TEST PROCEDURE

FOR

SEISMIC VIBRATION

QUALIFICATION TEST

OF

E10 SERIES MCA/RRW TRANSMITTERS

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8006300 414

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1.0 Test Objective

To determine the ability of the E10 Series Transmitters to perform without loss of function under the seismic vibration conditions specified herein.

Since the criteria for acceptable performance under seismic vibration vary with application requirements, they are not included in this document.

Reference guide is IEEE Std 344-1971 Trial-Use Guide for Seismic Qualification of Class I Electric Equipment for Nuclear Power Generating Stations.

2.0 Test Items

The test units are those designated as Class 1 or Category 1 Electrical or Electronic equipment. This equipment is essential to the safe shutdown and isolation of the reactor, and whose failure or damage could result in significant release of radioactive material.

The following test transmitters are included in the above mentioned class:

E13DM-ISAMX

E13DH-ISAM5

E11GM-ISAE2

E11GH-IINM2

Construction Features:

MCA/RRW Modified

Cast Iron Base and Covers

Amercoat 66 Paint

Cast Iron "XJB" Junction Boxes

3.0 Test Procedure

3.1 Test Mounting

Because all service mountings cannot be duplicated, the units will be rigidly mounted to a test fixture. The test fixtures are designed for an input transmissibility of one to the test units.

3.2 Test Monitoring

The test units shall be operational with inputs and outputs checked and monitored before, during and after each test.

Accelerometers shall be attached to the test units for determining vibratory response.

3.3 Resonance Survey

Using a sinusodial input signal of 0.5g, a frequency sweep from 1-35 Hz will be run at an octave/min. This will be run in each of the three mutually perpendicular planes independently. Resonances shall be noted and included in the subsequent test. See Diagram No. 1. This test will be run in all planes before proceeding to 3.4.

3.4 Sine Beat Test

This test consists of amplitude modulated sinusoids at frequencies from 1 to 35 Hz with a peak acceleration corresponding to that for which the device is to be qualified. Diagram No. 1 shows the frequencies and acceleration levels. Diagram No. 2 shows the sine beat.

The test period for each frequency will be ten beats with a pause between beats of 10 times the beat period. The three mutually perpendicular planes will be tested independently and a specific test level in each plane will be completed before proceeding to the next level.

3.5 Pressure Integrity Test

Following completion of a sine beat test level, the units will be subjected to a pressure test as follows:

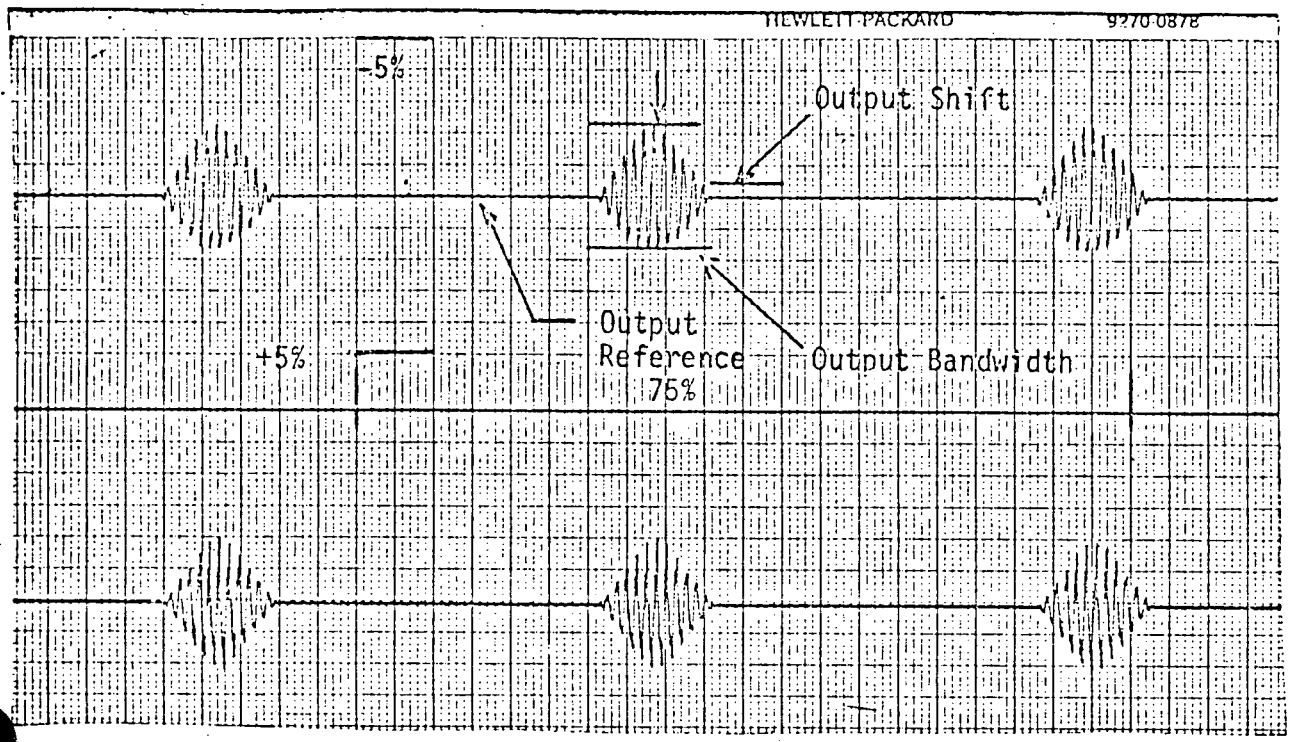
All gauge pressure transmitters shall be subjected to a hydraulic pressure input equal to the maximum overrange pressure rating. Pressure will be applied for one minute.

