CURTISS-WRIGHT

Nuclear

Commercial Grade Dedication and Equipment Qualification

www.cwnuclear.com

Quality Assurance / Certifications

Quality Program

- ASME NQA-1
- ANSI N45.2
- ASME B31.1
- ASME Section IX
- AWS
- 10CFR50 Appendix B
- 10CFR21
- CSA Z299
- CSA N285
- CSA B51
- NUPIC and NIAC audited

Certifications

- ASME Section III, N, NA, NPT
- ASME Section III Class 1, 2, 3 and MC
- ISO 9001

Employee Involvement

- Appendix J Program Owners Group
- Ice Condensers Users Group (ICUG)
- ASME NQA-1 Committee
- IEEE-323 Standard Committee
- IEEE-344 Standard Committee
- IEEE-C37.98 Standard Committee
- IEEE-C37.105 Standard Committee
- IEEE-SC-2 Standard Committee
- IEEE-572 Standard Committee
- IEEE-649 Standard Committee
- IEEE-NPEC Conformity Assessment Steering Group (CASG)
- EPRI Generic Seismic Technical Evaluations of Replacement Items (G-STERI)
- EPRI Seismic Qualification Reporting and Testing Standardization (SQURTS)
- EPRI Critical Characteristics for Seismically Sensitive Items (CCASSI)
- EPRI Guidance for the Utilization of Commercial Grade Items
- EPRI Guidelines for EMI Testing
- Seismic Changes in JUTG to USNRC NUREG's CR-3875 ASME-AG-1
- Nuclear Air & Gas Treatment Code Committee

N NA NPT

Activities conducted in accordance with the requirements of the ASME Boiler and Pressure Vessel Code.

ACCREDITED Testing Laboratory

CGD / EQ Services

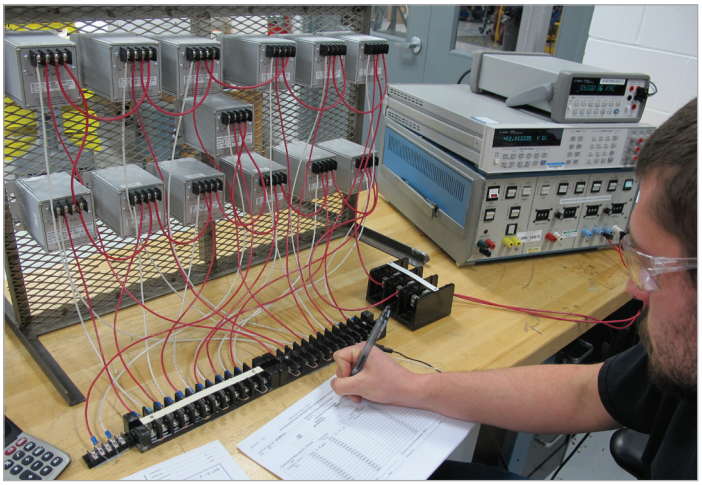
Who We Are

For over 30 years, Curtiss-Wright Nuclear Division has played a vital role in supporting the nuclear power industry's safety-related hardware needs through Commercial Grade Dedication (CGD) and Equipment Qualification (EQ) services. These services are performed in-house at the Center of Excellence, located in Cincinnati, Ohio.

With over 50,000 components qualified and dedicated, the CGD/EQ team maintains an extensive library containing thousands of dedication plans, qualification plans, and test reports. This repository of historical data represents decades of procedural experience and industry knowledge necessary to perform safety-related testing to regulatory standards.

Whether the challenge at hand involves an individual component or a complex system, Curtiss-Wright Nuclear has it covered. Capabilities include:

- Commercial grade dedication
- Equipment qualification
- Full-scope design engineering
- Project management
- Fabrication and assembly
- Safety-related hardware and replacement parts
- Obsolescence solutions
- 24/7 emergency response (+1.513.528.7900)



Commercial Grade Dedication

Dedication Procedures

Curtiss-Wright Nuclear Division follows a highly structured dedication process that adheres to governing industry guidelines. This methodology begins with a dedication procedure that includes technical evaluation, definition of critical characteristics for acceptance (based on safety function), acceptance criteria, acceptance test procedures, and data sheets. The CGD team performs all required dedication testing and, upon completion, issues a Certificate of Compliance or Conformance (CofC).

In-House Testing

The Center of Excellence – Curtiss-Wright Nuclear Division's CGD/EQ test lab – contains the fundamental equipment required to support an accredited commercial grade dedication program. Testing capabilities include elastomers, metallic items, oil and lubricant, and chemical analysis. Component functional tests are conducted by in-house technicians with specializations in electrical, electronic, mechanical, and I&C equipment.

