ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket Nos.:	50-275; 50-323
License Nos.:	DPR-80; DPR-82
Report No.:	50-275/98-301; 50-323/98-301
Licensee:	Pacific Gas and Electric Company
Facility:	Diablo Canyon Nuclear Power Plant, Units 1 and 2
Location:	7 ½ miles NW of Avila Beach Avila Beach, California
Dates:	May 11-15, 1998
Inspector(s):	T. O. McKernon, Chief Examiner, Operations Branch S. L. McCrory, Examiner, Operations Branch H. F. Bundy, Examiner, Operations Branch M. E. Murphy, Examiner, Operations Branch T. R. Meadows, Examiner, Operations Branch R. E. Lantz, Examiner, Operations Branch
Approved By:	John L. Pellet, Chief, Operations Branch Division of Reactor Safety

ATTACHMENTS:

Attachment 1:	Supplemental Information
Attachment 2:	Facility Initial License Written Examination Comments
Attachment 3:	Final Written Examinations and Answer Keys (RO and SRO)

EXECUTIVE SUMMARY

Diablo Canyon Nuclear Power Plant, Units 1 and 2
NRC Inspection Report 50-275/98-301; 50-323/98-301

NRC examiners evaluated the competency of 6 reactor operator and 9 senior operator applicants for issuance of operating licenses at the Diablo Canyon Nuclear Power Plant facility. The licensee developed the initial license examinations using NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," Interim Revision 8. NRC examiners reviewed, approved, and administered the examinations. The initial written examinations were administered to all 15 applicants on May 8, 1998, by facility proctors in accordance with instructions provided by the chief examiner. The NRC examiners administered the operating tests on May 11-15, 1998.

Operations

- All applicants (9 senior operators and 6 operators) passed their license examinations (Sections O4.1).

- Overall good licensed operator applicant performance was observed during the initial license examinations. Effective communications and good peer checks were observed in the dynamic simulator scenarios (Section O4.2).

Plant Support

- Housekeeping and condition of external panels observed coincident with plant walkthroughs was good (Section F8.1).

Report Details

Summary of Plant Status

Both units operated at essentially 100 percent power for the duration of this inspection.

I. Operations

O4 Operator Knowledge and Performance

O4.1 Initial Written Examination

a. Inspection Scope

The licensee developed the written examination with dedicated training instructors on the security agreement and used facility training and operations staff on security agreement to validate the examination. The licensee proctored the administration of the written examination to the license applicants on May 8, 1998. The licensee staff proposed grading for the written examinations, analyzed the proposed results, and presented their evaluation and resultant draft comments for examination revision to the chief examiner on May 15, 1998. The licensee formally transmitted the examination comments to the NRC on May 19, 1998.

b. Observatons and Findings

The minimum passing score was 80 percent. All applicants (9 senior operators and 6 operators) passed with scores ranging from 80.6 to 92.8 percent for the reactor operators, with an average score of 86.5 percent, and scores ranging from 83.6 to 92.8 percent for the senior reactor operators, with an average of 88 percent. The NRC specifically notified the licensee learning services representative of two individuals, who passed with scores of 80.6 and 81.6 percent, for consideration of additional enhancement or remedial training. The grades reflected the results after examination changes recommended by the licensee as a result of post-examination question analysis were incorporated.

The licensee provided comments and the appropriate references for four questions. Two questions were recommended for deletion: RO Question 9 (SRO Question 12) because no correct answer was listed; RO Question 72 (SRO Question 75) because three of the choices were correct answers. One question was revised to accept two correct answers; RO Question 11(SRO Question 14.) The fourth question was revised to accept answer B in lieu of A as the correct answer; RO Question 47 (SRO Question 54.) The chief examiner reviewed and accepted these recommendations based on the technical merits of each recommendation and the material references provided by the licensee. The licensee's submitted examination comments are included as Attachment 2 to this inspection report.

In addition to the above, while proctoring the written examination the licensee revised a technical error in the stem of RO Question 26 (SRO Question 32) by changing the term "Mode 5" to "Mode 6." All applicants taking the examination were orally advised of the change. No other questions asked during the examination resulted in changes to the examination.

The licensee's post-examination test analysis indicated that more than half of the applicants missed the same 13 questions. Two of the questions were procedures related; 5 questions were plant systems related (all different systems); and 6 questions were generic in subject. The chief examiner determined that there were no significant interrelationships to indicate generic weaknesses in knowledge or ability. The licensee stated that all missed questions would be reviewed with the individuals as part of the training department's remediation prior to assuming shift watch.

c. Conclusions

All applicants passed the written examination.

O4.2 Initial Operating Test

a. Inspection Scope

The examination team administered the various portions of the operating test to the 15 applicants between May 11-15, 1998. Each applicant participated in two or three dynamic simulator scenarios and received a walkthrough test, which consisted of ten system job performance tasks (except for the 1 reactor operator upgrading his license to senior operator, who performed five tasks), together with two followup questions for each system. Additionally, each applicant was tested on five subjects in four administrative areas by answering two questions or performing one task for each subject.

b. Observations and Findings

The examiners observed effective communications and good peer checks of control board activities during the dynamic simulator scenarios. Good plant and component awareness was observed during the walkthrough portion of the operating tests. The crews utilized effective two-way communications.

Applicants displayed good knowledge of the location and operation of local plant components. With one exception, the applicants responded accurately to the walkthrough followup questions, which indicated a depth of associated system knowledge. The one exception involved the system effect and failure position of Letdown System Valve PCV-135 upon loss of its air supply. More than 50 percent of the applicants answered this question incorrectly, which indicated an isolated knowledge weakness of failure positions for air operated valves. The question was required to be answered without the use of references. The licensee stated that all applicants would have this information reviewed with them prior to assuming shift duties.

c. Conclusions

All applicants passed all sections of the operating test. Effective communications and good peer checks were observed during the dynamic simulator scenarios. Overall, good operator performance was observed during the examination.

O5 Operator Training and Qualification

O5.1 Initial Licensing Examination Development

The licensee developed the initial licensing examination in accordance with NUREG-1021.

O5.1.1 Examination Outline

a. Inspection Scope

The licensee submitted the initial examination outline on February 9, 1998. The examiners reviewed the submittal against the requirements of NUREG-1021.

b. Observations and Findings

The chief examiner provided only minor enhancement suggestions related to a balanced mix of malfunctions and power maneuvers in the dynamic simulator scenarios. Some other minor enhancements were suggested to the scenarios to ensure that senior operator applicants were evaluated in exercising the facility's technical specification.

c. Conclusions

The licensee's examination outline was acceptable. However, minor enhancements suggested by the chief examiner were incorporated.

