



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

October 3, 1988

Docket Nos. 50-321
50-366

MEMORANDUM FOR: David B. Matthews, Director
Project Directorate II-3
Division of Reactor Projects I/II

FROM: Lawrence P. Crocker, Project Manager
Project Directorate II-3
Division of Reactor Projects I/II

SUBJECT: MEETING SUMMARY

On September 21, 1988, a meeting was held at the NRC Region II office with representatives of Georgia Power Company to discuss the status of the licensee's actions in response to NRC Bulletin 85-03 for the Hatch Nuclear Plant. Enclosure 1 provides a listing of the attendees. The meeting had been arranged at the request of the licensee to obtain clarification regarding the Bulletin requirements.

The original Bulletin 85-03 was issued on November 15, 1985, and was intended to ensure that licensee developed and implemented a program to ensure that switch settings on certain safety-related, motor-operated valves are selected, set and maintained correctly to accommodate the maximum differential pressures expected on these valves during both normal and abnormal events. Supplement 1 to Bulletin 85-03 was issued on April 27, 1988 to clarify which valves on BWRs were to be included in the program and to clarify the meaning of a phrase in the original bulletin.

The licensee responded to the initial bulletin by letters dated October 2, 1986, March 12, 1987 and April 8, 1987. On April 4, 1988, the staff requested additional information regarding certain aspects of the licensee's program. The licensee responded to the RAI by letter dated May 4, 1988. Included in the May 4 response was a request to meet with the staff to explain the licensee's program. The September 21 meeting was held in response to that request. In the meantime, the licensee also had responded to Supplement 1 to Bulletin 85-03 by letter dated May 27, 1988.

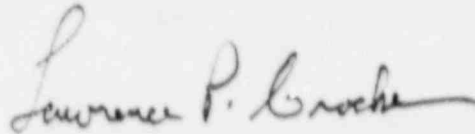
The licensee briefed the staff on the program developed to respond to Bulletin 85-03, including the methodology used to identify valves and determine the maximum differential pressures, the establishment of correct switch settings, testing results to date, and the program and schedule for long-term compliance. A copy of the briefing charts is provided at Enclosure 2.

The staff informed the licensee that the bulletin is being superseded by a generic letter, to be issued within a few months, which will address the problems the staff has observed and provide guidance on the actions needed for a long-term approach to resolving potential motor-operated valve problems.

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The licensee has almost completed the testing on Unit 2 valves to meet the original scope of Bulletin 85-03. However, completion of the Unit 2 valve testing to meet the scope of Supplement 1 to the bulletin will have to await the next Unit 2 maintenance/refueling outage in the Spring of 1989. Testing of all Unit 1 valves is scheduled to be completed during the maintenance/refueling outage which began on September 28, 1988. The licensee agreed to submit the test data as it becomes available rather than to hold it for a complete, final report.



Lawrence P. Crocker, Project Manager
Project Directorate II-3
Division of Reactor Projects I/II

Enclosures:

1. Attendance List
2. Briefing slides

cc: w/enclosures
See next page

October 3, 1988

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Lawrence P. Crocker, Project Manager
Project Directorate II-3
Division of Reactor Projects I/II

- Enclosures:
1. Attendance List
 2. Briefing slides

cc: w/enclosures
See next page

DISTRIBUTION FOR MEETING SUMMARY DATED: September 21, 1988

Docket File

NRC PDR	
Local PDR	
PDII-3 Reading	
M. Rood	14-H-25
L. Crocker	14-H-25
OGC	15-B-18
E. Jordan	MNBB-3302
B. Grimes	9-A-2
RKiessel	11-A-1
ACRS (10)	H-1016
Frank Jape	R11
Stephen Tinger	R11