Engineering Services

Services are performed by an in-house team of Professional Engineers (P.E.) specialized in civil, mechanical, and thermal engineering. Based on customer specifications, Curtiss-Wright Nuclear Division provides "build-to-print" assemblies or skids and complete turn-key services, including design, procurement, fabrication, assembly, testing, qualification and/or dedication.

In addition to individual components and piece parts, Curtiss-Wright Nuclear Division leverages its broad spectrum of complementary capabilities to provide solutions to complex hardware needs and support for major projects. With decades of experience combined with specialized Program Management tools, Curtiss-Wright Nuclear effectively manages projects involving multiple procurements and system integrations.

For a complete catalog of qualified components, please visit:
www.cwnuclear.com/brands/qualtech-np/commercial-grade-dedication

Equipment Qualification

Harsh or Mild Environment

Chambers / Ovens
- LOCA
- HELB
- MSLB
- Humidity Chambers
- Thermal Aging Ovens

Steam Test Simulators
- Harsh environmental testing

Post LOCA Submergence Chamber

Radiation Testing

Mechanical/Electrical Cycling

EMI/RFI Testing
- Electromagnetic/Radio Frequency Interference

Seismic Tables

Triaxial Tables
- 10' x 10': capacity to 10,000 lbs, accelerations to 8g's ZPA, frequency control up to 100Hz
- 3' x 3': capacity to 7,000 lbs, accelerations to 16g's ZPA, frequency control up to 100Hz
- 2' x 3': capacity to 300 lbs, accelerations to 12g's ZPA, frequency control up to 100Hz

Single Axis Table
- 33" x 33": capacity to 1,100 lbs, accelerations to 80g's ZPA, frequency up to 2200 Hz

Since 1993, Curtiss-Wright Nuclear Division has been the leading seismic test lab for Seismic Qualification Reporting and Testing Standardization (SQURTS).

Curtiss-Wright Nuclear Division offers a distinguished set of Equipment Qualification capabilities for harsh and mild environments. Our Qualification Center is fully equipped for in-house testing for a broad range of components and assemblies. Throughout our many years of practice, we have developed an expansive library of qualification test procedures and reports.

Our procedures abide by the following industry standards:
EQ Testing: N290.13-05, IEEE 323, 334, 382, IEC-60780
Seismic Testing: CSA N289, IEEE 344, 535, and C37.98

Qualification Process
- Material evaluation and assistance with material selection
- Review of initial product design for qualification risk and susceptibility
- Definition of test samples and design variations to maximize the probability of successful testing
- Development of test plans and procedures to comply with governing specifications
- Resolution of anomalies which may occur during testing
- Provision of final qualification report

Turn-Key Capabilities

Curtiss-Wright Nuclear Division's diversified portfolio exemplifies thirty years of solving design challenges and providing safety-related equipment to domestic and international nuclear utilities. The Center of Excellence features an in-house engineering team with specializations in mechanical, electrical, and structural design - including system integration strategies. Whether the project at hand requires "build-to-print" or complete turn-key solutions, Curtiss-Wright Nuclear Division is equipped to deliver custom engineering, qualification, and dedication services.

Engineered Systems, Skids, and Assemblies

From designing, to fabrication and assembly, Curtiss-Wright's engineered systems are built to meet customer defined performance specifications. These custom engineered systems can take the form of skids, racks, and assemblies, including:

- Timing
- Logic
- Pneumatic control systems
- Electrical control systems
- Instrumentation racks
- Various skid mounted assemblies, including:
  - Compressor
  - Exhauster
  - Vacuum skids

Curtiss-Wright Nuclear Division will work with outside vendors to upgrade their "off-the-shelf" commercial systems to "safety-related" through comprehensive qualification testing. Upon completion, documentation is provided to the customer, including drawings, operating manuals, maintenance procedures, and qualification reports.

Custom Electrical Equipment Panels

With extensive experience building safety-related electrical equipment panels, Curtiss-Wright Nuclear Division utilizes standard NEMA enclosures or provide custom panels. Panels can be built to customer-provided drawings or can be designed/built, based on customer specifications.