O5.1.2 Examination Package

a. Inspection Scope

The licensee submitted the initial examination package on March 11, 1998. The chief examiner reviewed the submittal against the requirements of NUREG-1021.

b. Observations and Findings

The licensee submitted 126 draft written examination questions, of which 74 were designated to be common to both the reactor operator and senior operator examinations. The chief examiner provided comments or questions on 20 reactor operator examination items and 21 senior operator examination items; 4 questions were common to both examinations. In resolving these comments, the licensee revised or replaced 11 questions. The remaining questions were found to be satisfactory. The majority of

the chief examiner's comments were enhancements and not considered substantive. The examinations were acceptable for administration as submitted. As discussed in Section O4.1, following post-examination review, credit was given for 2 questions on both the reactor operator and senior operator examinations. Further, credit for multiple answers on 1 question was allowed on both examinations and on another question the correct answer was changed. The failure to make these changes would not have invalidated the examinations or degrade their discriminatory value. The examinations were considered acceptable for administration as submitted.

The licensee submitted three sets of operating tests, which included a total of 30 job performance measures, 3 administrative tests, 8 scenarios, and 2 backup scenarios. The submitted scenarios were considered acceptable for administration. However, some enhancement suggestions were incorporated during the validation week to add better balance to the scenarios and ensure evaluated senior operator applicants exercised the facility's technical specification? The submitted facility walkthrough subsection of the examination discriminated at the required level. Some enhancement suggestions were incorporated to better facilitate the test administration and focus the initiating cues on the desired tasks. Some of the job performance followup questions were revised or replaced to avoid ~~a few~~ direct lookup type questions and to better define the acceptance criteria for questions requiring multiple answers. While some enhancements and revisions to the operating tests were made, the number of revisions were few and the changes did not impact administering the examination.

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Final revisions to the examination were completed during the preparation week and prior to the examination week. The licensee's training department and operations department provided excellent support during the development and administration of the examination.

c. Conclusions

The licensee submitted an acceptable examination for administration to operator license applicants. Only minor enhancements were made to the submittal before and during the onsite preparation week. The facility provided excellent support during the development and administration of the examination.

O5.2 Simulation Facility Performance

The examiners observed simulator performance with regard to fidelity during the examination validation and administration. The simulation facility supported the examination administration well. No problems were observed.

IV. Plant Support

F8 Miscellaneous Fire Protection Issues

F8.1 General Comments

The examiners observed good plant housekeeping and condition of external panels coincident with the inplant walkthrough portion of the examination. The facility was reasonably clean, well lighted, and the floors were clear and free of debris.

V. Management Meetings

X1 Exit Meeting Summary

The examiners presented the inspection results to members of the licensee management at the conclusion of the inspection on May 15, 1998. The licensee acknowledged the findings presented.

The licensee did not identify as proprietary any information or materials examined during the inspection.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

S. Kettlesen, Supervisor, Licensing
G. Goelzer, Acting Operations Director
T. Blake, Learning Services Director
D. Burns, Training Instructor
J. Buckley, Training Instructor
R. Jett, Training Leader
J. Haynes, Training Leader
J. Molden, Operations Manager
B. Garrett, Operations Director
D. Christensen, Engineer
B. McRory, Instructor
J. Becerra, Instructor
R. Burnside, Engineer

ATTACHMENT 2
Facility Initial License Written Examination Comments

Question #		Question	Recommendation	Justification
RO	SRO			
9	12	Given the following: • Operators are performing EOP ECA-2.1, "Uncontrolled Depressurization of All Steam Generators." • Cooldown rate is 200°F per hour. • Steam Generator levels range from 1% to 3% NR level. WHICH ONE (1) of the following is the reason for maintaining a MINIMUM of 25 gpm AFW flow to each steam generator in this condition? a. To provide AFW pump minimum recirc flow requirements. b. To minimize the potential water hammer by maintaining a minimum flow through the feed ring J tubes. c. To keep the S/G tubes covered while ensuring the minimum detectable feed flow is maintained. d. To conserve CST inventory until the end of the blowdown phase. ANSWER: c.	No correct answer. Delete question from both exams.	Per ECA 2.1 Background document AFW flow is reduced to 25 gpm per Steam Generator to prevent "Dryout." Keeping the tubes covered implies 4% water level in the Faulted Steam Generator (see attached reference).

Written Examination Comments (cont'd)

Question #		Question	Recommendation	Justification
RO	SRO			
11	14	Given the following: At 0803, the following conditions exist: • Reactor power = 56% • Condenser pressure = 4.0 inches Hg. At 0806, it is reported that the following conditions exist: • Reactor power = 50% • Condenser pressure = 5.0 inches Hg. WHICH ONE (1) of the following describes the MINIMUM action(s) required to be taken at 0806? a. Continue to reduce turbine load. b. Stabilize turbine load and start the vacuum pump. c. Immediately trip the turbine. d. Immediately trip the reactor. ANSWER: a.	Accept A & B as correct answers for both exams.	Per the RNO column of AP -7 "Degraded Condenser" both answer A and distracter B can be done, Turbine load is reduced "as necessary" since Condenser pressure is still in the Acceptable Operating Range, per Foldout page of AP-7 and the condenser Vacuum pump is placed inservice (see attached reference).

Written Examination Comments (cont"d)

Question #		Question	Recommendation	Justification
RO	SRO			
47	54	Given the following: • The unit is at 30% power. • RCP 1-2 trips. • NO operator action is taken. WHICH ONE (1) of the following describes the INITIAL unit response to the RCP trip? a. A reactor trip will NOT occur and S/G 1-2 water level will INCREASE. b. A reactor trip will NOT occur and S/G 1-2 water level will DECREASE. c. A reactor trip WILL occur and S/G 1-2 water level will INCREASE. d. A reactor trip WILL occur and S/G 1-2 water level will DECREASE. ANSWER: a.	Change correct answer to B instead of A for both exams.	When a RCP trips, loop flow goes down in that loop which affects heat transfer into the Steam Generator (S/G). Less heat into the S/G means lower boiling rate, so steam pressure drops, until the Main Steam Line Isolation Check Valve closes. This drop in boiling rate causes smaller steam bubble formation and S/G level drops until steam flow also drops. The initial response is a decrease in S/G water level, not an increase. Additionally reverse flow will not occur until the RCP has coasted down (see attached reference).

Written Examination Comments (cont'd)

Question #		Question	Recommendation	Justification
RO	SRO			
72	75	Given the following: • Unit is at 100% power. • Reactor protection system (RPS) testing is in progress. • Train "B" reactor trip breaker is CLOSED. • Train "B" bypass breaker is CLOSED. • Train "A" reactor trip breaker is OPEN. • Train "A" bypass breaker is OPEN. WHICH ONE (1) of the following is the system response following a spurious reactor trip signal and Bypass Breaker Train "B" fails to open? a. A Feedwater Isolation Signal will NOT be initiated by Train "A." b. If an SI occurs and the signal is RESET, an automatic reinitiation of SI would NOT be prevented. c. The Turbine Generator remains on line and must be manually tripped. d. Condenser steam dumps receive an open signal, but do NOT arm. ANSWER: b.	Multiple correct answers (3). Delete question from both exams.	Since Bypass breaker A does not open no P-4 train A signal is generated. This makes distractors A and D also correct answers (see attached reference).