mc
PDII-3
LCrocker:ls
10/3/88

DM
PDII-3
DMatthews
10/3/88

Mr. W. G. Hairston, III
Georgia Power Company

Edwin I. Hatch Nuclear Plant,
Units Nos. 1 and 2

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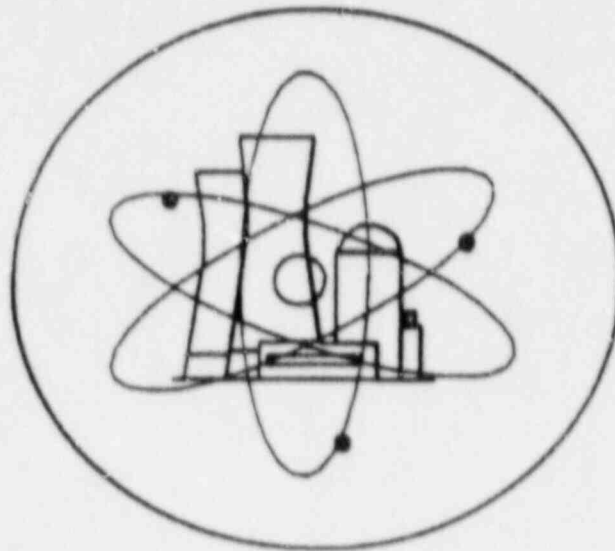
Mr. J. Leonard Ledbetter, Commissioner
Department of Natural Resources
270 Washington Street, N.W.
Atlanta, Georgia 30334

Chairman
Appling County Commissioners
County Courthouse
Baxley, Georgia 31513

MEETING
MOTOR-OPERATED VALVES
BULLETIN 85-03
21 SEPTEMBER 1988

<u>NAME</u>	<u>POSITION</u>	<u>REPRESENTING</u>
Larry Crocker	Project Manager, Hatch	NRC, NRR
Frank Jape	TPS/DRS	NRC, RII
Richard J. Kiessel	Sr. Mech. Eng.	NRR/OGCB
Stephen Tingen	TPS/DRS/NRC	MRC, RII
Dan Warsing	Tech. Mgr.	Limitorque
Dave Midlik	Lead Engineer 85-03 Hatch	GPCO
Chris Sorensen	I&C ENG.	SCSI
Gene Talton	GPC-Corp. Engr.	GPC
Brad Harkins	SCSI-AE	SGSI
Jim Heidt	Lic. Mgr. - Hatch	GPC
Ken McElroy	Lic. Engineer - Hatch	GPC

E. I. HATCH NUCLEAR PLANT



IEB 85-03

MOV TESTING

SEPTEMBER 21, 1988

PURPOSE OF MEETING

OBTAIN NRC CONCURRENCE ON GPC'S BULLETIN 85 - 03 PROGRAM

PROGRAM OVERVIEW

BWR OWNERS GROUP METHODOLOGY FOR DP CALCULATIONS
INDUSTRY STANDARD (LIMITORQUE) SIZING EQUATIONS
LIMITORQUE DIAGNOSTIC EQUIPMENT FOR SIGNATURE ANALYSIS
LIMITED DP TESTING

PROGRAM STATUS

UNIT 2 TESTING COMPLETE FOR ORIGINAL BULLETIN SCOPE
UNIT 1 TESTING STARTED (OUTAGE BEGINS 9-28-88)

A G E N D A

NRC/GPC MEETING ON PLANT HATCH BULLETIN 85-03 PROGRAM

SEPTEMBER 21, 1988 - ATLANTA

NRC REGION II OFFICES

9:00 - 12:00

- o ADGENDA
- o PROGRAM DESCRIPTION
 - METHODOLOGY TO IDENTIFY VALVES AND DETERMINE MAXIMUM DIFFERENTIAL PRESSURE (DP)
 - ESTABLISHMENT OF CORRECT SWITCH SETTINGS
 - o SWITCH FUNCTIONAL REVIEW
 - o THRUST CALCULATIONS
 - o OPERATOR CAPABILITY
 - TESTING RESULTS
 - o OVERVIEW
 - o AS-FOUND CONDITION
 - o STATIC AND DP SIGNATURE ANALYSIS
 - LONG-TERM COMPLIANCE
 - o PROCEDURES
 - o PROACTIVE EFFORTS
 - SCHEDULE
- o NRC FUTURE PLANS
- o SUMMARY/OPEN ITEMS

