

# PORC CHAIRMAN UNIT 1 CONTROLLED COPY

1301-1  
Revision 27  
07/07/79

THREE MILE ISLAND NUCLEAR STATION  
UNIT #1 SURVEILLANCE PROCEDURE 1301-1  
REQUIRED INTERVAL - SHIFT AND DAILY CHECKS

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Unit 1 Staff Recommends Approval

Approval

NA  
Cognizant Dept. Head

Date       

Unit 2 Staff Recommends Approval

Approval

NA  
Cognizant Dept. Head

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W. B. Smith  
V-Chairman of PORC

Date 7-6-79

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Date 7/7/79

Unit 2 Superintendent Approval

NA

Date       

STANDING PROCEDURE

NA  
Supervisor of QC

Date       

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THREE MILE ISLAND NUCLEAR STATION  
UNIT #1 SURVEILLANCE PROCEDURE 1301-1  
REQUIRED INTERVAL - SHIFT AND DAILY

(See 2.0, Plant Status for Exceptions)

1.0 PURPOSE

To perform shift and daily checks in compliance with the requirements of TMI Technical Specifications, Table 4.1.1, 3.5.2.4.d, 3.5.2.5.d, and Environmental Technical Specifications.

2.0 PLANT STATUS

<u>Tech Spec Paragraph</u>	<u>Title</u>	<u>Frequency</u>
3.5.2.4.d	Quadrant Power Tilt	Every 2 Hrs. during operation >15% power
3.5.2.4.d	Core Imbalance	Every 2 hrs. >40% power
4.1.1.3	Power Range Amplifier	Daily when reactor power is >15%
4.1.1.4	Power Range Channel	Shift
4.1.1.5	Inter. Range Channel	Shift, when in service
4.1.1.6	Source Range Channel	Shift, when in service
4.1.1.7	P.C. Temperature Channel	Shift
4.1.1.8	High R.C. Pressure Channel	Shift
4.1.1.9	Low R.C. Pressure Channel	Shift
4.1.1.10	Flux-R.C. Flow Comparator	Shift
4.1.1.11	R.C. Press Temp Comparator	Shift
4.1.1.12	Pump Flux Comparator	Shift
4.1.1.13	High R.B. Press. Channel	Shift
4.1.1.15	High Press. Inj. Analog Channel	Shift, when reactor coolant system is pressurized above 300 psig or T <sub>ave</sub> is >200°F

- 4.1.1.17 Low Pres. Inj. Analog Channels Shift, when reactor coolant system is pressurized above 300 psig or  $T_{av.}$  is  $>200^{\circ}\text{F}$
- 4.1.1.19 R.B. Emergency Cooling and Isolation Sys. Analog Channels Shift
- 4.1.1.22 Pressurizer Temp Channels Shift
- 4.1.1.23 Control Rod Abs. Position Shift, check with rel. position indicator
- 4.1.1.24 Control Rod Relative Position Shift, check with abs. position indicator
- 4.1.1.25 Core Flooding Tanks (pressure and level channels) Shift, when reactor coolant system pressure is  $>700$  psig
- 4.1.1.26 Pressurizer Level Channels Shift
- 4.1.1.27 Makeup Tank Level Channel Daily, when makeup and purification system is in operation
- 4.1.1.44 Reactor Coolant Pressure DH Valve Interlock Bistable Covered in 4.1.1.15

Sec.

- 4.4.1.2.5B-Seal of Pers. & Emerg. Air lock's outer door If Cold S/D - 1/W; other times - after each opening, but not more than once/day

- 4.19.1 Reactor Building Temp Daily when reactor is critical

Environmental Radiation Monitor Sensor and Daily  
Tech. Specs. Recorder Check (RM-L6, A7, A8,  
Pages 17, 30 A9, RM-A5 Source Check Daily

### 3.0 LIMITS AND PRECAUTIONS

Readings should be consistent with various plant conditions and should not be taken during transient conditions. If readings are taken during transient conditions, it should be so noted on the data sheet.

- 3.1 Location denoted with asterisk is the designated place where readings are to be taken.

### 4.0 LOCATION

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#### 4.1.1.3 POWER RANGE AMPLIFIERS (DAILY)

<u>CHANNEL</u>	<u>CONSOLE CENTER READOUT DESIGNATOR</u>	<u>RPS CAB</u>	<u>RPS CABINET DESIGNATOR</u>	<u>INSTRUMENT NUMBER</u>
A or B**	Power Range $\phi$ *	A/B	Total $\phi$ NI-5/ NI-6 $\Sigma$ Amplifier	NI-5/NI-6
** Whichever channel is selected at RPS Cabinet A			2.0	

1301-1

4.1.1.13

HIGH R.B. PRESS. CHANNEL (SHIFT)INDICATIONCONSOLE RIGHT  
READOUT DESIGNATORINSTRUMENT  
NUMBERR.B. Pressure  
0-10 PSIGR.B. Pressure  
Recorder

PT-503

4.1.1.27

MAKEUP TANK LEVEL CHANNEL (Daily)INDICATIONCONSOLE CENTER  
READOUT DESIGNATORINSTRUMENT  
NUMBER

Mu Tk Level

Makeup Storage\*  
Tank Level

MU-14-LT

3.5.2.4 e,f

QUADRANT POWER TILT

Rev 1

POWER RANGE CHANNELCONSOLE CENTER  
READOUT DESIGNATORA  
B  
C  
DTotal  $\emptyset$  NI-5  
Total  $\emptyset$  NI-6  
Total  $\emptyset$  NI-7  
Total  $\emptyset$  NI-8

3.5.2.5.d

CORE IMBALANCEPOWER RANGE CHANNELCONSOLE CENTER  
READOUT DESIGNATORA  
B  
C  
D $\Delta \emptyset$  NI-5  
 $\Delta \emptyset$  NI-6  
 $\Delta \emptyset$  NI-7  
 $\Delta \emptyset$  NI-8

4.1.1.4

POWER RANGE CHANNELSCHANNELCONSOLE CENTER  
READOUT DESIGNATORRPS  
CAB.RPS CABINET  
DESIGNATORINSTRUMENT  
NUMBERA Total  $\emptyset$  NI-5  
B Total  $\emptyset$  NI-6  
C Total  $\emptyset$  NI-7  
D Total  $\emptyset$  NI-8A Total  $\emptyset$  NI-5  $\Sigma$  Amplifier \* NI-5  
B Total  $\emptyset$  NI-6  $\Sigma$  Amplifier \* NI-6  
C Total  $\emptyset$  NI-7  $\Sigma$  Amplifier \* NI-7  
D Total  $\emptyset$  NI-8  $\Sigma$  Amplifier \* NI-8

3.0

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4.1.1.5

INTERMEDIATE RANGE CHANNELS

<u>Channel</u>	<u>Console Center Readout Designator</u>	<u>RPS Cab.</u>	<u>RPS Cabinet Designator</u>	<u>Instrument Number</u>
A	SUR NI-3	C	NI-3 Rate/Change AMP. *	NI-3
	Log N NI-3	C	NI-3 Logarithmic AMP. *	NI-3
B	SUR N NI-4	D	NI-4 Rate/Change AMP. *	NI-4
	Log N NI-4	D	NI-4 Logarithmic AMP. *	NI-4

4.1.1.6

SOURCE RANGE CHANNELS

<u>Channel</u>	<u>Console Center Readout Designator</u>	<u>RPS Cab.</u>	<u>RPS Cabinet Designator</u>	<u>Instrument Number</u>
A	SUR NI-1	A	NI-1 Rate/Change AMP. *	NI-1
	C/R NI-1	A	NI-1 Count Rate AMP. *	NI-1
B	SUR NI-2	B	NI-2 Rate/Change AMP. *	NI-2
	C/R NI-2	B	NI-2 Count Rate AMP. *	NI-2

4.1.1.7

R.C. TEMPERATURE CHANNELS (TH)

<u>Indication</u>	<u>Console Center Readout Designator</u>	<u>Mode Select Sw. Position</u>	<u>Mode Select Console Sw.</u>	<u>Instrument Number</u>
Loop A TH	R.C. Outlet Temp. * Loop A	Loop A TH1 (Normally selected)	RC4A-MS	RC4A-TE1
Loop A TH	R.C. Outlet Temp. * Loop A	Loop A TH2	RC4A-MS	RC4A-TE4
Loop B TH	R.C. Outlet Temp. * Loop B	Loop B TH1 (Normally selected)	RC4B-MS	RC4B-TE1
Loop B TH	R.C. Outlet Temp. * Loop B	Loop B TH2	RC4B-MS	RC4B-TE4