Pacific Gas and Electric Company

Diablo Canyon Power Plant
P.O. Box 56
Avila Beach, CA 93424
805/545-6000

Robert P. Powers
Vice President–Diablo Canyon
Operations and Plant Manager

May 20, 1998

PG&E Letter DCL-98-074

Thomas O. McKernon, Chief Examiner
U.S. Nuclear Regulatory Commission, Region IV
611 Ryan Plaza Dr., Suite 400
Arlington, TX 76011-8064

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Power Plant Units 1 and 2
NRC License Written Examination Formal Comments

Dear Mr. McKernon:

In accordance with NUREG 1021, Interim Revision 8, PG&E is providing the enclosed formal comments on the written examination administered to Diablo Canyon Power Plant license candidates on May 8, 1998.

PG&E appreciates the NRC staff efforts during the entire examination and review cycle.

If you have any questions, please contact Roger Jett, Operations Training Supervisor, at (805) 545-3439.

Sincerely,

Robert P. Powers

Enclosures

cc: Joseph M. Haynes
Roger L. Jett
David L. Proulx

TLH/1753

May 1998 Diablo Canyon
Written Examination Formal Comments

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9	12	Given the following: • Operators are performing EOP ECA-2.1, "Uncontrolled Depressurization of All Steam Generators." • Cooldown rate is 200°F per hour. • Steam Generator levels range from 1% to 3% NR level. WHICH ONE (1) of the following is the reason for maintaining a MINIMUM of 25 gpm AFW flow to each steam generator in this condition? a. To provide AFW pump minimum recirc flow requirements. b. To minimize the potential water hammer by maintaining a minimum flow through the feed ring J tubes. c. To keep the S/G tubes covered while ensuring the minimum detectable feed flow is maintained. d. To conserve CST inventory until the end of the blowdown phase. ANSWER: c.	No correct answer. Delete question from both exams.	Per ECA 2.1 Background document AFW flow is reduced to 25 gpm per Steam Generator to prevent "Dryout." Keeping the tubes covered implies 4% water level in the Faulted Steam Generator (see attached reference).

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May 1998 Diablo Canyon
Written Examination Formal Comments

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Attachment
PG&E Letter DCL 98-074

Reference Material

STEP: CONTROL Feedflow To Minimize RCS Cooldown

PURPOSE: To control feedflow to minimize the effects of the cooldown due to the secondary depressurization and to subsequently control the transient.

BASIS:

Depending upon the size of the effective break areas for the S/Gs, the cooldown rate experienced after reactor trip could exceed 100°F/hr. A reduction of feedflow to the S/Gs three primary effects:

1) To minimize any additional cooldown resulting from the addition of feedwater,
2) To prevent S/G tube dryout by maintaining a minimum feedflow to the S/Gs, and
3) To minimize the water inventory in the S/Gs that eventually is the source of additional steam flow to containment or the environment.

The 25 gpm value is representative of a minimum measurable feedflow to a S/G. Values depend upon flow instrumentation and the sensitivity of the controls on the feedflow.

As steam flow rate drops, the feedflow will eventually increase the S/G inventory. Feedflow is controlled to maintain S/G NR level less than 44% to prevent overfeeding the S/Gs.

In addition, as S/G pressure and steam flow rate drop, RCS hot leg temperatures will stabilize and start increasing. The operator controls feedflow or dumps steam to stabilize the RCS hot leg temperature. The operator controls feedflow or dumps injection flow to establish conditions for SI termination and minimizes thermal stresses that may be generated.

ACTIONS:

- Determine if NR level in all S/G greater than 4%[20%]
- Determine if cooldown rate in RCS cold legs is less than 100°F/hr
- Determine if NR level in all S/Gs is less than 44%
- Determine if RCS hot leg temperatures are stable or decreasing
- Decrease feedflow to 25 gpm to each S/G
- Control feedflow to maintain NR level less than 44% in all S/Gs
- Control feedflow or dump steam to stabilize RCS hot leg temperatures

INSTRUMENTATION:

- RCS cold leg temperature indication
- RCS hot leg temperature indication
- S/G NR level indication
- Total feedflow indication
- Feedflow control valve position indication
- Steam dump valve position indication
- S/G 10% steam dump valve position indication

SECTION A: LOSS OF CONDENSER VACUUM (Continued)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

****

CAUTION: If both CWPs are lost, Attachment 4.1 should be implemented after EOP E-0 is performed.

****

1.	CHECK Condenser Parameters - NORMAL:		
a.	Condenser Pressure LESS THAN 7" Hg ABS	a.	Trip the Turbine and GO TO EOP E-0 (if applicable)

****

CAUTION: If turbine power is reduced to less than 30%, condenser pressure requirements are more restrictive. Refer to Foldout Page.

