

Test Report No. 14950

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## Report of Test on

SEISMIC VIBRATION TESTING OF  
ONE (1) HYDROGEN ANALYZER ASSEMBLY  
GENERAL ELECTRIC SPACE SYSTEMS  
VALLEY FORGE SPACE CENTER  
UNDER PURCHASE ORDER NO. A28000A10155



Date October 17, 1979

	Prepared	Checked	Approved
By	B. Esposito	R. Gilfoy	M. L. Tolf
Signed	<i>B. Esposito</i>	<i>R. Gilfoy</i>	<i>M. L. Tolf</i>
Date	<i>October 18, 1979</i>	<i>18 Oct 79</i>	<i>10/18/79</i>

BE/hmf

S023-508-17-18-0

8304220592 830420  
PDR ADCK 05000361  
P PDR

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## Administrative Data

- 1.0 Purpose of Test: To subject one hydrogen analyzer assembly to seismic vibration testing.
- 2.0 Manufacturer: General Electric  
Valley Forge Space Center  
Space Division
- 3.0 Manufacturer's Type or Model No: P/N 47E240609
- 4.0 Drawing, Specification or Exhibit: AETC Test Procedure No. 14950 Rev 0  
dated July 3, 1979.
- 5.0 Quantity of Items Tested: Refer to section 1.0 below.
- 6.0 Security Classification of Items: Unclassified
- 7.0 Date Test Completed: October 3, 1979
- 8.0 Test Conducted By: C. Pilotte  
P. McDermott
- 9.0 Disposition of Specimens: Returned to General Electric.
- 10.0 Abstract: Refer to the results section below.

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## 1.0 TEST ITEM

One (1) Hydrogen Analyzer Assembly P/N 47E240609 consisting of one (1) free standing enclosure approximately 72-1/16" X 25-1/6" X 31-9/16" containing signal conditioning for hydrogen analyzers, one (1) hydrogen sensor and one (1) pressure transducer with a total weight of approximately 660 lbs was submitted by General Electric Space Systems, Valley Forge Space Center, for seismic vibration testing at Acton Environmental Testing Corporation (AETC).

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## 2.0 TEST REQUIREMENTS

The purpose of this test was to subject the assembly specified in section 1.0 above to the seismic vibration test specified in section 3.0 below to determine its ability to withstand such vibration without evidence of mechanical damage, deterioration, or loss of its ability to operate properly during or after the simulated seismic event.

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### 3.0 TEST PROCEDURES

#### 3.1 Test Mounting

The enclosure specified in section 1.0 above was bolted to a 1-1/2" thick steel plate test fixture. The sensor and the transmitter were mounted to brackets supplied by General Electric. The brackets were bolted to the steel plate test fixture. The test fixture was then securely attached to the small 45° biaxial table of the AETC seismic test facility. The use of the 45° biaxial table results in equal horizontal and vertical components.

#### 3.2 Test Monitoring

The hydrogen analyzer assembly was monitored with accelerometers to determine its mechanical response during the resonance survey and multiple frequency tests specified in sections 3.4 and 3.5 below. The eleven (11) monitoring accelerometers and one (1) control accelerometer were located as follows:

ACCELEROMETER NO.	AXIS SENSING ORIENTATION	LOCATION*
1	Vertical	On upper right front corner of cabinet
2	In-axis Horizontal	On lower right intermediate panel above ATB1 & ATB2
3	Vertical	On backside of train B
4	In-axis Horizontal	Gas calibration panel
5	Vertical	On backside of train A
6**	In-axis Horizontal	Gas calibration switch panel
7	Vertical	On lower right front corner of cabinet
8***	In-axis Horizontal	On test table
9	Vertical	Control is #12
10	In-axis Horizontal	
11	In-axis Horizontal	
12	Vertical	

During the resonance survey, data from all twelve (12) accelerometers through appropriate signal conditioning was recorded onto visicorder recording paper included with this test report and onto magnetic tape.

- \* Refer to the included photographs
- \*\* 6A for tests 2, 3 & 5
- \*\*\* 8A for tests 2, 3 & 5

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During the multiple frequency test specified in section 3.5 below, data from all twelve (12) accelerometers, through appropriate signal conditioning was recorded onto magnetic tape. Data from the control accelerometer was also analyzed on line by a Spectral Dynamics SD321 Shock Spectrum Analyzer and the X-Y plots of the Test Response Spectra (TRS) of the control accelerometer are included as part of this test report.

The hydrogen analyzer assembly was visually monitored for any evidence of mechanical damage or deterioration.

General Electric personnel monitored the hydrogen analyzer assembly performance. General Electric supplied the required performance monitoring equipment including gas. AETC supplied two (2) channels of brush recording for the following:

CHANNEL NO.	CHANNEL DESCRIPTION
1	Analyzer output A
2	Analyzer output B

The Brush Recordings were retained by General Electric personnel at the completion of testing.

### 3.3 Test Conditions

The hydrogen analyzer assembly was tested at room temperature.

During the resonance survey specified in section 3.4, the hydrogen analyzer assembly was not operational.

During the multiple frequency test specified in section 3.5 below, the hydrogen analyzer assembly was operational. All electrical and operating test conditions were set and controlled by General Electric personnel.

### 3.4 Resonance Survey

The resonance survey consisted of a biaxial sinusoidal input with peak horizontal and vertical accelerations of 0.25's at frequencies from 1.0 through 35.0 Hz. The resonance survey was performed at a sweep rate of 1/2 octave/minute. The input was applied in two (2) biaxial directions of excitation as follows:

TEST	BIAXIAL DIRECTION OF EXCITATION*
1, 1A, 1B, 1C	Front-to-back & Vertical
2	Right-to-left & Vertical

\*Refer to the included photographs.

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### 3.5 Multiple Frequency Test

A biaxial multiple frequency excitation was applied. The test input had been recorded on a 14-channel tape recorder, each track having discrete frequency sine beats recorded at a different frequency and delay between beats. All frequencies were recorded at maximum levels.

The input was played back through a 14-channel tape recorder. The outputs of the 14 channels were then combined in a 14-channel mixer which resulted in a multiple frequency output.

The individual mixer channels had gain controls so that the level of each output tape channel passing through the mixer could be controlled. In this manner, the required test spectrum could be shaped by controlling the level of individual frequencies.