SUBJECT SYSTEMS

The Bulletin addresses high-pressure coolant injection systems and emergency feedwater systems which are to be tested in accordance with 10 CFR 50.55a(g)

The applicable systems at Plant Hatch include:

HIGH PRESSURE COOLANT INJECTION
REACTOR CORE ISOLATION COOLING

SUBJECT VALVES

Valves which are considered to be included under the scope of the Bulletin are those which are required to be tested in accordance with Section XI of the ASME Boiler and Pressure Vessel Code.

SWITCH SETTINGS ADDRESSED

- OPEN TORQUE SWITCH
- OPEN TORQUE SWITCH BYPASS
- CLOSE TORQUE SWITCH
- CLOSE TORQUE SWITCH BYPASS
- OPEN LIMIT SWITCH
- CLOSE LIMIT SWITCH
- THERMAL OVERLOADS

OPEN TORQUE SWITCH

Jumpered from circuit.

Opening Capability is limited to the motors ability to develop the maximum required torque when coupled with the operator gearing.

OPEN TORQUE SWITCH BYPASS

Setting not required.

Permanent jumper installed around open torque switch.

CLOSED TORQUE SWITCH

Used to stop travel in the closed direction.

Set to assure that the valve will close against the maximum DP and that damage does not occur to:

- Operator thrust components
- Operator torque components
- Valve thrust components
- Valve torque components

CLOSED TORQUE SWITCH BYPASS

Set to bypass the closed torque switch during the initial 1/8" of travel to assure that valve clears backseat.

OPEN LIMIT SWITCH

Set to limit travel in the open direction to prevent backseating due to inertia.

CLOSED LIMIT SWITCH

Setting not required.

All control in the close direction is by
the close torque switch.

THERMAL OVERLOADS

Setting not required.

Overloads bypassed per NRC Regulatory
Guide 1.106

OPERATION CRITERIA

The valves were reviewed to establish:

Events that require operation

Valve functions

Required safety actions

Events that impose maximum DP

Location of maximum DP

PLANNED EVENTS

- Refueling outages
- Achieving Criticality
- Heatup
- Power Operation
- Achieving Shutdown
- Cooldown

CONDITIONS CONSIDERED IN DP CALCULATIONS

- Maximum Reactor Vessel Pressure
- Maximum Equipment Output
- Hydrostatic Head
- Atmospheric Pressure
- Water Hammer
- Velocity Head
- LOCA Related Pressure

MINIMUM THRUST REQUIREMENT

Forces which must be overcome to operate valve:

Stuffing Box Load

Stem Load

Differential Pressure Load

STUFFING BOX LOAD

Dependent upon stem diameter.

Assigned the following loads:

Up to 1"	1000 #
Up to 1-1/2"	1500 #
Up to 2-1/2"	2500 #
Up to 4"	4000 #
Above 4"	5000 #

STEM LOAD

The force required to drive the valve stem into the valve.

Neglect if line pressure < 500 PSIG

For line pressure > 500 PSIG:

Stem Area X (Line Pressure - Max DP)

Calculated for both maximum open and close DP, with the higher being selected.

DIFFERENTIAL PRESSURE LOAD

The **force** required to overcome the **component** of resistance caused by differential pressure.

Valve seat area X DP X Valve Factor

MAXIMUM TARGET TORQUE/THRUST

Selected on the lower of:

Operator Available Torque

Operator Maximum Allowable Thrust

Operator Maximum Allowable Torque

Valve Maximum Allowable Thrust

Valve Maximum Allowable Torque

REQUIRED MOTOR TORQUE

(Max Calculated Stem Torque / Ratio *
Pullout Efficiency * Application Factor)
* 100

REQUIRED MOTOR RUN TORQUE

Maximum Unit Run Torque/
(Unit Ratio * Unit Efficiency / 100)

DERATED MOTOR VOLTAGES

The required motor torque at the derated voltages is calculated and compared to the rated motor voltages.

