

Next Gen MG Set Power Supply Control Cabinets

Background

The MG Set Power Supply Control Cabinets are applicable for both Westinghouse and Combustion Engineering applications. In the Westinghouse system, the Rod Drive Power Supply (RDPS) provides reliable power to the Rod Control System through two Motor Generator (MG) sets and two control cabinets. Similarly, in a Combustion Engineering application the control cabinets make up the Control Element Drive Mechanism (CEDM) Power Supply.

Existing cabinets are showing signs of aging, including component failure and obsolescence. The obsolescence is reaching the point that suitable replacement products are unavailable. Without spare parts or replacement products, plants will lose the reliability of the system, putting the plant in a single vulnerability to trip offline.

Description

Westinghouse has developed a next-generation power supply control cabinet that meets the needs of both the existing Westinghouse and CE fleet and any future plants. This cabinet provides a form, fit and functional replacement that uses readily available components. The control cabinets can be utilized with the existing MG sets for vintage Westinghouse Rod Drive Power Supply systems or Combustion Engineering Control Element Drive Mechanism Power Supply.

Deliverables

- Detail Bill Of Material
- Design drawings
- Technical manual
- Onsite installation support (optional)



Typical Next Gen Cabinet Front

Benefits

The control cabinet design features increase reliability, improved operation and can assist in troubleshooting.

- Eliminates obsolescence and age-related failures
- No sensitive mechanical relays
- Selective tripping ensuring only one MG set is tripped in the event of a failure allowing the plant to continue operating
- Digital Meters providing indication of: Volts, Amps, Frequency, VARs, KW, Exciter / Field Current
 - VAR meter allows balancing voltages while synchronized
- Connections on outside of door to support taking independent voltage readings
- Enhanced diagnostic system to aid in trouble shooting
- All data availability locally is also capable of being transmitted to the plant DCS
- Ability to display motor temp / vibration if MG sets are equipped with sensors (new replacement MG sets will include RTDs)

and velometers on motor and generator

- Replace obsolete components with readily available parts
- Electromagnetic compatibility (EMC) qualified
- Auto-synchronization capability
- Door Switches
 - Mitigate any cyber security concerns by remotely indicating the cabinets are being accessed
- Eliminated known SPVs (Single Point Vulnerabilities)
- Incorporated years of industry operating experience and lessons learned in the new design

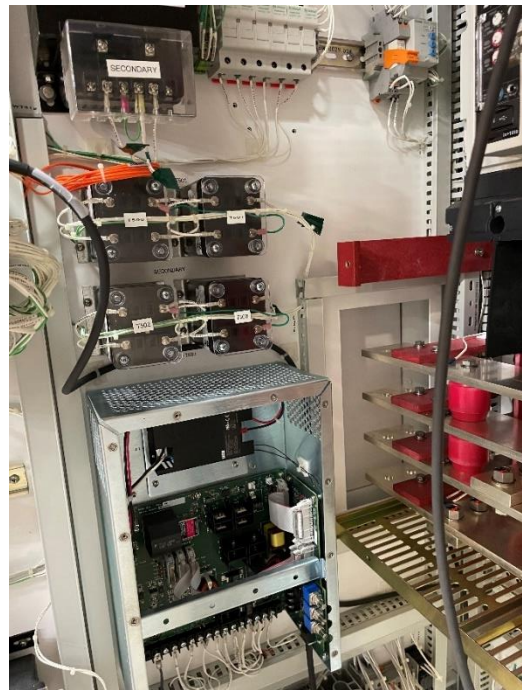
Motor Generator (MG) Sets

While not required to be replaced with the control cabinets, replacement MG sets offer the following benefits:

- Adequately sized – a single MG set can carry full load
- Zig Zag Wye wound
- Contain stator and bearing temperature detectors and vibration sensors to allow for monitoring at the cabinet
 - Used to trend MG sets and potentially increase time between maintenance intervals

Experience

Westinghouse developed the original MG sets and control cabinets utilized in the existing PWR operating fleet. In order to maintain system functionality, our advanced control power cabinets are based on the original design but utilize modern, readily available components to improve reliability. These next-gen MG Set Control Power cabinets are applicable to all Westinghouse and CE-designed Pressurized Water Reactors (PWRs). These next generation cabinets are being supplied to operating plants in both the US and EMEA.



Typical Cabinet Internals with safety shields removed



Internal Cabinet Backpanel with safety shields removed