ] Delete existing EPN from MEL (equipment no longer exists in the plant)

[ ] Blank-out C1E/SRM fields (equipment no longer safety-related, but still exists) Note: Place a "#" symbol or a Q in Field No. 30: See EI 2.35 Instructions for Field No. 30

[ ] Tag Change Only: Enter former EPN here 2-: Enter new EPN in Field # 1

GENERAL INSTRUCTIONS

1. Place a # symbol in any field that is not applicable
2. Place a * symbol in any field for which data is to be deleted
3. Leave field blank if data is to be entered, but is currently unavailable
4. Complete the numbered fields below per EI 2.35
5. Show numeric zero as Ø, and alphabetic "oh" as O, to avoid confusing the computer.
6. Left-hand justify all entries.

GENERAL MEL INPUT DATA

1. EPN 2-RQA-SPV-11 2. NSSS 3. SYS
4. DESC
5. MFG 6. MODEL NP83Z0A17ZE
7. S/N 8. LOC. DETAIL
9. REF DWG/ZONE / 10. BLDG 11. ELEV/ZONE /
12. CVI * 13. PWR/OUT 14. VEND 15. QC
16. CONT/EXP 17. CONN/ASM 18. IEEE 19. CODE
20. ELEM 21. SEIS 22. CLEAN
23. FP1 24. EQUIP DESCR. 25. PSTOT
26. FP2 27. CEPN 2-
28. PS1 2- 29. PS2 2-

EQ/C1E/SRM FIELDS ONLY

30. FLAG (C,S,#,OR Q) 31. CONTRACT SS 32. LEVEL 33. EQUIP CLASS 34. USE
35. HOURS 36. SAFETY FUNCTION 37. ACCURACY 38. RM
SEISMIC QUAL: 39. HYDRO LOADS 40. TEST 41. ANALYSIS
42. QUALIFICATION STATUS - SEISMIC ENV 43. TM 44. FREQ 45. QID

PREPARED BY Thomas C. [signature] DATE APRIL 28, 1986 CHECKED BY [signature] DATE 4/30/86

SUPPLY SYSTEM

MEL INPUT DATA SHEET EI 2.35

DCP PAGE NO. 86-0156-0A-012

SUPERSEDES PREVIOUSLY APPROVED DCP PAGE:

CHECK ONE:

- [ ] Add a new EPN and information to MEL
- [X] Modify existing EPN information on MEL
- [ ] Delete existing EPN from MEL (equipment no longer exists in the plant)
- [ ] Blank-out C1E/SRM fields (equipment no longer safety-related, but still exists) Note: Place a "#" symbol or a 0 in Field No. 30: See EI 2.35 instructions for Field No. 30
- [ ] Tag Change Only: Enter former EPN here [2]-[ ]: Enter new EPN in Field # 1

GENERAL INSTRUCTIONS

1. Place a # symbol in any field that is not applicable
2. Place a * symbol in any field for which data is to be deleted
3. Leave field blank if data is to be entered, but is currently unavailable
4. Complete the numbered fields below per EI 2.35
5. Show numeric zero as ∅, and alphabetic "oh" as O, to avoid confusing the computer.
6. Left-hand justify all entries.

GENERAL MEL INPUT DATA

1. EPN [2]-[R][O][A]-[S][P][V]-[1][2] 2. NSSS [ ] 3. SYS [ ]
4. DESC [ ]
5. MFG [ ] 6. MODEL [N][P][B][3][2][0][A][1][7][2][E]
7. S/N [ ] 8. LOC. DETAIL [ ]
9. REF DWG/ZONE [/] 10. BLDG [ ] 11. ELEV/ZONE [/]
12. CVI [X] 13. PWR/OUT [ ] 14. VEND [ ] 15. QC [ ]
16. CONT/EXP [ ] 17. CONN/ASM [ ] 18. IEEE [ ] 19. CODE [ ]
20. ELEM [ ] 21. SEIS [ ] 22. CLEAN [ ]
23. FP1 [ ] 24. EQUIP DESCR. [ ] 25. PSTOT [ ]
26. FP2 [ ] 27. CEPN [2]-[ ]
28. PS1 [2]-[ ] 29. PS2 [2]-[ ]

