

Global Instrumentation and Control

Instrumentation and Control System Retrofits

Background

Equipment obsolescence and end-of-life issues with various plant systems continue to present a problem for the nuclear energy industry. To address these challenges, Instrumentation and Control (I&C) system retrofits are used to functionally replace the existing systems, minimize the implementation risk and cost and improve electromagnetic immunity. I&C retrofits provide the additional benefits of the ability to be implemented in the available outage window and establishing the platform infrastructure for future systems. Westinghouse has successfully implemented our I&C technology upgrades in existing nuclear power plants in a scalable manner through complete plant integrated replacements.

Working with the plant engineering and operations personnel, the condition of plant equipment, plant performance and operational problems and economic factors are used to assess, plan and prioritize a phased upgrade of the operating plant's I&C systems. Through this approach, utilities can solve equipment obsolescence and system functionality problems by taking advantage of state-of-the-art performance provided with a fully-integrated digital I&C system.

Westinghouse has extensive experience with I&C retrofits in the United States, United Kingdom, Europe and Asia for large integrated retrofits and smaller retrofits for critical systems.

Our critical system retrofits include fleet-wide replacements for feedwater control systems, single plant replacements for turbine control systems and safety system replacements driven by obsolescence such as Post-Accident Monitoring systems and Core Protection Calculator systems.

Description

With a distributed, modular design employed by our I&C platforms, Westinghouse can supply a scalable, integrated solution to upgrade one, several or all of the plant I&C systems using a consistent, cost-effective approach. Upgrades for safety and safety-related systems meet the current level of functionality while having other features that improve plant performance.

The Westinghouse approach to retrofits uses the same field wiring and terminations as the current system and can be implemented in a given outage window, using new or existing control system cabinets.



Intelligent Field Devices



Common Q™ Replacement Cabinet

Westinghouse Capabilities

- Determine and provide system requirements
- Perform a detailed plant walkdown
- Supply new cabinets or implementation in existing cabinets
- Design and interface the backfit hardware
- Design and validate the control application software
- Perform equipment qualification testing
- Perform system acceptance testing
- Perform system installation
- Support system startup and power ascension testing
- Support system licensing
- Provide platform and application training
- Provide design and system application documentation

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Benefits

- Scalability to cover both small and large system applications
- Implementation with existing cabinets or new cabinets using existing plant space
- Use of existing field wiring and terminations
- Ability to interface with existing systems
- Improved control algorithms that require minimal operator intervention
- Improved system alarming
- Advanced system diagnostics
- Fault-tolerant design
- Ability to be implemented with no design, installation or licensing risk
- Reduced spare parts inventory
- Capability of retaining plant operational and transient data
- Ability to monitor all functions and parameters at remote locations via information provided over a data network
- Compatibility with intelligent field devices and advanced fieldbus technologies



Redundant Controller and Local Input/Output Modules

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