ORIGINAL

PROCEDURE REVISION FORM

Procedure Number: TP 8.6.6 Current Revision: 0

Procedure Title: Special Test Procedure for TDAS Class 1E Isolators

POC Meeting Number: _____

CHANGE: (See attached copy of marked up procedure.)

DELETE PROCEDURE

REASON FOR CHANGE:

TEST COMPLETED 9-20-85

	Yes	No	
1.	___	X	This procedure/revision constitutes a change to procedures as described in the FSAR.
2.	___	X	This procedure/revision constitutes a change to Technical Specifications.
3.	___	X	This procedure/revision constitutes an unreviewed safety question as defined in 10CFR50.59. Justification for this evaluation: This procedure has been reviewed against the 3 criteria established in 10CFR50.59 and in the opinion of this author does not represent an unreviewed safety question.
4.	___	X	This procedure/revision constitutes an unreviewed environmental question or a change in the Environmental Protection Plan. (See Tech. Spec. App. -B, EPP 3.0.)
5.	X	___	This procedure/revision nullifies a previous regulatory commitment being satisfied. (See paragraph 1.2.4.2.A.2.d.) Supports information sent to NRC Question A. "SPDS" Letter
6.	___	X	This procedure revision constitutes a 602-84-534 (J. Joyce) Maximum Credible Fault Voltage.

|___| Review of the entire procedure.

|___| Partial review only of the procedure.

Prepared By: Helen Dockter Date: 9-24-85

Reviewed By: _____ Date: _____

ALARA EVALUATION:

7.	___	___	This procedure was reviewed for ALARA considerations and determined adequate.

Signed By: _____ Date: _____

HP/Chem Manager

Attachment III

TEMPORARY PROCEDURE

PROCEDURE NUMBER	AUTHOR	PLANT MANAGER APPROVED/DATE	EXPIRATION DATE/CONDITION
TP 8.6.6	G. Dockter	C M Powers 1/22/85	

PROCEDURE TITLE

Special Test Procedure for TDAS Class 1E Isolators

SAFETY RELATED

___ YES _X_ NO

POC REVIEW (If required)

MEETING/DATE _____

1. Purpose

INFORMATION ONLY

2. References

3. Prerequisites

4. Precautions

UNCONTROLLED COPY
Verify Prior To Use
Verify By _____ Date 9/5/85

8.6.6.1 Purpose

This procedure provides the instructions necessary to determine what effect (if any) the application of the Maximum Credible Fault Voltage to a TDAS isolator output has on the input (Class 1E) side of the isolator.

8.6.6.2 References

A. WYLE Laboratories Nuclear Environmental Qualification Test Report No. 46206-1.

B. Telecon 2/28/85 NRC to Supply System (Joe Joyce to Gordon Brastad) establishing the Maximum Credible Fault Voltage).

8.6.6.3 Discussion

The Qualification Test Program for the TDAS Class 1E isolators established the Maximum Credible Fault Voltage on the Class II side to be 15 volts DC.

Since there is 120 volts AC (fused 15 amps or less) in the cabinets which contain the isolators, it has been determined that 120 volts AC shall be the Maximum Credible Fault Voltage.

This test shall supplement the Qualification Test Plan for the TDAS isolators and shall verify that Class 1E functions are not adversely affected by the application of the Maximum Credible Fault Voltage to the isolator output.

8.6.6.4 Prerequisites

None

8.6.6.5 Procedure

A. Provide the test configuration shown in Figure 1. Record the WPPSS identification numbers and calibration due dates for the test equipment used.

Device	WPPSS No.	Calibration Due Date
FLUKE	12930	12-11-85
VISICORDER	C000869	3-17-86

Gordon Brastad — Verified By

9-20-85 — Date

B. Provide test signals on the recorder to verify the voltage scale. Label the signals and the voltage ranges on the recorder trace.

G Dockter — Verified by
9-20-85 — Date

C. Mount the isolator to be tested in an isolator tray and electrically connect it as shown in Figure 1. Provide a 4 ma signal (1 VDC across R1) from the differential pressure transmitter. Record the serial number of the isolator.