All differential pressure transmitters shall be subjected to simultaneous pressure inputs at both process inputs. The hydraulic pressure shall be at the maximum static pressure rating of the unit. Pressure will be applied for one minute.

Failure of the transmitters to hold the test pressures shall constitute a failure to meet seismic requirements.

After these tests if the units require recalibration, it shall be done before proceeding to the next sine beat test level.

Figure No. 3
Samples of Output Chart Records
Data Reduction Method



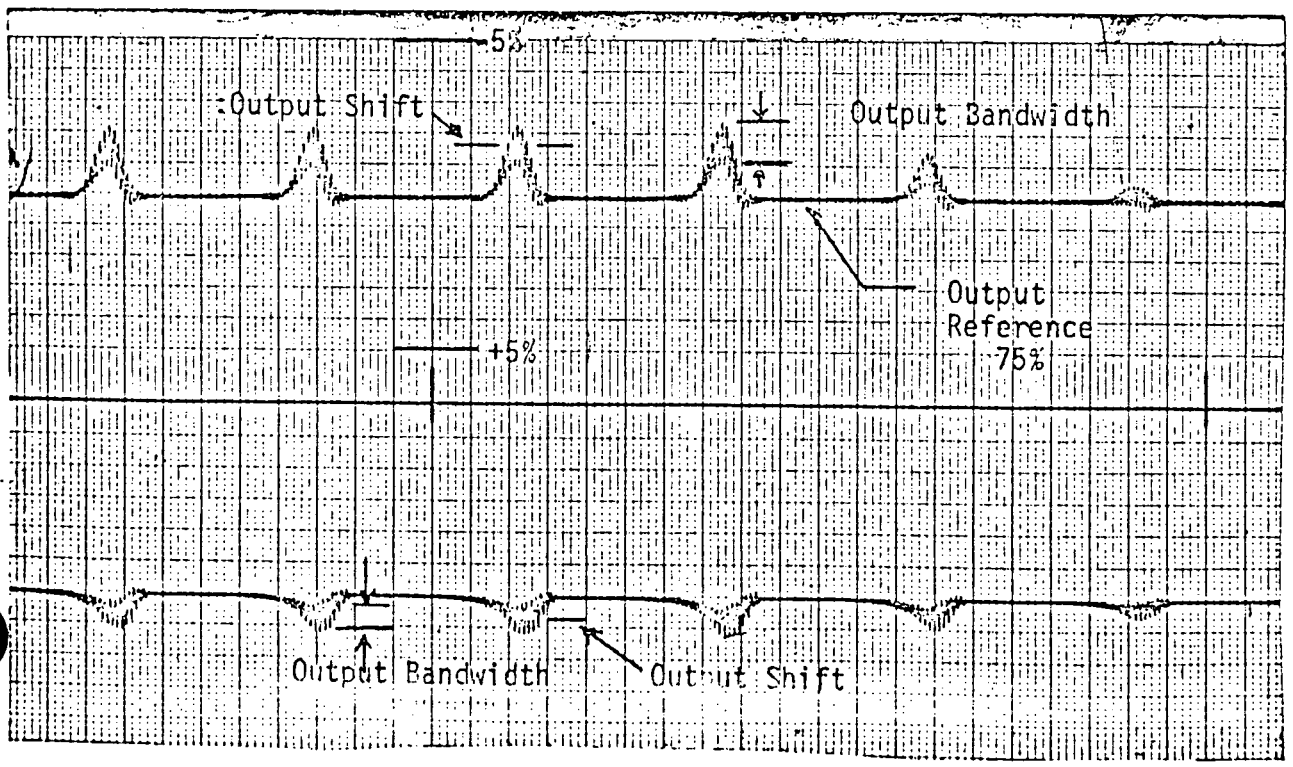
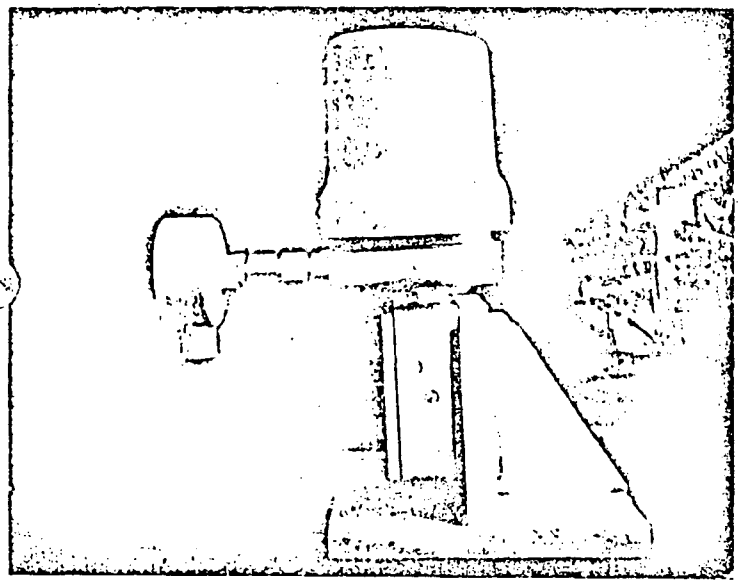
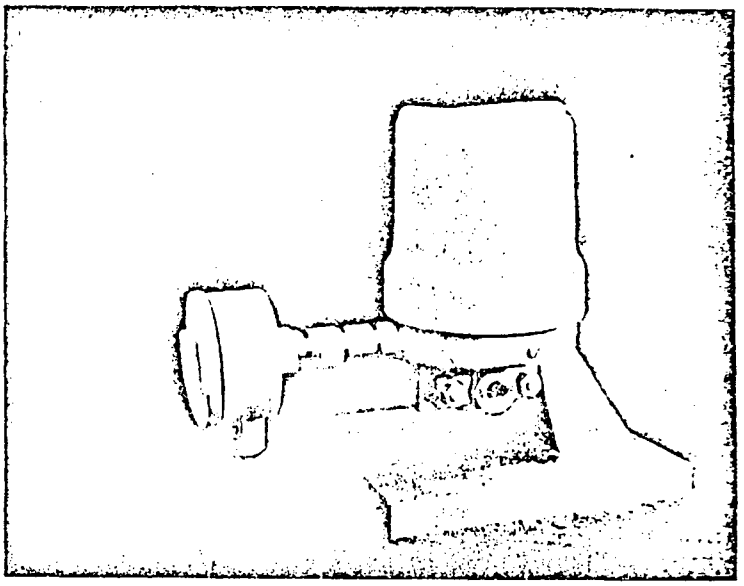


