WESTINGHOUSE CORPORATE DEVELOPMENT OF A DECISION SOFTWARE PROGRAM FOR RADIOLOGICAL EVALUATION DECISION INPUT (REDI)

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ABSTRACT

In December 1992, the Department of Energy (DOE) implemented the DOE Radiological Control Manual[1] (RCM). Westinghouse Idaho Nuclear Company, Inc. (WINCO) submitted an implementation plan showing how compliance with the manual would be achieved. This implementation plan was approved by DOE in November 1992. Although WINCO had already been working under a similar Westinghouse RCM, the DOE RCM[1] brought some new and challenging requirements. One such requirement was that of having procedure writers and job planners create the radiological input in work control procedures. Until this time, that information was being provided by radiological engineering or a radiation safety representative. As a result of this requirement, Westinghouse developed the Radiological Evaluation Decision Input (REDI) program.

INTRODUCTION

During a March 1993 Defense Nuclear Facility Safety Board (DNFSB) visit to the Idaho Chemical Processing Plant (ICPP), WINCO was questioned about how the expertise of other Westinghouse organizations was being utilized in the development of programs required by the DOE RCM.[1] Although some examples were given, WINCO felt that more involvement on a corporate-wide level could provide great savings throughout the Westinghouse organization. Soon after that visit, a corporate-wide committee was organized to develop a program for the development of Radiological Work Packages.

WesTIP Team

Because the DNFSB had questioned the use of Westinghouse expertise from other sites in RCM[1] implementation, WINCO officials began to review items which were to be implemented in the near future for the possibility of corporate involvement. The Radiological Work Package process was a very good possibility, and was eventually chosen for corporate committee review.

WINCO sponsored the committee known as the Westinghouse Technologies to Improve Processes (WesTIP®) Combined Team Review. The goal of the committee was to reduce the costs and time associated with development of Radiological Work Packages while improving quality and consistency. WINCO, West Valley Nuclear Services (WVNS), Westinghouse Savannah River Company (WSRC), and Westinghouse Hanford Company (WHC) chose to participate in the project, and selected members with appropriate expertise for the team. This committee then met in Pittsburgh, Pennsylvania to begin learning the WesTIP® Process and begin applying it to the creation of radiological work packages.

The first step in the WesTIP® Process was to define the current process being used. To do this, the committee members outlined the process being used by their individual facilities and then the processes were

combined to get an overview of the basic process being used within the Westinghouse Complex. Problems associated with each step were discussed, and those which were deemed to be significant were then listed on the flow chart model of the process.

Once the overview was completed, each step in the process was reviewed to see how much time it took and how much it cost to complete. Costs for individual steps ranged from $25 to $1,625 and time spent ranged from 0.1 day to 5 days per step. Those steps which cost the most or took the most time were then highlighted on the flow chart and reviewed to see where reductions could be made.

Findings revealed that it was taking an average of 37 days and costing an average of $6,875 to complete one radiological work package. Using the WesTIP* technique, the committee developed a plan which would allow a radiological work package to be completed in 7 days and cost $2,480. This established a time reduction of 30 days and a cost savings of $4,395 per work package (Figure 1). Because of the number of work packages created in a year, the committee determined that significant yearly savings would be realized through the use of the program they proposed. A key point to implementation of the new program was the need for a risk-based decision tree process for creating and completing radiological work packages.

