

### **N304. ROSA III: The Westinghouse Workhorse**

By building on experience with ROSA I and II and incorporating key enhancements, the new ROSA III is fast becoming the workhorse of Westinghouse's nuclear service robots.

ROSA III is the third generation of remotely operated maintenance and inspection robots designed, manufactured, and operated by the Nuclear Services Division of Westinghouse Electric. ROSA III builds on the experience of using ROSA I and II. It is designed to perform all the services ROSA I and II were capable of performing. One of the primary enhancements to ROSA III is a completely upgraded control system and operator interface. The new control system enables the operator interface through a distributed control integrated system, i.e., all job control functions - including robotic delivery, process control, and database management - are directed to a single operation point. The control system hardware includes a Silicon Graphics workstation, which provides a highly graphic user interface and single point control. The robot path planner allows reference coordination generated by C-based routines to be input to the system. This allows teleoperation via joystick, and generalized teach and repeat with the robot arm. The workstation also handles process and tool control. An interpretive set of functions at the I/O node allows high level control at the workstation with detailed tool and process control at the node.

The ROSA III arm was redesigned and reconfigured to enhance its usefulness in steam generator services. The new arm configuration allows the freedom needed for remotely loading itself and tools. This means that personnel need not go into the steam generator channel head where dose rates are quite high. The arm actuator has also been improved as the design goal was to provide 20,000 site hours of maintenance-free operation. ROSA III can also cover 95% of the tubesheet from a single base location, compared to the 50% coverage achieved by ROSA I.

*For more, "ROSA III: The Westinghouse Workhorse," Nuclear Engineering International, pp. 42-43, December 1991.*