4.0

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## 4.1.1.8 &amp; 4.1.1.9

HIGH AND LOW R.C. PRESSURE CHANNELS

<u>Indication/ Function</u>	<u>Console Center Readout Designator</u>	<u>RPS Cab.</u>	<u>Comp. Pt.</u>	<u>RPS Cabinet Designator</u>	<u>Instrument Number</u>
Loop A N.R. Pressure & Pressurizer Htr. Control	R.C. Pressure  Narrow Range Recorder	A	586	Pressure Buffer Amp. *	RC3A-PT1
Loop B N.R. Pressure & Pressurizer Htr. Control	R.C. Pressure  Narrow Range Recorder	B	588	Pressure Buffer Amp. *	RC3B-PT1
Loop A N.R. Pressure	None	C	587	Pressure Buffer Amp. *	RC3A-PT2
Loop B N.R. Pressure	None	D	589	Pressure Buffer Amp. *	RC3B-PT2

## 4.1.1.10

FLUX-R.C. FLOW COMPARATOR

<u>Indication/ Function</u>	<u>Console Center Readout Designator</u>	<u>RPS Cab.</u>	<u>RPS Cabinet Designator</u>	<u>Instrument Number</u>
Flux/Flow Comparator	R.C. Total Flow  Delta $\phi$ NI-5	A  A	Total Flow * Buffer Amp. Delta Flux NI-5 E/ $\Delta$ Amp.	RC14A-dPT1 RC14B-dPT1 NI-5
Flux/Flow Comparator	R.C. Total Flow  Delta $\phi$ NI-6	B  B	Total Flow * Buffer Amp. Delta Flux NI-6 E/ $\Delta$ Amp.	RC14A-dPT2 RC14B-dPT2 NI-6
Flux/Flow Comparator	None	C  C	Total Flow * Buffer Amp. Delta Flux NI-7 E/ $\Delta$ Amp.	RC14A-dPT3 RC14B-dPT3 NI-7
Flux/Flow Comparator	None	D  D	Total Flow * Buffer Amp. Delta Flux NI-8 E/ $\Delta$ Amp.	RC14A-dPT4 RC14B-dPT4 NI-8

## 4.1.1.11

R.C. PRESSURE TEMPERATURE COMPARATOR

<u>Indication/ Function</u>	<u>Console Center Readout Designator</u>	<u>RPS Cab.</u>	<u>RPS Cabinet Designator</u>	<u>Instrument Number</u>
Press./Temp. Comparator	Temperature	A	(Signal Converter)* Temperature	RC4A-TE2
	None **	A	Pressure Setpoint Corres. to T hot	
Press./Temp. Comparator		B	(Signal Converter)* Temperature	RC4B-TE2
	None **	B	Pressure Setpoint Corres. to T hot	
Press./Temp. Comparator	None	C	(Signal Converter)* Temperature	RC4A-TE3
	None	C	Pressure Setpoint Corres. to T hot	
Press./Temp. Comparator	None	D	(Signal Converter)* Temperature	RC4A-TE3
	None	D	Pressure Setpoint Corres. to T hot	

## 4.1.1.12

PUMP-FLUX COMPARATOR

<u>Indication/ Function</u>	<u>Console Center Designator</u>	<u>RPS Cab.</u>	<u>RPS Cabinet Designator</u>	<u>Instrument Number</u>
Pump/Flux Comparator	Total Ø NI-5	A	Total Ø NI-5 Σ Amp. Contact *	NI-5
	RCP Breaker Disagreement Lights	A	Monitor Lites	R.C.P. Breakers
Pump/Flux Comparator	Total Ø NI-6	B	Total Ø NI-6 Σ Amp. Contact *	NI-6
	RCP Breaker Disagreement Lights	B	Monitor Lites	R.C.P. Breakers
Pump/Flux Comparator	Total Ø NI-7	C	Total Ø NI-7 Σ Amp. Contact *	NI-7
	RCP Breaker Disagreement Lights	C	Monitor Lites	R.C.P. Breakers
Pump/Flux Comparator	Total Ø NI-8	D	Total Ø NI-8 Σ Amp. contact *	NI-8
	RCP Breaker Disagreement Lights	D	Monitor Lites	R.C.P. Breakers

\*\* No console readout for Pressure Setpoint corresponding to T-hot.

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3.0 See attached sheet for High R.B. Press. Channel (Daily)

4.1.1.15a, 4.1.1.17a, 4.1.1.44

H.P. & L.P Injection Analog Channels R.C. Pressure, DH Valve Interlock Bistable

<u>Indication/ Function</u>	<u>Console Center Readout Designator</u>	<u>E.S. Bistable Cabinet</u>	<u>Cabinet Readout Designator</u>	<u>Instrument Number</u>
Loop A W.R. Pressure & E.S. Actuation 1500# & 500#	R.C. Pressure Wide Range (Recorder)	1	Reactor Press. Channel 1 Buffer Amp.* 0-2500 PSIA	RC3A-PT3
Decay Heat 400# Interlock Bistable DH-V1	None	1	Bistable tripped if >400 PSIG (output State lamp bright)	
Loop A W.R. Pressure & E.S. Actuation 1500# & 500#	None	2	Reactor Press. Channel 2 Buffer AMP.* 0-2500 PSIA	RC3A-PT4
Decay Heat 400# Bistable DH-V2	None	2	Bistable tripped if >400 PSIG (output State lamp bright)	
Loop B W.R. Pressure & E.S. Actuation 1500# & 500#	None	3	Reactor Press Channel 3 Buffer AMP. * 0-2500 PSIA	RC3B-PT3

4.1.1.19 Reactor Building Emergency Cooling and Isolation Analog Channels

<u>Indication/ Function</u>	<u>Console Right Readout Designator</u>	<u>E.S. Bistable Cabinet</u>	<u>Cabinet Readout Designator</u>	<u>Instrument Number</u>
R.3. Pressure & E.S. Actuation 4 PSIG	None	1	Bldg. Press. Ch. 1 Buffer Amp.* 0-25 PSIA	PT-282
R.B. Pressure & E.S. Actuation 4 PSIG	None	2	Bldg. Press. Ch. 2 Buffer Amp.* 0-25 PSIA	PT-285
R.B. Pressure & E.S. Actuation 4 PSIG	None	3	Bldg. Press. Ch. 3 Buffer Amp.* 0-25 PSIA	PT-288
R.B. Pressure 0-100 PSIG	R.B. Pressure * Indicator	None	None	PT-291
R.B. Pressure 0-10 PSIG	R.B. Pressure * Recorder	None	None	PT-503

PRESSURIZER TEMPERATURE CHANNELS

4.1.1.22

<u>Indication</u>	<u>Console Center Readout Designator</u>	<u>Console Mode Select Sw. Position</u>	<u>Console Mode Select Switch</u>	<u>Instrument Number</u>
Pressurizer Temperature	Pressurizer Temperature *	Pressurizer Temperature 1	RC2-MS	RC2-TE1 Normally Selected
Pressurizer Temperature	Pressurizer Temperature *	Pressurizer Temperature 2	RC2-MS	RC2-TE2

PRESSURIZER LEVEL CHANNELS

4.1.1.26

<u>Indication/ Function</u>	<u>Console Center Readout Designator</u>	<u>Console Mode Select Sw. Position</u>	<u>Console Mode Select Switch</u>	<u>Instrument Number</u>
Pressurizer Level & Level- Htr. Interlock	Pressurizer *	Pressurizer Level 1	RC-1MS	RC1-LT1
Pressurizer Level & Level- Htr. Interlock	Pressurizer *	Pressurizer Level 2	RC1-MS	RC1-LT2
Pressurizer Level & Level- Htr. Interlock	Pressurizer *	Pressurizer Level 3	RC1-MS	RC1-LT3

CORE FLOOD TANKS  
PRESSURE CHANNELS

4.1.1.25a

<u>Indication</u>	<u>Console Center Designator</u>	<u>Instrument Number</u>
Core Flood Tank A Pressure	Core Flood Tank *	
	Pressure A1	CF1-PT1
Core Flood Tank A Pressure	Core Flood Tank *	
	Pressure A2	CF1-PT2
Core Flood Tank B Pressure	Core Flood Tank *	
	Pressure B1	CF1-PT3
Core Flood Tank B Pressure	Core Flood Tank *	
	Pressure B2	CF1-PT4

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CORE FLOOD TANKS  
LEVEL CHANNELS

4.1.1.25b

<u>Indication</u>	<u>Core Center Designator</u>	<u>Instrument Number</u>
Core Flood Tank A Level	Core Flood Tank Level A1*	CF2-LT1
Core Flood Tank A Level	Core Flood Tank Level A2*	CF2-LT2
Core Flood Tank B Level	Core Flood Tank Level B1*	CF2-LT3
Core Flood Tank B Level	Core Flood Tank Level B2*	CF2-LT4

4.1.1.23

CONTROL ROD ABSOLUTE POSITION

<u>Indication</u>	<u>Control Room Location</u>	<u>Actuating Device</u>
Individual Control Rod Absolute Position	Vertical Panel Center*	Individual Reed Sw.

