JERSEY CENTRAL POWER & LIGHT COMPANY
OYSTER CREEK NUCLEAR GENERATING STATION

PROVISIONAL OPERATING
LICENSE NO. DPR-16

Technical Specification
Change Request No. 98
Docket No. 50-219

Applicant submits, by this Technical Specification Change Request No. 98 to the Oyster Creek Nuclear Generating Station Technical Specifications, a change to Specifications Sections 2.2, and 2.3.

By: Philip R. Clark
Philip R. Clark
Vice President - Nuclear
Jersey Central Power & Light Co.
Executive Vice President -
GPU Nuclear

Sworn and subscribed to before me this 27th day of August, 1981.

Phyllis A. Kasis

PHYLLIS A. KASIS
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Aug. 16, 1984

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF	)	
	)	DOCKET NUMBER 50-219
JERSEY CENTRAL POWER & LIGHT COMPANY	)	

CERTIFICATE OF SERVICE

This is to certify that a copy of Technical Specification Change Request No. 98 for the Oyster Creek Nuclear Generating Station Technical Specifications, filed with the U. S. Nuclear Regulatory Commission on August 27,1981, has this 27 day of August, 1981 , been served on the Mayor of Lacey Township, Ocean County, New Jersey by deposit in the United States mail addressed as follows:

The Honorable Jorge A. Rod
Mayor of Lacey Township
818 West Lacey Road
Forked River, N. J. 08731

BY Philip R. Clark

Philip R. Clark
Vice President - Nuclear
Jersey Central Power & Light Co.
Executive Vice President -
GPU Nuclear

DATED: August 27, 1981

JCP&L / GPU

Jersey Central Power & Light Company
Madison Avenue at Punch Bowl Road
Morristown, New Jersey 07960
(201) 455-8200

August 27, 1981

The Honorable Jorge A. Rod
Mayor of Lacey Township
818 West Lacey Road
Forked River, N. J. 08731

Dear Mayor Rod:

Enclosed herewith is one copy of Technical Specification Change Request No. 98 for the Oyster Creek Nuclear Generating Station Technical Specifications.

These documents were filed with the U. S. Nuclear Regulatory Commission on August 27, 1981.

Very truly yours,

Philip R. Clark

Philip R. Clark
Vice President - Nuclear
Jersey Central Power & Light Co.
Executive Vice President -
GPU Nuclear

/mt
Enclosures

Jersey Central Power & Light Company
Oyster Creek Nuclear Generating Station
(Docket No. 50-219)
Provisional Operating License DPR-16

1. Section to be changed:

   a. Section 2.2 bases
   b. Section 2.3
   c. Section 2.3 bases

2. Extent of changes:

   a. Section 2.2 remove reference and results of a superceded analysis and eliminate the 25 psi margin to safety valves set point requirement for the turbine trip without bypass transient.

   b. Section 2.3 Specification for reactor high pressure relief valve initiation is changed from less than or equal to 1070 psig to 2 valves less than or equal to 1070 psig and 3 valves less than or equal to 1090 psig.

   c. Section 2.3 eliminated reference to peak pressure for turbine trip with failure of bypass to 1188 psig (25 psig margin to safety valves).

3. Change requested:

   The requested change is on the attached revised Tecnnical Specification pages 2.2-1, 2.3-2 and 2.3-5.

4. Discussion:

   See attached report "Safety Evaluation for the Increase in the Oyster Creek Relief Valve Set Points", dated May 14, 1980.

SAFETY EVALUATION FOR THE

INCREASE IN THE OYSTER CREEK

RELIEF VALVE SET POINTS

PREPARED BY

R. R. FURIA

APPROVED: Robert B. Lee
R. B. Lee
Superviser Oyster Creek Fuels

APPROVED: G.R. Bond
G. R. Bond
Manager Nuclear Fuels

APPROVED: [signature]
R. W. Keaten
Director Systems Engineering

May 14, 1980

INTRODUCTION

The current Oyster Creek Technical Specifications require relief valves set points to lift at pressure less than or equal to 1085 psia. This value would provide a 50 psi separation between the set points and the normal operating pressure of 1035 psia.

A previous study, which was sent to the NRC in reference 1, was conducted to evaluate the structural response of the suppression chamber (torus) to the vent clearing effects during ERV discharge transients. One of the recommendations from this study, which was implemented to mitigate the initial lift of the electromagnetic relief valves (ERV's) into a cold pipe, was the lowering of the set point of one ERV in each of the two discharge lines to 1065 psia. This limited the number of initial lifts into a common discharge header to one, clearing the non-condensible gases from the pipe at a slower rate which reduces stresses. The remaining ERV's in each header would discharge into a pipe in which steam is flowing and would cause no abnormal stresses. Based upon the maximum pressurization rate of 100 psi per second which occurs during the Turbine Trip without Bypass transient, a 20 psi margin was required between the two ERV set points to insure a 0.2 second time difference in ERV lifts to clear noncondensibles from the discharge pipe during blowdown. The 20 psi reduction in the set points on two valves resulted in narrowing the margin to normal operating pressures from 50 to 30 psi.