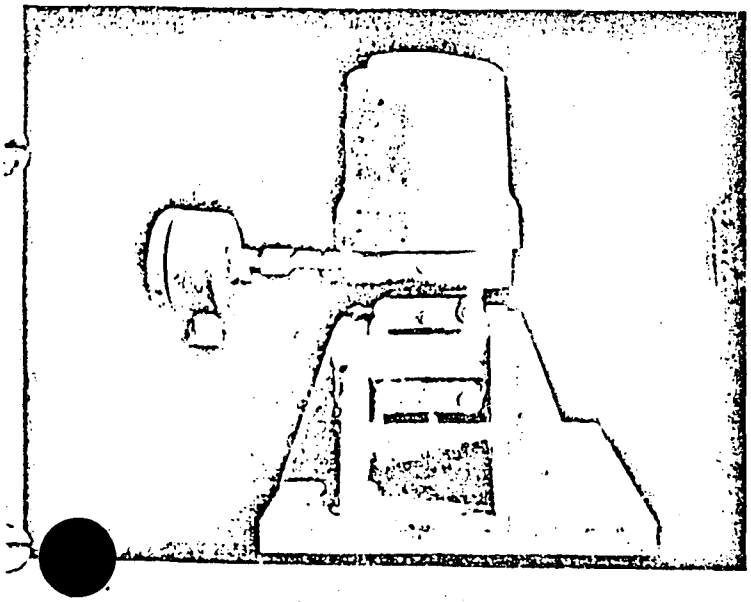
Figure No. 4
Photographs
of
Test Units and Test Fixtures



