

EQUIPMENT QUALIFICATION DATA PACKAGE

This document contains information, relative to the qualification of the equipment identified below, in accordance with the methodology of WCAP 8587. The Specification section (Section 1) defines the assumed limits for the equipment qualification and constitute interface requirements to the user.

HEAD VENT SYSTEM

Electronic Control Module (HE-10B)

This system also includes the following pieces of equipment:

Solenoid Operated Isolation Valve (HE-10A)
Modulating Valve (HE-10C)

Seperate Equipment Qualification Data Packages (EQDPs) and Equipment Qualification Test Reports (EQTRs) have been developed for each of the above pieces of equipment utilized in the Head Vent System

APPROVED:

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WESTINGHOUSE CLASS 3

SECTION 1 - SPECIFICATIONS

1.0 PERFORMANCE SPECIFICATIONS

1.1 Electrical Requirements

1.1.1 Voltage: 90-140 VDC

1.1.2 Frequency: N/A

1.1.3 Load: N/A

1.1.4 Electromagnetic Interference: N/A

1.1.5 Other: N/A

1.2 Installation Requirements: The Electronic Control Module must be installed in a location outside containment that is limited to normal environment conditions and earthquake loads. Mounting should be to a vertical surface using the holes provided on the back panel.

1.3 Auxiliary Devices: None

WESTINGHOUSE CLASS 3

- 1.4 Preventative Maintenance Schedule: Per the Westinghouse Equipment Qualification test program, no preventive maintenance is required to support the equipment qualified life of 10 years as specified in Section 1.9. This does not preclude development of a preventive maintenance program designed to enhance equipment performance and identify unanticipated equipment degradation as long as this program does not compromise the qualification status of the equipment. Surveillance activities may also be considered to support the basis for/and a possible extension of the qualified life.
- 1.5 Design Life: 40 years
- 1.6 Operating Cycles (Expected number of cycles during design life, including test): 20,000 for a 40 year life.

1.7 Performance Requirements for (b): Electronic Control Module

Parameter	Normal Conditions	Abnormal Conditions	Containment Test Conditions	DBE Conditions(a)		Post DBE Conditions(a)			
				FLB/SLB	LOCA	Seismic	FLB/SLB	LOCA	Seismic
1.7.1 Time requirement	Continuous	Included under normal	N/A	N/A	N/A	Event duration	N/A	N/A	Continuous
1.7.2 Performance requirement	Note c		N/A	N/A	N/A	Note c	N/A	N/A	Note c

1.8 Environmental Conditions for Same Function (b)

1.8.1 Temperature(°F)	50-120	Included under normal	N/A	N/A	N/A	Ambient	N/A	N/A	Ambient
1.8.2 Pressure (psig)	-6.7/+3		N/A	N/A	N/A	Ambient	N/A	N/A	Ambient
1.8.3 Humidity (Percent RH)	0-100		N/A	N/A	N/A	Ambient	N/A	N/A	Ambient
1.8.4 Radiation (R)	3.5×10^4 y		N/A	N/A	N/A	None	N/A	N/A	None
1.8.5 Chemicals	None		N/A	N/A	N/A	None	N/A	N/A	None
1.8.6 Vibration	Figure 1		N/A	N/A	N/A	None	N/A	N/A	None
1.8.7 Acceleration(g)	None		N/A	N/A	N/A	Figure 2	N/A	N/A	None

Notes: a: DBE is the Design Basis Event.

b: Margin is not included in the parameters of this section.

c: The valve stroke time, fully closed to fully open or fully open to fully closed, shall not exceed ten (10) seconds.

WESTINGHOUSE CLASS 3

1.9 Qualified Life: The demonstrated qualified life is 10 years
 - based on the actual test conditions
 identified in Table 1.

1.10 Remarks:

None

SECTION 2 - QUALIFICATION BY TEST

2.0 TEST PLAN

The complete sequence of type testing for the Target Rock Corporation (TRC) Electronic Control Module was conducted at several different test facilities. All functional tests were conducted at Target Rock Corporation, East Farmingdale, N.Y. The environmental and vibration/seismic testing was performed at American Environment Co., Inc., in West Babylon, N.Y. All radiation testing was performed by Isomedix, Inc., in Parisippany, N.J.