A requirement from TMI-2 lessons learned (reference 2) was to investigate ways to reduce the number of challenges to relief valves. One of the methods suggested to accomplish this goal was increasing set points. GPU Nuclear performed an analysis to determine if the Oyster Creek ERV set points could be raised to provide margin similar to that which existed prior to lowering the set points on 2 valves. In addition, the 20 psi separation was maintained to reduce torus stresses.

An amendment to the Oyster Creek technical specification is required to change the set points from 5 relief valves at less than or equal to 1085 psia to two valves at less than or equal to 1085 psia and three valves at less than or equal to 1105 psia. Pressurization transients which result in relief valve actuation were reanalyzed with the higher set points and evaluated against design criteria specified in the technical specification. The results of these analyses support such a change to the technical specifications.

ANALYSIS OF PRESSURIZATION TRANSIENTS

Pressurization transients were analyzed for a full core of ENC 8X8 fuel using the ENC Plant Transient Analysis Code PTSBWR2 (reference 3). The transients were initiated from a full power level of 1930 MW. End-of-cycle kinetics parameters and a bounding scram curve were used in the analysis. Conservative multipliers of 1.25 on the void reactivity coefficient and 0.9 on the doppler reactivity were used, consistent with previous analyses (References 6, 7 and 8).

The criteria used for accepting the results of a pressurization transient are 1) a peak pressure of less than 1227 psia (minimum safety valve (SV) set point) for normal operational transients, and 110% of reactor coolant pressure boundary design pressure for the most severe abnormal operational transient with reactor scram (TTWOBP). 2) a change in critical power ratio (Δ CPR) of less than 0.15. The Δ CPR is to insure that the previously calculated minimum CPR for an Oyster Creek transient (Rod Withdrawal Error) is not penetrated.

The pressure criteria is a change from the current technical specification bases. The technical specification bases includes a 25 psi margin to SV's for the TTWOBP transient. Because the actuation of a SV is not a safety concern, the 25 psi margin requirement to SV set point is being eliminated in the technical specification change request. The justification for removal of the 25 psi limit is provided in reference 9.

A summary of the results is presented in Table 1, and description of the transients is provided below.

Turbine Trip

A turbine trip is the primary turbine protection mechanism and is initiated whenever various turbine or reactor system malfunctions threaten turbine operation. The turbine trip initiates closure of the turbine stop valves and opens the bypass valves. Upon initiation of the trip, pressure rises, opening the first two ERV's at 1.4 seconds. All 5 ERV's are open by 2.0 seconds and are closed by 6.0 seconds. A peak pressure of 1129.3 psia occurs at 2.0 seconds which is well below the SV set points. The transient response is shown in Figures 1a and 1b.

Turbine Trip Without Bypass

The relief-valve sizing transient (TTWOBP) demonstrates the adequacy of the relief valves in keeping pressure below the safety valves set points. The failure of the bypass valves to open following a turbine trip results in a rapid pressurization, opening the first two relief valves at 1.2

seconds and all five valves by 1.5 seconds. The valves are all closed at 10.5 seconds. A peak pressure of 1201 psia is reached at 3.6 seconds, 26 psi below the lowest safety valve lift set point. Pressure in the dome reaches 1204.9 psia and 1215.3 at the core midplane, which is below design limits. The isolation condenser is actuated at 1065 psia; this does not affect peak pressure, but assures that the system will not re-pressurize following closure of the relief valves. The transient response is shown in Figures 2a and 2b.

Main Steam Line Isolation Valve Closure

The transient resulting from a 3 second closure of the main steam line isolation valves is shown in Figures 3a and 3b. Two relief valves open at 3.7 seconds and all five are open by 4.0 seconds, remaining open to 14.9 seconds. A peak pressure of 1135.4 psia occurs at 4.5 seconds which is well below SV set points. The analysis shows that the relief valves would reopen at 18 seconds. Operation of the isolation condenser, for which no credit is taken in this analysis, would prevent subsequent lifts.

Loss of Electrical Load

The Loss-of-Electrical Load transient exhibits the same characteristics as the Turbine Trip transient. However, since the steam flow to the turbine is initially reduced by action of the throttle valve rather than sudden closure of the stop valve, the pressure and power transients are milder, and a detailed analysis of this transient was not performed.

Loss of Auxiliary Power

Loss of auxiliary power causes loss of condenser cooling water, trip of feedwater pumps, trip of recirculation pumps and turbine trip. It is assumed (4) that the bypass will remain open for about 1.5 seconds. The bypass valves trip shut when the main condenser vacuum reaches 10 inches Hg. Reactor operating experience has shown that vacuum does not drop below the 10 inch set point until after 1.5 seconds. This period of steam bypass significantly reduces the magnitude of the reactor power transient following the turbine valve closure, and the ensuing pressures transient is less severe than that obtained in the Turbine Trip Without Bypass Transient. Hence, this transient is not analyzed in detail.

Loss of Main Condenser Vacuum

The sudden loss of main condenser vacuum causes a simultaneous scram, turbine trip, and bypass valve closure. This transient is identical to the turbine trip without bypass transient which is discussed above.