EQ/C1E/SRM FIELDS ONLY

30. FLAG (C,S,#,OR 0) [ ] 31. CONTRACT [S][S][ ] 32. LEVEL [ ] 33. EQUIP CLASS [ ] 34. USE [ ] [ ]
35. HOURS [ ] 36. SAFETY FUNCTION [ ] 37. ACCURACY [ ] 38. RM [ ]
SEISMIC QUAL; 39. HYDRO LOADS [ ] 40. TEST [ ] [ ] [ ] 41. ANALYSIS [ ]
42. QUALIFICATION STATUS - SEISMIC [ ] ENV [ ] 43. TM [ ] 44. FREQ [ ] 45. QID [ ]

PREPARED BY	DATE	CHECKED BY	DATE
Thomas L. Miller	APRIL 28, 1986.	R.W. Van Ee	4/30/86

SUPPLY SYSTEM

MEL INPUT DATA SHEET EI 2.35

DCP PAGE NO. 86-0156-0A-013

SUPERSEDES PREVIOUSLY APPROVED DCP PAGE:

CHECK ONE:

[ ] Add a new EPN and information to MEL

[X] Modify existing EPN information on MEL

[ ] Delete existing EPN from MEL (equipment no longer exists in the plant)

[ ] Blank-out C1E/SIIM fields (equipment no longer safety-related, but still exists) Note: Place a "#" symbol or a O in Field No. 30: See EI 2.35 Instructions for Field No. 30

[ ] Tag Change Only: Enter former EPN here 2-: Enter new EPN in Field # 1

GENERAL INSTRUCTIONS

1. Place a # symbol in any field that is not applicable
2. Place a * symbol in any field for which data is to be deleted
3. Leave field blank if data is to be entered, but is currently unavailable
4. Complete the numbered fields below per EI 2.35
5. Show numeric zero as ∅, and alphabetic "oh" as O, to avoid confusing the computer.
6. Left hand justify all entries.

GENERAL MEL INPUT DATA

1. EPN 2-ROA-SPV-13
2. NSSS
3. SYS
4. DESC
5. MFG
6. MODEL NP8320A172E
7. S/N
8. LOC. DETAIL
9. REF DWG/ZONE /
10. BLDG
11. ELEV/ZONE /
12. CVI *
13. PWR/OUT
14. VEND
15. QC
16. CONT/EXP
17. CONN/ASM
18. IEEE
19. CODE
20. EI EM
21. SEIS
22. CLEAN
23. FP1
24. EQUIP DESCR.
25. PSTOT
26. FP2
27. CEPN 2-
28. PS1 2-
29. PS2 2-

EQ/C1E/SIIM FIELDS ONLY

30. FLAG (C,S,#,OR O)
31. CONTRACT SS
32. LEVEL
33. EQUIP CLASS
34. USE
35. HOURS
36. SAFETY FUNCTION
37. ACCURACY
38. RM

SEISMIC QUAL: 39. HYDRO LOADS
40. TEST
41. ANALYSIS
42. QUALIFICATION STATUS - SEISMIC
ENV
43. TM
44. FREQ
45. QID

PREPARED BY	DATE	CHECKED BY	DATE
Thomas C Miles	APRIL 28, 1986	[signature]	4/30/86

SUPPLY SYSTEM

MEL INPUT DATA SHEET EI 2.35

DCP PAGE NO. 86-0156-0A-014

SUPERSEDES PREVIOUSLY APPROVED DCP PAGE:

CHECK ONE:

- [ ] Add a new EPN and Information to MEL
- [x] Modify existing EPN information on MEL
- [ ] Delete existing EPN from MEL (equipment no longer exists in the plant)
- [ ] Blank-out C1E/SRM fields (equipment no longer safety-related, but still exists) Note: Place a "#" symbol or a O in Field No. 30: See EI 2.35 Instructions for Field No. 30
- [ ] Tag Change Only: Enter former EPN here 2- : Enter new EPN in Field # 1

GENERAL INSTRUCTIONS

1. Place a # symbol in any field that is not applicable
2. Place a * symbol in any field for which data is to be deleted
3. Leave field blank if data is to be entered, but is currently unavailable
4. Complete the numbered fields below per EI 2.35
5. Show numeric zero as Ø, and alphabetic "oh" as O, to avoid confusing the computer.
6. Left-hand justify all entries.

