

Plant Process Computer System

Background

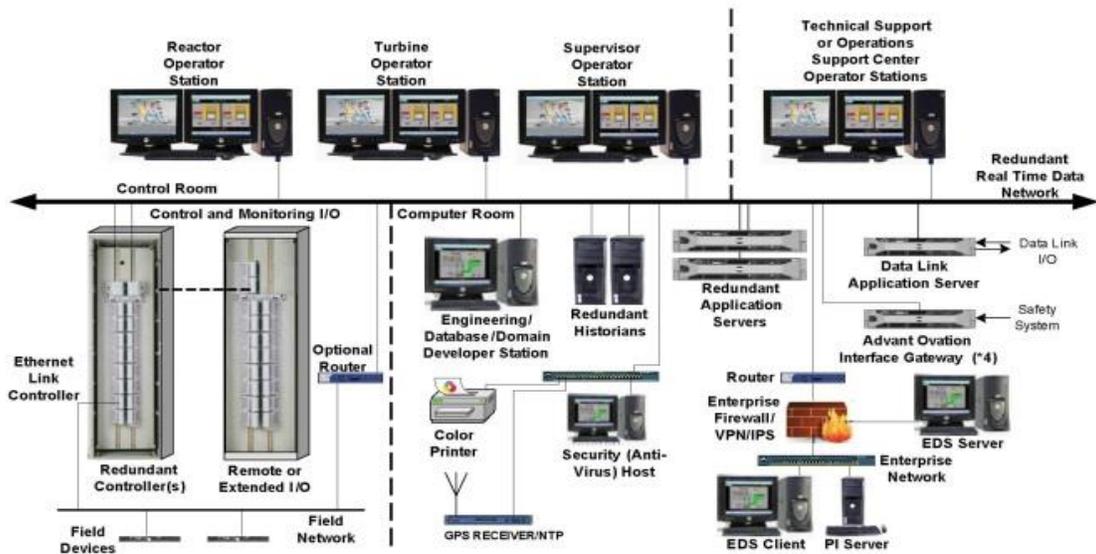
The Plant Process Computer system (PPC), or plant computer, is a plant-wide information system for new and retrofit plants. The PPC consists of data acquisition and presentation layer components, with configurable, reusable software programs for performing nuclear plant performance and monitoring applications. PPC uses a redundant network design with advanced connectivity features that provides high capacity data transmission and reliable external system communications via standard and custom protocols.

The Westinghouse PPC is a reliable and cost-efficient instrumentation and control (I&C) solution for new and phased modernization programs that provides a well-organized and integrated system solution.

Description

The PPC includes the following data collection, information processing, calculation, development and maintenance tools, and system integration components.

- Powerful Ovation[®] distributed information and control system platform implementation using Microsoft Windows[®] functionality provides operator workstation displays, database repository, historical storage and retrieval, with supporting software development tools to maintain and update the system.
- A PC-compatible, redundant controller executes simple or complex data acquisition and control algorithms. The controller interfaces with a power industry input/output (I/O) module subsystem that accepts a wide range of analog, digital and bus technology I/O.
- Operator and engineering workstations present high resolution process graphics, system and detailed diagnostics, trends, alarms and status displays. These workstations provide access to dynamic system points, a comprehensive alarm management system, historical data, general messages, standard function displays, event logging, and detailed analysis through intuitive navigation tools.
- Powerful redundant-application servers with a standard function library of proven and fully tested performance and monitoring application programs (AP) provide complex calculations and standard or custom data-link interfaces. An extensive function block library with an application builder graphical user interface is included to allow the customer to program and maintain standard and custom applications.
- Multi-function system servers provide system configuration, I/O and calculation point database, historical storage and retrieval configuration, and control algorithm information, all in an organized and centralized relational database structure. Engineering tools provide process graphic editing, control programming, configuration and maintenance.
- The Ovation Historian provides mass storage and retrieval of process data, alarms, sequence of events (SOE), logs and operator actions. Data analysis tools and applications provide state-of-the-art data retrieval and querying solutions. Data backup and redundancy are available, as well as standard reporting templates for scheduled and triggered reports.
- A fully redundant, fault-tolerant network provides high capacity real-time data transmission without data loss, degradation or delay, even during plant upsets. Custom gateways and interfaces are eliminated through the use of widely available commercial hardware; and full connectivity to corporate LANs, WANs and intranets can be provided. Time synchronization is also available using a network time protocol (NTP) time server.
- Enhanced cyber security uses cutting-edge cyber-security assessment tools and an integrated system approach of domain control, security user- and system-function permission configuration, antivirus software management and system hardening. In addition, the Ovation Security Center provides vulnerability scanning and patch management, malware prevention, security incident and event management.



Typical Plant Process Computer System Architecture

Benefits

The PPC helps users save operation and maintenance costs by achieving higher levels of plant availability, reliability, safety, environmental compliance and efficiency. The PPC offers the following features and benefits:

- Large suite of proven power-industry I/O and data communication interfaces allowing the system to provide both information and control system functions, and easy integration with existing sensors and systems
- Large, proven library of application programs (APs) and software incorporating the Westinghouse nuclear steam supply system (NSSS) knowledge base, including safety parameter display system (SPDS) applications
- Application builder graphical user interface allowing customers to maintain and construct new application programs without the need to learn programming languages such as C or C++
- Presentation, trending and redundant storage of live and historical plant data to plant engineering and information systems via standard, open interfaces
- Comprehensive cyber-secure interface solutions with plant-wide and fleet-wide LAN/WAN
- Ability to integrate PPC functions with other control and monitoring applications in a single system architecture that supports both small and large systems, offering the capability to interface with safety systems and phased future upgrades
- Large experience base of over fifty pressurized water reactor and boiling water reactor retrofits, and new plant computer implementations
- Platform equipment consistency providing more familiarity among all users, improved operator performance and improved system performance
- Reduced need and subsequent cost of maintenance, spare parts, training, and number of supplier interfaces

Using the powerful Ovation open architecture and innovative control and monitoring system, combined with an application server, user-friendly development tools and standard program libraries, the Westinghouse PPC provides an unprecedented level of performance, power and flexibility to solve plant computer and monitoring system needs. The PPC is an excellent starting point for a plant I&C upgrade program. Providing a clear migration path for future upgrades and control system applications, the Westinghouse PPC is a true investment that can be leveraged for future applications with savings in spare parts, training, maintenance and infrastructure costs.

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