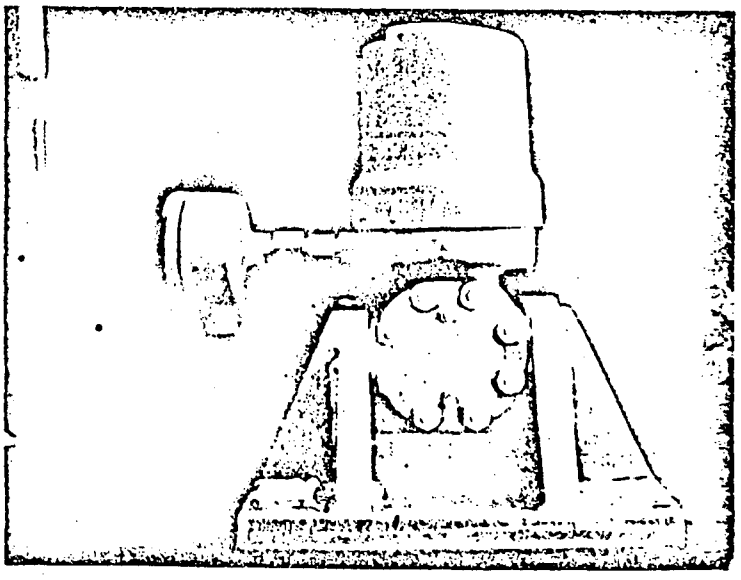
E11GH-IINM2
Gauge Pressure Transmitter



E11GM-ISAE2
Gauge Pressure Transmitter



E13DM-ISAMX
d/p Transmitter

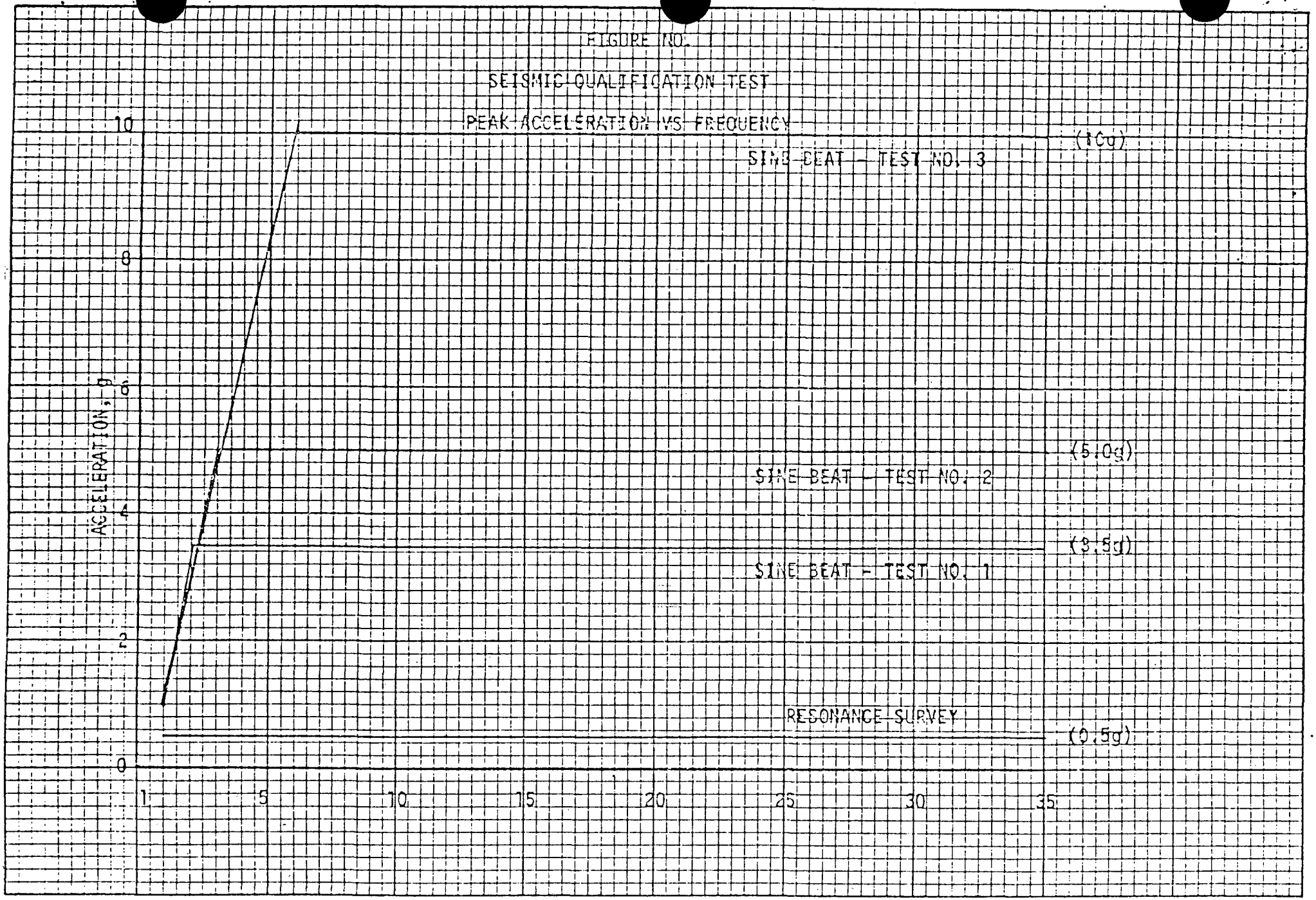


E13DH-ISAM5
d/p Transmitter

FIGURE NO.

SEISMIC QUALIFICATION TEST

PEAK ACCELERATION VS FREQUENCY



est Item
T3DM-ISAMX
/N 2713118
nput-Output: 75%

TABLE NO.