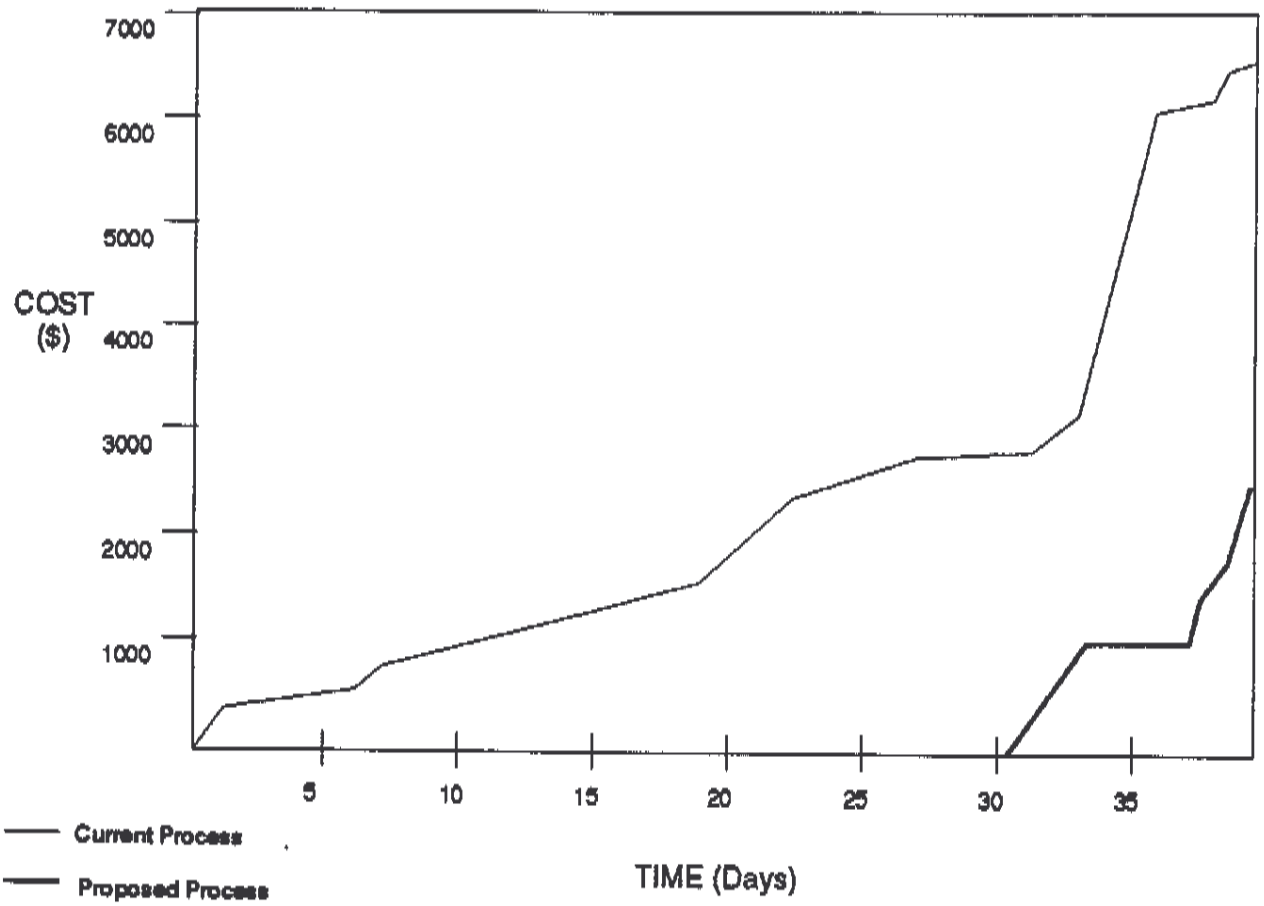

Figure 1 - Work Package Costs Before and After Process Modification

The committee discovered that gathering data from various resources was the largest consumer of both time and money. Much of the data gathered was standard information which was recreated every time a radiological work package was needed. This collection of information was spread over several different steps in the original process.

With the decision made that the goal of the group would be to reduce time and costs associated with gathering information and writing work packages, the work of improving the process could begin. Several changes to the process were proposed, including creating "points of contact" who would function as area experts and creating a decision tree program which would eliminate recreation of information for every work package.

The committee decided that approximately 80 percent of the information recreated every time a radiological work package was developed could be placed into a decision tree software, thus eliminating the need for recreation of that information. This information included Radiological Control Manual[1] requirements, Federal Regulations, common work standards and policies, and local procedural requirements.

Development of REDI

Once the WINCO representatives returned from Pittsburgh, they began to explore hardware/software resources and availability. They made the determination that DClass®, a commercially available software, would be used to develop their decision tree. This determination was based upon applicability, adaptability, and cost. Because DClass® was already being used by WINCO personnel who would be doing the programming, a significant cost savings was realized.

The first step in development of the REDI program was to produce a risk-based decision tree which could be input into DClass®. To accomplish this, a number of radiological packages were reviewed to determine the questions that must be answered in order to create a valid work package. The answers to these questions were not the same in all cases, and were dependent upon the specifics of the work to be completed. With this in mind, multiple choices were designed to cover all probable answers to a question. These choices correspond with precise output devised to be used for final work package details.

Prior to the development of the REDI program, planners and procedure writers would normally solicit information from a number of resources. With the use of the REDI program, the information could be automatically compiled by simply answering area-specific questions. By answering such questions, the requirements could be narrowed for the specific job to be performed. The program was to be designed to automatically create radiological input containing the appropriate guidelines. This input would then be available for use in creating radiological work package portions of procedures.

The REDI program asks the user multiple choice questions. Based upon the answers to those questions, appropriate information is placed into a radiological input package (Figure 2).

Features of REDI

One of the main features of the REDI program is the capability it offers for electronic review and approval of radiological work packages. REDI is installed on a network with access by all individuals in the review and approval process. When the package is ready for review, it is electronically transferred. When the appropriate personnel have reviewed the package, they enter a password which allows the package to be sent back to the originator with comments or approval. If changes are made to the package, prior approvals