2.1 Equipment Description: Target Rock Corporation, "Electronic Control Module, Model 80T, part number 300592-1, serial number 001.

2.2 Number Tested: 1

2.3 Mounting: As defined in Section 1.2

2.4 Connections: As specified by manufacturer on the 79AB-003 modulating valve assembly drawings

2.5 Aging Simulation Procedure

By a sequential type test program as described by Subprogram A of Appendix B to WCAP-8587 and reported in Reference 1.

2.6 Service Conditions to be Simulated by Test⁽¹⁾

	<u>Normal</u>	<u>Abnormal</u>	<u>Containment Test</u>	<u>Seismic</u>	<u>HELB/LOCA</u>	<u>Post-HELB/LOCA</u>
2.6.1 Temp. (°F)	50-120	Included under normal	N/A	Ambient	N/A	N/A
2.6.2 Pressure (psig)	-6.7/+3			Ambient		
2.6.3 Humidity (Percent RH)	0-100 percent			Ambient		
2.6.4 Radiation (R)	2.5×10^4 y			None		
2.6.5 Chemicals	None			None		
2.6.6 Vibration	See Fig. 1			None		
2.6.7 Acceleration (g)	None			Figure 2		

2.7 Measured Variables

This section identifies the parameters required to be measured during the test sequence(s).

2.7.1	Category I - Environment	<u>Required</u>	<u>Not Required</u>
2.7.1.1	Temperature	B	A,C,D
2.7.1.2	Pressure	B	A,C,D
2.7.1.3	Moisture		A,B,C,D
2.7.1.4	Composition		A,B,C,D
2.7.1.5	Seismic Acceleration	C	A,B,D
2.7.1.6	Time	B,C,D	A
2.7.2	Category II - Input Electrical Characteristics		
2.7.2.1	Voltage	A,B,C	D
2.7.2.2	Current	A,B,C	D
2.7.2.3	Frequency		A,B,C,D
2.7.2.4	Power		A,B,C,D
2.7.2.5	Other		A,B,C,D
2.7.3	Category III - Fluid Characteristics		
	N/A		
2.7.4	Category IV - Radiological Features		
2.7.4.1	Energy Type	D	A,B,C
2.7.4.2	Energy Level	D	A,B,C
2.7.4.3	Dose Rate	D	A,B,C
2.7.4.4	Integrated Dose	D	A,B,C

		<u>Required</u>	<u>Not Required</u>
2.7.5	Category V - Electrical Characteristics		
2.7.5.1	Insulation Resistance	A,B,C	D
2.7.5.2	Output Voltage		A,B,C,D
2.7.5.3	Output Current	A,B,C	D
2.7.5.4	Output Power		A,B,C,D
2.7.5.5	Response Time		A,B,C,D
2.7.5.6	Frequency Characteristics		A,B,C,D
2.7.5.7	Simulated Load	A,B,C	D

2.7.6 Category VI - Mechanical Characteristics

N/A

2.7.7 Category VII - Auxiliary Equipment

N/A

- A. Performance Tests
- B. Environmental Aging Tests
- C. Vibration/Seismic Tests
- D. Radiation Test

2.8 Test Sequence Preferred

This section identifies the preferred test sequences as specified in IEEE-323-74

2.8.1 Inspection of Test Item

2.8.2 Operation (Normal Condition)

2.8.3 Operation (Performance Specifications Extremes, Section 1)

2.8.4 Simulated Aging

2.8.5 Vibration/Seismic

2.8.6 Disassembly and Inspection

Note: Since the Electronic Control Modules are limited to installation outside of containment, the HELB and post-HELB conditions are not applicable.

2.9 Test Sequence Actual

The Electronic Control Module was tested in accordance with the preferred test sequence identified in Section 2.8.

2.10 Test Data

2.10.1 Objective

The objective of this test program is to demonstrate that the Target Rock Electronic Control Module meets or exceeds the safety related performance requirements while subjected to simulated normal, abnormal and accident environments in accordance with the recommended practices of Reg. Guide 1.89 (IEEE-323-1974), Reg. Guide 1.100 (IEEE 344-1975) and Reg. Guide 1.73 (IEE-382-1972).