Isolator S.N. 578 (G=10)

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9-20-85 — Date

CAUTION: The performance of the next step will have an unknown effect on the isolator. Care should be taken to insure no personnel harm from any resultant action.

D. Turn on the visicorder at 40 mm/sec and turn on switch S1. After approximately 3 seconds, turn switch S1 to the "OFF" position.

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9-20-85 — Date

E. Sign and date the recorder trace and identify all signals and the isolator serial number. Attach the trace to this procedure.

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F. Repeat Steps C through E above for two more isolators chosen at random. Record their serial numbers below.

453 — Isolator S.N.
401 — Isolator S.N.
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9-20-85 — Date

G. For all three cases above, determine:

1. The voltage applied to the output.
2. The length of time voltage was applied.
3. The maximum voltage resulting on the input.
4. The duration of the voltage resulting on the input.

Summarize the results in Section 8.6.6.7.

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H. Compare the results of this test to the acceptance criteria of Section 8.6.6.6 and verify that the isolator functioned properly.

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9-20-85 — Date

8.6.6.6 Acceptance Criteria

A. Electrical

The Class 1E signal measured interference is less than 50 mv peak to peak for no more than 10 msec during the application of the Maximum Credible Fault Voltage and the signal function is not inhibited.

The Class 1E signal maintains its initial value after the Maximum Credible Fault Voltage has been removed (within signal tolerance of the transmitter).

B. Physical Acceptance Criteria

The isolator remains intact during and after the application of the Maximum Credible Fault Voltage.

7.6.6.7 Test Summary

See attached summary

TP 8.6.6
TEST SUMMARY

STEP B. The signals recorded and voltage ranges are :

CH	DESCRIPTION	INITIAL VALUE	SENSITIVITY
1	Isolator Power Supply	24.01VDC	4.03VDC/DIV
2	Isolator Input	1.02VDC	.05VDC/DIV
3	Transmitter Power Supply	24.00VDC	3.51VDC/DIV
4	Isolator Output	10.22VDC	34.0VDC/DIV

STEP C. The functionality of the isolator (measuring of the output voltage) was also verified in this step.

STEP D. The actual chart speeds for Test Case #1 and #2 were 40 in/sec and for Test Case #3 80 in/sec.

STEP G. From the attached recorder traces:

TEST CASE#	OUTPUT VOLTAGE	DURATION	MAXIMUM VOLTAGE	DURATION
1	114.6Vrms	>3 Sec.	0.070VDC(p-p)	250usec.
2	114.6Vrms	>3 Sec.	0.275VDC(p-p)	250usec.
3	114.6Vrms	>3 Sec.	0.400VDC(p-p)	250usec.

STEP H. The resultant voltage spikes on the input (Class 1E) side of the isolator exceeded the acceptance criteria voltages of Section 8 6.6. However, the pulse duration was much shorter than the maximum allowed. The control signal was not affected (other than the pulse) and the transmitter continued its function after the application of the voltage. The isolator (in all three cases) performed its intended function by not allowing the Maximum Credible Fault voltage to adversly affect the Class 1E function.