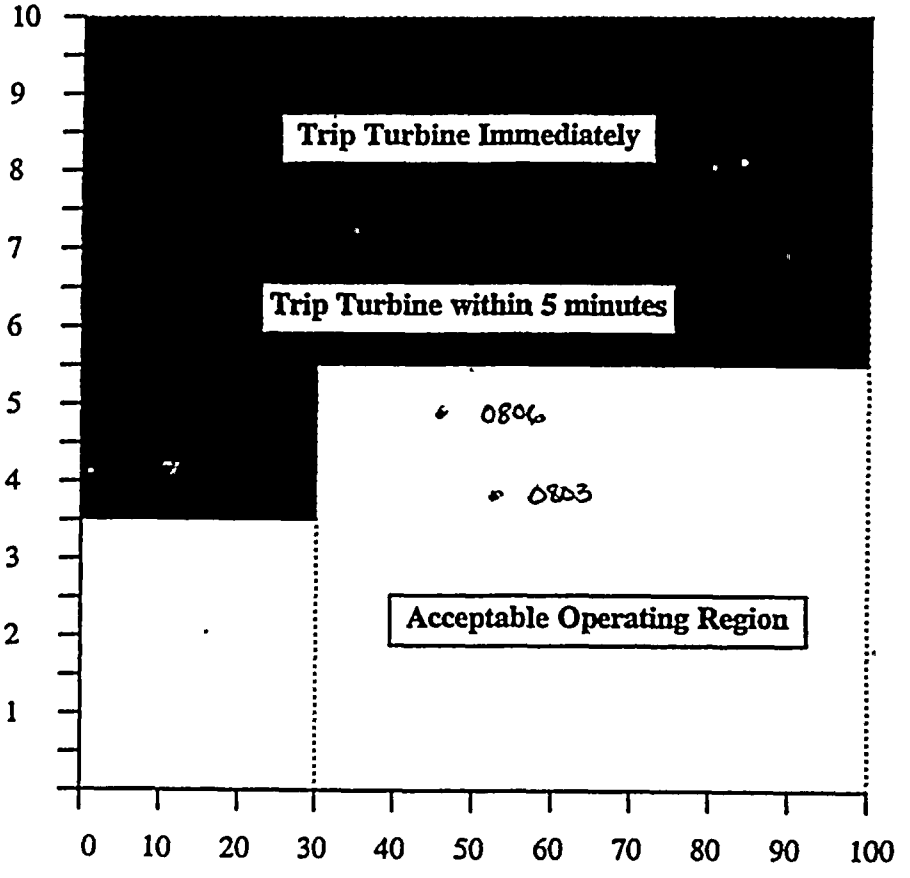
****

b.	Condenser Pressure LESS THAN 3.5" Hg ABS	b.	REDUCE Unit load as necessary to remain within the operating limitations of the Foldout Page. IF Condenser Pressure exceeds the Foldout Page limitations, THEN Trip the Turbine and GO TO EOP E-0 (if applicable)
c.	Condenser Pressure LESS THAN 4" Hg ABS	c.	IF Condenser Pressure continues to INCREASE, THEN Place the Vacuum pump on the affected Unit per OP C-6:I, Attachment 9.1.
2.	CHECK SJAE After Condenser Vent Flow (FR-81): NORMAL (LESS THAN 15 SCFM at 100% Power)		Investigate cause of air inleakage AND valve in additional Air Ejectors per OP C-6:I.