2.10.2 Equipment Tested

A sample component from the Generic Design was identified randomly and tested. Manufacturing processes, production tests and materials of construction for the design are monitored and controlled and a quality release provided. The sample components selected completed the entire test sequence of Section 2.8.

2.10.3 Test Summary

2.10.3.1 The test module was randomly selected from a production run, for Westinghouse, as specified by Westinghouse equipment Specification G-955186.

- 2.10.3.2 The Electronic Control Module was initially performance tested in accordance with the manufacturer's applicable Test Procedure and inspected to insure no damage had occurred since manufacture. Performance testing and subsequent inspection was successfully completed.
- 2.10.3.3 The Electronic Control Module was thermally aged in a controlled oven for a time period and at a test temperature equivalent to a qualified life of 10 years. The module was cycled 4850 times during thermal aging. Prior to thermal aging, the module was cycled 15,150 cycles for a total of 20,000 cycles.
- 2.10.3.4 The test unit was radiation tested by exposure to a gamma source for a dosage of 2.5×10^4 Rads to simulate the normal environment total dose.
- 2.10.3.5 The test unit was vibration/seismic tested in accordance with the requirements of Figures 1 and 2 and IEEE 344-1975.
- 2.10.3.6 The test unit was additionally radiation tested by exposure to a gamma dosage of 1.0×10^4 rads after the DBE vibration/seismic testing.

2.10.3.7 During and after the testing identified in Sections 2.10.3.3 through 2.10.3.5 the Electronic Control Module was performance tested to demonstrate valve operability to the requirements of Sections 1.1 and 1.7.

2.10.4 Conclusion

The demonstrated qualified life of the Target Rock Corporation Electronic Control Module has been established in accordance with Subprogram A of the Westinghouse Aging Evaluation Program. The results of the aging program, together with the seismic and environmental testing described herein, demonstrate the qualification of the Model 80T Electronic Control Module for a period of 10 years employing the practices recommended by Reg. Guide 1.89, 1.100 and 1.73.

2.11 Section 2 Notes

- (1) The generic tests completed by Westinghouse employ parameters designed to envelope a number of plant applications. Margin is a plant specific parameter and will be established by the applicant.

2.12 References

1. Kamenic, M. E., "Equipment Qualification Test Report Target Rock Corporation Electronic Control Module", WCAP 8687, Supplement 2-E10B (Proprietary).

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SECTIONS 3 AND 4 QUALIFICATION BY EXPERIENCE AND/OR ANALYSIS

Westinghouse does not employ operating experience or analysis in support of the qualification program for the Target Rock Electronic Control Module.

TABLE 1

ACTUAL QUALIFICATION TEST CONDITIONS

EQUIPMENT (1) SYSTEM/CATEGORY	LOCATION STRUCTURE/AREA	MANUFACTURER TYPE/MODEL	ABNORMAL/ACCIDENT ENVIRONMENTAL EXTREMES		OPERABILITY REQ	ACCURACY(%)		QUAL LIFE	QUAL METHOD	QUAL REF	QUAL PROGRAM STATUS
			PARAMETER	SPECIFIED (2)		DEM	RFQ				
Valve	Outside	Target Rock	Temperature	240°F	1 yr.	1 yr.	N/A	N/A	10	Seq.	HE-10B Completed
appurtances/ CVCS, SIS	Containment	Model 80T	Pressure	.3 psig	Post	Post			yrs.	Test	
RHR, RCS		Electronic	Rel. humidity	100 percent	DBE	DBE					
Category a		Control	Radiation	$3.5 \times 10^4 R(\gamma)$							
		Module									
			Chemistry	None							

1. For definition of the equipment category, refer to NUREG-0588 "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment," Appendix E, Section 2.
2. Plant specific environmental parameters are to be inserted by the applicant.