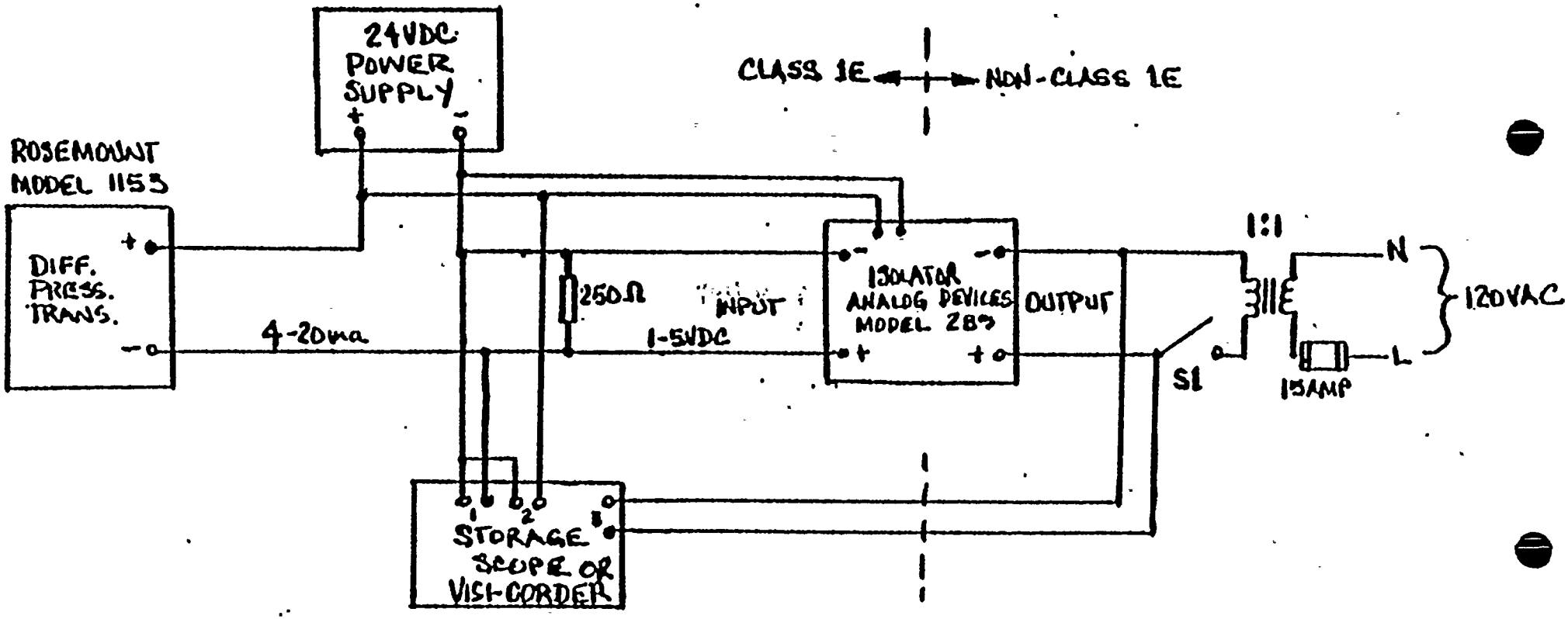