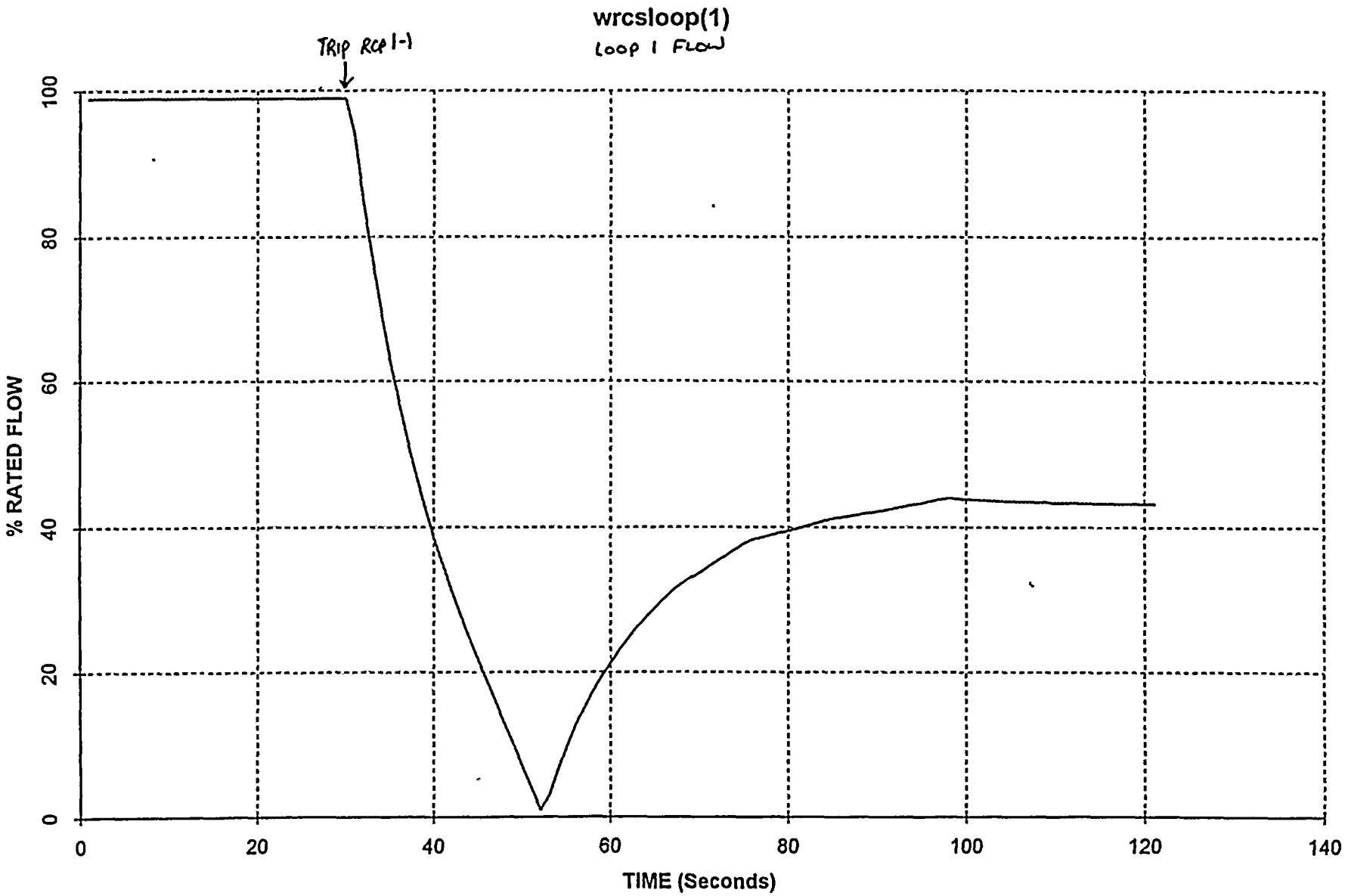
FOLDOUT PAGE FOR OP AP-7

Turbine Operating Limitations

Condenser Pressure, in Hg Abs



Turbine Load, %



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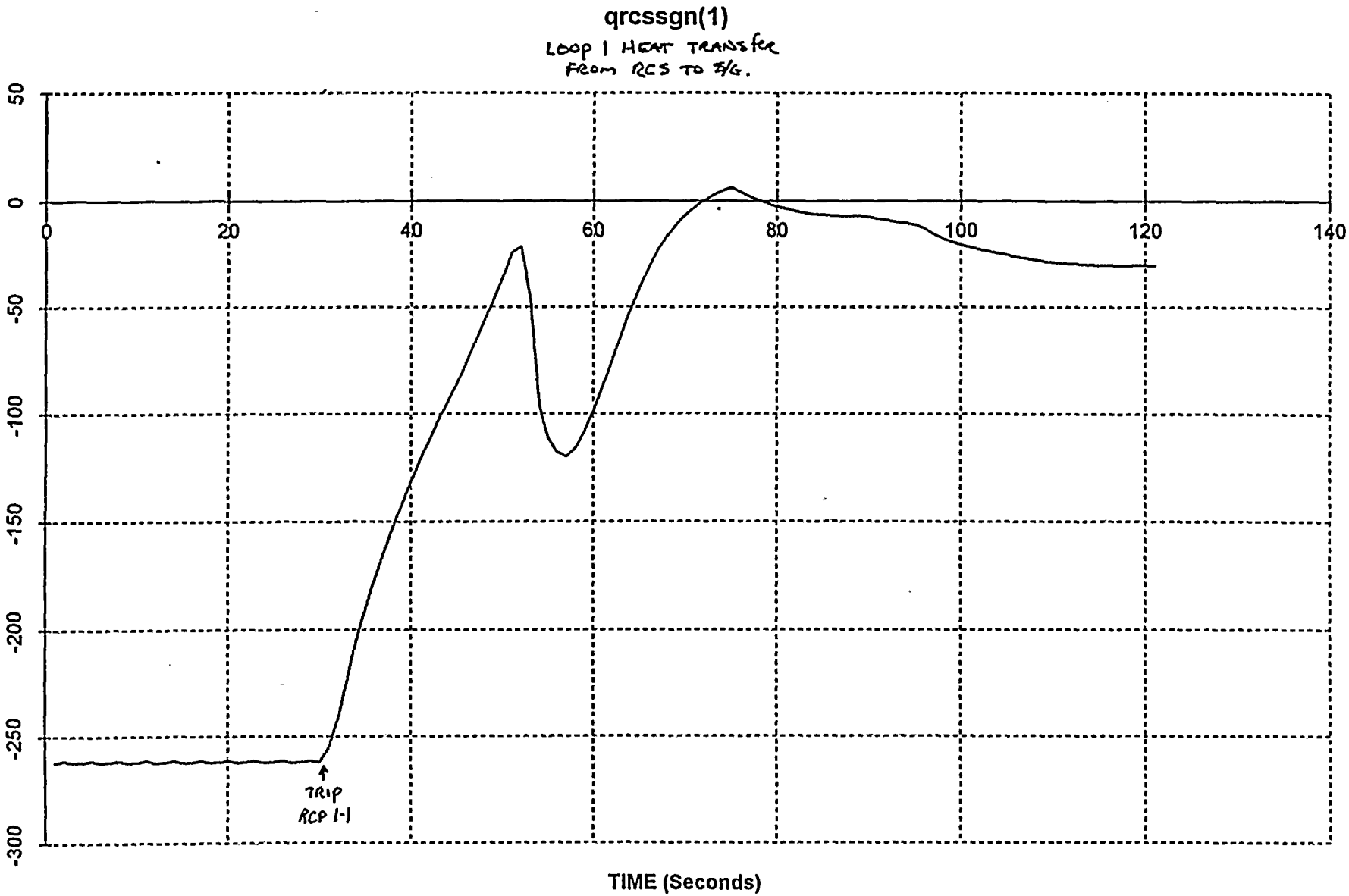

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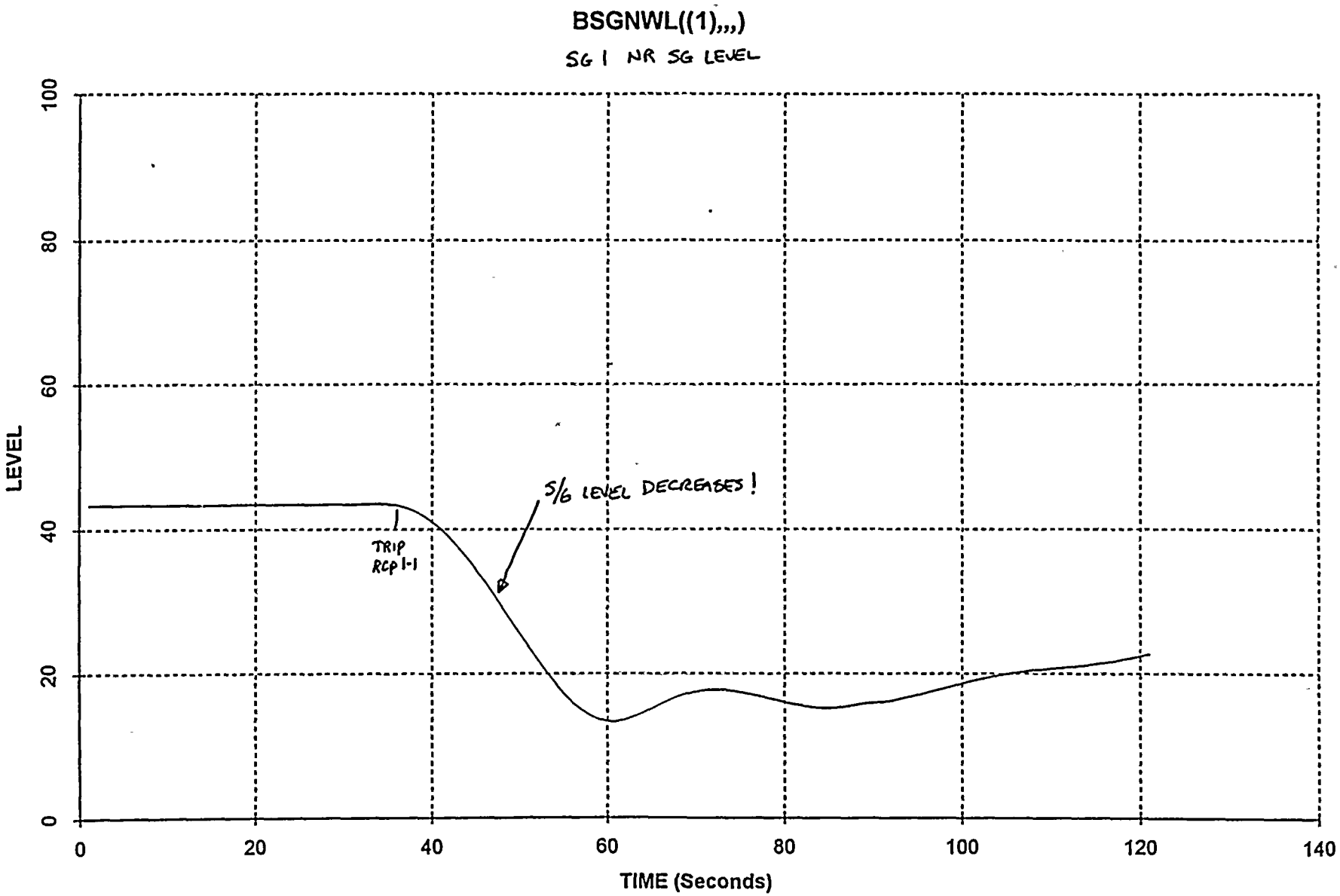