4.1.1.24

CONTROL ROD RELATIVE POSITION

<u>Indication</u>	<u>Control Room Location</u>	<u>Actuating Device</u>
Individual Control Rod Relative Position	Vertical Panel Center*	Individual Stepping Motors and 3 turn Potentiometers

5.0 EQUIPMENT REQUIRED

None

6.0 PROCEDURE

- 6.1 At location of Instrument (Step 4), record Instrument readings on Shift and Daily Sheet 1301-1.
- 6.2 RADIATION MONITOR SENSOR AND RECORDER CHECK (Daily)
  - 6.2.1 At console PRF, read the background indication for each applicable RMS channel. Record the values on the data sheet.
  - 6.2.2 Source Check
    - 6.2.2.1 At console PRF, depress C.S. (Check Source) button for the channel under test. Look for a definite increase in CPM.



Record check source response on the data sheet.

NOTE: If the indicated background level is greater than twice the radiation level which the check source should exhibit, an increase due to check source actuation may not occur. In this case mark "N/A" in the applicable space on the data sheet. If no increase was observed on RM-L6 or RM-A7, perform Step 6.2.2.2.

6.2.2.2 Special source check for RM-L6/RM-A7.

- a. For RM-L6, remove the lead plug from the source well in the sampler and insert Met-Ed Rod Source #192 (11.37  $\mu\text{Ci}$   $\text{Cs}^{137}$ ). Record resulting CPM on the data sheet in the block marked Special Check. Compare this reading with the background recorded in Step 6.2.1. A minimum increase of  $1 \times 10^5$  CPM is required. Remove the source and reinsert the lead plug.
- b. For RM-A7, purge the sampler with  $\text{N}_2$ . Record the new background reading in place of the value recorded in Step 6.2.1. Actuate the check source again and check for a definite increase in CPM. If a definite increase is still not obtained, remove the lead plug from the source well in the sampler and insert Met-Ed Rod Source #192 (11.37  $\mu\text{Ci}$   $\text{Cs}^{137}$ ). Record resulting CPM on the data sheet in the block marked Special Check. Compare this reading with the background that was recorded above. A minimum increase of 600 CPM is required. Remove the source and reinsert the lead plug.

6.2.3 Compare the panel meter and recorder indication for each channel being checked. Look for a significant difference which would imply mis-calibration or malfunction.

### 6.3 Quadrant Power Tilt

- 6.3.1 Record values for NI-5 through NI-8 on data sheet 4 of 4. Add the readings for NI5, NI6, NI7 and NI8 and enter in the Total Column. Find average power for the Core by dividing by 4 and enter average in the AVE column. Determine tilt for each power range channel using the equation and record on data sheet.

$$\text{Tilt} = 100 \left[ \frac{\text{Power range channel reading}}{\text{Average Power}} - 1 \right]$$

$$\text{Example } \text{QTI} = \frac{\text{NI5} + \text{NI6} + \text{NI7} + \text{NI8}}{4} - 1 \times 100$$

### 6.4 Core Imbalance

- 6.4.1 Read imbalance at console center and record on data sheet.
- 6.5 Consult the R.B. entry log to determine whether the Rx bldg. personnel and/or emergency air lock's outer doors were opened during the previous 24 hours. (Record the following on data sheet page 24)
- 6.5.1 Were the Rx. bldg. personnel and or Emergency airlock's outer doors tested after last use?
- 6.5.2 If 6.5.1 is "No", were the door(s) tested within the past 24 hours.
- 6.5.3 If 6.5.2 is "No", Do SP 1303-11.25 - Unless cold S/D condition which requires once a week test.
- 6.6 High & Low R.C. Pressure Channels (Shift)
- 6.6.1 If Bailey 855 plant computer is operable, go to Step 6.6.2. If computer is not operable, go to step 6.6.3.
- NOTE: Ensure that R.C. Pressure is maintained at a stable level before performing this procedure.

6.6.2 Using Group Trend, Operator Group A or B, assign computer points 586, 588, 587 & 589 (in that order) to be printed out once per minute. Acceptable values are those which have been printed out one (1) minute after the previous printed values. Attach the Group Trend printout of the RC Pressure values to the data sheets. Include date and time on printout if not already present.

Record acceptable values on data sheet 1a under Step 5.5.2 and appropriate shift & computer point headings.

6.6.3 Record on data sheet 1a, under Step 6.6.3 and appropriate shift, the R.C. Pressure Buffer Amp Meter Readings in each R.P.S. Cabinet.

6.6.4 Record on data sheet 1a under step 6.6.4 and appropriate shift, the RC Narrow Range Pressure as found on ICS Panel Recorders for loop "A", and loop "B". Go to Step 6.6.7 (if Computer operable)

NOTE: I&C department must take readings for the following:

6.6.5 Take voltage readings from the "Scaled Output" jack of the R.C. Pressure Buffer Amps in each R.P.S. Cabinet, and record the voltage found under Step 6.6.5, and appropriate shift, on data sheet 1a. Use a D.V.M. readable to  $1 \times 10^{-4}$  V.D.C., internal resistance  $\geq 100 \text{ M}\Omega$  and an accuracy of 0.01% or better. Record the Model number & Serial number of the DVM used on Data Sheet 1a. (End of I&C dept. responsibility)

6.6.6 Convert voltage readings from data sheet 1a as found in step 6.6.5 to PSIG using the equation:

$$\text{PSIG Actual} = 1700 \text{ PSIG} + \left[ \frac{80 \text{ PSIG}}{\text{V.D.C.}} \times \text{As found V.D.C.} \right]$$

Round off each answer to the nearest PSIG & record answers on data sheet 1a under step 6.6.6 and appropriate shift.

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6.6.7 Answer all Questions "yes" or "No" on data sheet 1a. under step 6.6.7 and appropriate shift.

6.7 Reactor Building Temperature

6.7.1 Complete Data Sheet 2 pa 1

7.0 ACCEPTANCE CRITERIA

7.1 Readings are acceptable if within normal expected range for various plant conditions.

7.2 Quadrant Power Tilt

7.2.1

- a. Except for physics tests, if incore quadrant tilt exceeds +3.52% power shall be reduced immediately to below the power level cutoff. (See Fig. 1A-B). Moreover, this power level cutoff value shall be reduced 2% for each 1% tilt in excess of +3.52% tilt. For less than 4 pump operation, thermal power shall be reduced 2% of the thermal power allowable for the reactor coolant pump combination for each 1% tilt in excess of +3.52%.
- b. Within a period of 4 hrs. the incore quadrant power tilt shall be reduced to less than +3.52% except for physics tests, or the following adjustments in setpoints and limits shall be made:
  1. The protection system reactor power/imbalance envelope trip setpoints shall be reduced 2% in power for each 1% tilt.
  2. The control rod group withdrawal limits (Fig. 1A-B, & 2A-B) shall be reduced 2% in power for each 1% tilt in excess of +3.52%.
  3. The operational incore imbalance limits (Fig. 3A-B) shall be reduced 2% in power for each 1% tilt in excess of +3.52%.

- c. If incore quadrant tilt is in excess of +16.80%, except for physics tests or diagnostic testing, the reactor will be placed in the hot shutdown condition. Diagnostic testing during power operation with a quadrant power tilt is permitted provided the thermal power allowable for the reactor coolant pump combinations is restricted as stated in a, above.
- d. Quadrant tilt shall be monitored on a minimum frequency of once every two hours during power operation above 15% of rated power.