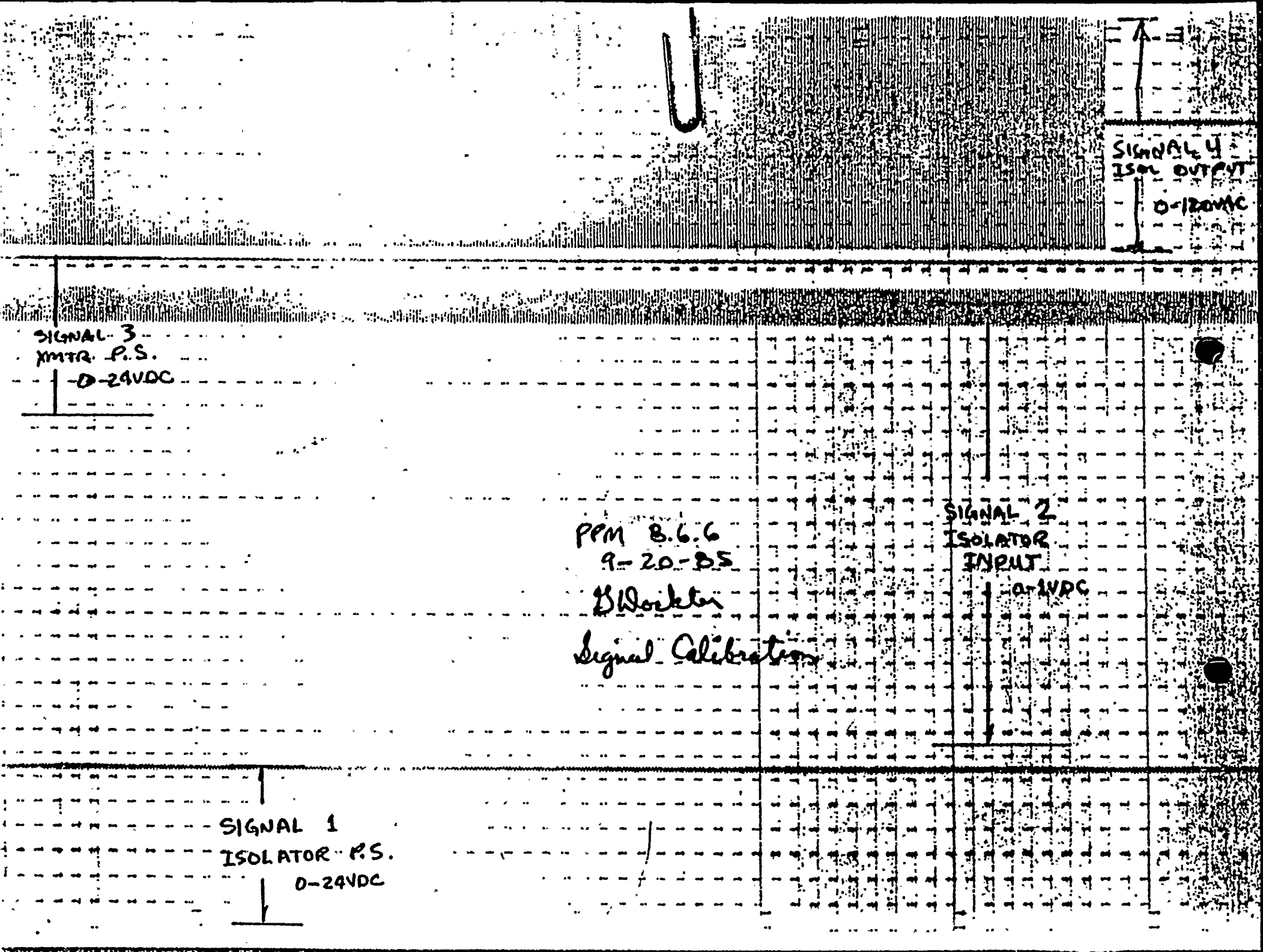