Qualification tests, consisting of biaxial periodic pseudo-random excitation, were performed. The level of the periodic pseudo-random excitation was such that the Test Response Spectra (TRS), from the control accelerometer would envelop the appropriate Required Response Spectra (RRS) shown in Figure 1, except where limited by AETC shaker table capabilities.

The input was applied six (6) times in each of four (4) biaxial directions of excitations as follows:

TEST NO.	BIAXIAL DIRECTION OF EXCITATION*
3	Right-to-left & Vertical
4	Front-to-back & Vertical
5	Left-to-right & Vertical
6	Back-to-front & Vertical

The test duration for each input was thirty (30) seconds.

The level of the first five (5) inputs in each biaxial direction was such that the TRS from the control accelerometer computed at  $Q=10$  (5% damping) would envelop the OBE RRS shown in Figure 1, except where limited by AETC shaker table capabilities. The level of the sixth input in each biaxial direction was such that the TRS computed at  $Q=10$  (5% damping) would envelop the SSE RRS shown in Figure 1, except where limited by AETC shaker table capabilities.

*\*Refer to the included photographs.*

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Figure 1 is a composite curve of Revisions A of Sketches S023-SK-S-655, S023-SK-S-656, S023-SK-S-633, S023-SK-S-634, S023-SK-S-739, S023-SK-S-725, S023-SK-737 and S023-SK-S-701 of Revision 1 of Appendix 4F "Criteria for Seismic Qualification of Seismic Class 1 Equipment", dated July 20, 1973.

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#### 4.0 TEST RESULTS

##### 4.1 Resonance Survey Test Results

During test 1, resonances were detected at 23.0, 30.75 and 33.75 Hz. Accelerometers 7 and 8 fell off during the test at the 30.75 Hz resonance. Because the readout of accelerometer 8 was high, accelerometers 5, 6\*, 7 and 8\* were replaced to lighter model accelerometers to reduce the effect of the mass of the accelerometers on the panels' response.

Test 1A was the same as test 1 except the lighter accelerometers were used. During test 1A data from accelerometer 6 was lost.

Test 1B was a rerun of test 1A to gain the lost data from accelerometer 6.

Resonances were detected at 23 and 33-35 Hz during test 1B. The train A gas calibration switch panel was then removed and a 3/4" X 3/4" X 17" aluminum angle stiffener was bolted to the backside of the panel with five (5) 10-32 screws.

Test 1C was the same as test 1B except the stiffener was used. Resonances were audible from 31 to 35 Hz on panels that were not monitored with accelerometers and accelerometer #8 still showed resonances at 23 Hz.

Resonances were detected from 22 to 26 Hz during test 2. The added stiffener was used for test 2.

##### 4.2 Multiple Frequency Test Results

Due to AETC shaker table limitations, the Test Response Spectra (TRS) of the SSE tests did not envelop the Required Response Spectra (RRS), Figure 1, at frequencies below 1.2 Hz.

The added stiffener was used for all the multiple frequency tests.

There was no evidence of mechanical damage or deterioration of the hydrogen analyzer assembly as a result of the multiple frequency test specified in section 3.5 above. The operating conditions were set and controlled by General Electric personnel, who retained the brush recording charts of the analyzers' output.

\*and 6A and 8A when used.

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# TEST EQUIPMENT LIST

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NAME	MFGR.	MODEL	SER. NO.	RANGE	ACCURACY	INV. #	CAL. FREQ.
Accelerometer	PCB	302A	695	0.25 Hz - 5 KHz	+5%	AC385	3 months
"	"	"	2853	1 Hz - 5 KHz	"	AC395	"
"	"	308B	3017	1 - 3000 Hz	"	AC398	"
"	"	"	982	"	"	AC400	"
"	"	"	983	"	"	AC401	"
"	"	"	1068	"	"	AC402	"
"	"	"	1070	"	"	AC404	"
"	"	"	1071	"	"	AC405	"
"	"	"	989	"	"	AC407	"
"	"	"	990	"	"	AC408	"
"	"	"	1073	"	"	AC409	"
"	"	302A	1773	1 Hz - 5 KHz	"	AC416	"
"	"	"	1775	"	"	AC418	"
"	"	"	1813	"	"	AC431	"
"	"	"	1815	"	"	AC433	"
"	"	308B	1782	1 Hz - 3 KHz	"	AC447	"
"	"	"	1783	"	"	AC448	"
"	"	"	1784	"	"	AC449	"
"	"	"	1785	"	"	AC450	"
Filter-Dual	Ithaco	4302	35207	10-1 Mhz	+3%	AM346	6 months
Scope	Tektronix	T912	T912-R011852	DC-10 Mhz Storage	4%	OS302	3 months
Power Supply	Buhr	506/16	322	+15 VDC, 1 ADC	0.5%	PD372	6 months
Function Generator	MTS	410.41	140	0-10 VDC 0-5 KHz Sq.Sine Trigger	0.1%V 0.1%F	PE310	6 months