Test Proc e
Section 6.
Part 3.3

RESONANCE SURVEY
OUTPUT SHIFT AND BANDWIDTH VS FREQUENCY
T3-1091 Nov. 1973 by R. Ramsell

VIBRATION		VERTICAL				HORIZONTAL Parallel to Zero Adj.				HORIZONTAL Normal to Zero Adj.			
Input													
Disp. 10"-008"PP													
Freq.	Accel.	Output Shift		Bandwidth		Output Shift		Bandwidth		Output Shift		Bandwidth	
Hz	G's	(%)		(%)		(%)		(%)		(%)		(%)	
1-2	0.5	<0.1	<0.1	1.2	1.0	<0.1	<0.1	1.2	1.4	<0.1	<0.1	0.8	0.8
3-4		<0.1	<0.1	0.8	1.0	<0.1	<0.1	1.2	1.2	<0.1	<0.1	0.6	0.6
5-6		<0.1	<0.1	1.0	1.0	<0.1	<0.1	1.0	1.2	-0.1	<0.1	0.4	0.6
7-8		<0.1	<0.1	1.0	1.0	<0.1	<0.1	1.0	1.2	<0.1	<0.1	0.8	1.2
9-10		<0.1	<0.1	1.2	1.2	<0.1	<0.1	1.2	1.4	<0.1	<0.1	0.6	1.0
11-12		<0.1	<0.1	1.2	0.8	<0.1	<0.1	1.4	1.2	-0.1	<0.1	0.8	0.4
13-14		<0.1	<0.1	0.8	0.8	<0.1	-0.1	1.2	1.2	<0.1	<0.1	0.8	0.8
15-16		<0.1	<0.1	0.6	0.6	<0.1	<0.1	1.6	1.0	<0.1	<0.1	0.6	0.6
17-18		<0.1	<0.1	0.4	0.4	<0.1	<0.1	1.4	1.2	<0.1	<0.1	0.6	0.8
19-20		<0.1	<0.1	0.4	0.4	-0.1	-0.1	1.6	1.2	<0.1	<0.1	0.8	0.9
21-22		<0.1	<0.1	0.4	0.4	<0.1	<0.1	1.4	1.0	<0.1	<0.1	0.8	1.0
23-24		<0.1	<0.1	0.4	0.4	<0.1	<0.1	1.6	1.6	-0.1	-0.1	0.8	1.0
25-26		<0.1	<0.1	0.4	0.4	<0.1	<0.1	1.6	1.8	-0.1	-0.1	1.6	1.6
27-28		<0.1	<0.1	0.4	0.4	+0.1	<0.1	1.4	1.2	-0.1	-0.1	1.0	1.0
29-30		<0.1	<0.1	0.4	0.4	+0.1	<0.1	1.2	1.6	-0.1	-0.1	1.2	1.2
31-32		<0.1	<0.1	0.4	0.4	<0.1	+0.2	1.4	1.6	-0.1	-0.1	0.8	0.8
33-34	↓	<0.1	<0.1	0.4	0.4	+0.1	<0.1	1.6	1.6	-0.1	-0.1	1.0	1.2
35	0.5	<0.1		0.4		<0.1		0.8		-0.1		0.8	

FOXBORO

Test Item
ET3DH-ISAM5
S/N 2713119
Input-Output: 75%

TABLE NO. [redacted]

RESONANCE SURVEY
OUTPUT SHIFT AND BANDWIDTH VS FREQUENCY
T3-1091 Nov. 1973 by R. Ramsell

Test Pr[redacted]re
Section
Part 3.3

VIBRATION		VERTICAL				HORIZONTAL				HORIZONTAL			
Input						Parallel to Zero Adj				Normal to Zero Adj			
Disp.10"-.008"PP													
Freq.	Accel.	Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)	
Hz	G's												
1-2	0 .5	-0.1	<0.1	0.8	0.8	<0.1	<0.1	2.5	2.5	<0.1	<0.1	1.8	2.0
3-4		<0.1	<0.1	0.6	0.5	-0.2	<0.1	2.3	1.8	<0.1	<0.1	1.6	1.5
5-6		<0.1	0.5	0.6	0.6	<0.1	<0.1	1.8	1.3	<0.1	<0.1	1.3	1.3
7-8		<0.1	<0.1	0.6	0.8	<0.1	<0.1	1.7	2.0	<0.1	<0.1	1.0	1.5
9-10		<0.1	<0.1	0.9	1.0	-0.2	<0.1	2.0	1.8	<0.1	-0.1	1.5	1.5
11-12		-0.1	-0.1	1.0	0.8	<0.1	+0.2	2.0	1.8	-0.1	-0.1	1.5	1.5
13-14		-0.1	-0.1	0.5	0.5	<0.1	-0.3	1.8	1.1	-0.1	-0.1	1.8	1.0
15-16		-0.1	-0.1	0.5	0.4	-0.2	<0.1	1.3	1.0	-0.1	-0.1	1.0	0.8
17-18		-0.1	<0.1	0.4	0.4	-0.2	<0.1	1.0	1.0	-0.1	-0.1	0.8	0.8
19-20		<0.1	<0.1	0.4	0.4	<0.1	-0.2	1.0	1.0	-0.1	-0.1	1.3	0.8
21-22		<0.1	<0.1	0.4	0.4	-0.2	-0.2	1.0	1.3	-0.1	-0.1	1.0	1.0
23-24		<0.1	<0.1	0.4	0.4	-0.1	-0.2	1.0	1.3	-0.1	-0.1	1.0	2.6
25-26		<0.1	<0.1	0.4	0.4	-0.2	<0.1	1.2	1.2	-0.1	-0.1	0.9	1.0
27-28		<0.1	<0.1	0.4	0.4	<0.1	<0.1	1.0	1.4	-0.1	-0.1	1.5	1.0
29-30		<0.1	<0.1	0.4	0.4	<0.1	<0.1	1.0	1.0	-0.1	-0.1	1.0	0.9
31-32		<0.1	<0.1	0.4	0.4	<0.1	<0.1	1.0	1.3	-0.1	-0.1	0.7	1.3
33-34	Y	<0.1	<0.1	0.4	0.4	<0.1	0.4	1.5	1.5	-0.1	-0.1	1.3	1.5
35	0.5	<0.1		0.4		<0.1		0.8		<0.1		1.5	