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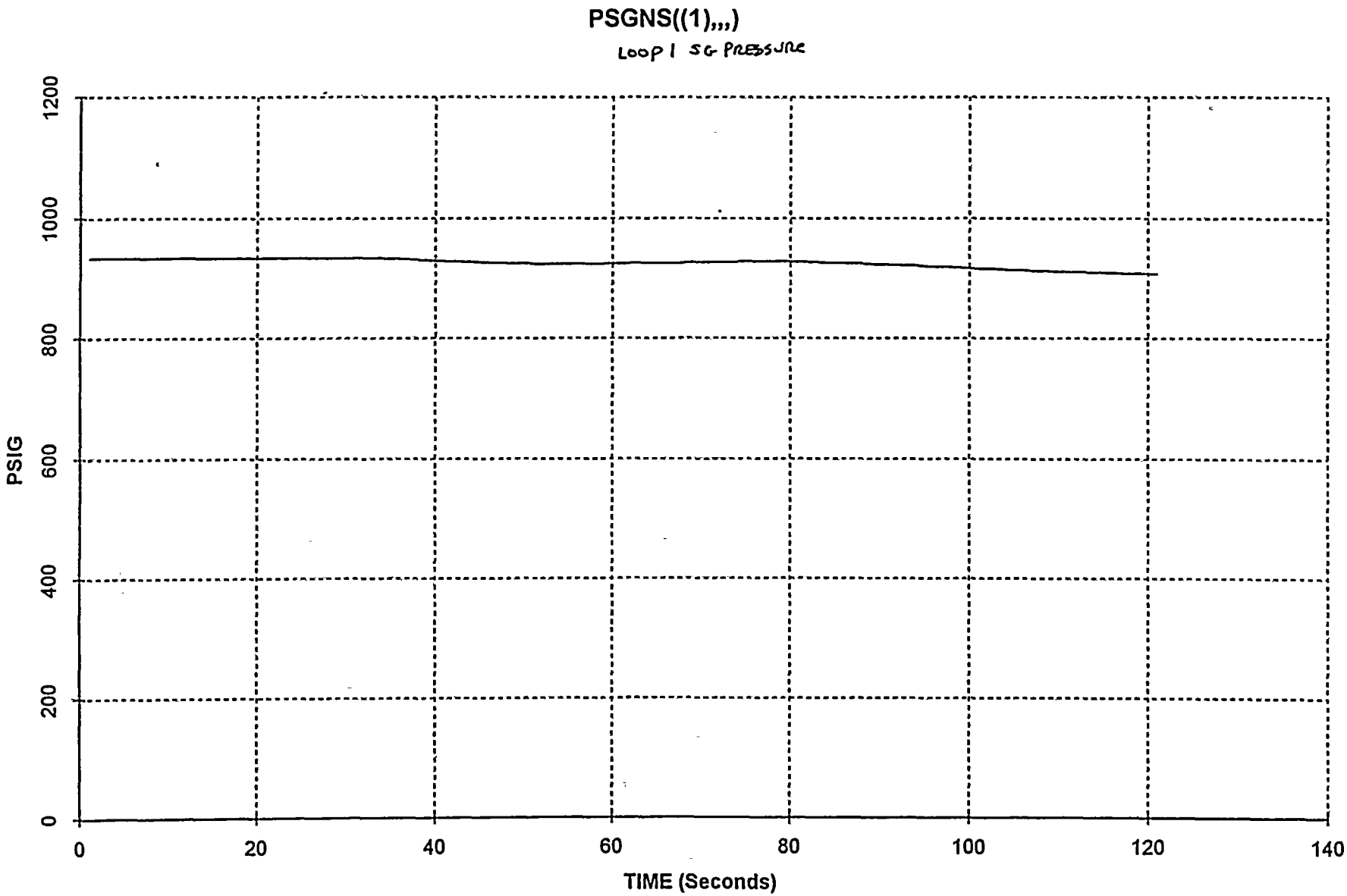
E rcp trip a[illegible] power



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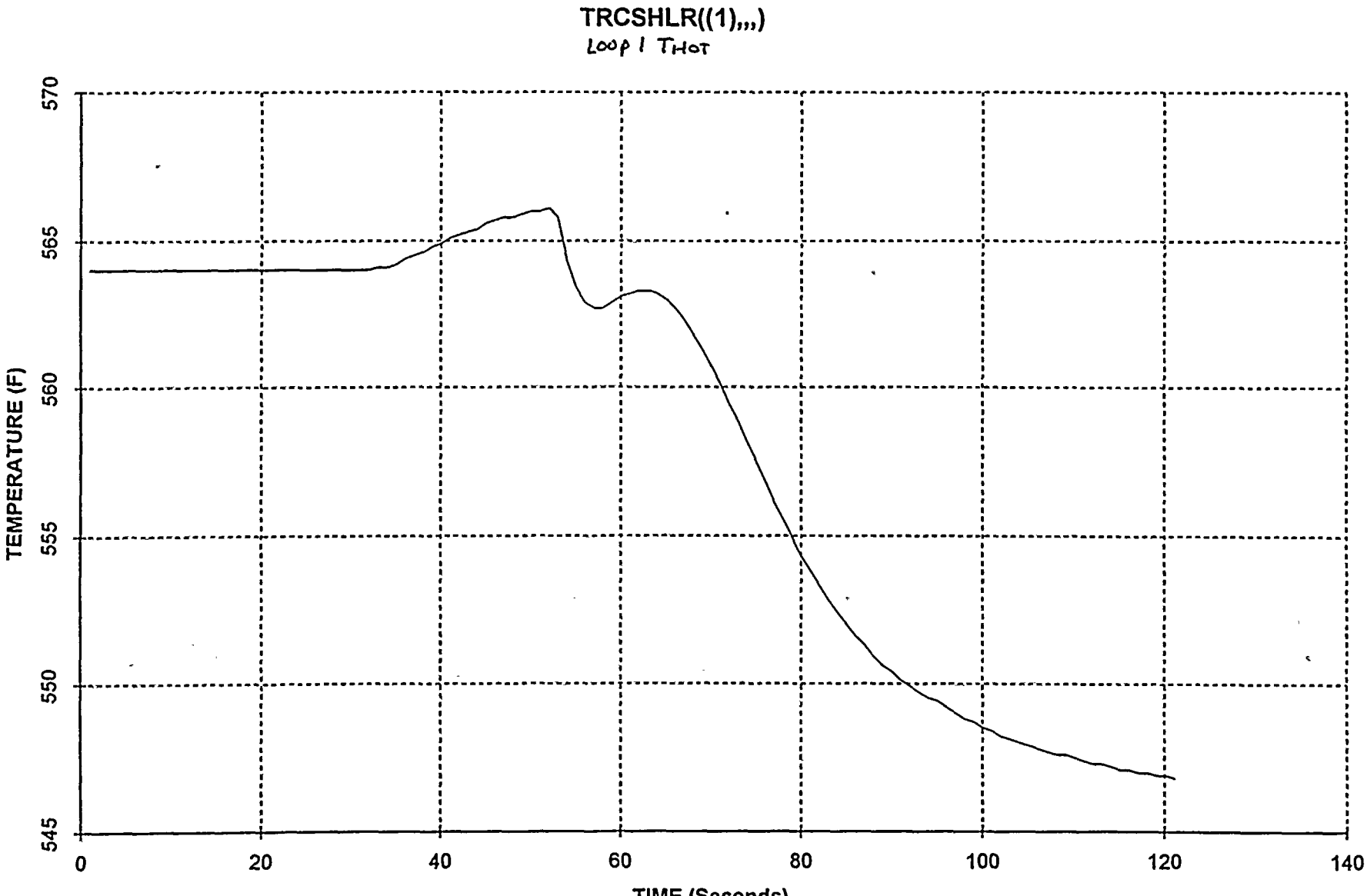
E rcp trip at power