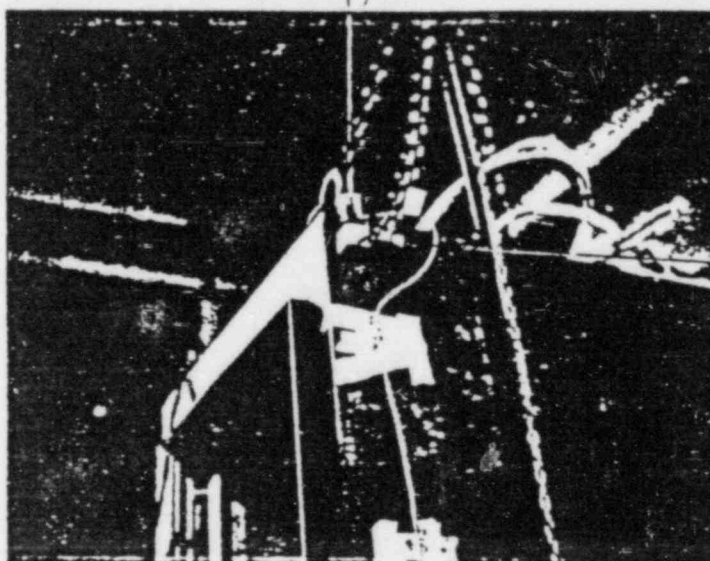
# TEST EQUIPMENT LIST

NAME	MFGR.	MODEL	SER.NO.	RANGE	ACCURACY	INV.#	CAL.FREQ.
Hydraulic Actuator	MTS	204.635		DC-300 Hz, 25K force lbs.	+2%F		
Controller	MTS	443.115		25" DA max.	+5%A		
Shock Spectrum Analyzer	Spec.Dyn.	SD321	18	DC to 2000 Hz	+1%	PE367	6 months
Power Supply & Amplifier	PCB	483M23	288	Input: 0.1 Hz - 10 KHz Sens. 31.6 MV - 100V F.S.	+0.5db	PE381	6 months
Temp Recorder	Brush	280	1132	12 channel X1 & X5 gain filter freq. 50 Hz	N/A	PE384	6 months
Recorder X-Y	MFE	715E	42167	0.5 mv/div	+2%	RE302	3 months
Recorder Tape	Honeywell	5600E	01410CE76	Input: 1-10-100 MV 1-10V both channels	+0.5%	RE340	3 months
Visicorder	Honeywell	1508	161715R	1" tape 7 speeds 14 channel	N/A	RE345	3 months
"	"	"	15-419	12 channel-metric	+1db	RE347	3 months
Recorder	Honeywell	5700E		12 channels 8" paper	"	RE349	" "

Electro Rent #73377

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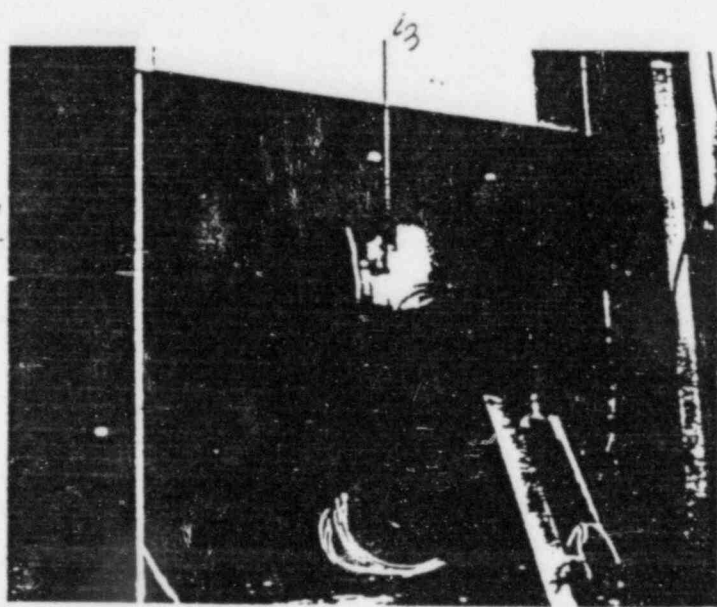