Scope of service includes design, fabrication, assembly, and qualification for the following:

- Annunciator panels
- Fire protection panels
- Sampling panels
- Electrical control panels
- Instrument panels
- HVAC control panels
- Electrical distribution panels
- Disconnect panels
- HELB panels
- High resistance ground panel
- Custom cabinets and racks

Uninterruptible Power Supply (UPS)

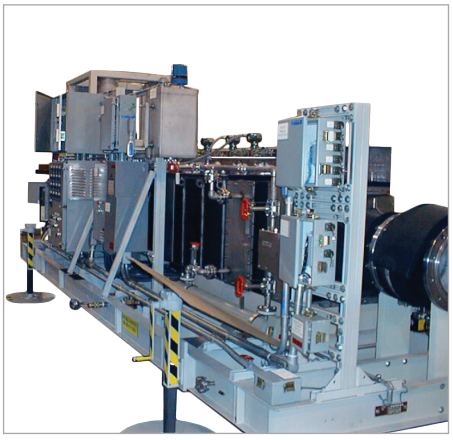
Uninterruptible Power Supply (UPS) system configurations:

- 500VA to 5 KVA
- Standard voltage - single or three phase
- Rack-mounted, wall-mounted, freestanding, or custom enclosed
- Custom designed

Additional support for vital safety-related UPS features include:

- Inverters (with and without static and/or manual bypass switches)
- Rectifier/chargers
- Regulating transformers
- Frequency converters
- ... and other related components

Replacement components are either identical or can be shown to meet equivalent requirements. Curtiss-Wright Nuclear Division provides complete qualification services to meet IEEE 323, 344, and 650, in addition to EPRI TR-102323 or Regulation Guide 1.180.



Exhaustor Skid

Control Panel

Uninterruptible Power Supply

OEM Support

Curtiss-Wright Nuclear takes pride in providing comprehensive Original Equipment Manufacturer (OEM) support by working with manufacturers to resolve legacy issues for depreciated, discontinued, and obsolete parts. Designed and manufactured to custom specifications, Curtiss-Wright Nuclear maintains a dedicated library of effective OEM solutions for continued analysis of industry obsolescence requirements and trends.

Motor Control Centers (MCCs)

A Motor Control Center (MCC) is a module of assembled components that contain control functions for motor systems. Curtiss-Wright Nuclear Division provides MCC solutions that range from routine part replacements to refurbishment, retrofit kits to complete systematic rebuilds of buckets. All replacement cubicles are engineered to the same fit, form, and function as the preexisting OEM part. Project scope includes evaluation, design, manufacturing, qualification, and supply of safety-related or commercial grade components. With over 10,000 electrical items qualified, Curtiss-Wright Nuclear Division supplies MCC replacement parts for all major manufacturers.

Replacement Motors

In the face of growing motor obsolescence issues, Curtiss-Wright Nuclear Division can provide utilities with equivalent motor replacements. AC motors, ranging from Fractional HP through 400 frame size, are designed as drop-in replacements to match mechanical, electrical, and footprint parameters of the original equipment. U-frame motors are also available.

Curtiss-Wright Nuclear Division motors are designed and built to customer specifications for the following applications:

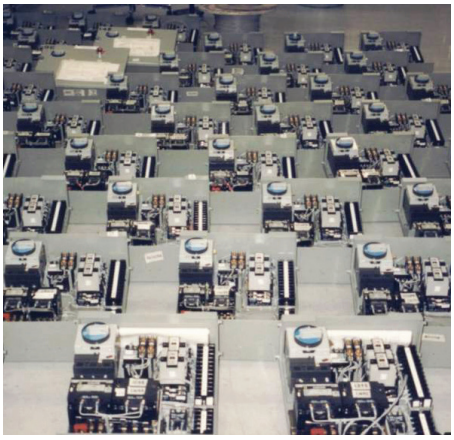
- HVAC
- Pumps, mixers, and blowers
- Motor operated valves
- OEM process skids
- Conversion, DC to AC
- Crane and hoist
- Elevator

HVAC Systems

As a turn-key supplier for safety-related HVAC equipment, Curtiss-Wright Nuclear Division provides reverse engineering and CGD testing to resolve part replacement and obsolescence challenges. Through multiple teaming partnerships, Curtiss-Wright Nuclear Division can provide the following HVAC components as direct replacement assemblies, spare parts, and/or complete engineered solutions:

- Charcoal canisters
- Chillers and chiller tubes
- Compressors
- Control system components
- Cooling coils
- Dampers and louvers
- Duct heaters
- Ductwork and restraints
- Fans
- Filters
- Heater elements
- Purge units
- Starter/control panels
- Valves

Curtiss-Wright Nuclear Division actively maintains the design information and documentation for CVI/CTI HVAC equipment.



400 Safety-related MCC Buckets

Electric Motor

Emergency Chiller

Contact Information

CGD/EQ Services

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