Alarm Presentation System

Background

Annunciator replacement is often part of plant computer upgrades or control room modernization projects as the existing system becomes increasingly difficult to maintain. Westinghouse offers an alarm presentation system (APS) as a replacement for aging annunciator systems. Our APS is a software-based alarm system built on technology from the Westinghouse AP1000® nuclear power plant.

Description

The APS is a modular, highly configurable software-based alarm system that consists of redundant alarm servers, large LCD monitors or lamp boxes, and alarm management software that runs on operator workstations. The system also includes a graphical configuration tool.

The APS uses client-server architecture. Redundant alarm servers are connected to APS clients via redundant Ethernet networks. For Ovation™-based upgrades, the APS uses the Ovation data highway.

The APS interfaces with existing silence and acknowledge buttons on the control board via digital input/output (I/O). The APS can interface to the existing alarm horn system or replace it.

The APS server monitors the plant for changes in alarm state and provides centralized alarm processing. The APS server gets alarm data from the control system (via Ovation or OPC), digital I/O, or a combination of sources.

Each LCD monitor is driven by a small PC that runs the APS wall panel client software. The wall panel client requests alarm updates from the APS server and displays the alarm tiles. If desired, the APS can drive lamp boxes in lieu of LCD monitors using digital I/O.

The APS workstation client provides alarm management functions at operator workstations. The software can be installed on existing workstations or on small standalone PCs. The workstation client requests alarm updates from the APS server and displays alarms using a combination of alarm tiles and alarm lists.

The workstation client provides a dynamic overview of all alarm tiles that exactly matches the large LCD monitors and lets the operator navigate to any monitor to view the individual alarm tiles on that monitor. Additional alarm management features are accessed from the alarm tiles or associated alarm lists.

Benefits

The Westinghouse APS offers the following benefits:

- Flexible architecture for custom solutions

- Simple, cost-effective replacement for lamp boxes and associated hardware/cabling

- Improved readability of alarm tiles

- Workstation clients that provide redundant backups to the large monitors

- Workstation client that can extend the alarm system outside the main control room (remote shutdown room, technical support center, etc.)

- Workstation client that provides easy access to electronic alarm response procedures

- Manual suppression of long-standing alarms and nuisance alarms to reduce workload

- Programmed suppression of consequence alarms during large transients/events

- Operator experience log that allows operators to record and review notes about alarms

- Alarm tile layouts that are easily developed using the graphical configuration tool

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Experience

The APS software is the basis of several successful alarm system upgrade projects including the Westinghouse Standardized Nuclear Unit Power Plant System (SNUPPS) training simulator (see SNUPPS photo).

SNUPPS Simulator Upgrade

APS Workstation Client