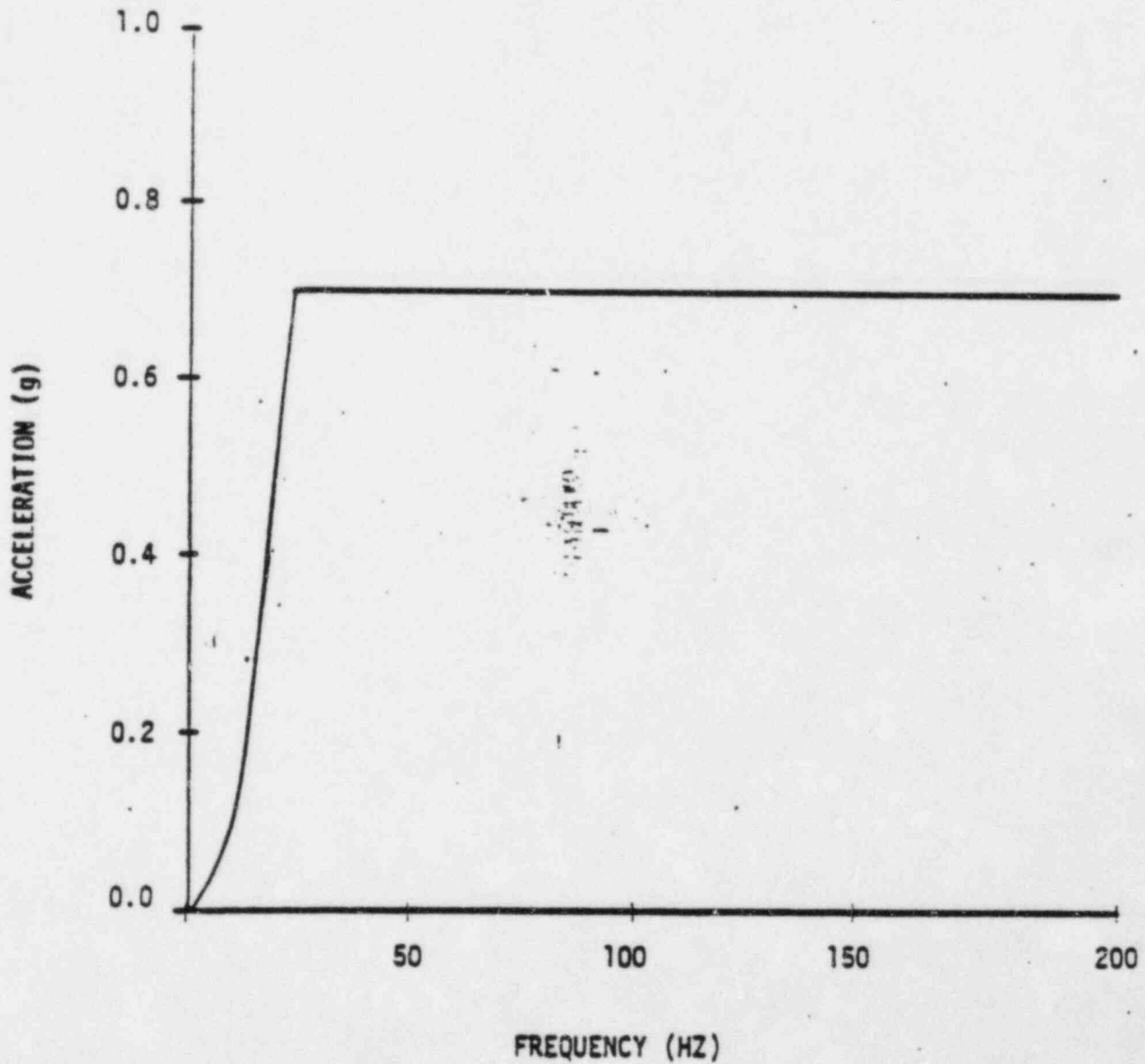


Fig. 1: Plant Induced Vibration Linear Spectra

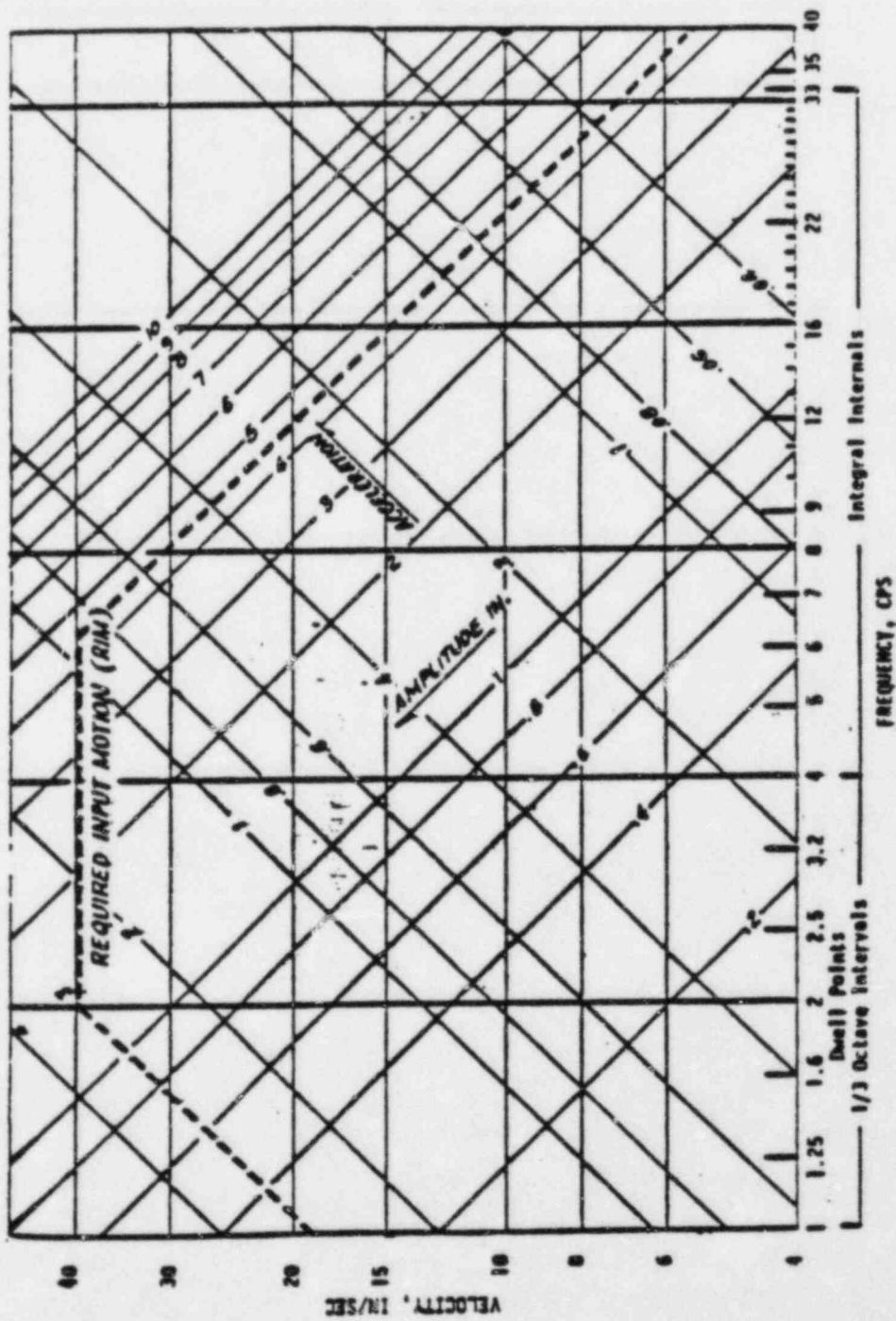


Figure 2 Seismic Qualification Required Input Motion

SNUPPS
Interim Justification Position for the
Seismic Qualification of International
Instruments 1151 Indicator
(J-110)

SPECIFICATION

J10

J-110

Equipment: International Instruments model 1151 panel indicators.

Qualification Concern: The indicators are currently in a test program. Test documentation will not be available until after fuel load.

J10:

1. The International Instrument model 1151 indicator has been seismically tested satisfactorily for other nuclear units and is in use at existing nuclear power plants.
2. The SNUPPS seismic test program will be completed by 3/9/84. Bechtel will monitor the testing to stay abreast of the qualification program. However, based on item 1 above, no adverse results are expected as a result of the testing program.

The International Instrument model 1151 indicators will be qualified or will be replaced with qualified indicators prior to March 31, 1985.

SNUPPS
Interim Justification Position for the
Seismic Qualification of American
Warming and Ventilating Dampers
(M-627A)

SPECIFICATION

JIO

M-627A

Equipment: AWV Model No. 7401 dampers supplied by American Warming and Ventilating, Inc. as identified in Attachment 1.