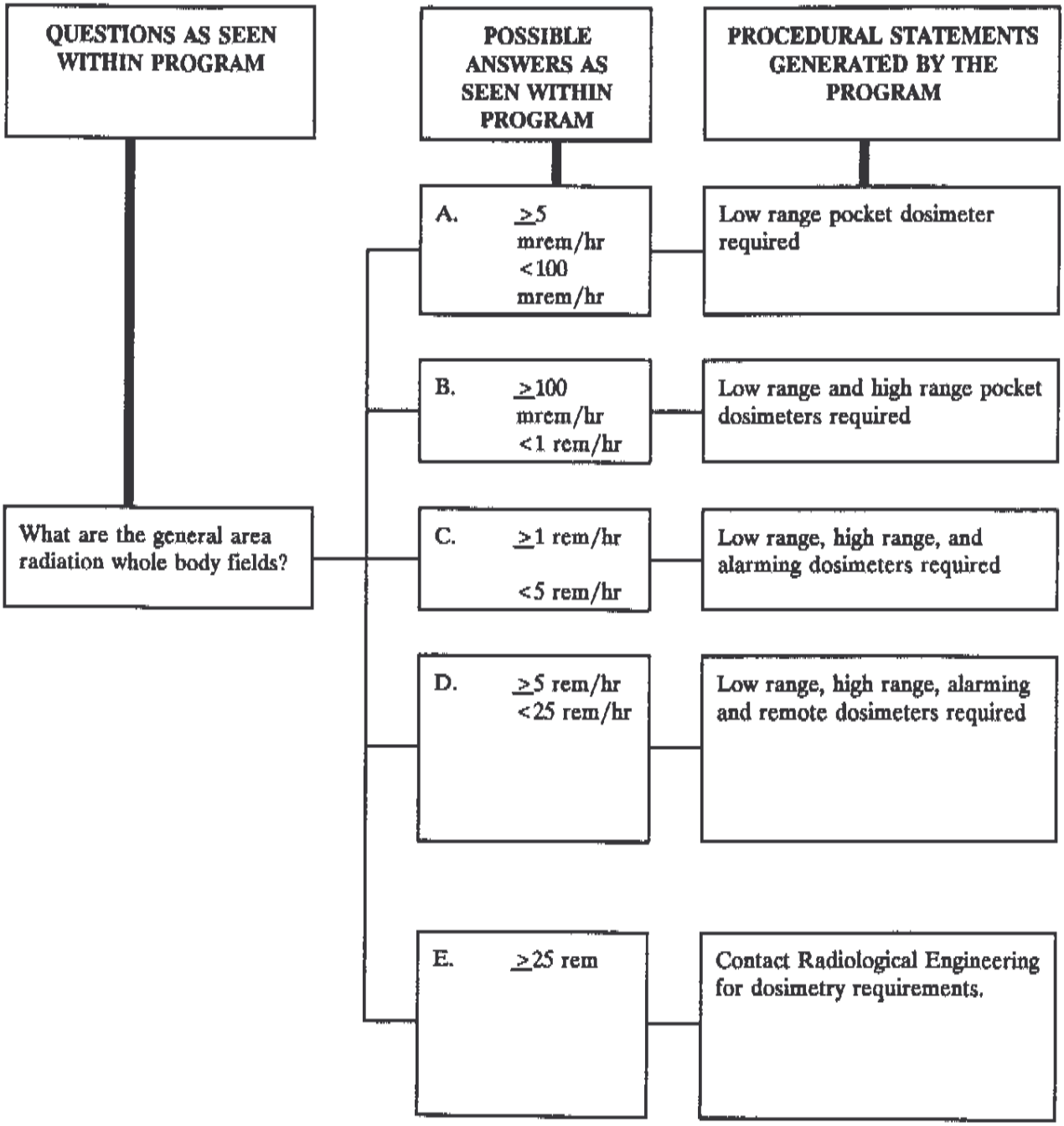

Figure 2 - Sample Decision Tree

are voided and the package is retransmitted for approvals. Any forms associated with the work evolution such as radiological work permits can also be attached and forwarded electronically.

The approved package is returned to the document originator who then places the package in the work control procedure for use in the field. The REDI cycle is not yet complete; however. Post-job critique information is entered as "lessons learned" before the work package can be closed out and considered complete.

All packages are stored electronically. Each package has its own unique file name which allows retrieval for review or modification at any time. For future referencing, packages can be retrieved using the file name assigned to the package. The information contained in this package can be used for future work packages, either in its entirety or by removing pertinent sections. "Lessons learned" will be of great value when planning for future work. Users can refer to previously developed radiological work packages to retrieve pertinent information for the development of the current work package.

CONCLUSION

Development of REDI is an ongoing process. It is currently being used at WINCO, and will be released to other Westinghouse GOCOs when the initial testing phase is complete. It will be customized for each facility, and will likely be released for other DOE facilities shortly after delivery to Westinghouse.

REFERENCES

1. U.S. Department of Energy, *DOE/EH-0256T Radiological Control Manual*, June 1992.

Author Biography

T. Shane Bush is a Sr. Technical Specialist at the Idaho Chemical Processing Plant located on the Idaho National Engineering Laboratory near Idaho Falls, Idaho. Shane currently works in the Radiological Engineering subsection of the Environment, Safety, and Health Department. Before joining Westinghouse in 1984, he worked at numerous commercial nuclear power plants providing health physics support during refueling outages. His primary responsibilities include coordinating implementation of the DOE Radiological Control Manual, Assistant Radiation Safety Officer for radiography operations, and development of the REDI (Radiological Evaluation Decision Input) program which he will be speaking about today. He has an Associate of Applied Science Certificate in Radiation Safety, is a registered radiation protection technologist, and has a Bachelor of Science degree from Idaho State University.

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