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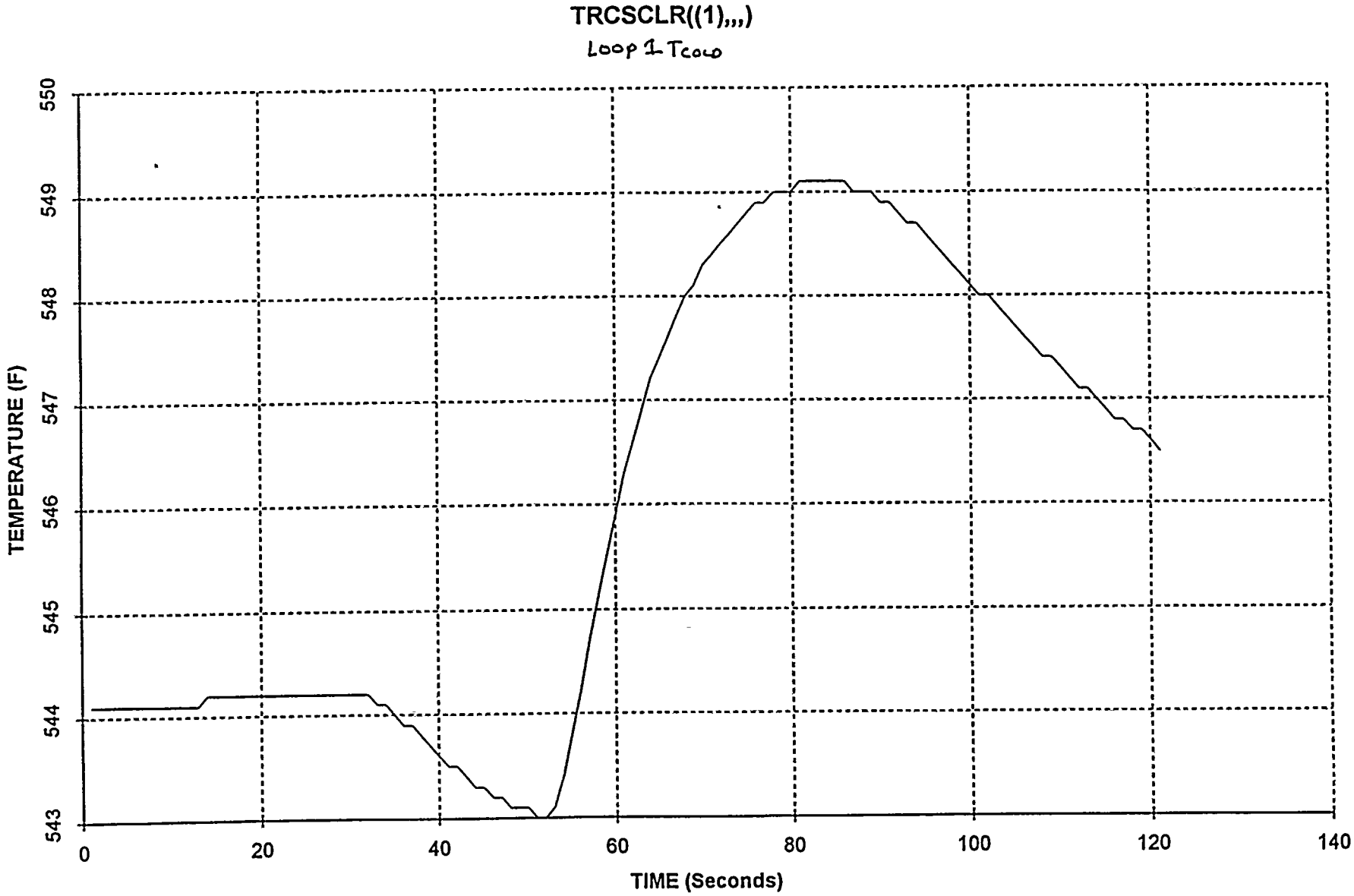

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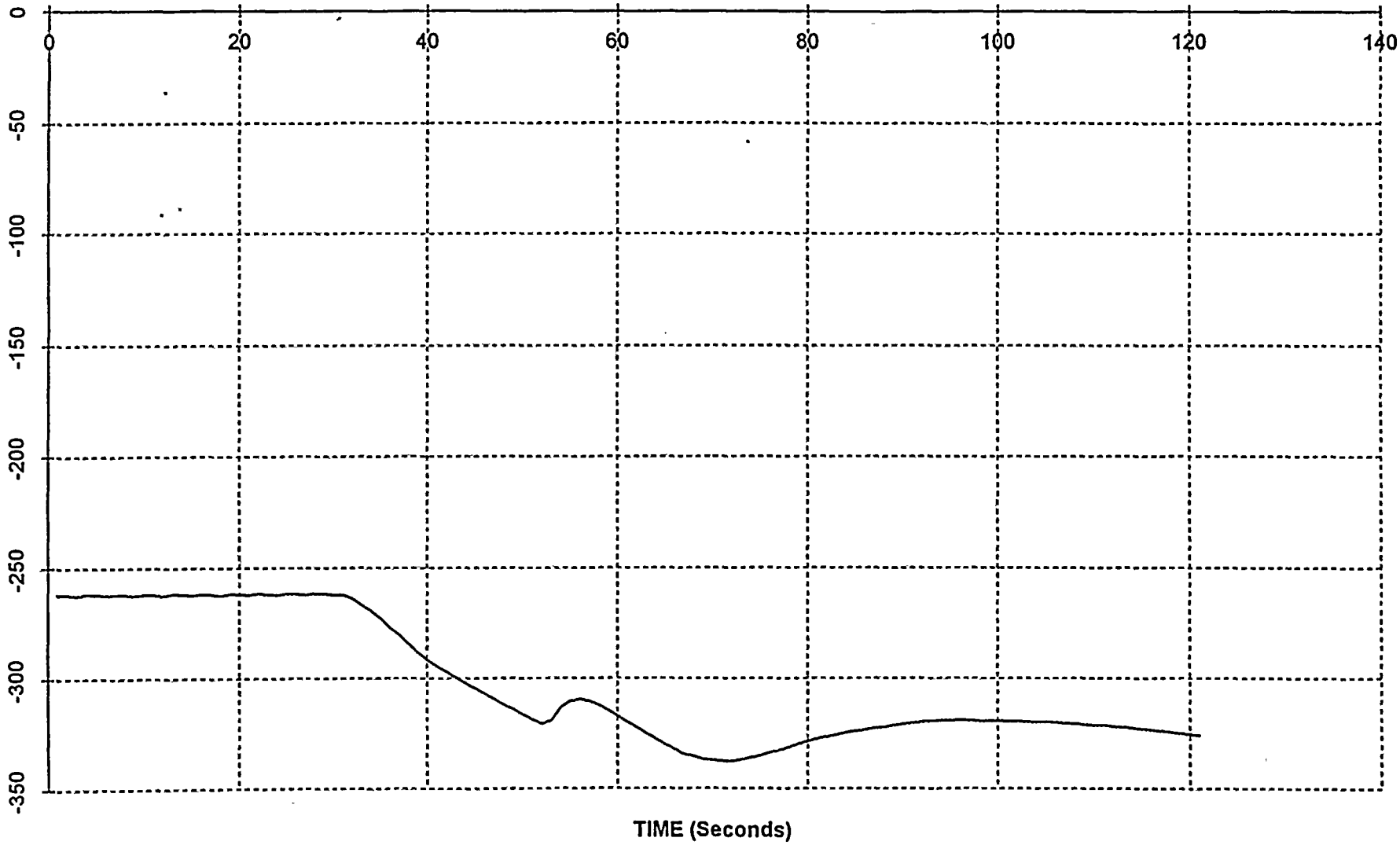
E rcp trip a[redacted] power

qrcssgn(2)



