

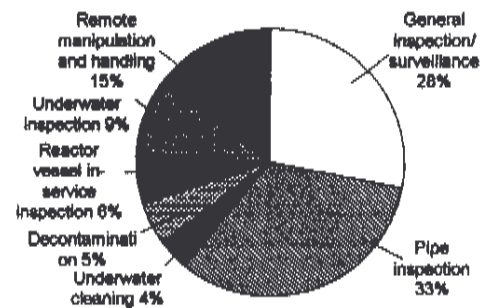
N295. A Brief History of Robots in the US

Robots of all kinds are on offer to the nuclear industry. A new survey reveals which applications are most popular.

The use of robots has increased considerably in the nuclear industry for the last ten years, and robotic devices are now routinely considered as an option in planning maintenance programs.

Apart from those areas where authorities require the use of robots - such as handling highly radioactive material - those currently in use are mostly teleoperated robots used for inspection, surveillance and monitoring. Few robots now in use are sophisticated enough for operation and maintenance tasks and most depend on direct human control.

The experience of utilities in using robots has been compiled by the Utility/Manufacturer Robot Users Group (U/MRUG). The results of the survey are shown below:



Survey of robot activities by category

U/MRUG's report shows that the amount of work carried out by robots at this time was still small. The economic case for using robots also had to be evaluated. Plants were not designed to take advantage of robots and employing one meant changing maintenance routines and retraining staff.

Although simple robots had been used since the early years in areas of high radioactivity, designers began to reconsider these applications. Instead of utilizing robots as basic manipulators and simple tools they began to investigate "radiation hardening" that would allow more sophisticated devices to be used in harsh environments.

By now the emphasis on robot use was changing. Cutting exposure by replacing a human with a robot began to be an objective in itself and development work followed this trend. Robots are mandatory in some inspection tasks and are used as the best option in others. In some inspection areas such as underwater work, use of robots is growing quickly; while in others, such as piping inspection, they are already widely used. Robot use is also growing in environmental monitoring, especially in controlled radiation areas, and in cleaning of reactor internals, steam generators, and pressure vessels.

Research at present attempts to replicate the benefits of a human worker. Precision positioning, dexterity, intelligence, and mobility are all being investigated and developed. The use of robots is relatively new in the maintenance of power plants. More robots will be in more applications in the future not only because of new products, but also due to increasingly favorable economics.

For more, "A Brief History of Robots in the US," *Nuclear Engineering International*, pp. 34-35, March 1992.