GENERAL MEL INPUT DATA

1. EPN 2-RCA-SPV-1A 2. NSSS 3. SYS
4. DESC
5. MFG 6. MODEL NP8320A17E
7. S/N 8. LOC. DETAIL
9. REF DWG/ZONE / 10. BLDG 11. ELEV/ZONE /
12. CVI X 13. PWR/OUT 14. VEND 15. QC
16. CONT/EXP 17. CONN/ASM 18. IEEE 19. CODE
20. ELEM 21. SEIS 22. CLEAN
23. FP1 24. EQUIP DESCR. 25. PSTOT
26. FP2 27. CEPN 2-
28. PS1 2- 29. PS2 2-

EQ/C1E/SRM FIELDS ONLY

30. FLAG (C,S,#,OR O) 31. CONTRACT SS 32. LEVEL 33. EQUIP CLASS 34. USE
35. HOURS 36. SAFETY FUNCTION 37. ACCURACY 38. RM
SEISMIC QUAL: 39. HYDRO LOADS 40. TEST 41. ANALYSIS
42. QUALIFICATION STATUS - SEISMIC ENV 43. TM 44. FREQ 45. QID

PREPARED BY Thomas L. [signature] DATE APRIL 28, 1986 CHECKED BY R. Van Eren [signature] DATE 4/30/86

SUPPLY SYSTEM

MEL INPUT DATA SHEET EI 2.35

DCP PAGE NO. 86-0156-01-015

SUPERSEDES PREVIOUSLY APPROVED DCP PAGE:

CHECK ONE:

- [ ] Add a new EPN and Information to MEL
- [X] Modify existing EPN information on MEL
- [ ] Delete existing EPN from MEL (equipment no longer exists in the plant)
- [ ] Blank-out C1E/SRM fields (equipment no longer safety-related, but still exists) Note: Place a "#" symbol or a Q in Field No. 30: See EI 2.35 instructions for Field No. 30
- [ ] Tag Change Only: Enter former EPN here 2- : Enter new EPN in Field # 1

GENERAL INSTRUCTIONS

1. Place a # symbol in any field that is not applicable
2. Place a * symbol in any field for which data is to be deleted
3. Leave field blank if data is to be entered, but is currently unavailable
4. Complete the numbered fields below per EI 2.35
5. Show numeric zero as Ø, and alphabetic "oh" as O, to avoid confusing the computer.
6. Left-hand justify all entries.

GENERAL MEL INPUT DATA

1. EPN 2-RDA-SPV-15 2. NSSS 3. SYS
4. DESC
5. MFG 6. MODEL NP8320A172E
7. S/N 8. LOC. DETAIL
9. REF DWG/ZONE / 10. BLDG 11. ELEV/ZONE /
12. CVI X 13. PWR/OUT 14. VEND 15. QC
16. CONT/EXP 17. CONN/ASM 18. IEEE 19. CODE
20. ELEM 21. SEIS 22. CLEAN
23. FP1 24. EQUIP DESCR. 25. PSTOT
26. FP2 27. CEPN 2-
28. PS1 2- 29. PS2 2-

EQ/C1E/SRM FIELDS ONLY

30. FLAG (C,S,#,OR Q) 31. CONTRACT SS 32. LEVEL 33. EQUIP CLASS 34. USE
35. HOURS 36. SAFETY FUNCTION 37. ACCURACY 38. RM
SEISMIC QUAL: 39. HYDRO LOADS 40. TEST 41. ANALYSIS
42. QUALIFICATION STATUS - SEISMIC ENV 43. TM 44. FREQ 45. QID

PREPARED BY Thomas L. Mil... DATE APRIL 28, 1986 CHECKED BY R. Allen ... DATE 4/28/86

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

MEL INPUT DATA SHEET EI 2.35

DCP PAGE NO. 86-0156-0A-016

SUPERSEDES PREVIOUSLY APPROVED DCP PAGE:

