

## N111. Expanding The Range Of Activities Performed Remotely At Nuclear Power Plants

A number of sample tasks are suggested:

- Emergency response with sampling, surveillance, and fire-fighting capability.
- Monitoring and surveillance in containment during power operation and in other high-radiation areas.
- Area decontamination.
- Decommissioning activities.
- Maintenance assistance with bolted closures, including steam generator manways, bolted valve bonnets, etc.

An EPRI study reviewed, in depth, 22 major tasks routinely performed at nuclear power plants. The study included an economic analysis of the remote performance of those tasks using existing remote technology, although that technology need not have been integrated into an existing system. Results of the study are shown in the table. Three of the tasks were shown to be economically justifiable in the short term, using existing technology. As the table shows, based on estimated development costs and economic returns, the three tasks shown have positive net present values.

### Results Of Economic Assessment Of Performance Of Selected Maintenance Tasks Using Near Term Robotic Systems

	Cavity Clean-up	Health Physics Survey	Maintenance Bolting
<b>Case 1:</b>			
Capital Investment	\$145,000	\$200,000	\$60,000
Annual Savings	\$264,000	\$104,000	\$273,000
Annual Costs	\$48,000	\$29,000	\$21,000
Net Present Value	\$874,000	\$224,000	\$1,075,000
Assumptions: 1.	Radiation Exposure Cost = \$1,000/man-rem		
Assumptions: 2.	Replacement Power cost = \$500,000/day		
<b>Case 2:</b>			
Capital Investment	\$145,000	\$200,000	\$60,000
Annual Savings	\$419,000	\$387,900	\$298,000
Annual Costs	\$48,000	\$29,000	\$21,000
Net Present Value	\$1,559,000	\$1,474,000	\$1,191,000
Assumptions: 1.	Radiation Exposure Cost = \$5,000/man-rem		
Assumptions: 2.	Replacement Power cost = \$800,000/day		

*Taken From: "Development of Robotic Maintenance Systems for Nuclear Power Plants," J. Timothy Lovett, Nuclear Plant Journal, May-June 1991, or contact J. Timothy Lovett, 3210 Funston Street, Austin, TX 78703, Phone (512) 458-2702.*