Test Item
E11GM-ISAE2
S/N 2713115
Input/Output: 75%

TABLE NO. [redacted]
RESONANCE SU[redacted]
OUTPUT SHIFT AND BANDWIDTH VS FREQUENCY
T3-1091 Nov. 1973 by R. Ramsell

Test Pro[redacted]re
Section [redacted]
Part 3.3

VIBRATION		VERTICAL				HORIZONTAL				HORIZONTAL			
Input						Parallel to Zero Adj.				Normal to Zero Adj.			
Disp. .10"-.008"PP													
Freq.	Accel.	Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)	
Hz	G's												
1-2	0 .5	<0.1	<0.1	1.0	1.0	<0.1	<0.1	3.5	2.8	<0.1	<0.1	0.2	0.2
3-4		<0.1	<0.1	0.8	0.8	0.1	<0.1	2.3	2.0	<0.1	<0.1	0.2	0.2
5-6		<0.1	<0.1	0.8	0.8	-0.2	<0.1	1.8	1.8	<0.1	<0.1	0.2	0.2
7-8		<0.1	<0.1	1.0	1.5	-0.2	-0.3	2.0	2.3	<0.1	<0.1	0.2	0.2
9-10		-0.2	-0.2	1.5	1.1	<0.1	-0.2	2.5	1.6	<0.1	<0.1	0.2	0.2
11-12		<0.1	<0.1	0.8	0.4	<0.1	<0.1	1.5	1.0	<0.1	<0.1	0.2	0.3
13-14		<0.1	<0.1	0.4	0.4	+0.2	-0.1	1.0	1.0	<0.1	<0.1	0.5	0.3
15-16		<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.8	0.8	<0.1	<0.1	0.3	0.5
17-18		<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.9	0.4	<0.1	<0.1	0.5	0.5
19-20		<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.8	0.6	<0.1	-0.1	0.5	0.8
21-22		<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.4	0.4	-0.1	-0.1	0.5	0.5
23-24		<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.4	0.4	-0.1	-0.2	0.5	0.5
25-26		<0.1	<0.1	0.4	0.4	+0.1	<0.1	0.4	0.8	-0.1	-0.2	0.5	0.5
27-28		<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.6	0.8	-0.1	-0.2	0.6	0.6
29-30		<0.1	<0.1	0.5	0.4	<0.1	<0.1	0.8	0.5	-0.1	-0.2	0.5	0.5
31-32		<0.1	<0.1	0.4	0.4	0.1	<0.1	0.4	0.4	-0.1	-0.2	0.5	0.6
33-34	↓	<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.4	0.5	-0.1	-0.1	0.6	0.6
35	0.5	<0.1		0.4		<0.1		0.3		<0.1		0.5	

Test Item
E11GH-IINM2
Input-Output: 75%

TABLE NO [redacted]

Test Pro[redacted]ure
Section 6.0
Part 3.3

RESONANCE SURVEY
OUTPUT SHIFT AND BANDWIDTH VS FREQUENCY
T3-1091 Nov. 1973 by R. Ramsell

VIBRATION		VERTICAL				HORIZONTAL				HORIZONTAL			
Input						Parallel to Zero Adj.				Normal to Zero Adj.			
Disp.10"-.008"PP													
Freq.	Accel.	Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)	
Hz	G's												
1-2	0.5	<0.1	<0.1	0.8	0.8	-2.0	<0.1	16.0	13.2	<0.1	<0.1	0.4	0.2
3-4		<0.1	<0.1	0.8	0.6	<0.1	<0.1	9.2	6.0	<0.1	<0.1	0.2	0.2
5-6		<0.1	<0.1	0.5	0.5	-0.8	-0.8	4.0	3.2	<0.1	<0.1	0.2	0.2
7-8		<0.1	<0.1	0.5	0.5	+0.1	+0.2	2.3	1.8	<0.1	<0.1	0.2	0.2
9-10		<0.1	<0.1	0.3	0.3	<0.1	<0.1	1.3	1.2	<0.1	<0.1	0.2	0.2
11-12		<0.1	<0.1	0.3	0.2	<0.1	<0.1	1.0	0.8	+0.1	<0.1	0.2	0.2
13-14		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.8	0.8	<0.1	<0.1	0.2	0.2
15-16		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.6	0.6	<0.1	<0.1	0.2	0.2
17-18		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.5	0.5	+0.1	<0.1	0.2	0.2
19-20		0.1	0.1	0.2	0.2	0.1	0.1	0.5	0.4	+0.1	<0.1	0.2	0.2
21-22		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.4	0.4	+0.2	<0.1	0.2	0.2
23-24		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.4	0.4	<0.1	<0.1	0.2	0.2
25-26		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.3	0.3	<0.1	<0.1	0.2	0.2
27-28		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.3	0.4	+0.1	<0.1	0.2	0.2
29-30		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.3	0.4	<0.1	<0.1	0.2	0.2
31-32		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.3	0.3	<0.1	<0.1	0.2	0.2
33-34		<0.1	<0.1	0.2	0.2	<0.1	<0.1	0.3	0.3	<0.1	<0.1	0.2	0.2
35	0.5	<0.1		0.2		<0.1		0.3		<0.1		0.2	