RELIEF VALVE MODEL

The relief valve model in PTSBWR-2 represented the five valves combined as one valve with a single set point. The separation of the relief valve set points could not be analyzed without modifying the program. Therefore, the latest version of PTSBWR-2 (5), which includes an isolation condenser model, separates the relief valves into two groups containing two and three valves, respectively. The model change was made such that the two groups of valves with equal set points would provide identical results to the combined five-valve model. The group with two relief valves were assigned the lower set points to represent the one ERV in each header lifting first.

EFFECT OF MODEL CHANGE ON PREVIOUS ANALYSES

The relief valve model in PTSBWR2 is bypassed by the basic calculations until activated when pressure reaches the ERV set points. Thus the model change would not alter the results of transients other than those having ERV actuation. Those transients with ERV actuation were re-evaluated as part of the current analysis. Previous analyses are given in references 6, 7 and 8.

EFFECT OF ERV SET POINT INCREASE ON CYCLE 9 OPERATION

The limiting pressurization transient (turbine trip without bypass) was analyzed for the current cycle 9 operation. The end of cycle (EOC) 9 kinetics parameters were used with the conservative multipliers described earlier. The EOC 9 scram curve was used with a 0.8 multiplier. The peak pressure was calculated to be 1193.6 psia and a Δ CPR of 0.0251. These values are within the required safety margins and would not alter the conclusions reached in the cycle 9 safety evaluation (Reference 10).

EFFECT OF INCREASED ERV SET POINTS ON LOCA ANALYSIS

The limiting LOCA analysis (11) for Oyster Creek is a large break which does not result in ERV actuation. Therefore the results of that analysis will not change with increased ERV set points. The most limiting LOCA analysis which lifts ERV's is the 1.0 sq. ft. break size. The increased set points would have an increase in peak clad temperature of less than 3.0°F. This would not change the limiting LOCA size or PCT location nor result in exceeding the 2200°F limit for PCT.

EFFECT OF INCREASED ERV SET POINTS ON TORUS STRUCTURAL RESPONSE

An analysis was performed to evaluate the affect of the proposed set point change on the hydrodynamic load along the south and north header relief valve discharge pipes. The results showed that the maximum hydrodynamic load increased by 0.81% during the blowdown transient. This small increase in hydrodynamic load will have a negligible impact on the torus structure, and is much less than the original design with five valves at the same point.

CONCLUSIONS

The resetting of the ERV set points 20 psi higher increase the peak pressure of the limiting pressurization transient by 4.6 psi while increasing the margin between ERV set points and normal operating pressure to 50 psi. The increase in margin of 20 psi provides the margin that existed before the set points were lowered. This added margin will minimize the probability of inadvertent relief valve actuation.

Based on these considerations and others previously mentioned, it is concluded that the proposed amendment will not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a signficant decrease in a safety margin. Nor will it increase the possiblity for an accident or malfunction of a different type than any evaluated previously.

TABLE 1

RESULTS OF PTSBWR2 TRANSIENT ANALYSIS

TRANSIENT	2ERV's at 1085, 3 at 1105 psia PEAK PRESSURE (PSIA)	Δ CPR***	5 ERV's at 1085 psia PEAK PRESSURE	Δ CPR
Turbine Trip*	1129.3	0.0	1121.0	0.0
TTWOBP**	1201.0	0.0752	1196.4	0.068
MSLIVC*	1135.4	0.0	1134.8	0.0

*Limiting Pressure = 1227.0 PSIA (minimum safety valve setpoint)

**Limiting Pressure = 110% of reactor coolant pressure boundary design pressure

*** Limiting Δ CPR = 0.15

REFERENCES:

1. Letter to George Lear (NRC) from I. R. Finfrock (JCP&L), Report on Steam Vent Clearing Phenomenon, January 10, 1977.

2. NUREG-0737, "Clarification of TMI Action Plan Requirements" October 31, 1980.

3. XN-74-6 Revision, "Plant Transient Simulation Code for Boiling Water Reactors, January 1975.

4. Letter to NRC from JCP&L Co., dated May 8, 1975.

5. Letter to NRC from JCP&L Co., "Transient of May 2, 1979", May 19, 1979.

6. XN-74-41, Revision 2, "Plant Transient Analysis of the Oyster Creek BWR with Exxon Nuclear 7X7 UO_2 Fuel Assemblies, January 1975.

