

Fuel-handling Equipment

Background

Westinghouse has provided equipment to support all aspects of nuclear fuel handling since 1970. Fuel-handling equipment designs range from full machines in new plants to component upgrades for operating fleets.

Description

Standard Westinghouse offerings include:

- Model GR control systems for General Electric boiling water reactors (BWRs)
- Model WR control systems for Westinghouse pressurized water reactors (PWRs)
- Model CR control systems for Combustion Engineering PWRs
- FUELMASTER® mast for BWRs
- Right- and left-hand controllers for BWRs
- FUELNET® controls to enable automatic fuel movement
- Training facilities

Custom engineered fuel-handling equipment solutions include:

- Refueling machines, refueling platforms and manipulator cranes
- Spent-fuel-handling machines, spent fuel pit cranes and pond fuel-handling machines
- Fuel transfer systems
- New fuel elevators
- Auxiliary platforms
- Control element assembly platforms and elevators
- Cable management systems
- Hydraulic power and pneumatic system upgrades
- Load-weighting systems
- Computer, programmable logic controller and drives
- Camera systems
- Supervisory consoles, machine simulators and training consoles

Benefits

Safety

- Redundancy
- Expanded interlocks
- Positioning precision
- Operator interface aids
- Automatic and semi-automatic operation

Efficiency

- Speed increases
- Automatic motion capabilities
- Simultaneous multi-axis movements
- Off-index maximum hoist speeds



Refueling machine

Reliability

- Maintenance-free servo motors
- Wide use of commercially available industrial components for ease of access to replacement parts
- Asset management program to track and maintain equipment health
- Continuous improvements to the FUELNET control system incorporate decades of lessons learned into the automated control and boundary system, reducing the possibility of operator error

Innovation

- Servo drive systems provide full torque at zero speed for accurate control of commanded speed to accommodate existing rail conditions
- Segregation of 480-VAC circuits from 24-VDC control circuits maximize technician safety
- Electromagnetic compatibility testing and resulting enhancements improve immunity and emissions
- Cyber security evaluations and enhancements provide a defense against cyber threats

Results

- More fuel moves per hour
- Reduced maintenance
- Potential for shorter outage duration
- Increased safety

Experience

- More than 45 years of experience in design, manufacturing, installation, testing and support
- Engineered to domestic and international standards to meet customer and regulatory requirements
- Trained technicians support legacy as well as modernized, standard equipment

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