Qualification Concern: The final test report will not be available until April, 1984.

Background: The dampers of concern were previously tested. An anomaly during the testing resulted in a modification in the attachment of the damper blades. Subsequent field verification determined that the modification was not performed as specified. A new test was performed to verify the acceptability of the installed configuration in February, 1984.

JIO: All dampers that were retested satisfactorily demonstrated the adequacy of the attachment method. The tests were witnessed by a representative from the SNUPPS Architect/Engineer. Written confirmation has been received from the testing lab that the dampers had the ability to withstand the specified TRS.

The dampers are considered qualified based on the satisfactory completion of the seismic test program. The documentation is being developed by the testing laboratory and vendor.

ATTACHMENT 1

DAMPER TAG NUMBERS

GE-D-046/1-5-4	GK-D-128/1-5-4
GE-D-047/1-5-4	GK-D-129/1-5-4
GF-D-024/1-5-3	GK-D-208/3-2-1
GF-D-025/1-5-3	GK-D-209/3-2-1
GF-D-028/1-5-4	GK-D-212/3-2-1
GF-D-029/1-5-4	GK-D-213/3-2-1
GG-D-003/6-1-1	GL-D-030/1-3-3
GG-D-004/6-1-1	GL-D-031/1-3-3
GG-D-032/6-3-1	GL-D-058/1-5-3
GT-D-009/1-5-4	GT-D-010/1-5-4
GF-D-065/1-4-4	GF-D-066/1-4-4
GL-D-156/1-4-2	GL-D-157/1-4-2
GK-D-317/3-4-1	GK-D-292/3-4-1
GK-D-320/3-3-1	GK-D-323/3-3-1
GK-D-002/1-5-2	GK-D-004/3-7-1
GK-D-009/3-2-1	GK-D-016/3-7-1
GK-D-018/1-5-2	GK-D-219/3-2-1
GK-D-220/3-2-1	GK-D-300/1-5-2
GK-D-301/1-5-2	GK-D-309/1-5-2
GK-D-310/1-5-2	GK-D-311/1-5-2
GK-D-312/1-5-2	GF-D-062/1-5-4
GF-D-063/1-5-4	GM-D-011/5-2-1
GM-D-012/5-2-1	GM-D-013/5-2-1
GM-D-014/5-2-1	GM-D-015/5-2-1
GM-D-016/5-2-1	GD-D-019/0-1-0 (Item U-15)
GD-D-020/0-1-0 (Item U-16)	GD-D-015/0-1-0 (Item U-11)
GD-D-016/0-1-0 (Item U-12)	GD-D-017/0-1-0 (Item U-13)
GD-D-018/0-1-0 (Item U-14)	

SNUPPS
Interim Justification Position for the
Seismic Qualification of the
Operator Interface Modules
(OIM's)

Westinghouse has conducted preliminary qualification testing on the Operator Interface Modules (OIM's). The objective of this program was to demonstrate the capability of the OIM's to perform their safety function while exposed to the abnormal environment of Attachment 1 and the safe shutdown earthquake of Attachment 2. This testing employed the recommended practices of R.G. 1.89 and R.G. 1.100 as interpreted by WCAP-8587.

