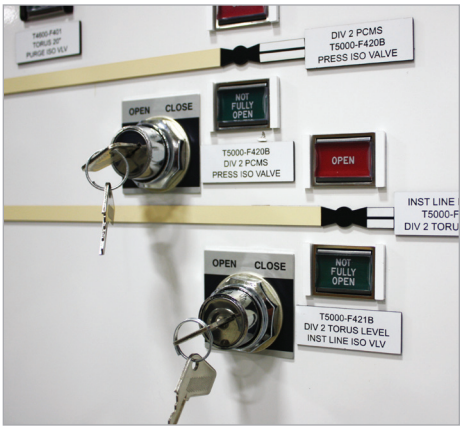
Hardened Containment Vent System

Control-Indication Panel and UPS System

Nuclear Power Products and Services



Product Description

Curtiss-Wright Nuclear offers post-Fukushima response solutions, including the compact Hardened Containment Vent System (HCVS) Control Panel. The HCVS Control Panel is an integrated design that is engineered to meet the Modified NRC Order for Containment Venting Systems (EA-13-109).

Design Features

- Nuclear safety-related or augmented quality
- Fully customizable to meet site requirements
- Multiple indication options, including:
  - Wetwell level and pressure
  - Drywell pressure
  - Vent temperature
  - Vent radiation level
  - Valve positions
- Lighted switch engravings for site specific valve and instrument component identification
- Full-color, custom engraved lamacoid mimic lines

Equipment Features

This turn-key solution provides all the systematic components required by NRC EA-13-109, including but not limited to:

- Actuators
- Valves
- Valve position control switches
- Power control switches
- Digital instrumentation
- Rad monitors
- Level instruments
- Pressure instruments
- Temperature instruments
- Nitrogen supply modules
- Electrical UPS systems, including batteries and automatic switchover
- Associated wiring

Application Functions

- Switching power from one safety train to another
- Switching power from normal to backup power
- Changing valve positions

Qualification Levels

- Environmental temperature: 160ºF (71ºC)
- Humidity
- Seismic
- EMI/RFI
- HMI
- System software V&V

Installation

The Curtiss-Wright Nuclear HCVS Control Panel has three install scenarios:

- Free-standing cabinet
- Wall-mounted cabinet
- Insert for existing control room panels and/or remote shutdown panels

The following concepts on page 2 provide a variety of functions and technical specifications. In many cases, a DC/DC or DC/AC UPS can be integrated into the HCVS Control Panel, providing a one-stop, plug-and-play design and procurement solution.

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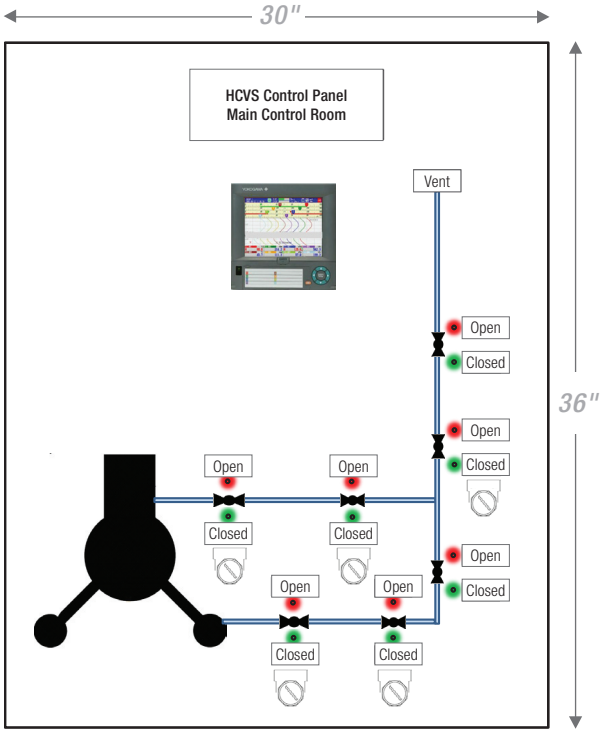

Digital Bargraphs

Design Features:

- Safety-related
- Seismically qualified to site-specific SSE levels
- Elevated temperature testing is necessary due to ambient temperature during the BDBEE
- A full-size sample is tested inside an environmental chamber to prove reliable functionality during harsh envinronment temperatures
- Software V&V, EMI/RFI testing, and qualification activities are performed by the OEM, with QualTech NP audit oversight
- Housing options:
  - 36" x 36" x 72" free-standing NEMA 12 dual access floor mount enclosure
- Monitoring capacity:
  - Eleven valves (seven with Master Specialties pushbutton controls)
  - Pushbutton controls are cycle tested with inductive loads to confirm reliability
  - Dual train Division 1 and Division 2 power with applicable control switches and electrical division separation barriers

Analog Indicators

Design Features:

- Non-safety related (augmented quality)
- Seismically qualified to site-specific BDBEE levels (1.55 x normal acceleration)
- Housing options:
  - 30" x 36" NEMA 12 wall-mount enclosure
- Monitoring capacity:
  - Four valve positions that are operated remotely and/or from the control room
  - This panel does not offer valve control features
- Rad Monitor Meter is designed for 4-20 mA input
- 24 VDC battery banks and chargers sized to site load requirements and mission times
- Simple lamp indications for valve position (open/close)
- Human Factor Mimics and labels are custom designed to match existing CR and site procedures
- Operation verified before, during, and after a Design Basis Accident

Monitoring Capabilities:

- Battery voltage
- DC amps
- Vent temperature
- Pressure

6-Channel Digital Indicator/Recorder (seen above)

Design Features:

- Non-safety related (augmented quality)
- Seismically qualified to site-specific SSE levels
- Housing options:
  - 30" x 36" NEMA 4X wall-mount enclosure
- Panel locations:
  - Control Room
  - Remote Operating Station (ROS)
- Monitoring capacity:
  - Seven valves (five with GE CR104 controls)
  - Two position indicators with seperate indication features
- 125 VDC battery banks and chargers sized to site load requirements and mission times
- Incandescent lamps used for indication
- Human Factor Mimics and labels are custom designed to match existing CR and site procedures
- Operation verified before, during, and after a Design Basis Accident

Monitoring Capabilities:

- Temperature
- Pressure
- Radiation
- N2 farm pressure
- Battery voltage

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