ACCELEROMETER LOCATIONS

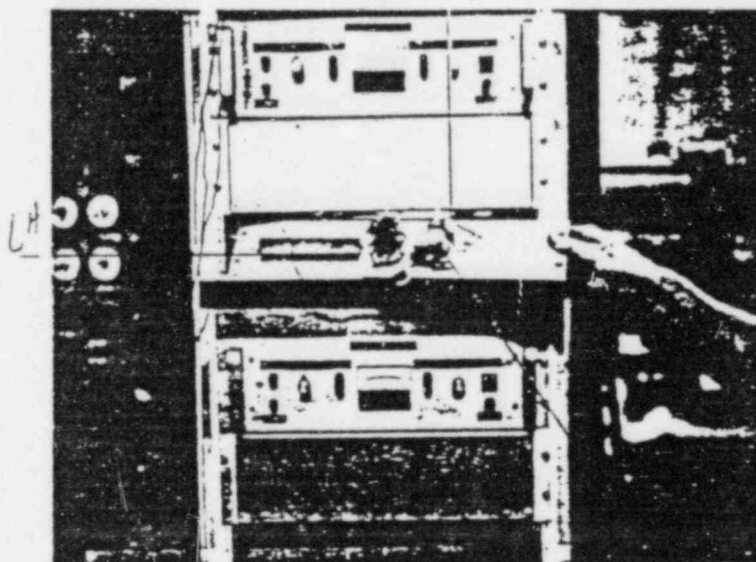
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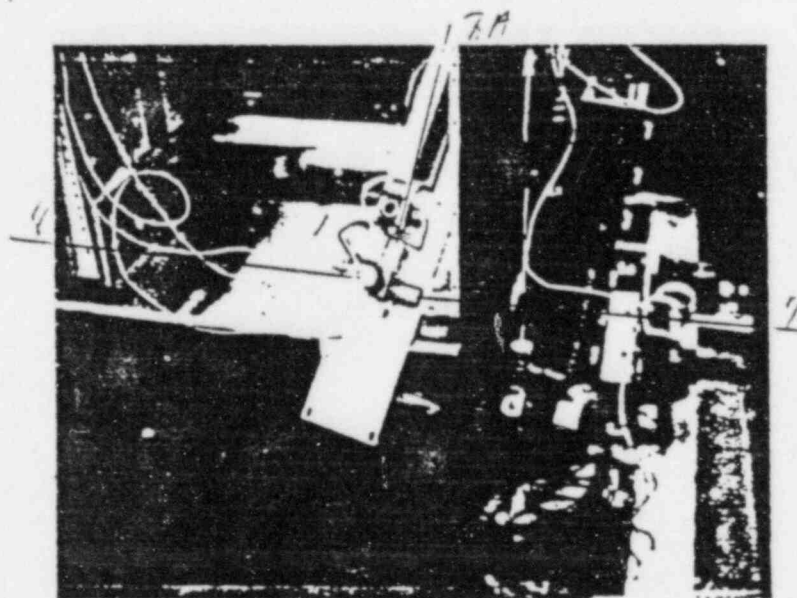
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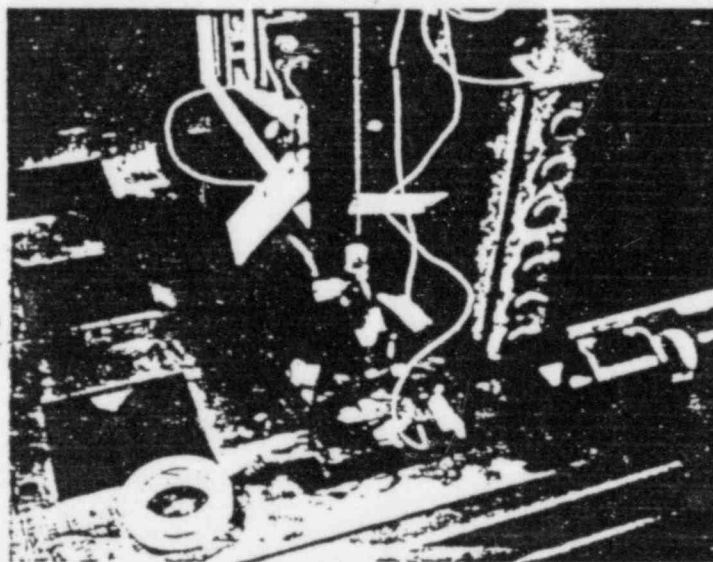
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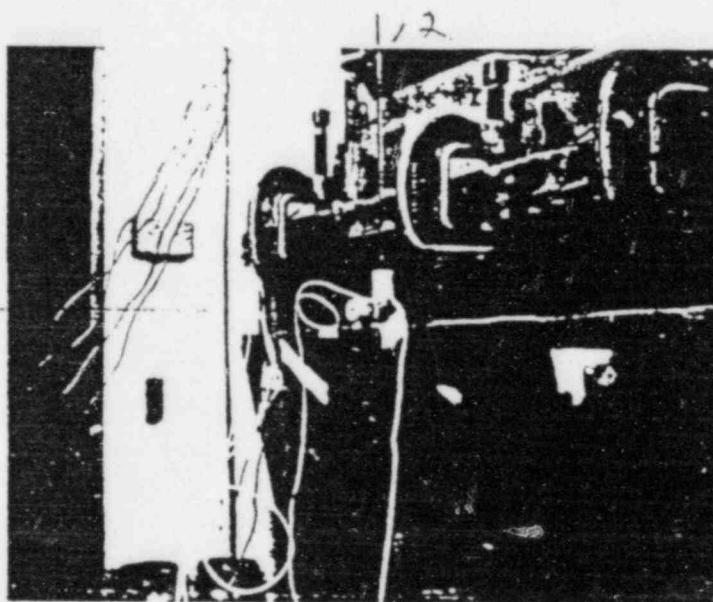
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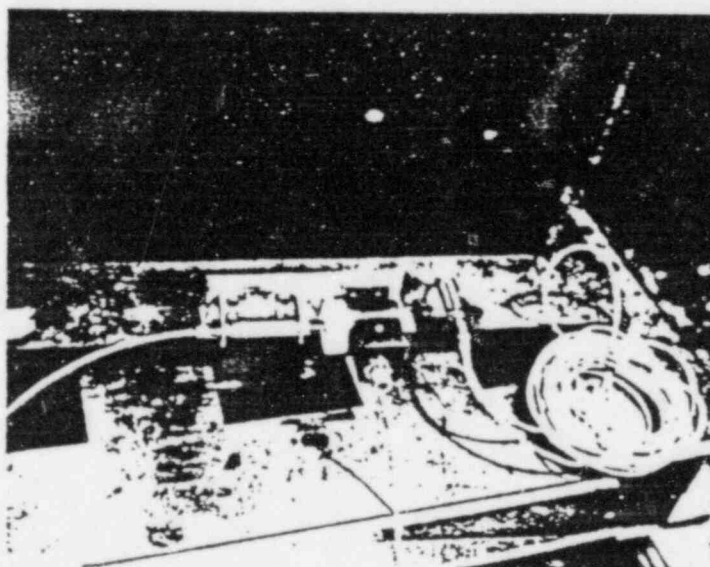
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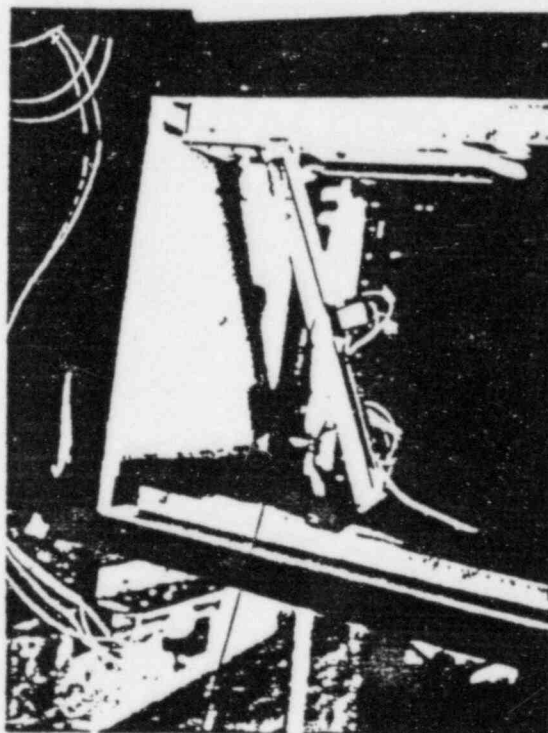
ACCELEROMETER LOCATIONS

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SENSOR & TRANSDUCER MOUNTING