24VDC
POWER
SUPPLY
+
-
CLASS 1E
NON-CLASS 1E
ROSEMOUNT
MODEL 1153
DIFF.
PRESS.
TRANS.
+
-
4-20ma
250Ω
INPUT
1-5VDC
ISOLATOR
ANALOG DEVICES
MODEL 283
OUTPUT
1:1
N
L
120VAC
15AMP
S1
1
2
3
STORAGE
SCOPE OR
VISI-CORDER

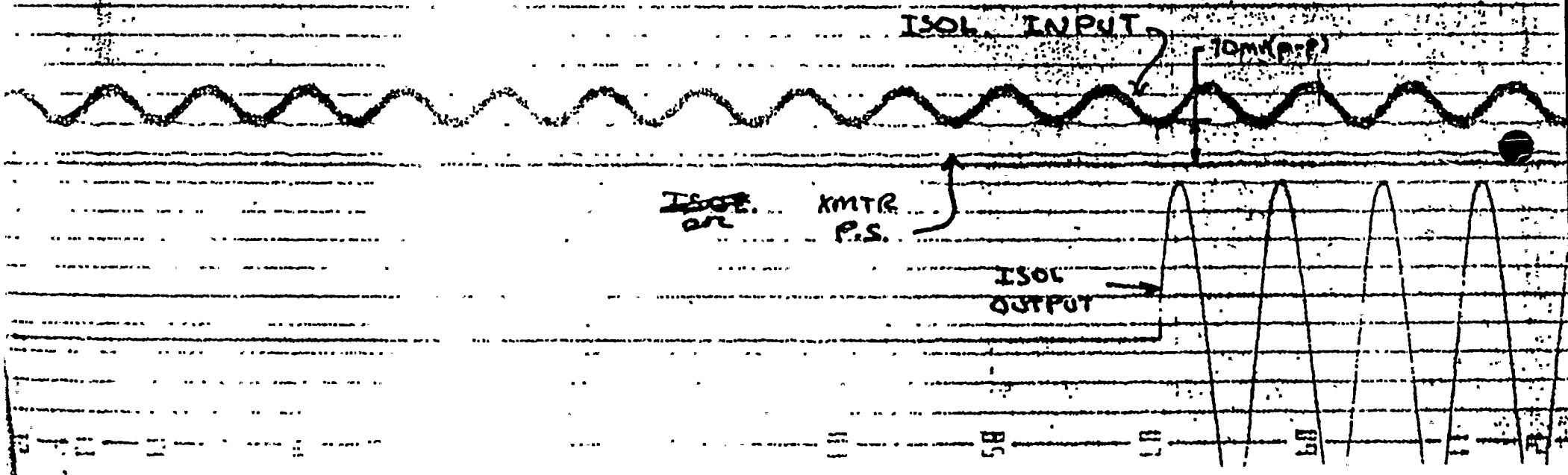
Figure 1


SIGNAL 4
ISOL OUTPUT
0-120VAC
SIGNAL 3
XMTR P.S.
0-24VDC
PPM 8.6.6
9-20-85
B Worden
Signal Calibration
SIGNAL 2
ISOLATOR
INPUT
0-1VDC
SIGNAL 1
ISOLATOR P.S.
0-24VDC

ISOL. P.S.

TP 8.6.6
9-20-85
G Dockter

40 N/SEC
ISOL. S/N 528



ISOL P.S.

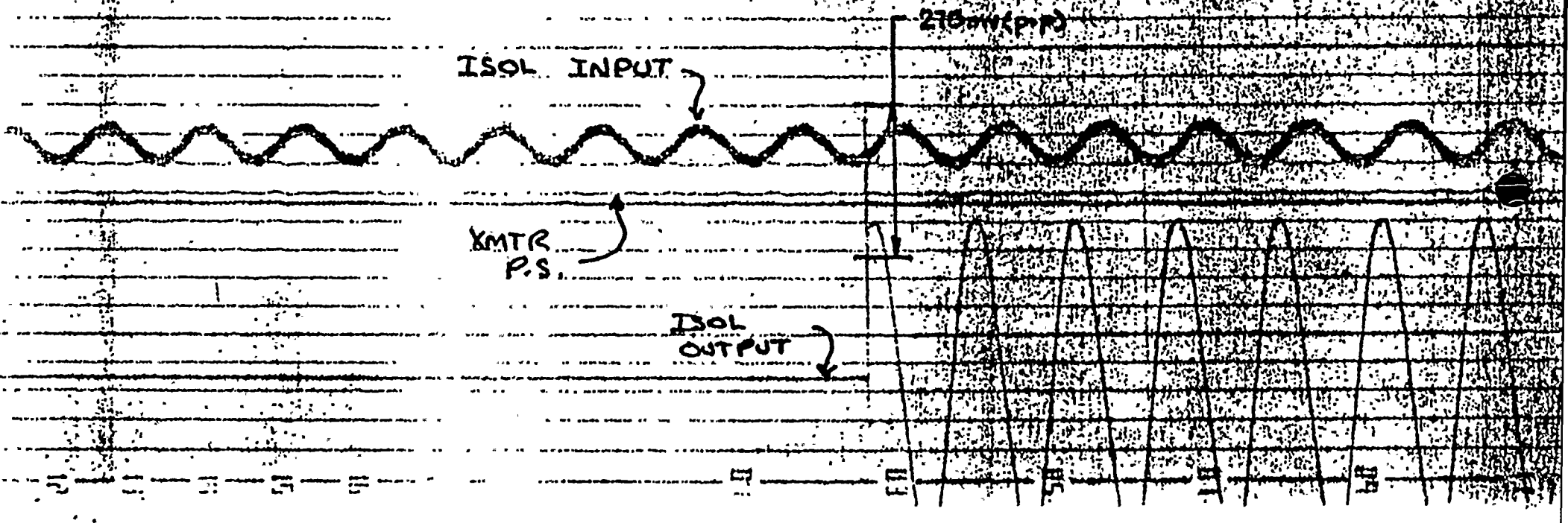
TP8.6.6

9-20-85

Y Docket

40 IN/SEC

ISOL S/N 453



ISOLATOR
POWER
SUPPLY

TP 8.6.6
9-20-85
H Dockter
30 IN/SEC

ISOL S/N = 401

ISOLATOR
INPUT

400mv (P-P)

TRANSMITTER
POWER SUPPLY

ISOLATOR OUTPUT