

32 List of Most Effective Modifications¹

32.1 Exceptionally Cost-Effective Modifications

Twenty-five evaluations were found to be exceptionally cost effective in that both costs and collective dose (rem) were saved. Using a nominal value of \$1,000 as the value of a rem saved, the predicted values for total dollars that should be saved over the expected useful life of the modification is listed below:

Project Description	Total \$ Saved (@ \$1,000/rem)
1. PWR refueling machine (new plant, on critical path)	\$32,000,000
2. PWR reactor vessel head, multi-stud tensioner/detensioner (two reactor site, on critical path)	\$29,000,000
3. PWR reactor vessel head multi-stud tensioner/detensioner (single reactor site, on critical path)	\$14,000,000
4. PWR integrated head assembly (new plant on critical path)	\$13,000,000
5. Multi-stud tensioners/detensioners for PWR reactor pressure vessel (on critical path)	\$13,000,000
6. PWR reactor vessel head tensioner/detensioner (on critical path 25% of time)	\$9,400,000
7. Steam generator channel head decontamination (not on critical path)	\$8,300,000
8. Reactor cavity decontamination using the WEPA Cleaning System	\$4,300,000
9. BWR control-rod-drive handling tool (on critical path 25% of time)	\$4,200,000
10. PWR reactor vessel head tensioner/detensioner (on critical path 25% of time)	\$4,100,000
11. PWR reactor vessel head tensioner/detensioner (on critical path 25% of time)	\$3,500,000
12. Shredder-compactor for dry active waste	\$3,000,000
13. Robotics system for remote inspections of BWR moisture separator and feedwater pump areas (three reactor site)	\$1,800,000

¹J.W. Baum and G.R. Matthews, "Compendium of Cost-Effectiveness Evaluations of Modifications for Dose Reduction at Nuclear Power Plants", NUREG/CR-4373, 1985, Superintendent of Documents, U.S. Government Printing Office, P.O. Box 37082, Washington, DC 20013-7982.

Project Description	Total \$ Saved (@ \$1,000/rem)
15. Remote readout near PWR seal table	\$1,700,000
16. PWR steam generator manway tensioner/detensioner and handling device (on critical path 25% of time)	\$1,200,000
17. Photographic technique for PWR steam generator tube plugging inspections	\$960,000
18. PWR steam generator manway tensioner/detensioner	\$820,000
19. Robotic inspection of PWR ice condenser area	\$630,000
20. Solid radioactive waste handling using high integrity containers	\$570,000
21. Robotics system for inspections in BWR moisture separator and feedwater areas (single reactor site)	\$280,000
22. Robotic mechanism for surveillance of BWR high pressure feedwater heater rooms (three reactor site)	\$280,000
23. Portable robotic system for smoke detector inspection (three reactor site)	\$200,000
24. Robotic mechanism for surveillance of BWR high pressure feedwater heater rooms (single reactor site)	\$78,000
25. Portable robotics system for smoke detector inspection (single reactor site)	\$28,000

32.2 Cost-Effective Modifications

Forty items with cost-effectiveness values at or below \$1,000/rem based on the BNL discounted rem present-worth model were identified. These were:

Project Description	\$/Rem
1. BWR-CRD scram discharge line flange for hydrolazing the header	\$35
2. Portable shielding system for the PWR steam generator channel heads	\$86
3. Shielding for CVCS demineralizers (Option B)	\$100
4. Clean seal cooling water supply for BWR recirculation pump	\$110
5. PWR power level monitor using ¹⁶ N detectors	\$120