### 7.3 Core Imbalance

- 7.3.1 Core imbalance shall be monitored on a minimum frequency of once every two hours during power operation above 40% of rated power. Corrective measures (reduction of imbalance by APSR movement and/or reduction in reactor power) shall be taken to maintain operation within the envelope defined by Fig. 3A. However, APSR's must be maintained within limits defined by Figure 4A. If the imbalance is not within the envelope defined by Fig. 3A, corrective measures shall be taken to achieve an acceptable imbalance. If an acceptable imbalance is not achieved within four hours, reactor power shall be reduced until imbalance limits are met.

### 7.4 Reactor Coolant High & Low Pressure Channels Check

- 7.4.1 All answers required under Step 6.6.7 on data sheet 1a must be yes to be acceptable. All "No" answers require a work request to be generated to correct the problem and an appropriate entry on an E&D sheet.

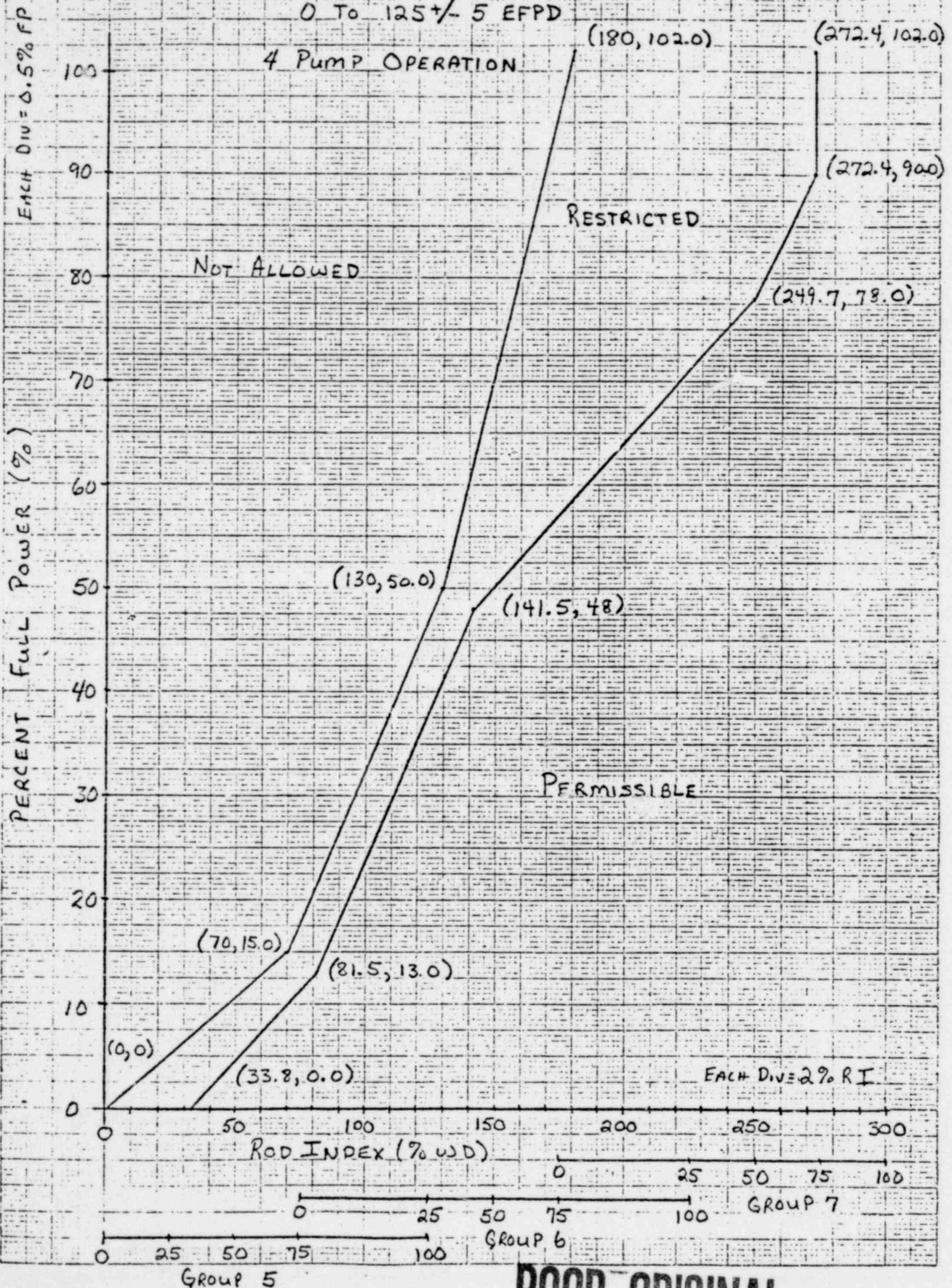
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# FIGURE 1A ERROR ADJUSTED ROD INSERTION LIMITS