90% Voltage for AC Motors

84% Voltage for DC Motors

1988 UNIT 2 OUTAGE
MOV TESTING BY ACTUATOR SIZE

8	SMB-000
6	SMB-00
4	SMB-0
3	SMB-1
1	SB-0
1	SB-3

11	HPCI MOVS
12	RCIC MOVS

14	LLRT
11	EQ

TEST CREW

IN - HOUSE MECHANICS, ELECTRICIANS, INSTRUMENTATION AND CONTROL TECHNICIANS

- SETUP OF TEST EQUIPMENT

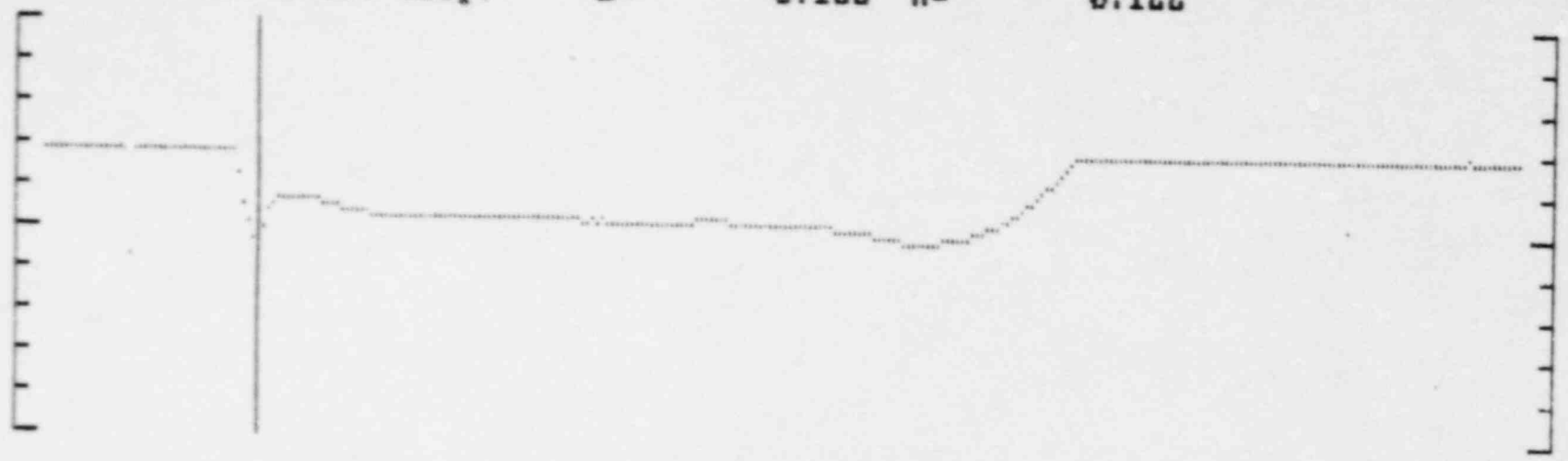
LIMITORQUE CERTIFIED TECHNICIANS

- ASSISTED IN SIGNATURE ANALYSIS
- ASSISTED IN EQUIPMENT SETUP

MOTOR ACTUATOR CHARACTERIZER
(MAC)

- OEM SUPPLIED - LIMITORQUE CORPORATION
- 10 CHANNEL CAPABILITY - ALL DATA COLLECTED
EACH STROKE
- USER FRIENDLY SOFTWARE AND DISPLAY - DISPLAY IN
REQUIRED ENGINEERING UNITS - NO FIELD CALCS
- MODEM DATA LINK WITH LIMITORQUE

