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DERAD - A DECOMMISSIONING ECONOMIC RISK ADVISOR: SOFTWARE TO ANALYZE DECOMMISSIONING STRATEGIES

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Principal Investigator:

A. Gjerde
Decision Focus Incorporated
6540 Castro Street
Suite 300 Mountain View, CA 94041
U.S.A.
Phone: (501) 934-4212

Project Manager:

Christopher Wood
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, CA 94304
U.S.A.
Phone: (415) 855-2379

Objectives: To develop a decision analysis tool that will help utilities identify economical strategic options and schedule decommissioning activities for shutdown nuclear power plants.

Decommissioning costs hundreds of millions of dollars per plant. Moreover, since the activities will take place over a lengthy period, the range of uncertainties in the cost components is very large. Understanding the effects of these uncertainties, accounting for alternative timing scenarios, and making overall better decisions can provide high value to utilities by helping to reduce the total economic impact of decommissioning activities. It was the intent of this project to develop a generic decision support tool to help utilities plan for decommissioning of operating plants.

Comments: The analytical approach in DERAD consists of a two-step process. First, users examine plant components as independent decision modules. Each decision module has its own inputs and outputs, providing decision maker with a tool to prioritize among component decision alternatives and examine sensitivities in input variables as well as changes over time. The second step in the analysis process involves integrating all components in a comprehensive site analysis. The objective for the sample site analysis is to look beyond narrowly defined component decisions to determine systems effects and overall economic risk associated with decommissioning. By examining each decision module in isolation, a number of key factors that can influence decisions may be identified. For example, for steam generators, stainless steel components and other low level waste the discount rate and burial costs dominate and escalation of burial charges favor early disposal. For the reactor vessel, disposal costs decrease with time. The economic benefits of dry fuel storage depend on manpower cost savings and the date when final disposal facility becomes available. The overall analysis includes total costs, decommissioning time, prioritization among components, cash flow, probabilistic analysis.

Remarks: The DERAD software provides a vehicle for identifying and comparing alternative decommissioning scenarios, explicitly addressing risks and uncertainties associated with each. Key insights from this decision support tool include the most economical time to initiate decommissioning activities given a current state of shutdown in the plant; information on how to prioritize decommissioning activities among plant components; consideration of cash flow constraints; and identification of areas that will benefit from further study. DERAD is also a

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helpful tool for use in conjunction with life cycle asset management studies for operating plants.

Version 1.0 of the software addresses decommissioning of PWR plant. Version 2.0 will extend the method to include BWRs, multiple unit analysis, and fund management analysis prior to permanent shutdown.

References: Gjerde, A.R., M. Qian, P. Govil and W. E. Balson, "Decommissioning Economic and Risk Advisor: DERAD User's Manual" Electric Power Research Institute Report, TR-104785, April 1995, available from EPRI Distribution Center, P.O. Box 23205, Pleasant Hill, CA 94523.

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