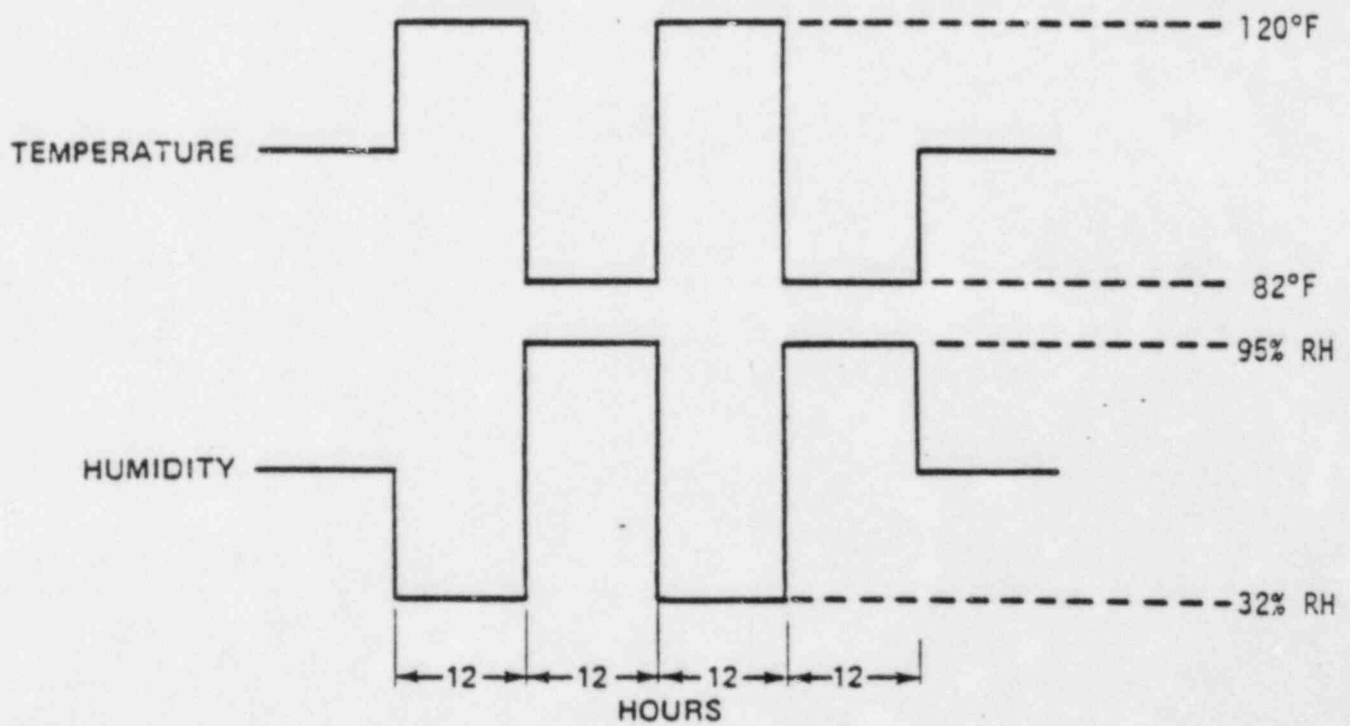
Acceptance criteria for the test was absence of switch contact bounce during the testing and no more than a $\pm 2\%$ shift in output on the 3.5 inch meter after the test.

Monitoring of the switch contacts during the test demonstrated no contact bounce. The 3.5 inch meter did slightly exceed its acceptance criteria but the increased error can be absorbed by the total channel allowance. However, since the original acceptance criteria was exceeded, Westinghouse is reviewing the meter design and plans to repeat the tests with a larger sample and a relaxed acceptance criteria. In the interim, the tests to date provide sufficient assurance that the total indicated accuracy of the channel will be satisfied and operation using these instruments is justified.

The final testing and report is scheduled to be completed by May 31, 1984 and will be documented in WCAP-8587 and WCAP-8687.