FOXBORO

Test Item
E13DM-ISAMX
S/N 2713118
Input-Output: 75%

TABLE NO. 5

VIBRATION EFFECTS

Test Procedure
Section 6.0
Part 3.4

SINE BEAT TEST
OUTPUT SHIFT AND BANDWIDTH VS FREQUENCY
T3-1091 Nov. 1973 by R. Ramsell

VIBRATION Input Disp. .20"-.05"PP		VERTICAL				HORIZONTAL Parallel to Zero Adj.				HORIZONTAL Normal to Zero Adj.			
Freq. Hz	Accel. G's	Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)	
1-2	1.0, 3.5	0.1	-0.2	4.0	5.8	<0.1	<0.1	1.8	5.0	<0.1	0.2	0.6	2.0
3-4		-0.4	-0.4	5.3	4.3	<0.1	<0.1	4.0	4.0	+0.2	+0.3	1.8	2.0
5-6		-0.4	-0.4	3.8	3.3	<0.1	<0.1	4.0	3.3	+0.2	+0.2	2.2	2.3
7-8		-0.8	-0.8	3.4	3.3	<0.1	<0.1	3.0	3.6	+0.3	+0.4	2.0	2.0
9-10		-1.2	+1.0	3.3	3.0	-0.1	-0.4	3.6	3.8	+0.2	+0.2	2.3	2.5
11-12		-1.0	-0.7	2.3	1.8	-0.1	0.2	3.0	3.0	+0.2	+0.2	2.5	2.3
13-14		-0.4	-0.3	1.5	1.3	+0.1	+0.2	3.0	3.0	+0.2	+0.2	2.2	2.8
15-16		-0.5	-0.2	1.3	1.0	+0.2	+0.2	3.0	2.4	+0.2	+0.2	2.5	2.8
17-18		-0.1	<0.1	0.8	0.6	<0.1	+0.2	1.8	1.9	+0.3	+0.2	2.5	2.8
19-20		-0.3	-0.4	0.8	0.6	+0.1	<0.1	3.5	3.5	+0.2	+0.3	2.3	2.8
21-22		-0.3	-0.1	0.6	0.7	<0.1	-0.1	3.3	2.5	0.1	+0.1	3.8	3.0
23-24		<0.1	<0.1	1.2	0.8	+0.4	<0.1	3.3	1.8	+0.1	+0.2	2.8	1.4
25-26		<0.1	<0.1	1.3	0.6	<0.1	+0.2	1.2	2.0	+0.1	+0.3	1.8	2.4
27-28		<0.1	-0.1	1.0	1.0	+0.2	<0.1	2.8	1.2	<0.1	+0.2	1.0	2.0
29-30		+0.1	0.1	1.0	1.0	<0.1	+0.1	2.8	3.0	+0.3	+0.2	2.2	1.8
31-32		<0.1	+0.1	1.2	1.0	<0.1	<0.1	3.2	1.8	0.1	-0.4	1.4	1.0
33-34		-0.1	<0.1	1.2	1.0	<0.1	<0.1	1.8	2.0	-0.4	-0.4	1.6	1.4
35	3.5	+0.1		1.3		+0.2		2.4		<0.1		3.4	

FORM 5989 (4/70)

