

ABSTRACT

Tactical Response in Oil Spill Clean Up Operations: Heuristics and an Optimizing Approach. (December 1994)

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The Tactical Decision Problem (TDP) associated with oil spill clean up operations allocates available equipment components over the planning horizon so that the clean up requirement for each time period is met. The objective is to minimize total response time to allow for the most effective clean up possible. We formulate the TDP as a general integer programming model. A method based on graph theory is used to generate columns efficiently. The column generator defines each response system, including constituent equipment components, the location where each of the components is stored, and the staging area in which that system is composed. We develop two heuristics to obtain approximate solutions to the TDP. We then present an optimizing procedure which is based on an aggregation scheme. The solution of the resulting aggregated model is used in reformulating the TDP, and in generating a family of facets for the TDP. We also present several preprocessing methods to facilitate the solution. Computational experience is reported in application to a realistic scenario based on the Galveston Bay Area.