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*2 - Buckle stiffener*

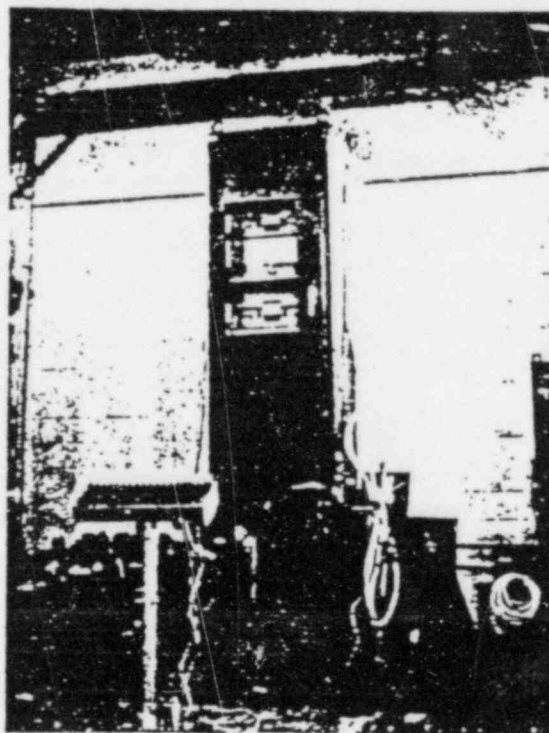
ADDED STIFFENER

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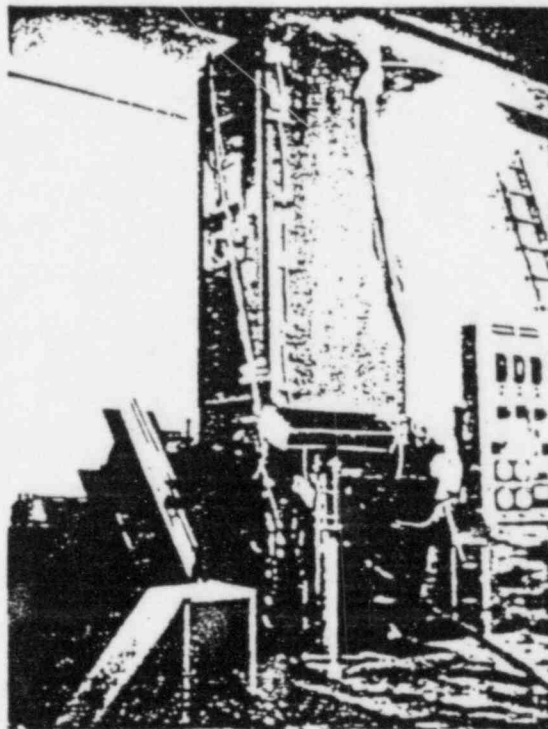
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FRONT-TO-BACK & VERTICAL  
BIAXIAL DIRECTION OF EXCITATION  
TESTS 1, 1A, 1B, 1C & 4

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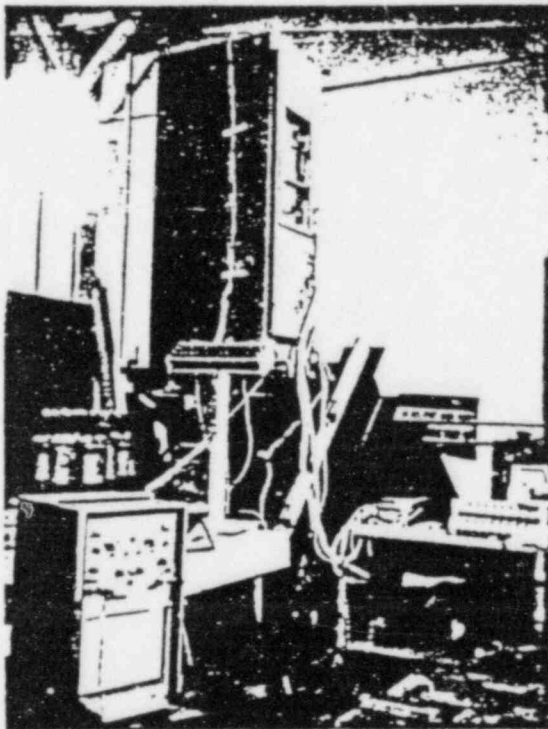
RIGHT-TO-LEFT & VERTICAL  
BIAXIAL DIRECTION OF EXCITATION  
TESTS 2 & 3

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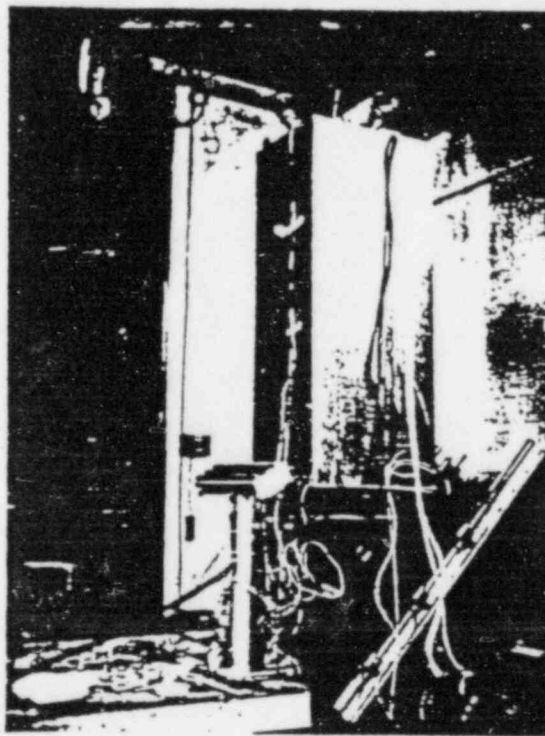
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LEFT-TO-RIGHT & VERTICAL  
BIAXIAL DIRECTION OF EXCITATION  
TEST 5

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BACK-TO-FRONT & VERTICAL  
BIAXIAL DIRECTION OF EXCITATION  
TEST 6

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Test No. RRS  
 Date 7/6/79  
 Customer GE 14950  
 Test Item P/N             
 Test Item S/N             
 Type of Test VIB BIAXIAL  
 Spec. No.             
 Para. No.             
 Conditions             
 Temperature ROOM  
 Period of Test 30 SEC  
 Control Axis VERTICAL  
 Pick-up No. CONTROL  
 Pick-up Axis VERTICAL  
 Operator             
 Test Engr. ES ES0570

GRMS



ACQUIRED RESPONSE SPECTRA (RRS)  $\phi=10$  (5% DRAFFING)

DGE	RS	A	COMPRESSIVE	CF <sub>0</sub>	REV A
	5023	-SK	-S - 634	5%	REV A
	5023	-SK	-S - 633	5%	REV A
	5023	-SK	-S - 701	5%	REV A
	5023	-SK	-S - 737	5%	REV A
DGE	RS	A	COMPRESSIVE	CF <sub>0</sub>	REV A
	5023	-SK	-S - 656	5%	REV A
	5023	-SK	-S - 655	5%	REV A
	5023	-SK	-S - 725	5%	REV A
	5023	-SK	-S - 739	5%	REV A

DGE

DGE

TIME

TEST OPERATOR





Test No. 3 Final  
Date 10-13-79  
Customer G.E. PHIL.  
Test Item P/N 47E340609  
Test Item S/N  
Type of Test 1st. OBE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature Room  
Period of Test 30 SEC.  
Control Axis R-LEFT  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. PILONE  
Test Engr. R. GILFOL

GRMS

Q=10 5% DAMPING



Test No. 3 Run 2  
Date 10-1-78  
Customer G.E. PHIL.  
Test Item P/N 47E240609  
Test Item S/N  
Type of Test Random 2nd OSE  
Spec. No.  
Para. No.  
Conditions OVER  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis R-LT/VERT  
Pick-up No. CENTRAL  
Pick-up Axis VERTICAL  
Operator C. P. H.  
Test Engr. R. S. LLOYD

GRMS-

Q=10 5% DAMPING



Test No. 3 Run 3  
Date 10-27-79  
Customer G.E.-PHIL.  
Test Item P/N 47624069  
Test Item S/N  
Type of Test 3rd PCE  
Spec. No.  
Para. No.  
Conditions QTR.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis R-CLVERT.  
Pick-up No. CONTRAC  
Pick-up Axis VERTICAL  
Operator C. P. H.  
Test Engr. R. G. F.