CHECK ONE:

- [ ] Add a new EPN and information to MEL
- [X] Modify existing EPN information on MEL
- [ ] Delete existing EPN from MEL (equipment no longer exists in the plant)
- [ ] Blank-out C1E/SRM fields (equipment no longer safety-related, but still exists) Note: Place a "#" symbol or a Q in Field No. 30: See EI 2.35 instructions for Field No. 30
- [ ] Tag Change Only: Enter former EPN here 2-: Enter new EPN in Field # 1

GENERAL INSTRUCTIONS

1. Place a # symbol in any field that is not applicable
2. Place a * symbol in any field for which data is to be deleted
3. Leave field blank if data is to be entered, but is currently unavailable
4. Complete the numbered fields below per EI 2.35
5. Show numeric zero as ∅, and alphabetic "oh" as O, to avoid confusing the computer.
6. Left-hand justify all entries.

GENERAL MEL INPUT DATA

1. EPN 2-KOA-SPV-117 2. NSSS 3. SYS
4. DESC
5. MFG 6. MODEL NP83Z0A1T2E
7. S/N 8. LOC. DETAIL
9. REF DWG/ZONE / 10. BLDG 11. ELEV/ZONE /
12. CVI X 13. PWR/OUT 14. VEND 15. QC
16. CONT/EXP 17. CONN/ASM 18. IEEE 19. CODE
20. ELEM 21. SEIS 22. CLEAN
23. FP1 24. EQUIP DESCR. 25. FSTOT
26. FP2 27. CEPN 2-
28. PS1 2- 29. PS2 2-

EQ/C1E/SRM FIELDS ONLY

30. FLAG (C,S,#,OR Q) 31. CONTRACT SS 32. LEVEL 33. EQUIP CLASS 34. USE
35. HOURS 36. SAFETY FUNCTION 37. ACCURACY 38. RM
SEISMIC QUAL: 39. HYDRO LOADS 40. TEST 41. ANALYSIS
42. QUALIFICATION STATUS - SEISMIC ENV 43. TM 44. FREQ 45. QID

PREPARED BY	DATE	CHECKED BY	DATE
Thomas L. Mh	APRIL 28, 1986.	R.T. Van Sun	4/30/86

INSTALLATION AND TEST REQUIREMENTS

DCP Page 86-0156-0A-017

Prepared by T. L. MILES APRIL 29, 1986
Date

PMR 2-86-0156-0 : Modification Title SOLENOID VALVE REPLACEMENT

INSTALLATION REQUIREMENTS

- The following design specifications must be adhered to during field work associated with this DCP. (REF: SPECIFICATIONS 2808-218 AND-220)

REFER TO PPM'S LISTED BELOW.

- Inspections are recommended to check the following important parameters.

Inspection	Parameter To Be Checked
PERFORM VISUAL INSPECTION TO VERIFY NO OBVIOUS DEFECTS AND CORRECT INSTALLATION	

CONSTRUCTION TESTS

The following construction tests should be performed to confirm construction completion.

PERFORM WIRING CONTINUITY CHECKS AND OPERATIONAL FUNCTIONAL TEST AFTER REPLACEMENT.

PPM'S
10.2.40 — INSTALLATION/MODIFICATION OF INSTR. & PROCESS TUBING.
10.24.12 — INSTR. TUBING & FITTING USAGE INSTRUCTION.
10.25.19 — TERMINATION AND SPLICING INSTRUCTION.
10.2.10 — FASTENER TORQUE AND TENSIONING.