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# FIGURE 1D ERROR ADJUSTED ROD INSERTION LIMITS

1301-1  
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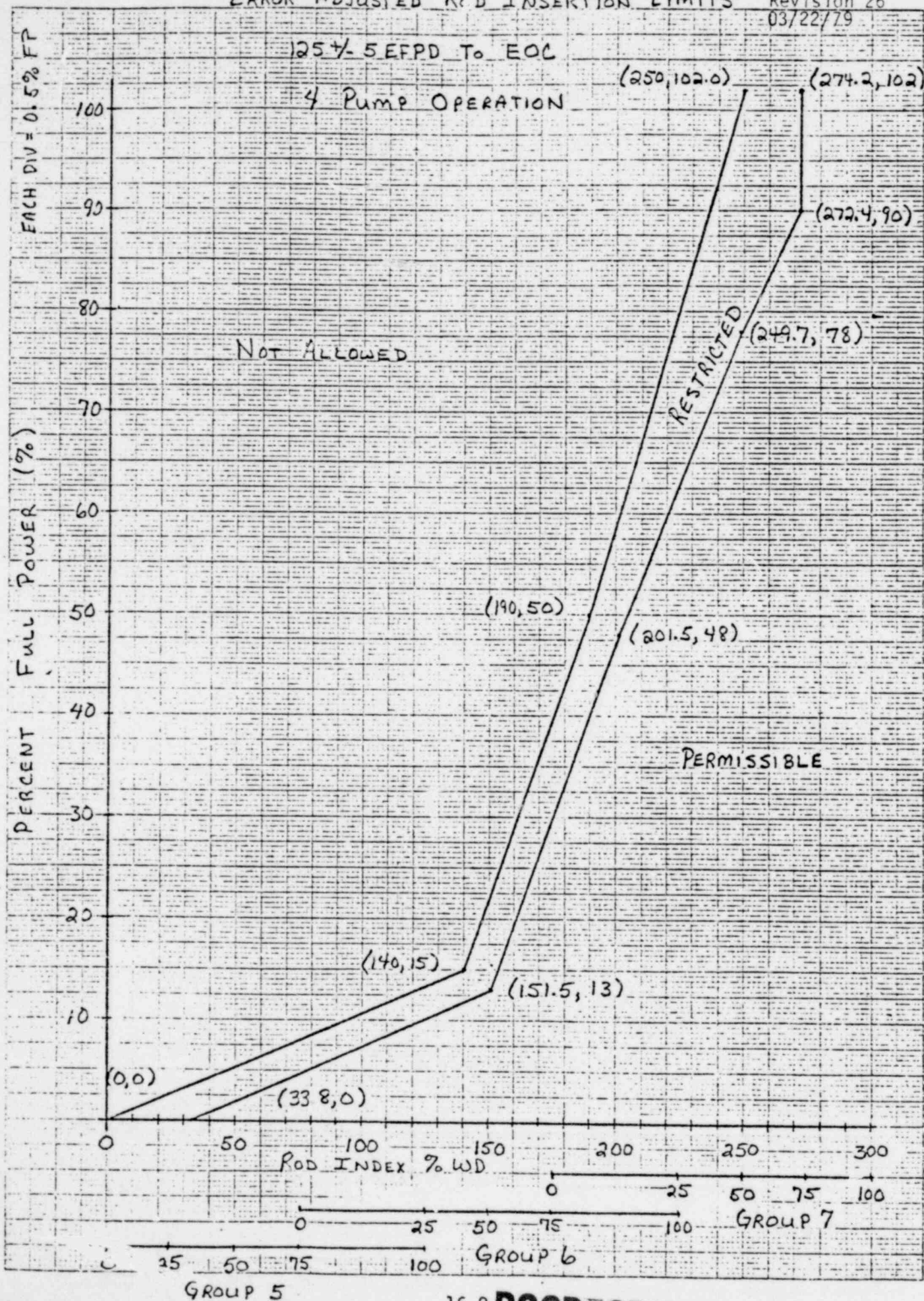
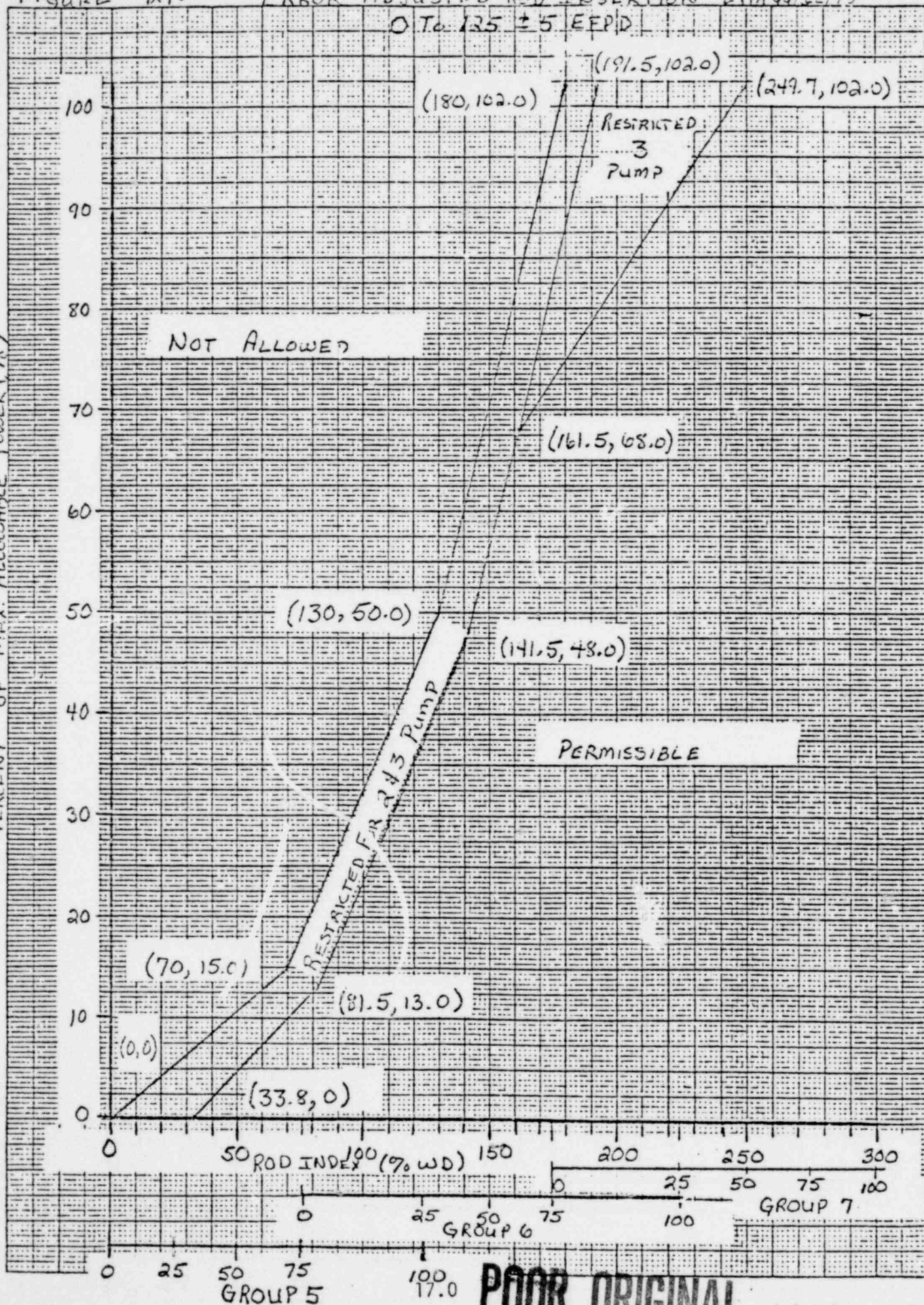




FIGURE 2A ERROR ADJUSTED ROD INSERTION Lim 93/22/79  
 0 To 135  $\pm 5$  EEPD

PERCENT OF MAX. ALLOWABLE POWER (%)



POOR ORIGINAL

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Figure 2B

12.5 ± 5 EFPD To EOC

TWO AND THREE PUMP OPERATION

(250, 102)

(261.5, 102.0)

NOT ALLOWED

PERMISSIBLE

RESTRICTED FOR 213 PUMP

(190, 50)

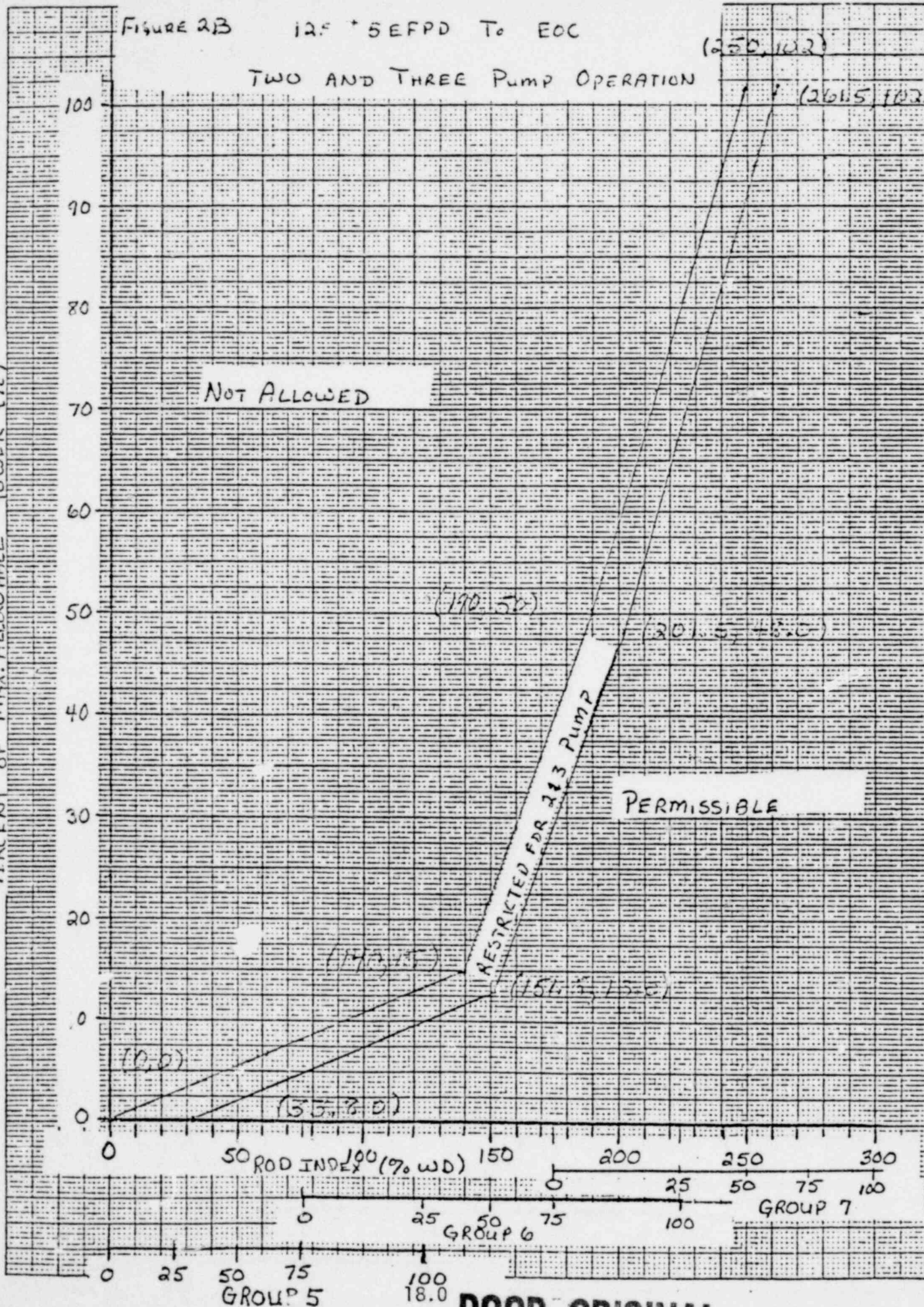
(201.5, 48.0)