GRMS

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Q=10 570 DAMPING

10.

9.5

10





Test No. 3 4th Run  
 Date 10-3-79  
 Customer B.E. PHIL  
 Test Item P/N 47E240609  
 Test Item S/N \_\_\_\_\_  
 Type of Test 4th OBE  
 Spec. No. \_\_\_\_\_  
 Para. No. \_\_\_\_\_  
 Conditions OPER.  
 Temperature Room.  
 Period of Test 30 SEC.  
 Control Axis R-CLVERT.  
 Pick-up No. Control  
 Pick-up Axis VERTICAL  
 Operator C. D. Hoff  
 Test Engr. R. G. Foy

GRMS-

Q=10 570 DAMPING

10.

63

10





Test No. 3 RUN 5  
Date 10-5-79  
Customer B. E. PHILL  
Test Item P/N 47E2V0609  
Test Item S/N  
Type of Test SHN DDC  
Spec. No.  
Para. No.  
Conditions OPERA.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis VERTICAL  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. P. Galt  
Test Engr. R. B. LLOYD

GRMS

57.2 AMPING

10-10

10.

53

10



Test No. 3 Run 1  
Date 10-3-78  
Customer G. E. Phil.  
Test Item P/N 47E240609  
Test Item S/N  
Type of Test SE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis R-CLVERT.  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. Pilant  
Test Engr. R. GLEFF

GRMS

CV=10 570 DAMPING



10.

54

10



Test No. 4 151 OBE  
 Date 10-13-79  
 Customer G.C. DHILL  
 Test Item P/N 41E2V0609  
 Test Item S/N  
 Type of Test VST OBE  
 Spec. No.  
 Para. No.  
 Conditions OPER  
 Temperature ROOM  
 Period of Test 30 SEC.  
 Control Axis F-BUCCP  
 Pickup No. CONTROL  
 Pickup Axis VERTICAL  
 Operator C. PILATE  
 Test Engr. R. GILFOT

GRMS

$Q = 10$  57g Dampings

10

55

10





Test No. 4-8nd 08E  
Date 10-13-79  
Customer G.E. Phil.  
Test Item P/N 47E2Y0209  
Test Item S/N \_\_\_\_\_  
Type of Test 2nd 08E  
Spec. No. \_\_\_\_\_  
Para. No. \_\_\_\_\_  
Conditions OPER.  
Temperature Room.  
Period of Test 30 SEC.  
Control Axis F-BYDORL.  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. RICARTE  
Test Engr. R. SICKFOL

GRMS

DEF 10 570 DAMNINS

10

gr

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Test No. 4 3rd Run  
Date 10-13-79  
Customer B.E. PHIL  
Test Item P/N 4252V0609  
Test Item S/N  
Type of Test Random 3rd use  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature Room  
Period of Test 30 SEC.  
Control Axis F-34/VECT.  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. DICK  
Test Engr. R. S. COY

GRMS



Q710 0-8 DAMPING



Test No. 41 Run 4  
Date 10-3-79  
Customer G.E. PHIL.  
Test Item P/N 47E240609  
Test Item S/N  
Type of Test 4th DOE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis F-BYPER.  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. PILONE  
Test Engr. R. GILFOLY

GRMS.

$\delta = 10$  570 DAMPING

10.

8.

10





Test No. 4 5th RUN  
Date 10-3-79  
Customer G.E. PHIL.  
Test Item P/N 47E2Y0609  
Test Item S/N  
Type of Test 5th OBE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis F-BUVERT.  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. P. 10th  
Test Engr. R. GILFOY

GRMS

Q=10 5th OBE





Test No. 4  
Date 10-3-79  
Customer B.E. P.A.C.  
Test Item P/N 47E240609  
Test Item S/N       
Type of Test SSE  
Spec. No.       
Para. No.       
Conditions OPER.  
Temperature Room  
Period of Test 30 SEC.  
Control Axis FORVERT.  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C.P. 10/10  
Test Engr. R. GILFOY

GRMS     

$Q = 10$  STANDARDING

10.