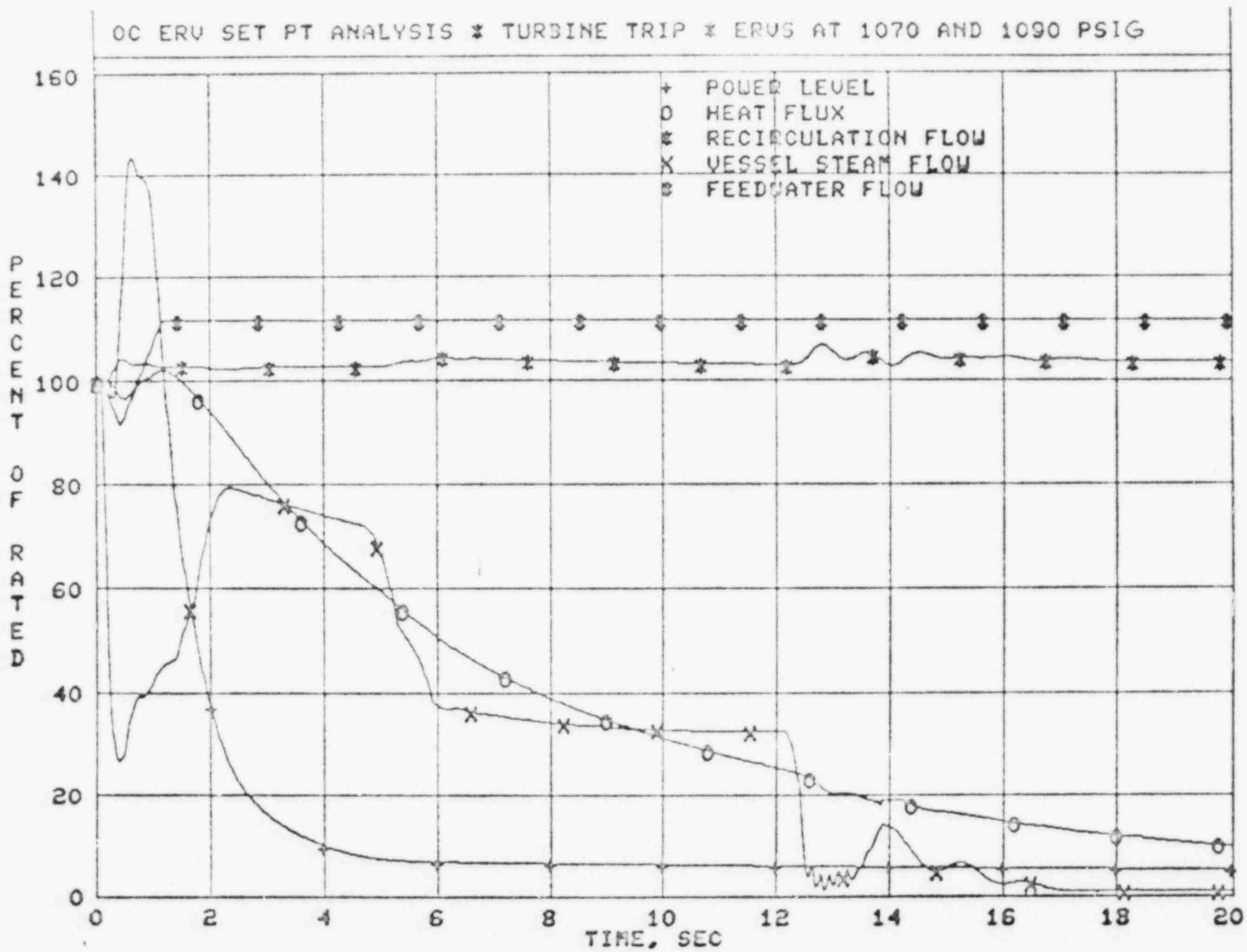
7. XN-74-43, Revision 2, "Plant Transient Analysis of the Oyster Creek BWR with Exxon Nuclear 8X8 UO_2 Fuel Assemblies, January 1975.

8. XN-75-51, "Additional Plant Transient Analyses of the Oyster Creek BWR with Exxon Nuclear Fuel Assemblies, September 1975.

9. Letter to NRC (O.D.Part) from GE (J. F. Quirk), "General Electric Licensing Topical Report NEDE-24011-P.A, 'Generic Reload Fuel Application,' Appendix D, Record Submittal" dated February 28, 1979.

