

Global Instrumentation and Control

Electromagnetic Compatibility Qualification Services

Background

Westinghouse's Electromagnetic Compatibility (EMC) Qualification Analysis and Testing Services facility, located in New Stanton, Pennsylvania (USA) provides a direct source for safety-related EMC qualification services. Westinghouse saves utilities time and money by providing nuclear steam supply system and balance-of-plant safety-related Class 1E parts, components and assemblies that are qualified to regulatory and plant-specific requirements.

EMC testing was developed to prove that electrical components do not emit or receive transmitted energy that would cause a false signal to trip a device thus causing a reactor scram. Westinghouse has invested heavily in this area in both personnel and equipment.

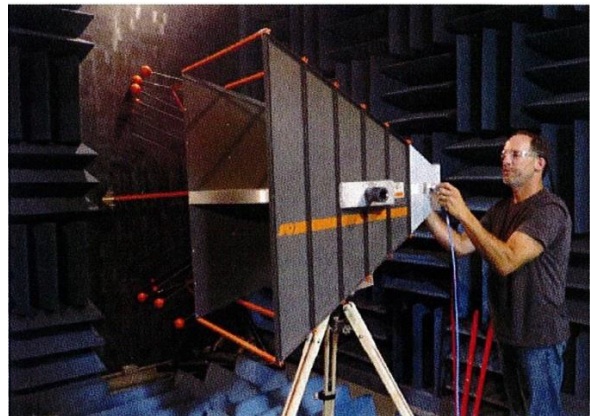
Electromagnetic interference (EMI), radio-frequency interference (RFI) and power surges have been identified as environmental conditions that can affect the performance of safety-related electrical equipment. Qualification to EMI/RFI and power surges were not historically considered as part of equipment qualification since the legacy I&C systems were less vulnerable to EMI/RFI, and historical data supported successful operation in the nuclear plant environment. The replacement of existing I&C equipment with computer-based digital I&C systems or advanced analog systems requires assessment of EMC since the replacement equipment may result in greater vulnerability to the nuclear power plant EMI/RFI and power surges environments.

Equipment that is not safety-related may require EMC testing to characterize the reliability of the equipment in the nuclear plant EMI/RFI environment.

Westinghouse's qualified and industry recognized experts test the ability of Class 1E parts, components and assemblies to withstand interference from other electrical sources without causing harmful interference with other electrical or electronic equipment.

At its New Stanton facility, Westinghouse has installed a semi-anechoic chamber (20.5ft x 20.5ft x 20.5ft), in addition to multiple ground plane sites, to conduct EMC testing on safety-related parts, components, and assemblies.

This large-capacity chamber provides room for fully integrated system level testing.



Double Ridge Guide Horn Antenna Used for IEC 61000-4-3 and MIL-STD-461E, RE102 Testing

Description

Westinghouse provides detailed qualification reports with a qualification summary, applicable standards, acceptance criteria and test results. EMC qualification is conducted in accordance with U.S. NRC RG 1.180 and other national and international support standards.

Westinghouse has successfully tested equipment such as:

- Instrumentation & Control Systems and Equipment
- Electrical Distribution Equipment
- Networking Systems and Equipment
- UPS Systems
- Power Supplies

RG 1.180 R1 Implementation		
Emissions MIL-STD-461E	Conducted Emissions	CE101 and CE102
	Radiated Emissions	RE101 and RE102
Susceptibility IEC 61000-6-2 IEC 61000-4 series MIL-STD-461E	ESD	IEC 61000-4-2
	Radiated Susceptibility	IEC 61000-4-3 MIL STD 461E RS103
	Conducted Susceptibility	IEC 61000-4-6 IEC 61000-4-16
	Magnetic Field Immunity	IEC 61000-4-8 IEC 61000-4-9 IEC 61000-4-10
	Surge Withstand Capability IEC 61000-4-5 IEC 61000-4-12	IEC 61000-4-4
Additional Capabilities to Support CE Marking		
Emissions MIL-STD-461E	Conducted Emissions	EN 55011
	Radiated Emissions	EN 55011
Susceptibility	Voltage Dips, Interruptions, and Fluctuations	IEC 61000-4-11

Documentation

With each qualification program or analysis, Westinghouse will provide:

- Report of letter
- Certificate of Qualification
- Equipment Qualification Data Sheet (EQDS)

Benefits

In-house capabilities allow Westinghouse to offer customers:

- Experienced personnel to perform EMC analyses, testing, and consultation on EMI issues
- Customized services
- Plant-specific qualification and test reports
- Integrated qualification (EMC, environmental, and seismic qualification)

Westinghouse is a worldwide leader and supplier of EMC testing services for utilities, both foreign and domestic. EMC testing at the New Stanton facility has supported both the **AP1000®** plant systems, as well as systems for legacy plants, such as the spent fuel pool instrumentation system.

Regulatory Compliance

Westinghouse complies with the requirements of the following organizations: U.S. Nuclear Regulatory Commission (NRC) Title 10 Code of Federal Regulations (CFR) Part 50, Appendix B, 10CFR21, Regulatory Guide (RG) 1.180, and International Standards Organization (ISO) 9001.

Experience

Westinghouse is a global leader and supplier of EMC qualification services for utilities. Westinghouse provides qualification for the following reactors:

- PWRs
- BWRs
- Candu

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