8i

10

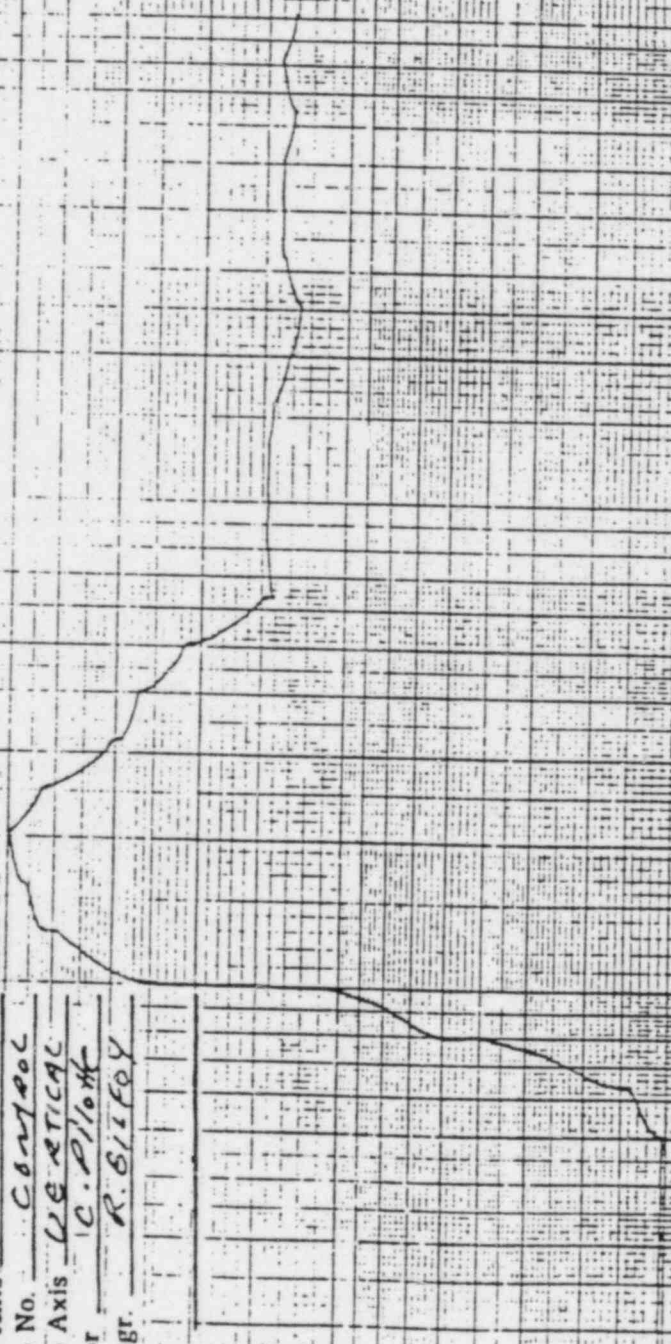




Test No. 5  
Date 10-3-79  
Customer G.E. PHIL  
Test Item P/N 47E240609  
Test Item S/N  
Type of Test 1st OGE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature Room  
Period of Test 30 SEC.  
Control Axis L-R + VERT.  
Pickup No. Control  
Pick-up Axis VERTICAL  
Operator C. P. Hoff  
Test Engr. R. G. Foy

GRMS-

Q = 10 570 Damping





Test No. 51 2nd Run  
Date 10-3-78  
Customer G.E. DH:11  
Test Item P/N 4176240609  
Test Item S/N  
Type of Test Random 2nd oct  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature room  
Period of Test 30 SEC.  
Control Axis Control  
Pick-up No. Control  
Pick-up Axis Vertical  
Operator C. Pilote  
Test Engr. R. Gilfoy

GRMS

573 Damping

Q = 10





Test No. 5 3rd Run  
Date 10-3-79  
Customer B.E. PHIL.  
Test Item P/N 47870609  
Test Item S/N  
Type of Test 3rd ODE  
Spec. No. \_\_\_\_\_  
Para. No. \_\_\_\_\_  
Conditions OPER.  
Temperature Room  
Period of Test 30 SEC.  
Control Axis VERTICAL  
Pick-up No. Control  
Pick-up Axis VERTICAL  
Operator C. Pilote  
Test Engr. R. Gilfoy

GRMS

$Q=10$  5 to DAMPING



Test No. 5  
Date 10-31-78  
Customer B. C. PHIL  
Test Item P/N 172240608  
Test Item S/N  
Type of Test 4th OBE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature Room  
Period of Test 30 SEC.  
Control Axis L-R+VERT.  
Pick-up No. CENTRAL  
Pick-up Axis VERTICAL  
Operator C. DiLotto  
Test Engr. R. B. Foley

GRMS-

Q = 10 5% Damping







Test No. 5  
 Date 10-3-79  
 Customer GIC: PHIL.  
 Test Item P/N 47E2Y0609  
 Test Item S/N  
 Type of Test 5th OBS  
 Spec. No.  
 Para. No.  
 Conditions OPER.  
 Temperature Room  
 Period of Test 30 SEC.  
 Control Axis C-210087.  
 Pick-up No. CONTROL  
 Pick-up Axis Vertical  
 Operator C. Pilett  
 Test Engr. A. Gilfoy

GRMS



Test No. 5  
Date 10-13-79  
Customer G.P. PHIL  
Test Item P/N 47E240609  
Test Item S/N  
Type of Test SSE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis VERTICAL  
Pick-up No. CONTROL  
Pick-up Axis VERTICAL  
Operator C. P. P. P.  
Test Engr. R. S. F. F.

GRMS

Q = 10 5% DAMPING

10

5r

10

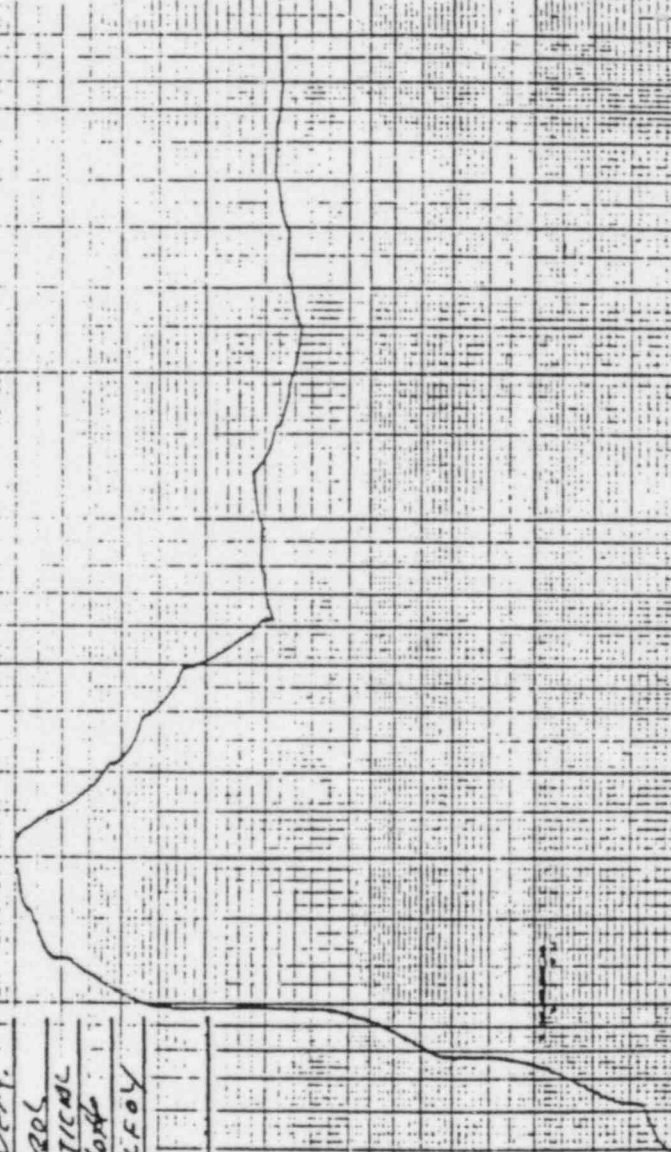




Test No. 6-15108E  
Date 10-3-79  
Customer G.E. PHIL.  
Test Item P/N Y2E2Y0609  
Test Item S/N  
Type of Test 15108E  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis B-F+VERT.  
Pick-up No. CONTROLS  
Pick-up Axis VERTICAL  
Operator Q. P. LOR  
Test Engr. R. GILFOLY