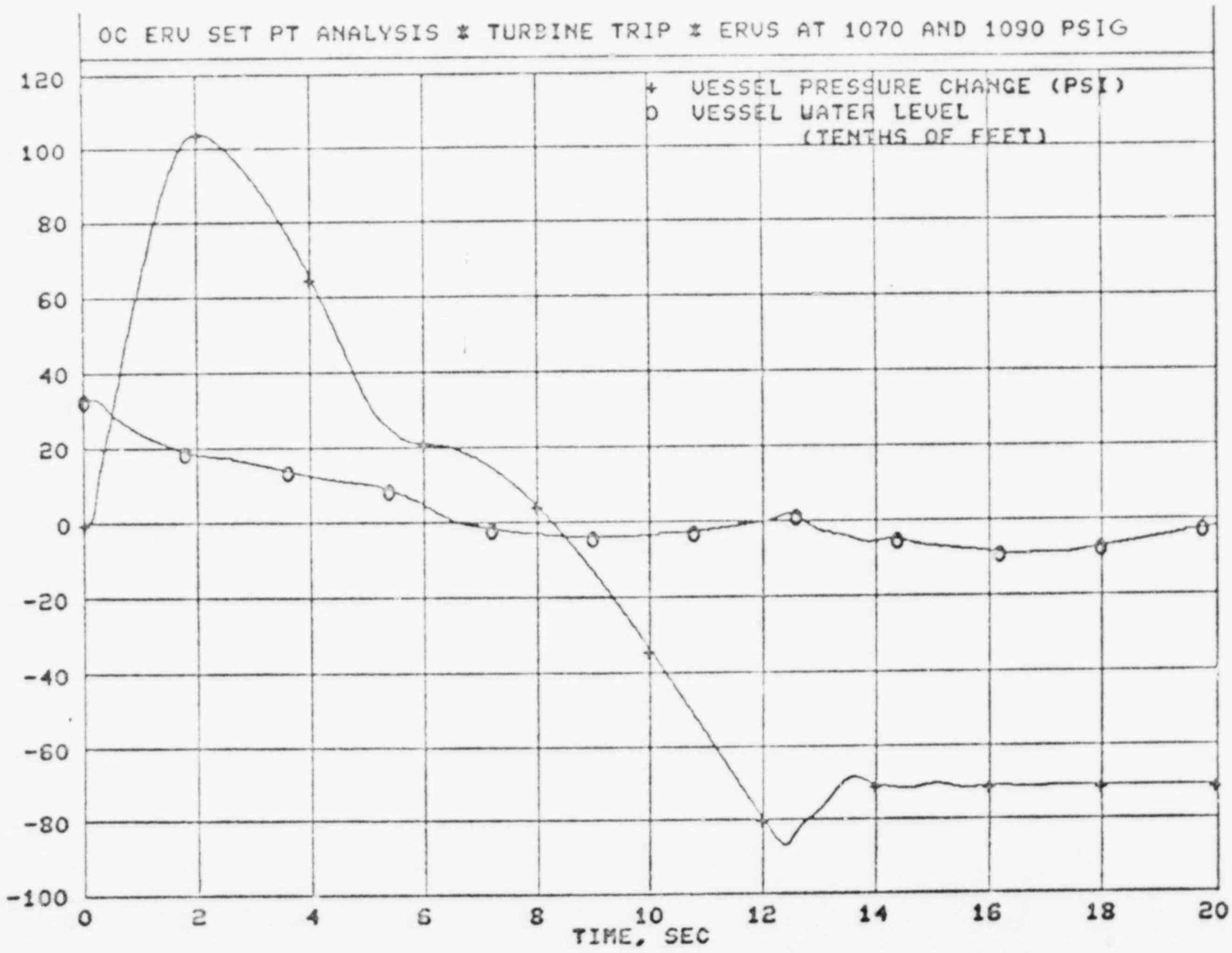
10. Reload Information and Safety Evaluation Report for Oyster Creek Cycle 9 Reload, by R B. Lee, dated May 15, 1980.

11. XN-75-55 Revision 2, Exxon Nuclear Company, the Exxon Nuclear Company WREM-Based NJP-BWR ECCS Evaluation Model and Application to the Oyster Creek Plant, August 1976.



OC ERV SET PT ANALYSIS * TURBINE TRIP * ERVS AT 1070 AND 1090 PSIG
+ POWER LEVEL
O HEAT FLUX
* RECIRCULATION FLOW
X VESSEL STEAM FLOW
* FEEDWATER FLOW
PERCENT OF RATED
160
140
120
100
80
60
40
20
0
2
4
6
8
10
12
14
16
18
20
TIME, SEC

FIGURE 1a



OC ERV SET PT ANALYSIS * TURBINE TRIP * ERVS AT 1070 AND 1090 PSIG
+ VESSEL PRESSURE CHANGE (PSI)
O VESSEL WATER LEVEL
(TENTHS OF FEET)
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
0
2
4
6
8
10
12
14
16
18
20
TIME, SEC