0.150 Worm shaft disp. L= -0.122 H= -0.122



-0.350 Thrust L= +0.0 Torque -450.1
5.400 Motor current L= +1.978 H= +1.978



-0.600 Abs Time 0.43 Rel Time +0.43
0.00 2E41-F001 (Time span 3.00) B:52688PT2.opn 3.00

MOTOR ACTUATOR CHARACTERIZER
(MAC)

- LIMIT SWITCHES

- TORQUE SWITCHES

- MOTOR CURRENT

- ~~WORM~~ SHAFT DISPLACEMENT
(SPRING PACK COMPRESSION)

- STEM THRUST
 - OPEN - MEASURED
 - CLOSE - CALCULATED

- ACTUATOR OUTPUT TORQUE
 - CLOSE - MEASURED
 - OPEN - CALCULATED

MOV TESTING

STATIC TEST - PERFORMED ON ALL MOV'S AT ZERO DIFFERENTIAL PRESSURE

PRESSURE TEST - SELECTED MOV'S TESTED AT SYSTEM PRESSURE

(RX PRESSURE APPROXIMATELY 1000 PSI)

STATUS OF TESTING - UNIT 2

- COMPLETE FOR ORIGINAL BULLETIN SCOPE
- SUPPLEMENTAL BULLETIN VALVES WILL BE COMPLETED NEXT OUTAGE

STATUS OF TESTING - UNIT 1

- TESTING STARTING
- WILL BE COMPLETED FOR ORIGINAL BULLETIN AND SUPPLEMENT DURING UPCOMING OUTAGE (STARTING 9-28-88)