DESIGN BACKUP AND REVIEW APPENDIX

DCP No. 02- 86 - 0156 - 0

This appendix contains the design backup and review documentation accumulated during development of this DCP. The contents of this Appendix are:

Design Verification Record - 7 pages 019 — 025

Calculation Cover Sheets - __ pages

Special Design Review Records as follows:

- o __ pages
- o __ pages
- o __ pages

EI 2.5
Rev. 3

DCP Page 86-0156-0A-019

DESIGN VERIFICATION RECORD

Prepared by T.L.MILES APRIL 29,1986 ; _____ ; _____

Verifier Name B.J. VAN EREM : Initial BJVE ; Date 4/30/86

Verifier Name _____ : Initial _____ ; Date _____

Verifier Name _____ : Initial _____ ; Date _____

PMR 2-86-0156-0 ; Modification Title SOLENOID VALVE REPLACEMENT

Design verification was determined to be necessary and was performed as follows:

1. ALTERNATIVE CALCULATIONS: yes (no) (circle one)
   - o Calculation No. _____, Revision _____

2. TESTING: yes (no) (circle one)
   - o Specification No. _____ Revision _____
     Title _____ Date _____

3. DESIGN REVIEW
   - o Formal Design Review per EI 2.7: yes (no) (circle one)
     (Report No. _____; Date _____;
     Chairman _____)
   - (o) Design Review Checklist as follows:

No.	Question	Preparer: Mark One Yes	No	Not Applicable	Verified By (Initial)
1.	Were the following inputs correctly selected and incorporated into the design?				
	o Basic functions of each structure, system and component.	✓			BJVE
	o Performance requirements: (capacity, rating, system output...)	✓			BJVE
	o Design conditions: (pressure, temperature, fluid chemistry, voltage....)	✓			BJVE

DCP Page 8-0156-0A-020

Preparer: Mark One

No.	Question	Yes	No	Not Applicable	Verified By (Initial)
	o External loads: (seismic, wind, thermal, dynamic....)	✓			BDE
	o Environmental conditions anticipated during storage, construction and operation: (pressure, temperature, humidity, corrosiveness, site elevation, wind direction, radiation, duration of exposure....)	✓			BDE
	o Requirements imposed on the design by functional and physical interfaces with structures, systems and components.	✓			BDE
	o Material requirements: (compatibility, electrical insulation properties, protective coating, corrosion resistance. Suitability for application and environment....)	✓			BDE
	o Mechanical requirements: (vibration, stress, shock, reaction forces....)	✓			BDE
	o Structural requirements: (equipment foundations, pipe supports....)	✓			BDE
	o Hydraulic requirements: NPSH, allowable pressure drops, allowable fluid velocities....)	✓			BDE
	o Chemistry requirements: (provisions for sampling, limitations on water chemistry....)			✓	BDE

EI 2.5
Rev. 3

DCP Page 86-0156-0A-021

Preparer: Mark One

No.	Question	Yes	No	Not Applicable	Verified By (Initial)
	o Electrical requirements: (source of power, fuse list, voltage, raceway requirements, electrical insulation, motor requirements, grounding, maintainability, separationfor safe shutdown....)	✓			BVE
	o Layout and arrangement requirements: (access clearances, instrument location, thermal expansion, seismic 2/1....)	✓			BVE
	o Operational requirements under various conditions: (plant startup, normal plant operation, plant shutdown, plant emergency operation, special or infrequent operation, and system abnormal or emergency operation....)	✓			BVE
	o Industrial safety/fire protection requirements: (Appendix R considerations, fire extinguishment, inert gas hazards, use of combustible materials, ventilation or venting path changes, fire protection systems....)			✓	BVE
	o Instrumentation and control requirements: (including instruments, controls and alarms required for operation/testing,/maintenance, setpoints, ranges, type of instrument, installed spares, location of control indication....)	✓			BVE

DCP Page 86-0156-0A-022

Preparer: Mark One

No.	Question	Yes	No	Not Applicable	Verified By (Initial)
	o Failure effects and prevention for structures, systems and components: (failsafe design, redundancy, diversity ....)	✓			BJNC
	o Maintainability requirements under normal and off-normal conditions.	✓			BJNC
	o Personnel requirements and limitations: (physical, ALARA, human factors....)			✓	BJNC
	o Transportability requirements: (size, shipping weight, I.C.C. regulations, other handling/ storage/shipping considerations....)	✓			BJNC
	o Cleanliness requirements.	✓			BJNC
	o Suitability of parts and equipment for the application: (environmental qualification, seismic qualification, size, weight, operating range, availability....)	✓			BJNC
2.	Are assumptions necessary to perform the design adequately described and reasonable?	✓			BJNC
3.	Was an appropriate design method used? Is the output reasonable compared to inputs?	✓			BJNC
4.	Are the correct quality category and quality assurance requirements specified?	✓			BJNC