FIGURE 1b

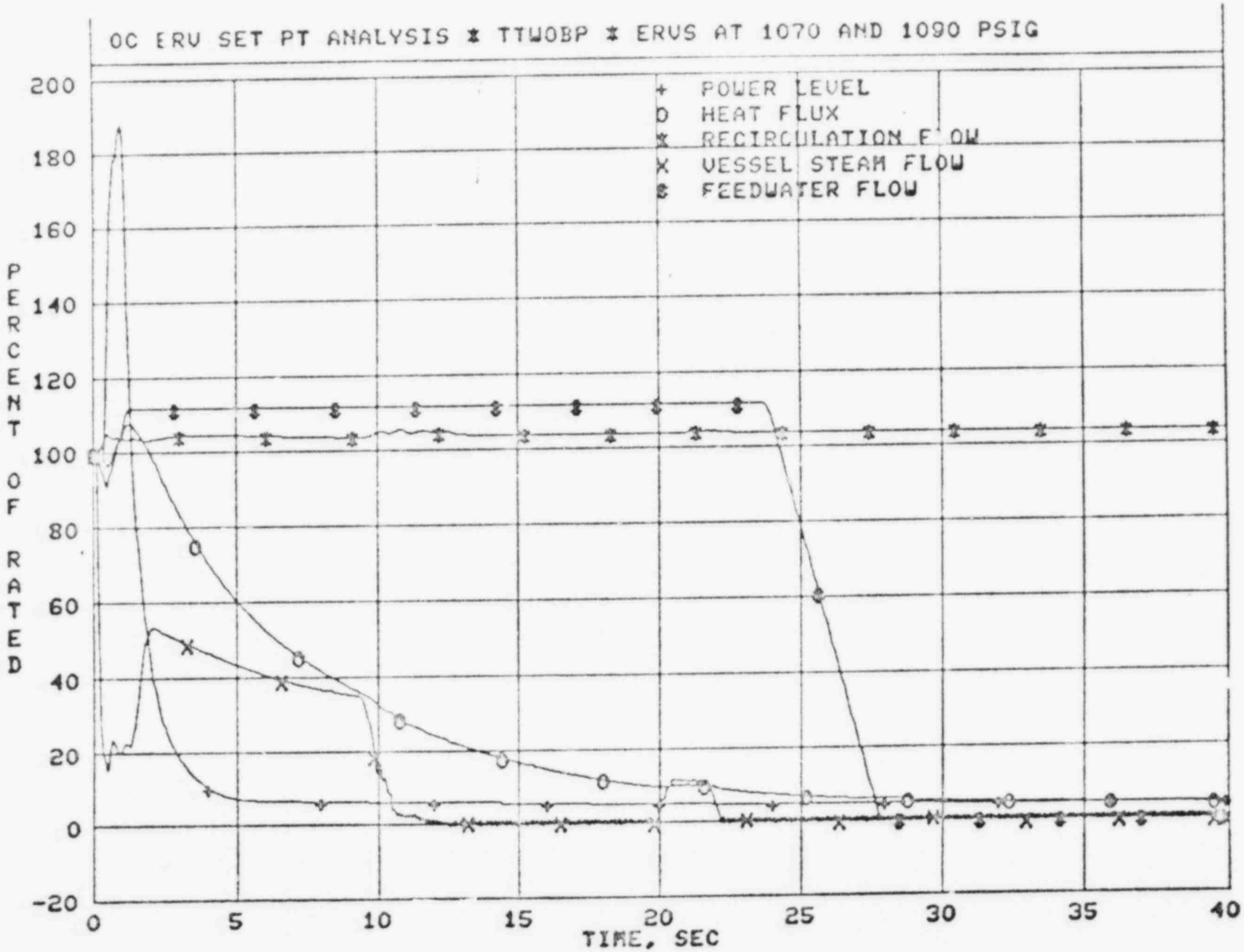

OC ERV SET PT ANALYSIS * TTWOBP * ERVS AT 1070 AND 1090 PSIG
+ POWER LEVEL
O HEAT FLUX
* RECIRCULATION FLOW
X VESSEL STEAM FLOW
$ FEEDWATER FLOW
PERCENT OF RATED
200
180
160
140
120
100
80
60
40
20
0
-20
0
5
10
15
20
25
30
35
40
TIME, SEC