AS - FOUND MOV CONDITIONS

23 MOVES TESTED (UNIT 2)

17 MOVES - AS FOUND THRUST ACCEPTABLE

6 MOVES - AS - FOUND THRUST BELOW THAT CALCULATED

DEGRADATIONS FOUND WITH DIAGNOSTIC EQUIPMENT

3 MOVS - GREASE IN SPRING PACK

2 MOVS - SPRING PACK REPLACED

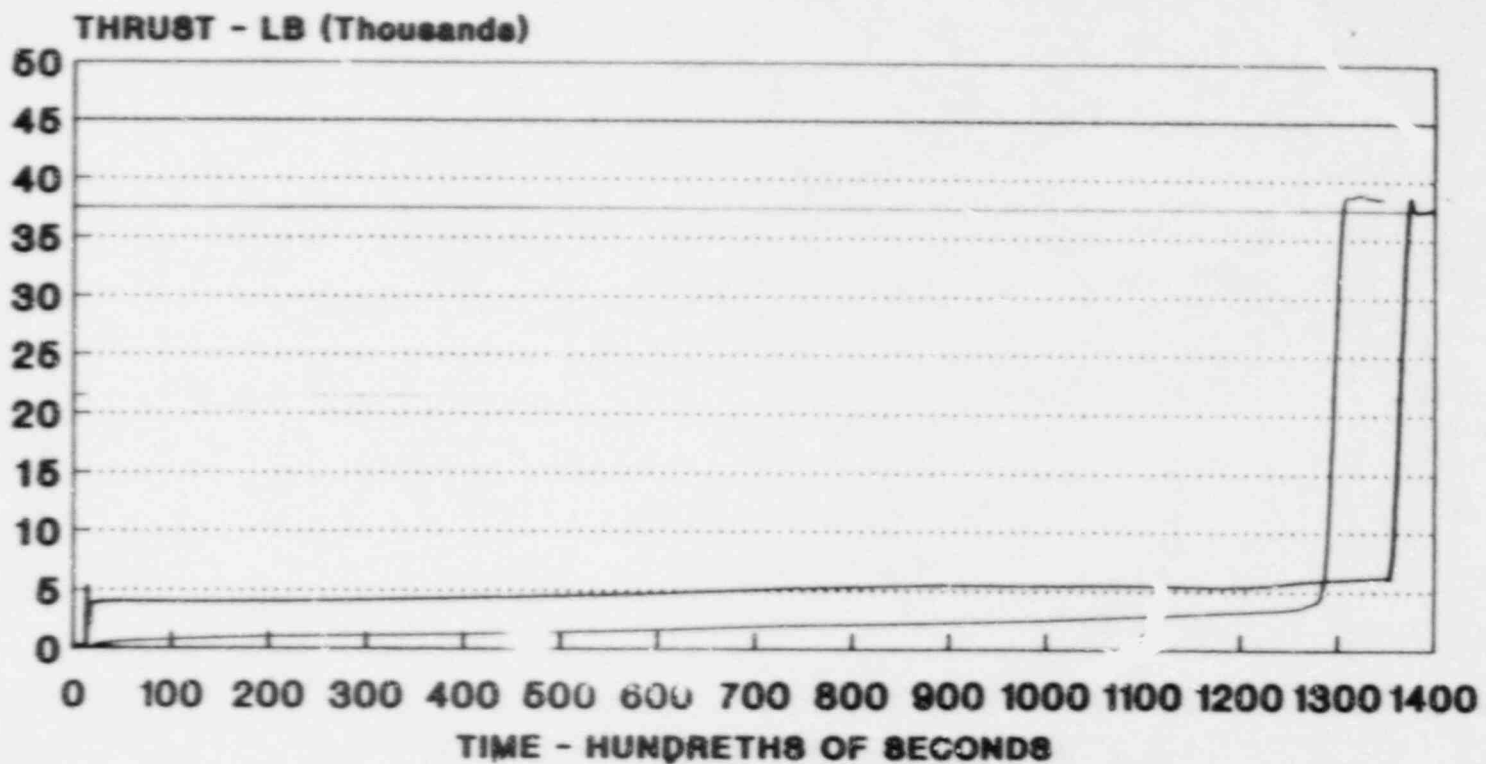
3 MOVS - TORQUE SWITCH REPLACED

1 MOV - TORQUE SWITCH PRELOAD

5 MOVS - MISCELLANEOUS WIRING OR GEARING PROBLEM

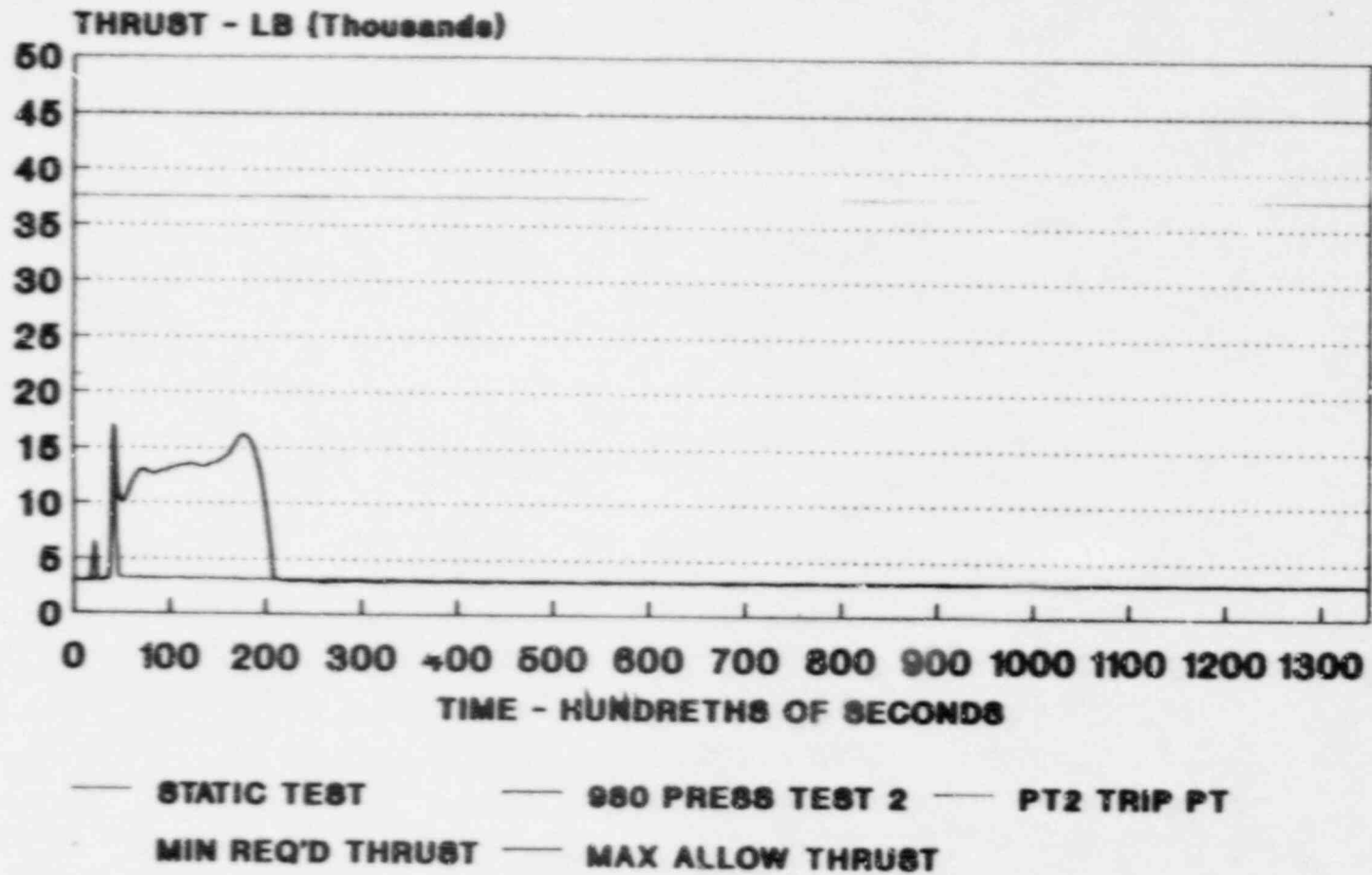
1 MOV - COMPLETE OPERATOR REBUILD

STATIC TEST VS PRESS TEST RESULTS MOV 2E41-FOO1, CLOSE TRACE



— STATIC TEST - - - 980 PRESS TEST 2 | PT2 TRIP PT
- - - MIN REQ'D THRUST — MAX ALLOW THRUST

STATIC TEST VS PRESS TEST RESULTS MOV 2E41-FOO1, OPEN TRACE



AS-LEFT THRUST MARGINS
% ABOVE MINIMUM REQUIRED