(142, 15)

(156.5, 15.0)

(0, 0)

(55, 8.0)



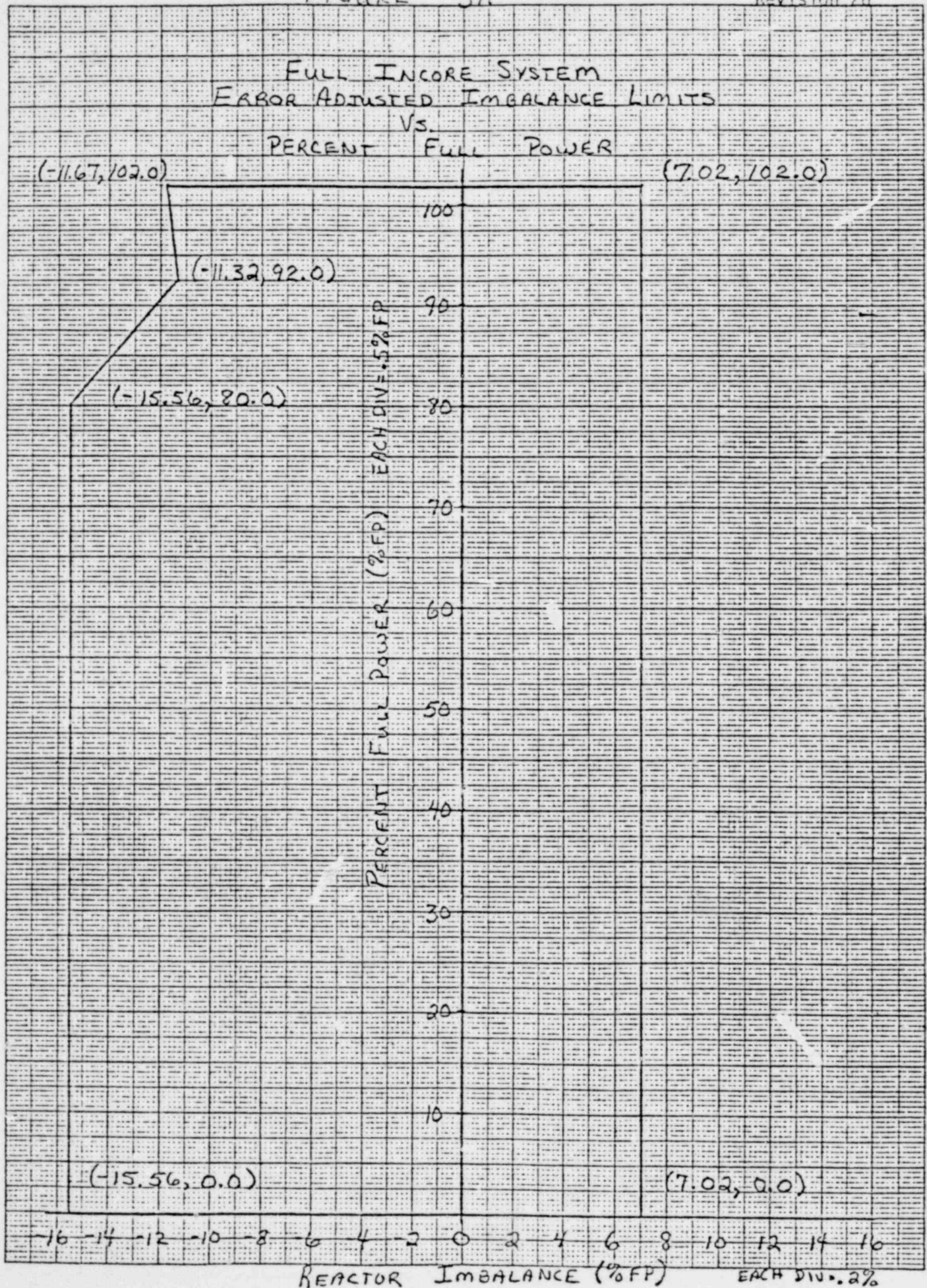
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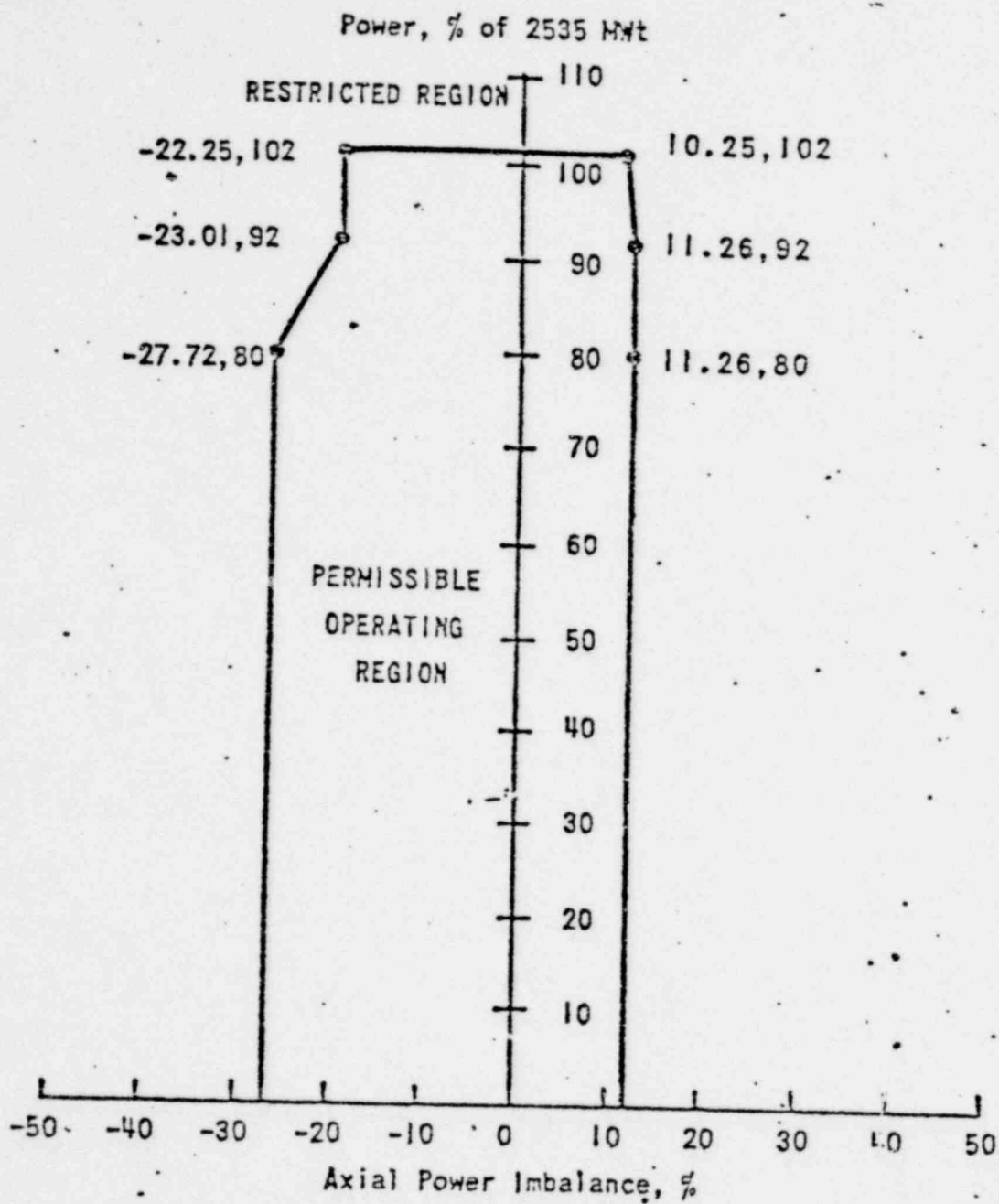
FIGURE 3A

