

# Radiation Monitoring System

Plant Information Solutions

**CURTISS -  
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Power & Process Products and Services



## About

Curtiss-Wright is a global integrated company with a long tradition of providing state-of-the-art, reliable solutions through trusted customer relationships.

The Plant Optimization Group, a business unit within Plant Information Monitoring and Control, provides a variety of products, services, and software-related solutions to the global power industry. We are leaders in thermal performance software and services; equipment reliability solutions; valve condition monitoring; and advanced data analytics. We further enhance our customer support through our Monitoring and Diagnostic Center providing remote detailed evaluation of the condition of clients' assets.

We are committed to the safe operation and improved performance and reliability of power plants worldwide.

## Fully redundant, automatic, seamless failover design

The Radiation Monitoring System is used by control room operators and radiation protection personnel to make rapid assessments of radioactivity levels in process and effluent streams, plant areas and HVAC ducts. The system includes a collection of radiation monitor assemblies, commonly referred to as skids, which are independently capable of sampling the environment and communicating the sample results through a local display and/or transmitting it to another system via a communications network. When a skid also performs a safety function, a separate hardwired connection is made to indicating devices and alarms usually located in the main control room.

The Scientech RMS system monitors and controls the skids installed throughout the plant. In addition to the data acquisition function, the system also controls skid hardware (such as pumps, valves and mechanical devices), retrieves status, monitors self-test/diagnostics and manages other skid-specific functions.

The communication link to the data collection system is typically redundant to ensure reliable and robust information transfer. The Scientech RMS system supports both the existing communication structures and modern Ethernet interconnections, as required by the customer.

The RMS data collection and operator display system is fully redundant with seamless automatic failover, mirrored data bases

and the necessary software and displays to facilitate real time situational awareness of radiation levels throughout monitored sections of the plant. Further, the system is fully capable of integrating tablet-based rounds data to provide a continuous real time view of radiation levels throughout the plant and its environs.

The RMS computer communicates with the skids over several pairs of existing redundant communication links servicing the skids in groups of 10 to 30 devices. If the primary link fails the secondary link, which is typically wired in reverse order, is used to reach the skids missing from the primary link. While this technology has proven to be effective it is not optimum. It suffers from noise, signal strength loss over large distances and can lack the facility to report a failed link. These issues can lead to potentially significant error rates and degraded performance. The Scientech RMS implements robust error checking and validation software to help relieve the issues associated with the older technology.

The protocol adapter in the new RMS computer enables communication with diverse skid types enabling the updated RMS system to continue to function without changes to the skid and communication architecture. The new RMS system is also capable of migrating to newer communications architectures should the older technology eventually prove untenable.

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The new RMS computer and software are fully capable of performing all of the command and status monitoring performed by the original system on a new and easily migratable server platform. No unique keyboards or other special devices are necessary to communicate with all parts of the system. As with the original design, the system has no effect on the safety-related functions of the skids.

The RMS is typically located at level four of the security architecture and has fully evolved interfaces for all of the popular data archives, as well as, proven data diode links. The new system is fully compliant with applicable NEI 08-09 cyber security requirements. Communications with other plant systems and archives is via Ethernet.

The new RMS system is built on the latest, proven Windows operating system and the R\*TIME system platform. The R\*TIME platform combines the operating system resources with its nuclear plant proven application and operator interface yielding a robust and configurable solution to the RMS requirements that are used at plants throughout the US and international market. More than 200 plants worldwide depend on the R\*TIME platform for Plant Process Computer, Annunciator, Thermal Performance, Steam Generator Level Control, Radiation Monitoring and a host of other applications.

The fully redundant, automatic, seamless failover design results in a system with greater than 99.9% availability. The design is highly fault tolerant and has fully addressed issues associated with network failures, server failures and possible loss of external power. For each of these types of failures, the design will tolerate single failures and in some cases, multiple failures without loss of RMS functionality.

System, skid and network diagnostics simplify plant maintenance activities and support fast problem resolution. Cyber security safeguards protect the system and data supporting an incremental increase in data availability throughout the plant.

The flexibility of the operator interface and report generation/logging application give the plant the ability to see, communicate and report the plant situation in real time. The plants' existing displays can be replicated or new operator friendly presentations can be implemented that provide graphical situational awareness at a glance. All existing alarm and notification equipment are supported. New trending, alarms and other functions are easily created on line to provide the operator and management the information they need, in the form they need it. The R\*TIME platform also supports execution of simple and advanced radiation distribution models as required by the plant.

The system supports simulator training requirements using the R\*TIME simulation support tools.

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