

Good Work Practice

Ergonomic Retooling Pays Dividends

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Summary: Fluor Hanford management credits safety success with the application of the best science can offer on every front--including the science of ergonomics. Employees (350) on the Hanford K Basin project reduced their OSHA recordable rate (the number of injuries per 200,000 hours worked, equivalent to 100 employees working for a year) from 10.5 to 1.3, an 88 percent improvement.

Discussion of Activities: After repackaging nuclear fuel and removing the canisters from a large storage pool to a safe location away from the Columbia River the task became to find a way to remove the sludge (nuclear material and settled silt) which formed across the bottom of the storage pool. The building is old, and lighting is less than ideal for the current mission; the water is so cloudy workers use underwater cameras to see what they're working on. The environment demands personal protective equipment which is bulky and will restrict movement. Most tasks can be done only awkwardly by reaching over railings. The best possible tools must be found or fabricated.



Analysis: The fuel sat 16 feet underwater, and workers stood on grating suspended 3 to 4 feet above the water's surface. Almost everything was oriented downward which required workers to reach over railings and bend forward to do their tasks. A closed-circuit monitor connected to an underwater camera was used to enhance the Operator's ability to see. While trying to maneuver tools with long handles, they also had to interact with one another. In some areas of the basins, several people had to work together in very close quarters. Communication was a challenge due to the very nature of the place. Acoustics were not good. There was background noise from pumps and fans. Meanwhile, people were working under productivity requirements and deadlines that added a degree of psychological pressure.

An ergonomics/human factors specialist was hired to observe conditions and formulate recommendations for all operations. The intent was to determine solutions that would reduce the injury rates associated with the number of strains, sprains, and "body mechanics" accidents and injuries.

Trying to solve the problem of people getting hurt or people being uncomfortable or feeling job

stress requires looking at all of the possible interactions and activities systematically. Look at all the things which impact people; the tools they need to do the job, and the environment including light, noise, and heat. It involved analyzing all task elements. .

The solutions developed appeared to be cumulative. When you improve tools, change protective equipment, provide more training, change work practices, introduce a new management philosophy, rewrite procedures -it all accumulates, and you build a better environment. The more solutions that can be applied based on a wide range of recommendations - the greater likelihood of success.

It's not just the tools that make the job. The way we stand or move, for example, matters. People are an integral part of the work process, and we have people of every size, shape, and disposition out there trying to do the same activities. There is no one-size-fits-all solution to dealing with the myriad of factors involved in human activities.

Recommended Actions: Utilize a systems approach to problem resolution. A systems approach includes consideration of physical and psychological effects on people, tasks to be performed, tools used, and workplace environment.

Cost Savings/Avoidance: Not Evaluated

Work Function: Operations, D&D, Construction, Maintenance

Hazards: Strains, Sprains, Injury

ISM Core Functions: Analyze the Hazards, Develop/Implement Controls

Keywords: Ergonomic, Safety

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References: An article appeared in the June 2006 issue of *Occupational Health & Safety* written by Thom Spencer of Fluor Hanford Inc.