WESTINGHOUSE CLASS 3

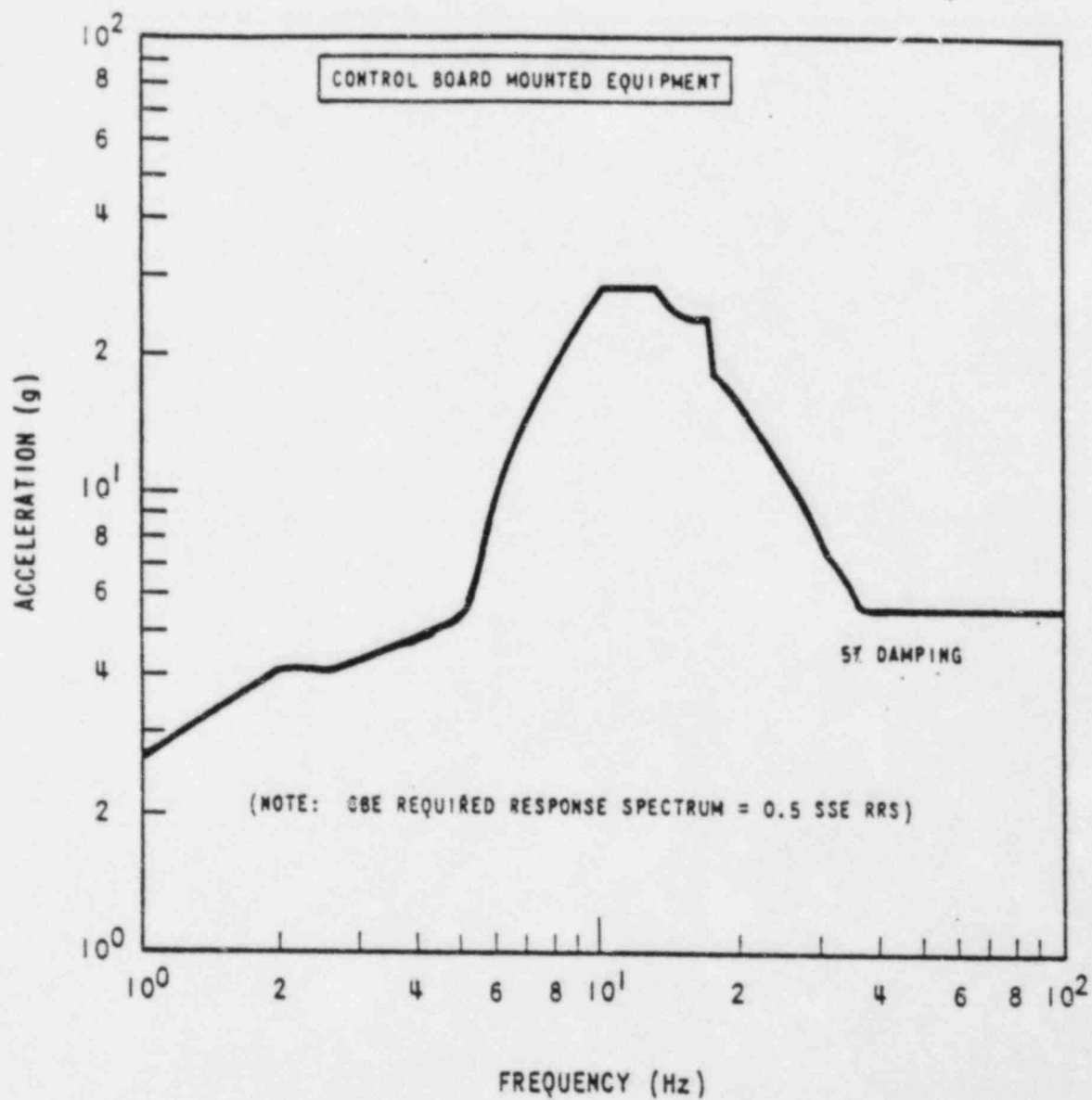
Attachment 1



Environmental Test Profile

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Attachment 2



Required Response Spectrum (RRS) for Safe Shutdown Earthquake (SSE)

SNUPPS
Interim Justification Position for the
Seismic Qualification of Cutler
Hammer Series E-30 Pushbutton
Assemblies
(E-028, J-200)

SPECIFICATION

J10

E-028, J-200

Equipment: Cutler Hammer series E-30 pushbutton assemblies.

Qualification Concern: These pushbutton assemblies are currently in a test program. The results are not available.

J10: The use of the pushbutton assemblies without complete seismic qualification is justified for the following reasons:

1. Cutler Hammer pushbutton assemblies have been qualified for use in existing nuclear power plants.
2. Similar SNUPPS plant pushbutton assemblies have been qualified to the SNUPPS seismic requirements as components of tested equipment. Pushbutton assemblies have been seismically qualified in motor control centers, load centers, switchgear and other electrical equipment.
3. The Cutler Hammer series E-30 pushbutton assemblies utilized in the SNUPPS design are heavy duty compact units that exhibit no apparent seismic fragility.
4. A qualification testing program is in progress with seismic testing scheduled for completion at a later date. Bechtel will monitor the testing to stay abreast of the qualification progress. The results of the testing will be known prior to fuel load. However, based on reasons 1-3 above no adverse results are expected.

The Cutler Hammer pushbutton assemblies are currently in a testing program to verify seismic qualification. The operators will be qualified or will be replaced with pushbutton operators that are qualified prior to March 31, 1985.