CASE STUDY

Sellafield Silo Maintenance Facility Control and Safety Systems

Working on behalf of Cavendish Nuclear and Balfour Beatty JV, Servelec Controls designed, manufactured, tested and delivered a complete control and safety system for a new Silo Maintenance Facility (SMF) at Sellafield.

This major new build mechanical handling facility will be used for supplementary storage, inspection, loading, decontamination and maintenance operations, supporting waste retrieval operations from legacy silos. This process requires a robust, reliable and integrated control system across multiple plant areas and related processes.

Networked Control and Operations

Servelec Controls provided an overall control system incorporating a series of PLC/HMI subsystems together with a Plant-Wide Alarm System to provide local and remote control of all the operations inside the SMF: flask loading and maintenance; package collection; package and shield door operation; the import and export of components inside package skips; decontamination, wash-down and effluence collection and sentencing; and bogie maintenance.

In addition, Servelec Controls provided a hard-wired safety interlock system, an Equipment Tracking System using hand-held bar code scanner devices and commercial off the shelf (COTS) software, a full Network Monitoring and Management System and a comprehensive Offline Development and Test System.

- Complex multi-subsystem control solution for a new facility
- Network performance and cyber-security monitoring and management
- Future development capability
Performance and Safety

The three year project included the detailed design, manufacture and testing of the systems, and ultimately delivered over 40 control panel cubicles across nine sub-systems. These incorporated Programmable Logic Controllers (PLCs) and Variable Speed Drives (VSDs) to control the shield doors, import bogie, gamma gate, skip bogie, package hoist, mast hoist and door removal machine.

Testing, Delivery and Beyond

A Supervisory Control and Data Acquisition (SCADA) System monitors, analyses and controls plant processes and performance, whilst numerous Human Machine Interface (HMI) displays monitor and provide local control for individual areas of the plant.

The Network Monitoring and Management System uses powerful monitoring, lockdown and whitelisting software packages to diagnose interruptions, faults, intrusions, undesired traffic and to control the launch and use of all active applications.

A Management Information System integrates the control solution with the Plant-Wide Alarm System and provides data from across the whole of the SMF. The system’s reporting software logs, displays and reports alarm and process data to alert operators to conditions, including alarm states from radiological monitors.

Following manufacture and factory acceptance testing at Servelec Controls’ modern manufacturing facility in South Yorkshire, the company deployed further resources to the SMF Delivery Team’s Integrated Works Test Facility, where they installed and supported testing of the system in conjunction with various plant packages, prior to shipment to site. This included the project management of sub-contracted specialist seal interspace test panels.

The project was completed with the provision of extensive training and a full Offline Development System capable of supporting future development and testing of the solution, enabling the client to manage their own upgrades as their requirements evolved.

Servelec Controls also continue to support the installation and commissioning of the SMF systems within the new facility on site.