FIGURE 2a

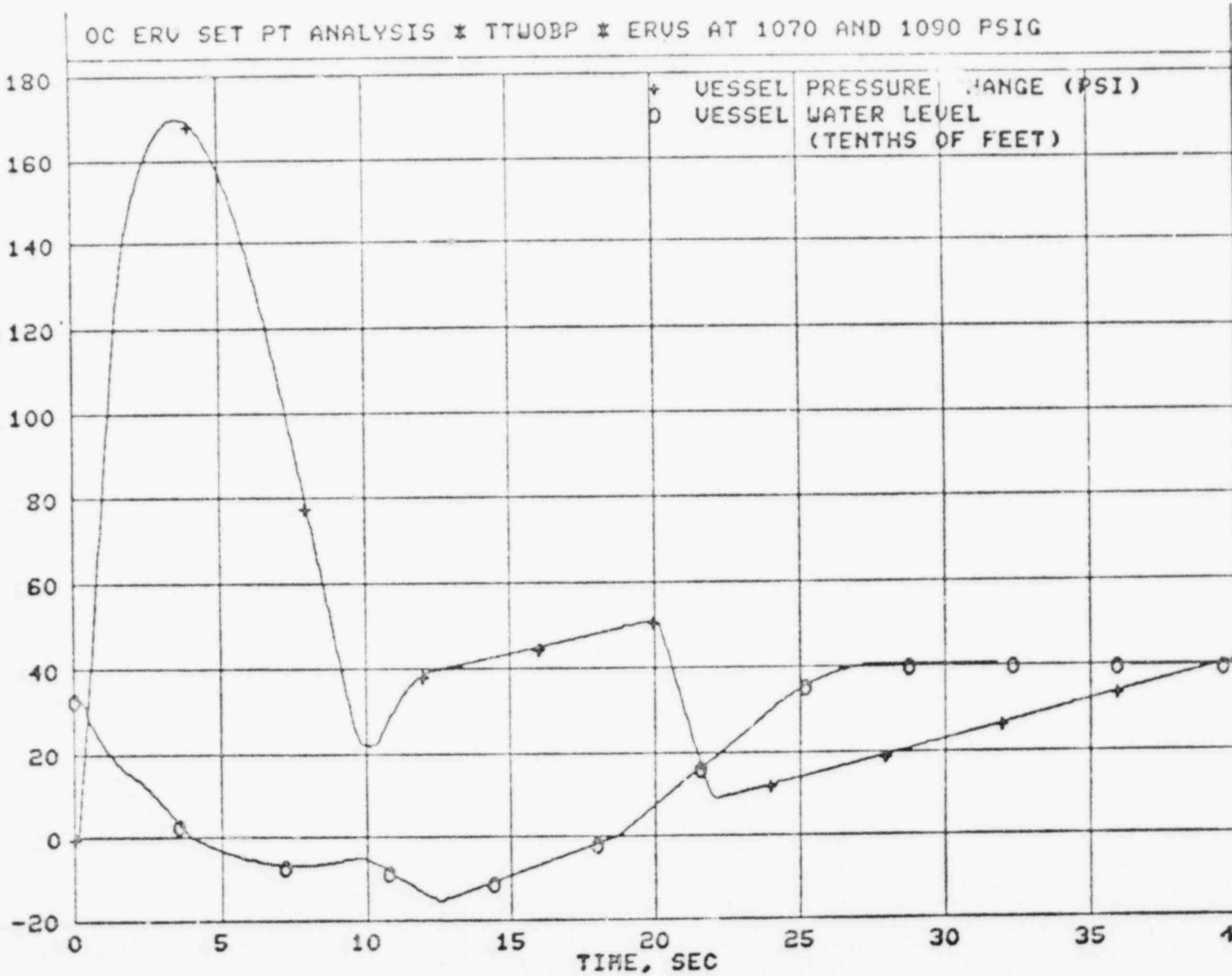

OC ERV SET PT ANALYSIS * TTWOBP * ERVS AT 1070 AND 1090 PSIG
+ VESSEL PRESSURE CHANGE (PSI)
O VESSEL WATER LEVEL
(TENTHS OF FEET)
180
160
140
120
100
80
60
40
20
0
-20
0
5
10
15
20
25
30
35
40
TIME, SEC

