

Information and Control Systems Platform

Background

The Information and Control (I&C) Systems Platform is a non-safety distributed computer system for Category B and Category C applications. The platform has been applied in numerous nuclear retrofit projects, and is the standard basis for non-safety related nuclear I&C systems in Westinghouse new-build projects worldwide.

The overall platform includes integral resources for both control and plant computer functions, thus eliminating the need for these to be separate systems. The basic architecture is flexible for use with small stand-alone systems to full-scale plant systems, expanding easily for future phased system upgrades.

Description

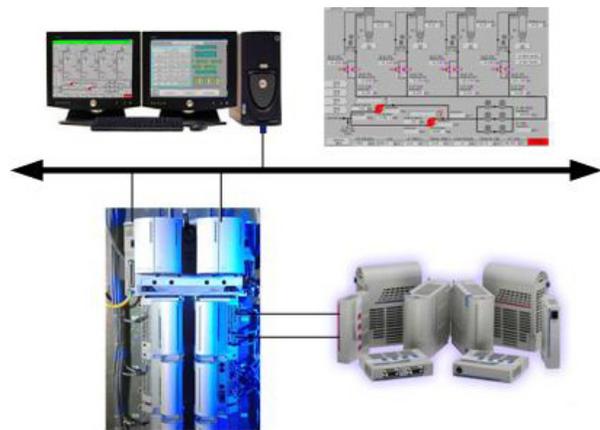
The platform is based on the Emerson Ovation® product line and also integrates key components developed by Westinghouse for nuclear I&C applications. As a distributed process control, information and data management system, Ovation offers a powerful, flexible and open-system architecture, supported with field-proven, industry-standard hardware, software, networking and communications components. The extended components support plant computer, monitoring and various system-interface applications to meet nuclear industry requirements.

Benefits

The I&C system platform presents true open computing, allowing users to achieve higher plant availability, reliability, efficiency, safety and environmental compliance.

Extensive system benefits are realized through the key elements of the Ovation product.

- **Network** – A standards-compliant, fully redundant, high-speed Ethernet network using commercial hardware, and copper or fiber cabling. Each originating drop periodically broadcasts point value and status at the appropriate frequency.
- **Controller** – Each fully redundant PC-based controller interfaces to the I/O subsystem, performs data acquisition, and executes simple or complex modulating and sequential control strategies (up to 32,000 process points per controller).



Core Ovation product components

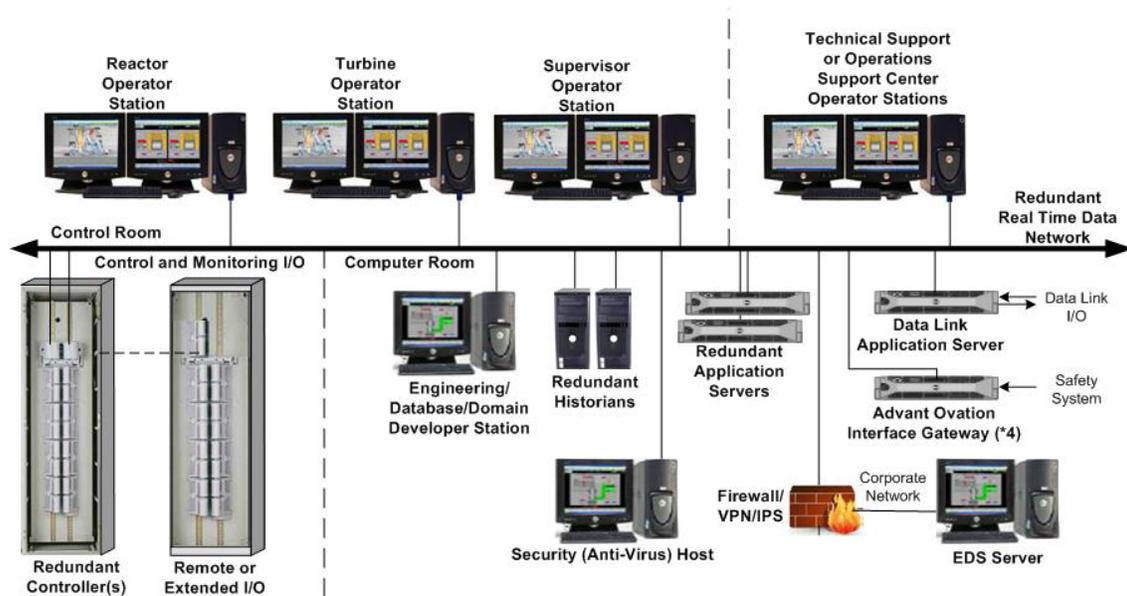
- **Input/output Modules** – Modular industrial grade I/O requiring no special handling, user addressing or configuration. Up to 128 modules per controller of analog, discrete, digital bus and special turbine-related I/O is available, including advanced fault diagnostics and channel isolation.
- **Workstations** – Operator/engineering workstations (Windows® PC-based) feature high-resolution display of control/monitoring graphics, diagnostics, trending, alarms and plant-status information with easy-to-use engineering and configuration tools. The engineering station contains a fully embedded relational database management system storing configuration, process-point information and control algorithm information. System and point data (including user-defined fields) can be imported via user-friendly database tools (e.g. Access or Excel).
- **Historian** – Scalable mass storage and retrieval of process data, alarms, sequence of events (SOE), logs and operator actions for 5,000 to 100,000 point values. Presentation capabilities include data queries, historical trending and SOE Reports. A bundled reporting package allows for scheduled and triggered reports to operators, engineers and maintenance personnel.
- **Connectivity Servers** – Open system interfaces (ODBC, NetDDE, OPC) provide innovative technology for securely transporting real-time or historical process data directly to a user desktop for critical analysis of plant performance data. Data link interfaces to third-party devices and protocols such as Modbus, Allen-Bradley, GE Mark V/VI, RTP I/O, Toshiba and MHI are also supported.

Westinghouse has designed and engineered several additional system components that complement and extend the Ovation product line to provide monitoring and plant

computer functionality, enhanced security, and integration of safety and non-safety platforms specifically for the nuclear power industry.

- **Application Server** – Redundant application servers execute complex calculations and monitoring from a robust Nuclear Applications Programs (NAP) library and data link interfaces with external plant systems. Standard, pre-tested function blocks based on IEC 61499/61131 standards significantly lower development and testing time. Custom sub-applications can also be created.
- **Cyber Security** – Westinghouse is leading the cyber security assessment and compliance activities in the industry in conjunction with the new AP1000™ plants, advanced boiling water reactor (ABWR) and existing plants worldwide. Using cyber security assessments, communication-isolation techniques, physical security, cyber-secure networks and operating systems, and the Ovation product security, Westinghouse’s cyber security team provides practical, cyber-secure solutions.
- **Advant Ovation Interface (AOI)** – A Gateway server connects each safety division data network to the non-safety real-time data network, providing strict one-way flow of real-time safety system data for display and control. Data flow is strictly one way from the safety to the non-safety subsystem.

Combining the superior high-speed performance and capacity of the widely used Ovation product line with broad nuclear application experience and system integration components, the Westinghouse I&C platform provides a flexible and upgradeable system that addresses both operating and new plant requirements.



I&C systems platform