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FIGURE 33



POWER IMBALANCE ENVELOPE FOR  
OPERATION FROM  $125 \pm 5$  TO  $265 \pm 15$  EFPD  
TMI-1, Cycle 4

Figure 3.5-2F



FIGURE 4

03/22/79

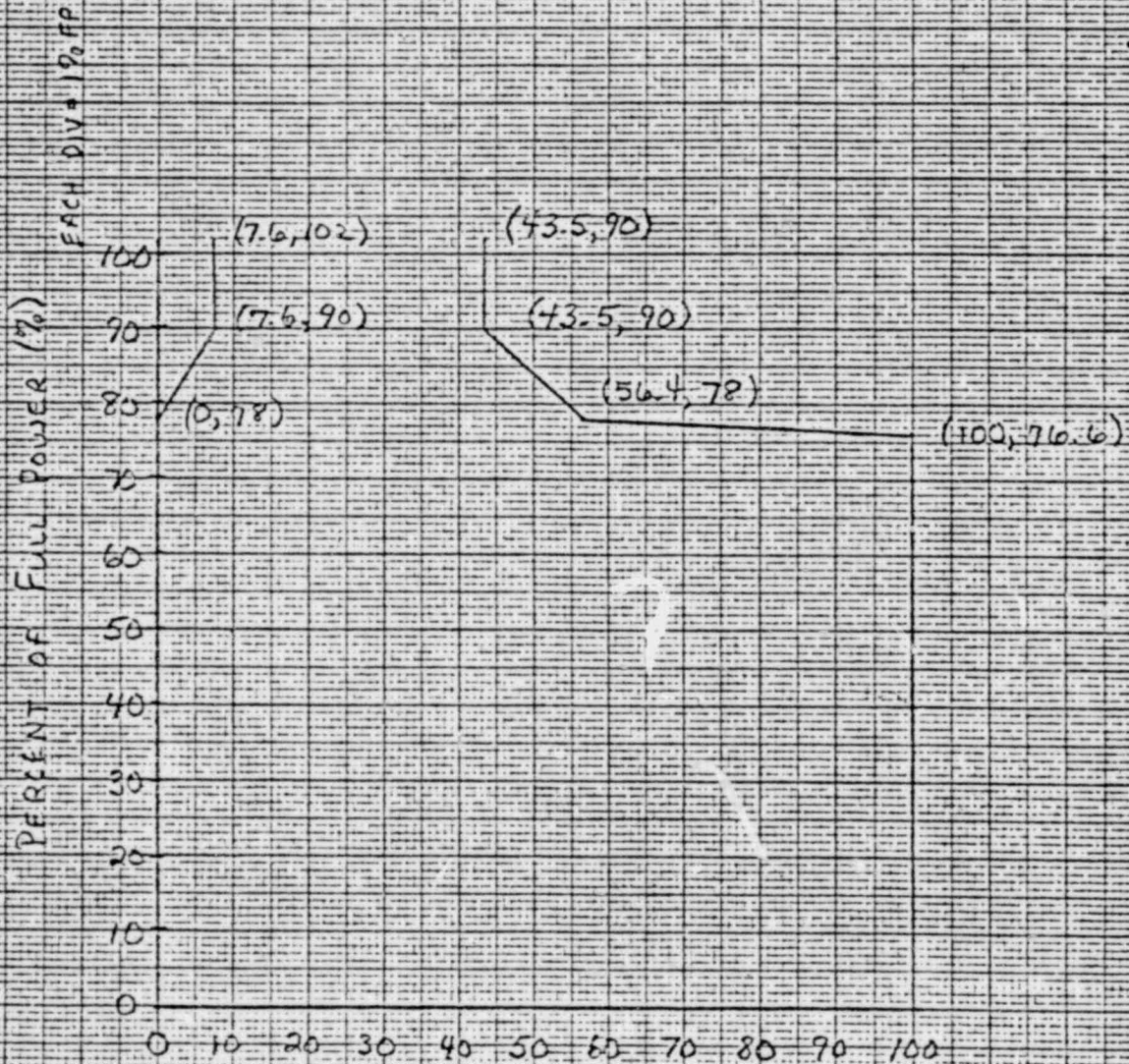
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CYCLE 5

APSR POSITION LIMITS  
OEEPT TO EOC

PERCENT WITHDRAWN  
VS  
PERCENT FULL POWER



POOR ORIGINAL

21.0.

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## SHIFT AND DAILY CHECKS

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RPS Cabinets	Designator	Sh	A	B	C	D	RPS Cabinets	Designator	Sh	A	B	C	D
Power Range % Power (T.S. 4.1.1.4)	Total $\phi$ Summation Amplifier	3					Flux Flow Comparator (T.S. 4.1.1.2)	$\Delta$ Flux % PWR — $\Sigma/\Delta$ AMP Total flow Buffer AMP	3				
		1							1				
		2							2				
		3	X	X					3				
Intermediate Range AMPS (T.S. 4.1.1.5)	Logarithmic Amplifier	1	X	X					1				
		2	X	X					2				
		3	X	X					3				
Intermediate Range DPM (T.S. 4.1.1.6)	Rate of Change Amplifier	1	X	X			Press Temp Comparator (T.S. 4.1.1.11)	Temp Signal Converter	1				
		2	X	X					2				
		3			X	X			3				
Source Range CPS (T.S. 4.1.1.7)	Count-Rate Amplifier	1			X	X			1				
		2			X	X			2				
		3			X	X			3				
Source Range DPM (T.S. 4.1.1.6)	Rate of Change Amplifier	1			X	X	Pump Flux Comparator (See note) (T.S. 4.1.1.12)	Contact Monitor	1	1 3	1 3	1 3	1 3
		2			X	X			2	2 4	2 4	2 4	2 4
		3			X	X			3	1 3	1 3	1 3	1 3
										2 4	2 4	2 4	2 4
										1 3	1 3	1 3	1 3
										2 4	2 4	2 4	2 4
										1 3	1 3	1 3	1 3
										2 4	2 4	2 4	2 4

Date Shift 3 2300-0700

Performed By \_\_\_\_\_

Approved By \_\_\_\_\_

NOTE: Circle the numbers corresponding to the bright lights shown on the Contact Monitor.

 Date Shift 1 0700-1500

Performed By \_\_\_\_\_

Approved By \_\_\_\_\_

Date \_\_\_\_\_

Shift 2 1500-2300

Performed By \_\_\_\_\_

Approved By \_\_\_\_\_

**POOR ORIGINAL**

## SHIFT AND DAILY CHECKS

(T.S. 4.1.1.8.9)

RPS Cabinet	A-Pt. 586			B-Pt. 588			C-Pt. 587			D-Pt. 589		
Shift	3	1	2	3	1	2	3	1	2	3	1	2
6.6.2 Computer Pt Values In PSIG												
6.6.3 R.C. Press Buffer Amps in PSIG												
6.6.4 In PSIG R.C. Press. NRW. RNG. Rec. Loop A from Cab A. Loop B from Cab B							Step 6.6.5 (cont'd) Digital Voltmeter to perform this step. Model Number      Serial Number _____					
6.6.5 "Scaled Output" Jacks on R.C. Press. Buffer Amps in V.D.C.												
6.6.6 Converted scaled output volts to RC Pressure in PSIG												

6.6.7 (c) Are values in step 6.6.2 or 6.6.6, whichever is applicable, within 20 PSIG of each other for:

Shift (3) \_\_\_\_\_ (yes/no). Shift (1) \_\_\_\_\_ (yes/no). Shift (2) \_\_\_\_\_ (yes/no).

(d) Are the values in step 6.6.3  $\leq \pm 24$  PSIG from the values in step 6.6.2 or Step 6.6.6 for:

Shift (3) \_\_\_\_\_ (yes/no). Shift (1) \_\_\_\_\_ (yes/no). Shift (2) \_\_\_\_\_ (yes/no).

(e) Are the values in step 6.6.4  $\leq \pm 24$  PSIG from the values in step 6.6.2 or Step 6.6.6 for:

Shift (3) \_\_\_\_\_ (yes/no). Shift (1) \_\_\_\_\_ (yes/no). Shift (2) \_\_\_\_\_ (yes/no).

