

WCAP 8587

"Equipment Qualification Data Packages"

Supplement 1

EQDP-ESE-10

Nuclear Instrumentation System (NIS) Console

(Power Range Channel)

Revision 5

Instruction Sheet

The following instructional information and checklist is being furnished to help insert the following into WCAP-8587 Supplement 1 EQDP-ESE-10 Class 3 (Non-Proprietary). Discard the old sheet and insert the new sheets as listed below. Revised information is indicated by a bar and number 5 on the outside margin of the page.

Remove
(Front/Back)

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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.

Nuclear Instrumentation System (NIS) Console

(Power Range Channel)

APPROVED:

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SECTION 1 - SPECIFICATIONS

1.0 PERFORMANCE SPECIFICATIONS

1.1 Electrical Requirements

- 1.1.1 Voltage: 118 VAC $\pm$ 5%
- 1.1.2 Frequency: 60 $\pm$ 1 Hz or 50 $\pm$ 1 Hz
- 1.1.3 Load: 294 watts (single rack with four drawers)
- 1.1.4 Electromagnetic Interference: None
- 1.1.5 Other: The electrical requirements are described in detail in WCAP-8255.

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- 1.2 Installation Requirements: Westinghouse Drawing 6055D66 Revision C. Location in a controlled environment. C&ES Standard 2.3.

- 1.3 Auxiliary Devices: 2-Section and 4-Section, Power Range Neutron Detectors (EQDP-ESE-8 and 22)

- 1.4 Preventative Maintenance Schedule: As a result of the completion of the Westinghouse Aging Evaluation Program (Phase 1, Short Term Aging) described in WCAP-8587 and discussed in WCAP-8687-Supplement 2, Appendix A1 (Component Aging) Reference 10 and Appendix A2 (Materials Aging) Reference 11 (Proprietary), no preventive maintenance is required to support the equipment qualified life. 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.

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- 1.5 Design Life: 40 years - auxiliary devices (1.3) 5 years.

- 1.6 Operating Cycles (Expected number of cycles during design life, including test): continuous duty

1.7 Performance Requirements for^(b): Reactor Trip

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	12 hours	N/A	N/A	N/A	event duration	N/A	N/A	Continuous
1.7.2 Performance requirement	Note c	as normal				Note c			Note c

1.8 Environmental Conditions for Same Function^(b)

1.8.1 Temperature ^o F	60 - 80	Note d				ambient			ambient conditions
1.8.2 pressure (psig)	0	0				0			
1.8.3 Humidity (% RH)	30 - 50	Note d				ambient			
1.8.4 Radiation (R)	< 400	None				None			
1.8.5 Chemicals	None	None				None			
1.8.6 Vibration	None	None				None			
1.8.7 Acceleration (g)	None	None				Fig. 2			

Notes: a: DBE is the Design Basis Event.

b: Margins are not included in the parameters specified in this section.

c: NIS power range performance requirements are specified on page 4.

d: Figure 1, envelope 3. However, since based on Westinghouse experience, operation at low humidity is not an equipment operating concern, the abnormal extreme for humidity shall be 95 percent RH. Also, for plants having a Class 1E HVAC for the area in which the NIS is located, the abnormal extremes are the same as the normal specified above.

location is a seismic event. The previously completed seismic testing reported in Reference 2,3,4,5 and 6 was completed on new equipment at differing seismic levels employing single axis sine beat testing in accordance with IEEE 344-1971. The seismic testing which has been performed and demonstrates the transition from IEEE-344-71 testing to IEEE-344-75 requirements is reported in Reference 12. The two units that were tested are manufactured to the same baseline, thus the units are not different in any way that would affect the test. This original testing, together with the demonstration testing requested by the NRC employing multi-axis multi-frequency inputs as reported in Reference 7, demonstrate the capability of the Power Range Channel of the NIS Console to perform prespecified safety-related functions during and after seismic events up to and including that defined by Figure 2 in accordance with the procedures recommended by Reg. Guide 1.100 (IEEE 344-1975). During the high seismic testing reported in Reference 7 the drawer latches failed. A modification to the NIS console employed for high seismic plants has been implemented as described in Reference 8. The generic required response spectrum (Figure 2) contains significant margin with respect to any single plant application referencing this program.(1)

2.10.3.3 Aging Evaluation

Subprogram C of the Westinghouse Aging Evaluation Program (Appendix B, WCAP 8587) has

incorporated a representative sample of components from the Power Range Channel of the NIS Console. This program is completed and reported in WCAP-8687 Supplement 2, Appendix A1 (Proprietary). The objective of Subprogram C is to demonstrate that during the qualified life there are no in-service aging mechanisms capable of reducing the capability of the Power Range Channel of the NIS Console to perform during or after a seismic event. As a consequence, the seismic testing on the un-aged Power Range Channel of the NIS Console described above, is not prejudiced by any in-service aging mechanisms.

2.10.4 Conclusion

The currently demonstrated qualified life of the Power Range Channel of the NIS Console is 5 years. Westinghouse is planning an extension of Subprogram C of the Aging Evaluation Program to increase the qualified life. The results of the aging program, together with the seismic and environmental testing described herein, demonstrate the qualification of the Power Range Channel of the NIS Console employing the practices recommended by Reg. Guide 1.89 and 1.100.

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.