GRMS

CD=10  
572 RHMP/K







Test No. 6 Rev 1  
Date 10-3-79  
Customer G.E. Phil.  
Test Item P/N 47E240609  
Test Item S/N  
Type of Test 2-1/2 DBE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature Room  
Period of Test 30 sec.  
Control Axis B-F Vertical  
Pick-up No. Control  
Pick-up Axis Vertical  
Operator C. P. 10/10  
Test Engr. R. S. 11/10/1

GRMS-

$\Delta = 10$  5% DAMPING



10-

5

10



Test No. 10-3-79 3rd RUN  
Date 10-3-79  
Customer G.E. PHIL.  
Test Item P/N 475240609  
Test Item S/N  
Type of Test 3rd DGE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature Room  
Period of Test 30 SEC.  
Control Axis B-Frequent.  
Pick-up No. Control  
Pick-up Axis VERTICAL  
Operator C. Pilot  
Test Engr. R. Gilfoyl

GRMS.

Q=10 5-20 Damping



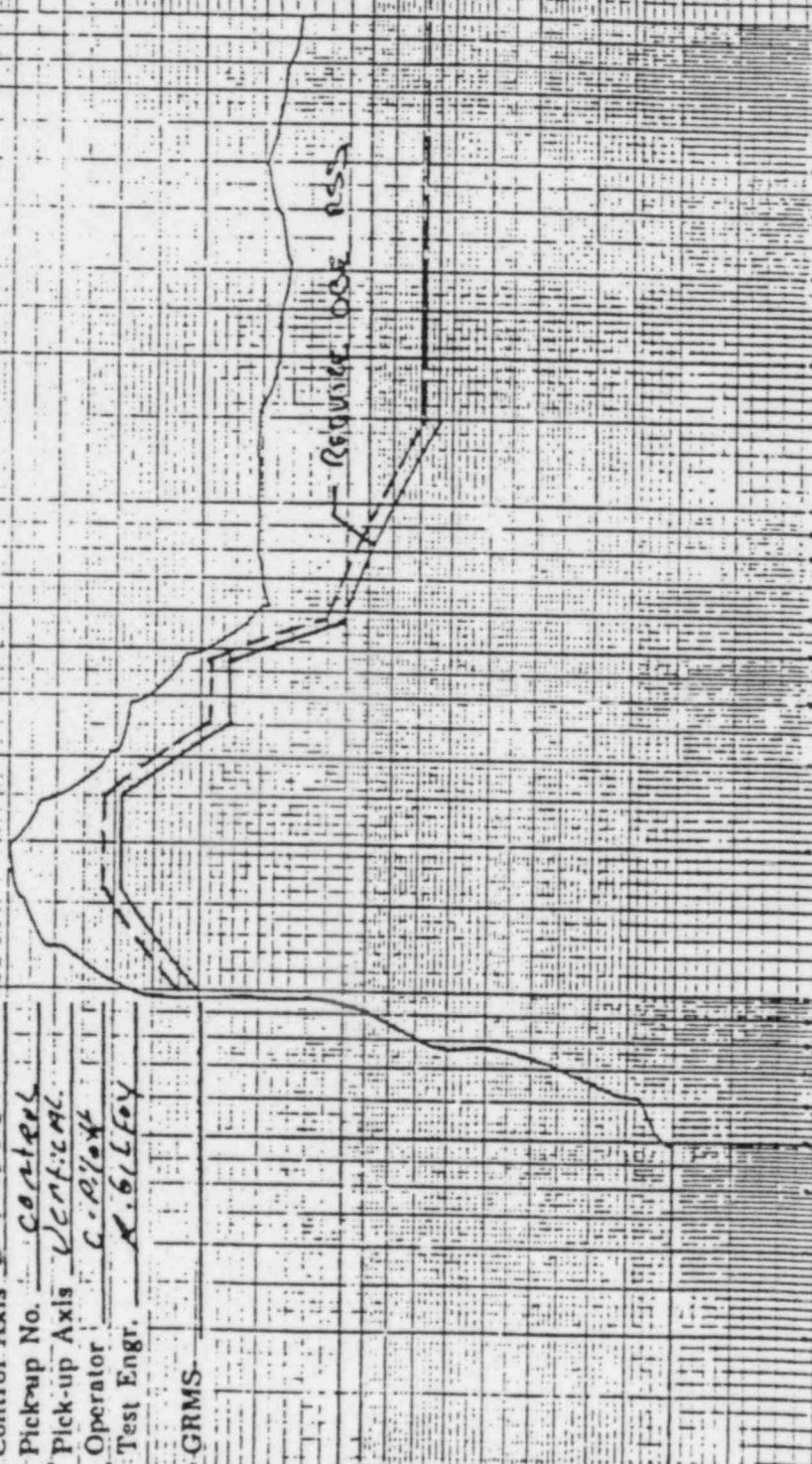
01.





Test No. C 541 P42  
Date 10-3-79  
Customer G.E. Phil.  
Test Item P/N 47E 240607  
Test Item S/N  
Type of Test 5th QBE  
Spec. No.  
Para. No.  
Conditions OPER.  
Temperature Room  
Period of Test 30 Sec.  
Control Axis B-F Vertical  
Pickup No. Control  
Pickup Axis Vertical  
Operator C. P. York  
Test Engr. A. G. L. Fox

GRMS



Required QBE PSS  
(+10% Margin)

508-17-18-1



Test No. 10-3-78  
Customer Q.E. PHIL.  
Test Item P/N 41E24060  
Test Item S/N  
Type of Test Random  
Spec. No. 508  
Para. No.  
Conditions OPER.  
Temperature ROOM  
Period of Test 30 SEC.  
Control Axis B-F/Vent.  
Pick-up No. 12  
Pick-up Axis Vertical  
Operator C. D. Hoff  
Test Engr. R. Gilfoy