FOXBORO

Test Item
ET3DH-ISAM5
S/N 2713119
Input-Output : 75%

TABLE NO. 6

VIBRATION EFFECTS

Test Procedure
Section
Part 3.4

SINE BEAT TEST
OUTPUT SHIFT AND BANDWIDTH VS FREQUENCY
T3-1091 Nov. 1973 by R. Ramsell

VIBRATION Input Disp. 20"-.05"PP		VERTICAL				HORIZONTAL Parallel to Zero Adj.				HORIZONTAL Normal to Zero Adj.			
Freq.	Accel.	Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)	
Hz	G's												
1-2	1.0, 3.5	<0.1	+0.1	2.8	5.0	+0.5	-0.2	6.3	9.0	<0.1	-0.2	3.3	7.3
3-4		-0.4	<0.1	4.5	2.8	-0.2	-0.3	7.8	7.8	-1.4	-0.4	6.3	4.8
5-6		<0.1	<0.1	2.3	2.5	-0.5	<0.1	6.8	5.8	<0.1	-0.4	4.0	4.0
7-8		-0.1	-0.4	2.5	2.8	-1.2	-1.4	4.6	4.0	-0.2	+0.2	4.0	3.8
9-10		-0.6	-0.8	3.0	2.8	-1.5	-1.9	3.4	3.2	<0.1	<0.1	3.7	3.5
11-12		-0.7	-0.6	2.5	2.3	-1.9	-2.0	2.2	1.8	<0.1	<0.1	4.3	3.0
13-14		-0.6	-0.6	2.0	1.8	-0.2	-0.2	2.0	3.0	-0.4	+0.2	3.0	3.0
15-16		-0.2	-0.4	1.5	1.8	-0.1	-0.4	2.5	2.5	-0.2	+0.1	2.8	3.5
17-18		-0.3	-0.3	1.4	1.2	-0.2	-0.1	2.8	2.0	-0.1	<0.1	3.0	2.5
19-20		-0.4	<0.1	1.0	0.8	<0.1	<0.1	2.5	2.5	-0.2	+0.2	3.0	2.5
21-22		<0.1	+0.1	0.5	0.5	+0.1	<0.1	1.8	2.5	-0.4	+0.4	2.3	2.5
23-24		+0.1	+0.1	0.5	0.8	-0.1	+0.1	2.0	2.0	<0.1	<0.1	2.0	2.8
25-26		+0.1	+0.1	0.8	0.8	+0.1	<0.1	2.0	2.0	<0.1	<0.1	2.3	2.0
27-28		+0.1	+0.1	0.5	0.5	<0.1	<0.1	2.0	2.5	-0.2	-0.2	2.0	1.2
29-30		+0.1	+0.1	0.5	0.5	<0.1	-0.1	2.5	2.5	+0.4	<0.1	2.0	2.8
31-32		+0.1	+0.1	0.5	0.5	<0.1	<0.1	2.5	1.8	<0.1	<0.1	2.5	1.8
33-34		+0.1	+0.1	0.5	0.5	-0.1	-0.1	2.3	2.5	<0.1	<0.1	1.4	1.6
35	3.5	+0.1		0.5		-0.2		2.5		<0.1		2.4	

FOXBORO

Test-Item
ETIGM-ISAE2
S/N-2713115
Input-Output: 75%

TABLE NO. 7

VIBRATION EFFECTS

Test Procedure
Section 6.0
Part 3.4

SINE BEAT TEST
OUTPUT SHIFT AND BANDWIDTH VS FREQUENCY
T3-1091 Nov. 1973 by R. Ramsell

VIBRATION Input		VERTICAL				HORIZONTAL Parallel to Zero Adj.				HORIZONTAL Normal to Zero Adj.			
Disp. Freq. Hz	Accel. G's	Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)		Output Shift (%)		Bandwidth (%)	
1-2	1.0, 3.5	<0.1	-0.6	4.5	7.3	<0.1	-1.6	6.0	9.0	<0.1	<0.1	0.3	1.3
3-4		-1.0	-0.5	6.3	4.8	-1.0	-1.2	7.8	7.5	<0.1	<0.1	1.3	0.8
5-6		-0.8	-1.0	4.0	3.8	-1.6	-1.6	6.5	6.0	<0.1	<0.1	0.8	1.0
7-8		-1.0	-1.3	4.0	3.4	-2.1	-2.4	4.0	2.8	<0.1	<0.1	1.0	1.0
9-10		-1.3	-0.8	3.0	2.8	-2.8	-2.6	2.6	2.0	<0.1	<0.1	1.0	1.0
11-12		-0.6	-0.5	2.4	1.8	-3.0	-3.2	1.2	2.6	<0.1	<0.1	0.8	0.8
13-14		-0.4	-0.4	1.6	1.2	-0.8	-0.8	2.0	2.3	<0.1	<0.1	0.8	0.8
15-16		-0.2	-0.2	1.2	1.2	-0.5	-0.4	2.3	1.8	<0.1	-0.2	1.0	1.3
17-18		-0.2	-0.2	0.8	1.0	-0.4	-0.2	2.0	1.3	<0.1	<0.1	1.0	1.0
19-20		-0.1	<0.1	0.8	0.5	-0.3	-0.5	1.5	1.5	-0.1	<0.1	1.3	1.0
21-22		<0.1	<0.1	0.8	1.0	-0.4	-0.6	1.5	2.3	<0.1	-0.2	1.0	1.8
23-24		<0.1	<0.1	1.0	0.8	-0.2	-0.3	1.3	1.3	-0.2	-0.2	1.5	1.5
25-26		<0.1	<0.1	0.8	0.8	-0.2	-0.4	2.0	2.0	-0.4	-0.2	1.2	1.8
27-28		<0.1	<0.1	1.3	0.8	-0.2	-0.1	1.5	1.3	<0.1	-0.1	1.3	1.3
29-30		<0.1	-0.2	1.0	1.3	-0.4	-0.2	1.8	1.5	-0.3	-0.1	1.0	1.3
31-32		<0.1	<0.1	1.3	1.0	-0.2	-0.2	1.5	1.5	<0.1	<0.1	1.2	1.1
33-34		<0.1	<0.1	0.8	1.0	-0.3	-0.3	1.5	1.5	-0.1	-0.2	1.3	1.0
35	3.5	0.1		1.0		-0.4		1.8		-0.4		1.4	