

Next Generation Rod Drive Power Supply

Background

The Rod Drive Power Supply (RDPS) provides reliable power to the Rod Control System through two Motor Generator (MG) sets and two control cabinets.

Existing RDPS cabinets are showing signs of aging including component failure and obsolescence. 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 RDPS cabinet that meets the needs of both the existing fleet as well as any future plants. This cabinet provides a form, fit and function replacement that uses readily available components. It leverages the original design requirements while incorporating lessons learned over the years.



Next Generation RDPS Control Cabinet

Benefits

Motor Generator (MG) Sets

While not required, replacement MG sets offer the following benefits:

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

Control Cabinets

Our cabinet design features help increase reliability, improve operation and assist in troubleshooting.

- No sensitive mechanical relays
- Selective tripping ensuring only 1 Mg set is tripped in the event of a failure allowing the plant to continue operating
- Digital Meters Volts, Amps, Freq, 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
- 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
- Remote indication available (not just a common trouble alarm)

- Electromagnetic compatibility (EMC) qualified
- Door switches
 - Mitigate any cyber security concerns by remotely indicating the cabinets are being accessed

Deliverables

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

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 RDPS cabinets are based on the original design but utilize modern, readily available components to improve reliability. Additionally, Westinghouse incorporated operating experience from the existing design including industry lessons learned and direct feedback from utilities. These next-gen RDPS cabinets are applicable to all Westinghouse and CE-designed Pressurized Water Reactors (PWRs).