EI 2.5
Rev. 3

DCP Page 86 - 0156 - 0A - 023

Preparer: Mark One

No.	Question	Yes	No	Not Applicable	Verified By (Initial)
5.	Are the applicable codes, standards and regulatory requirements (including issue and addenda) properly identified and are their requirements for design met?	✓			[illegible]
6.	Have construction and operating experience been factored into the design?	✓			[illegible]
7.	Have inspection and maintenance requirements been satisfied?	✓			[illegible]
8.	Are accessibility and other design provisions adequate for performance of maintenance, ISI and calibration?	✓			[illegible]
9.	Have the QC inspection criteria been incorporated in the DCP to allow verification that design requirements have been satisfactory accomplished?	✓			[illegible]
10.	Have adequate test requirements been appropriately specified in the DCP?	✓			[illegible]

DCP Page 86 -0158 -0A -024

Preparer: Mark One

No.	Question	Yes	No	Not Applicable	Verified By (Initial)
11.	Does this DCP affect items designed/ constructed of items covered by ASME rules?				
	o Items covered by Subsection NB, NC, ND, or NE?	___	___	✓	[illegible]
	o Items covered by Subsection NF?	___	___	✓	[illegible]
	o Items covered by Section VIII?	___	___	✓	[illegible]
	o If the ASME CDS is affected, has a DCP plate been included in the package identifying the change?	___	___	✓	[illegible]
	o Has a Professional Engineer Certification Form been completed and included in the DCP for all changes being made to the CDS?	___	___	✓	[illegible]
	o Has the certified stress report been updated for ASME III-1 changes?	___	___	✓	[illegible]
	o Have design calculations for other ASME III work been updated?	___	___	✓	[illegible]
	o If the overpressure protection report affected by this change?	___	___	✓	[illegible]
	o Does the DCP include required changes to the ASME III-1 over-pressure protection report?	___	___	✓	[illegible]
	o Has an evaluation been made as to the impact of the change on overpressure on ASME-III-2 and ASME III-3 systems?	___	___	✓	[illegible]

If any of the Item 11 questions are marked "Yes", the DCP must be routed for ASME review per EI 2.40

EI 2.3
Rev. 3

DCP Page 86-0156-01-025

Preparer: Mark One

No.	Question	Yes	No	Not Applicable	Verified By (Initial)
12.	Does the design impose requirements on interfacing systems, structures, or components which must be accomodated by a design change or a reanalysis? If so, the required design change or reanalysis must be included in this DCP.		✓		RJVS
13.	Was a physical inspection included in the plant?		✓		RJVS
14.	Does this DCP affect any of the four Safe Shutdown analysis (fire protection, electrical separation, pipe break/missile or control system failure)? If so, an updated analysis must be performed. (See EI 2.40)		✓		RJVS
15.	Have normal and off-normal operational requirements (including personnel limitations) been considered?	✓	N/A		RJVS
16.	Does this DCP result in a change to the design intent for modes or methods of operation?		✓		RJVS
17.	Has some or all of the DCP been discussed with knowledgeable plant staff personnel?	✓			RJVS
18.	Did the original design include reportable defects as defined in 10 CFR 21?		✓		RJVS

Priority 1

WNP-2

GENERATION ENGINEERING

TO Document Control

FROM Engineering

TRANSMITTAL NO. 3757

DATE 5-1-86

DOCUMENT BEING TRANSMITTED 86-0156-0A

Responds To:	Reference Doc.:	Advance Info For:
PMR 86-0156		

DOCUMENT RECEIPT ACKNOWLEDGEMENT _____ Signature _____ Date

WNP-2 Document Control is requested to make the following distribution of the issued Design Change Package (DCP)

L. Barndt	(1)	-	1020 (EDF)
D. Densley	(2)	-	981D
C. Hexum	(1)	-	994E
J. Weil	(2)	-	988U
KA Willoughby	(1)	-	964N
Design/Drafting	(1)	-	965 (UE/C)

_____

_____

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