7.4.1 Any "No" answer requires a work request to be generated and an appropriate entry on an "E&D Sheet".



## SHIFT AND DAILY CHECKS

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Absolute & Relative Rod Positions									(T.S.4.1.1.23 & 4.1.1.24)									Were the Rx. Bldg. Pers. &/or Emerg. Airlock's Outer Doors tested after their last use? (T.S.4.4.1.2.5b) Yes _____ No _____ If "No", were the door(s) tested within the past 24 hours. Yes _____ No _____ If "No" Do SP 1303-11.25. Date _____ Time _____	
2300-0700						0700-1500													
No.	Abs.	Rel.	No.	Abs.	Rel.	No.	Abs.	Rel.	No.	Abs.	Rel.	No.	Abs.	Rel.	No.	Abs.	Rel.		
1			24			47			1			24			47				
2			25			48			2			25			48				
3			26			49			3			26			49				
4			27			50			4			27			50				
5			28			51			5			28			51				
6			29			52			6			29			52				
7			30			53			7			30			53				
8			31			54			8			31			54				
9			32			55			9			32			55				
10			33			56			10			33			56				
11			34			57			11			34			57				
12			35			58			12			35			58				
13			36			59			13			36			59				
14			37			60			14			37			60				
15			38			61			15			38			61				
16			39			62			16			39			62				
17			40			63			17			40			63				
18			41			64			18			41			64				
19			42			65			19			42			65				
20			43			66			20			43			66				
21			44			67			21			44			67				
22			45			68			22			45			68				
23			46			69			23			46			69				

Shift 2300-0700

Date \_\_\_\_\_

PERFORMED BY \_\_\_\_\_

Shift 0700-1500

Date \_\_\_\_\_

PERFORMED BY \_\_\_\_\_

Shift 1500-2300

Date \_\_\_\_\_

PERFORMED BY \_\_\_\_\_

WARNING: Prior to placing RMS Interlock  
 Defeat Switch in Defeat, permission TMI UNIT NO. I 1301-1  
 must be granted by Shift Supv. &  
 entry must be made in Control Rm Log SHIFT & DAILY CHECKS

Absolute & Relative Rod Positions									Time	Daily Data								Reading			
1500-2300 (T.S.4.1.1.23 & 4.1.1.24)										(T.S.4.1.1.3) Power Range Recorder (T.S.4.1.1.27) Make-up Storage Tank Level (console) (E.T.S.)								circle NI-5 NI-6 one in			
No	Abs.	Rel.	No	Abs.	Rel.	No	Abs.	Rel.		Recorder - Panel Meter Comparison											
1			24			47			*RM-L6 Sensor Check (E.T.S.)							RM-L6					
2			25			48			*RM-A8 Sensor Check (E.T.S.)	P	I	G				RM-A8	P	I			
3			26			49			*RM-A9 Sensor Check (E.T.S.)	P	I	G				RM-A9	P	I			
4			27			50			*RM-A7 Sensor Check (E.T.S.)							RM-A7					
5			28			51			Pressurizer Level (T.S.4.1.1.26)	Sh	Sel	Read	Sel	Read	Sel	Read	Channel	C.S. Expected/PM	Background CPM		
6			29			52				3	1			2		3		RM-L6	1450		
7			30			53				1	1			2		3		RM-A8P	30		
8			31			54				2	1			2		3		RM-A8I	40		
9			32			55			Pressurizer Temperature (T.S.4.1.1.22)	3	1			2				RM-A8G	70		
10			33			56				1	1			2				RM-A8P	40		
11			34			57				2	1			2				RM-A9I	17		
12			35			58				3	loop A		loop B		Unit			RM-A9G	130		
13			36			59			R C Outlet Temperature (RC4-TR) (T.S.4.1.1.7)	1	A			B		"		RM-A7	145		
14			37			60				2	A			B		"		***	Final CPM	**	
15			38			61			*** (acceptable) * Definite Increase (yes/no)								RM-L6				
16			39			62			x(unacceptable) (if applicable; see note in step 6.2.2)								RM-A7				
17			40			63			*** Special Check. See text for Acceptance Criteria												
18			41			64			Sensor Check Acceptance Criteria - All Blanks "yes" or "N/A"												
19			42			65			Shift 2300-0700				Shift 0700-1500				Shift 1500-2300				
20			43			66			Date				Date				Date				
21			44			67															
22			45			68															
23			46			69			PERFORMED BY				PERFORMED BY				PERFORMED BY				

## SHIFT AND DAILY CHECKS

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				Console			0-10 Range		0-100 Range		7.5		
ESAS Bistable Cab.	Designator	Sh.	1	DI-V1 B/S	2	DI-V2 n/S	3	HI Press	3			CO <sub>2</sub> Tank for Relay Room	
HI & LO Press Inj.	Rx Press	3						RD 0-30#	1			Level PSI	
RC Press	Buffer Amp 0-2500	1						psig	2			7.5.1 7.5.2	
		2										( ) ( ) PSI	
									Sh	A1	B1	A2	B2
RB Emerg CLG & ISOL	Building Press Buffer	3		X		X		Core Flood Tank Press	3				
RB 4 PSIG	Amp 0-25 PSIA	1		X		X			1				
		2		X		X			2				
Channel	C.S. Expected (CPM)			Background				Core Flood Tank Level	3				
RM-A5	200								1				
RM-A5	Sensor Check								2				
Quadrant Power Tilt								Core Imbalance				Shift 2300-0700	
Power Range % Power (Console Indication)								$\Delta \phi$ (Console Indication)				Date /	
Time	NI-5	NI-6	NI-7	NI-8	Total	Ave.	QT 1 2 3 4	NI-5	NI-6	NI-7	NI-8	Performed By	
0000													
0200													
0400													
0600													
0800													
1000													
1200													
1400													
1600													
1800													
2000													
2200													
POOR ORIGINAL												PERFORMED BY	



DATA SHEET 2 pa 1  
REACTOR BUILDING TEMPERATURE DATA SHEET

(Tech Spec 4.19) When the reactor is critical)

1. Record temperatures from R.B. Temperature Recorder (Panel PLF).

PT	LOCATION	<sup>0</sup> F	PT	LOCATION	<sup>0</sup> F
1.	SE WALL ELEV 352	_____	13	NE WALL ELEV 314	_____
2.	NW SEC SH ELEV 352	_____	14	S WALL ELEV 314	_____
3.	NE SEC SH ELEV 352	_____	15	NW WALL ELEV 314	_____
4.	E WALL ELEV 382	_____	16	E SEC SHIELD ELEV 352	_____
5.	NE SEC SH ELEV 352	_____	17	S Rx WALL ELEV 321	_____
6.	NW SEC SH ELEV 352	_____	18	NE WALL ELEV 287	* _____
7.	NE SEC SH ELEV 352	_____	19	S WALL ELEV 287	* _____
8.	NW SEC GCH ELEV 352	_____	20	NW WALL ELEV 287	* _____
9.	NW WALL ELEV 352	_____	21	E SEC SHIELD ELEV 252	_____
10	E WALL ELEV 400	_____	22	NW SEC SHIELD ELEV 287	* _____
11	S SEC SH ELEV 352	_____	23	NE SEC SHIELD ELEV 364	_____
12	NW SEC SH ELEV 352	_____	24	N SEC SHIELD ELEV 364	_____

Avg Temp Above Elev 320 Calculation (required if any location is > 130<sup>0</sup>F)

Sum of Temperatures (Above Elev. 320) = \_\_\_\_\_ = \_\_\_\_\_<sup>0</sup>F Avg.

Avg Temp Below Elev 320 Calculation (required if any location is > 120)

\* Sum of Temperatures (Below Elev 320) = \_\_\_\_\_ = \_\_\_\_\_<sup>0</sup>F Avg.

\*\* If any detectors are inoperable, divide by the number of operable detectors, (15 required above elev 320, 3 required below elevation 320)

2. If avg temp above elevation 320 is greater than 130<sup>0</sup>F or if avg temp (below elev 320) is greater than 120<sup>0</sup>F the R.B. Emergency Cooling System shall be placed into operation to reduce temperatures. Also see Tech Spec 3.17

3. Forward copy of data sheet to Supervisor of Operations.

Performed by \_\_\_\_\_ RO/SRO Reviewed \_\_\_\_\_

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TMI-1 UNIT NO. 1

SHIFT AND DAILY CHECKS

Perform SP 1302-1.1

11-7 Shift

Performed By

7-3 Shift

Performed By

3-11 Shift

Performed By

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