FIGURE 2b

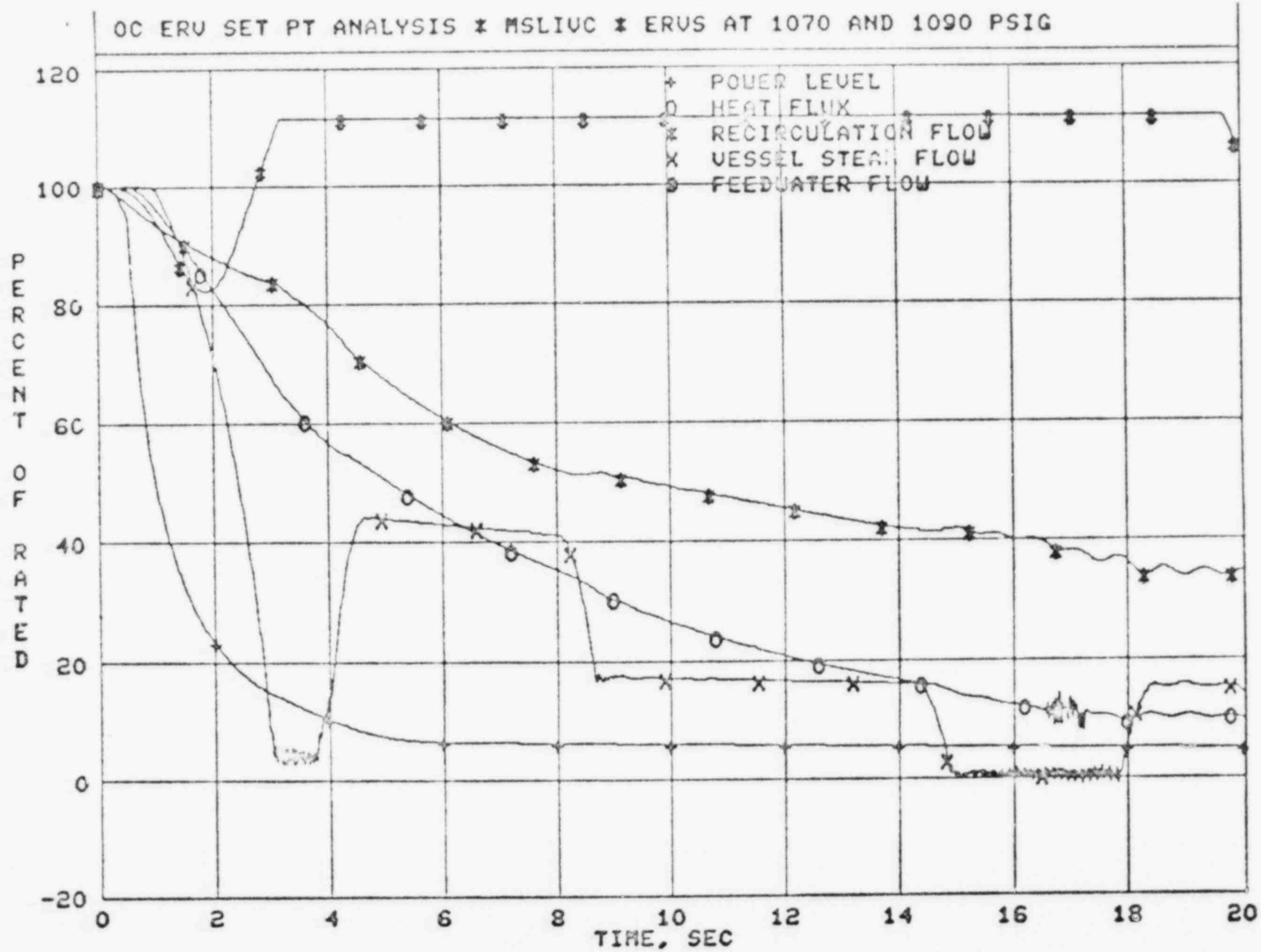

OC ERV SET PT ANALYSIS * MSLIVC * ERVS AT 1070 AND 1090 PSIG
POWER LEVEL
HEAT FLUX
RECIRCULATION FLOW
VESSEL STEAM FLOW
FEEDWATER FLOW
PERCENT OF RATED
120
100
80
60
40
20
0
-20
0
2
4
6
8
10
12
14
16
18
20
TIME, SEC

FIGURE 3a

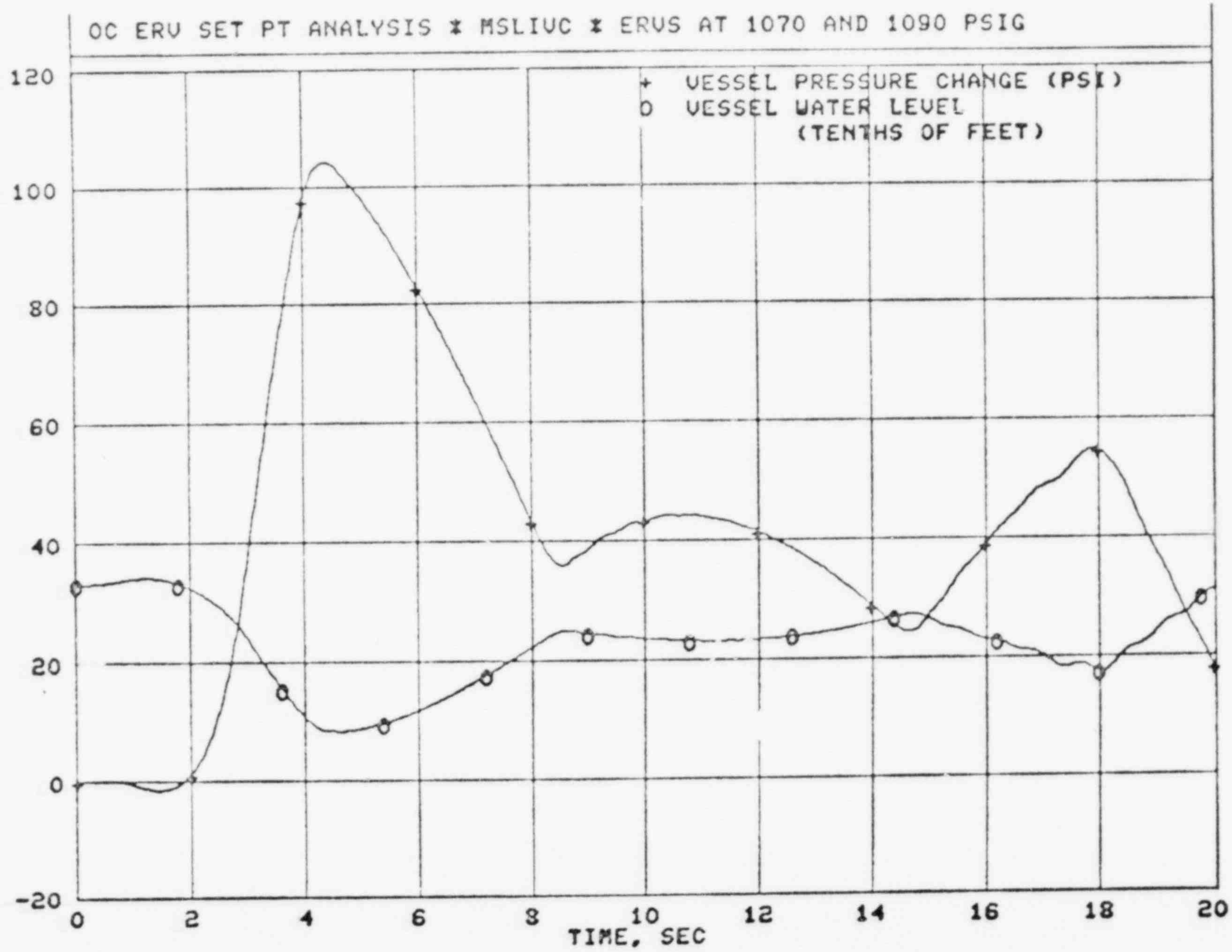

OC ERV SET PT ANALYSIS * MSLIVC * ERVS AT 1070 AND 1090 PSIG
+ VESSEL PRESSURE CHANGE (PSI)
O VESSEL WATER LEVEL
(TENTHS OF FEET)
120
100
80
60
40
20
0
-20
0
2
4
6
8
10
12
14
16
18
20
TIME, SEC

FIGURE 3b