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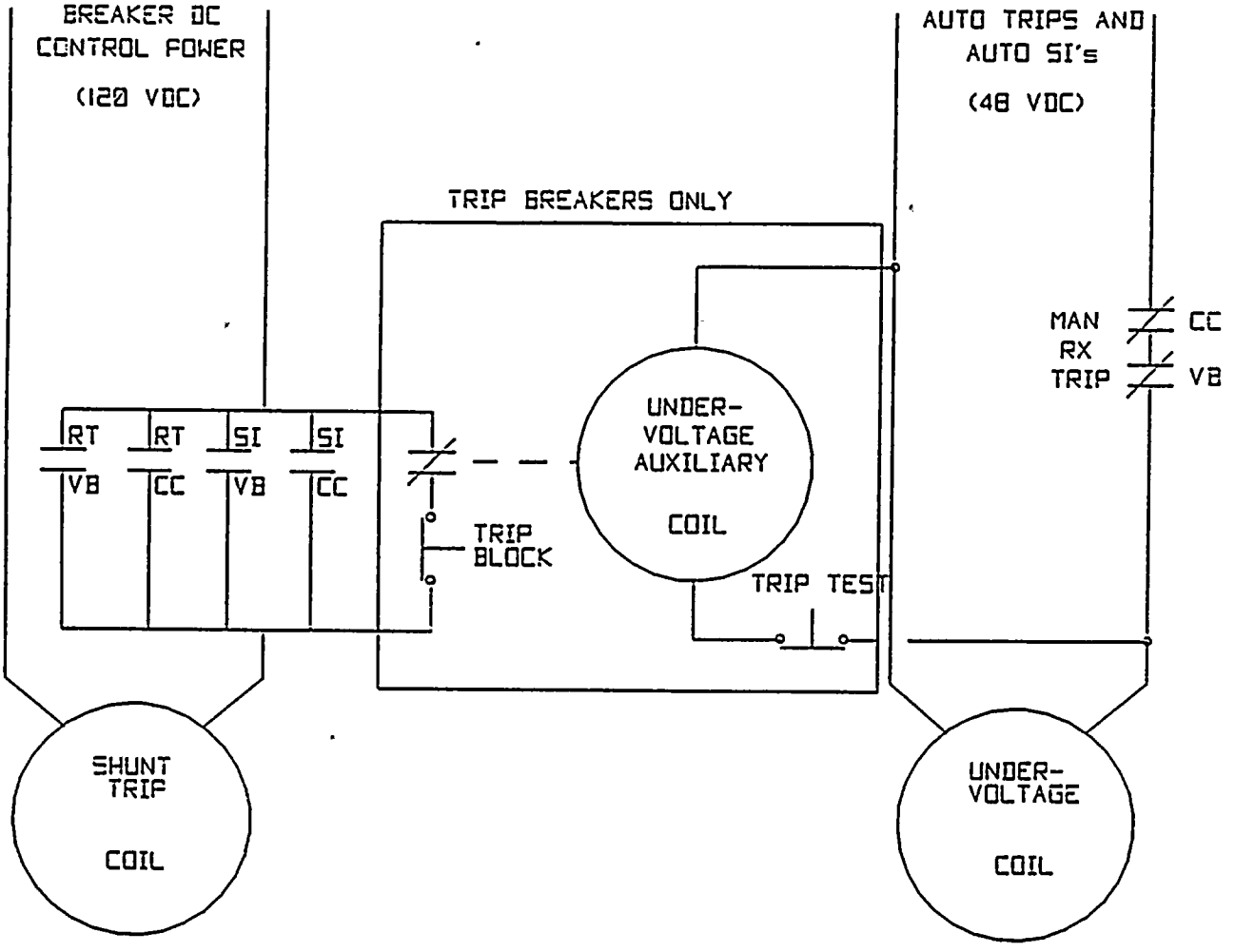
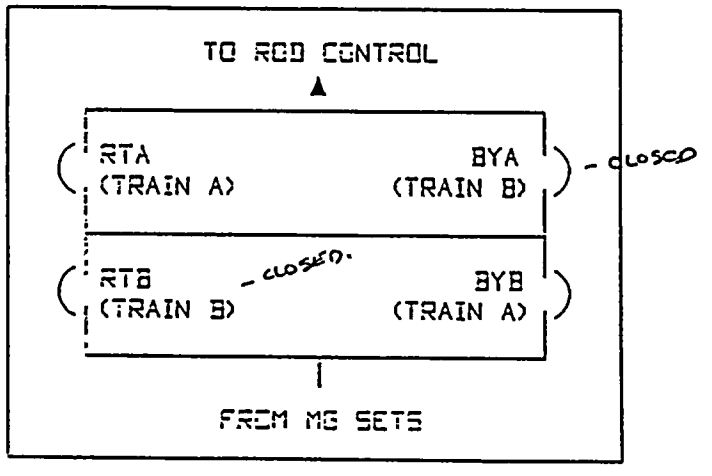
REACTOR TRIP BREAKERS





P-4: TRAIN A = TRIP "A" AND BYPASS "A" OPEN
TRAIN B = TRIP "B" AND BYPASS "B" OPEN

BYA DOES NOT OPEN → NO TRAIN A P-4 SIGNAL

REF: 437810 SECT 4 ELECT PRINTS

Steam Dump Control Signals

Associated Interlocks:

C-7A: Arming Signal to Groups I & II (in Tavg Mode).
C-7B: Arming Signal to Groups III & IV (in Tavg Mode).
P-4(Train A): Arming Signal to Groups I & II (in Tavg Mode).
Blocks Groups III & IV (in Tavg Mode).
P-4(Train B): Selects the Reactor Trip Controller (in Tavg Mode).
Blocks the Load Rejection Controller (in Tavg Mode).
Blocks Group IV (in Tavg Mode).
C-9: Arming Signal to Groups I & II (in all Modes).
P-12: Blocks all valves closed (may be bypassed for Group I valves during cooldown).