0 - 100 PSID +18-527%

11 MOVS

101 - 426 PSID +75-505%

2 MOVS

> 1000 PSID +20-405%

10 MOVS

PROCEDURES

- 53IT-TET-001-0S
LIMITORQUE VALVE OPERATOR DIAGNOSTIC
TESTING (MAC) AND SETUP

- 52PM-MNT-005-0S
LIMITORQUE VALVE OPERATOR INSPECTION
 - PM
 - EQ

- 52GM-MEL-022-0S
LIMITORQUE VALVE OPERATOR ELECTRICAL
MAINTENANCE
 - GENERAL ELECTRICAL MAINTENANCE, CHECKOUT
AND SWITCHES

- MECHANICAL MAINTENANCE PROCEDURES FOR VARIOUS
OPERATOR SIZES AND TYPES

PROACTIVE EFFORTS

- USE OF MAC TO TROUBLESHOOT "PROBLEM" MOVs

- CONSOLIDATION OF LIMITORQUE OPERATOR INFORMATION
 - OPERATOR SIZES, TYPES, SERVICE
 - **SPARE PARTS**

- PERIODIC REVIEW OF MAINTENANCE WORK ORDERS
GENERATED OR COMPLETED

- INCREASED ATTENTION TO NON-EQ, NON SAFETY
RELATED MOVs