

# LONG RANGE PLANNING, SCHEDULING & BUDGETING FOR THE ENVIRONMENTAL COMPLIANCE PROGRAM AT THE ROCKY FLATS PLANT

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## ABSTRACT

The Rocky Flats RCRA/CERCLA Group at the Rocky Flats Plant in Golden, Colorado is developing a computerized schedule and budget management system. The system will aggregate schedule, budgets, and regulatory commitments provided by RCRA/CERCLA Program Managers. The system will provide tabular and graphical representations of the schedule and budget information at various levels of detail. The system will perform a variety of analyses on the schedule and budget.

The RCRA/CERCLA Group will use the results to develop realistic compliance schedules and the budgets necessary to meet them. Presentation of the schedules and budgets in a consistent graphical and tabular form will give DOE, EPA, and other interested parties a good appreciation of the remediation costs as understood by the RCRA/CERCLA group. The system will then be used to test resource availability and remediation period scenarios, differing from the optimal combination as determined by the RCRA/CERCLA group.

The RCRA/CERCLA group expects development of the system to take one year. Six months into the project, the initial schedule and budget entry has been completed and refinement has begun. The system consists of a commercially available personal computer based package. The personal computer version has proven to be significantly slower than a mainframe equivalent. However, this drawback is well compensated by the flexibility, accessibility, and transportability provided by the personal computer based package. This is particularly true in the restricted high security environment of the Rocky Flats Plant.

Preliminary results indicate that the overall program will extend through the year 2003. Future scheduling tasks will include the development of budget constrained and manpower leveled schedules to realistically establish milestones, budgets and manpower requirements.

## INTRODUCTION

Facilities of the U.S. Department of Energy (DOE) are required to comply with all applicable environmental laws and regulations, including the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and related laws and regulations. Rocky Flats Plant complies with environmental protection legislation through its RCRA Part B permit, a compliance agreement between DOE, the US EPA, and the State of Colorado Department of Health (CDH), and DOE Albuquerque's Environmental Restoration Program. At the initiative of the agreements, a comprehensive phased program of site characterization, remedial investigations, feasibility studies, and remedial and corrective actions is in progress. Facility upgrades, personnel training, and monitoring programs are in place or are underway to ensure ongoing compliance. The focus of the legislation is hazardous and radioactive mixed waste management at the Rocky Flats Plant.

Rockwell International (the plant operator), DOE, EPA, and CDH share authority over Rocky Flats environmental programs. Each organization has a keen interest in waste management and environmental restoration at Rocky Flats. The shared responsibility for hazardous and radioactive waste management results in numerous, often conflicting, program commitments and milestones. The priorities

of the four controlling organizations and funding wholly controlled by Congress and DOE are the forces driving RCRA/CERCLA group schedules and budgets. To ensure that all commitments and regulations are fulfilled, that funding is available when needed, and that the highest priority sites receive precedence, Rocky Flats has implemented a comprehensive scheduling and budget management system.

DOE facilities will be entering into a Federal Facilities Compliance Agreement (FFCA). The agreement will be the basis for DOE's future relationship with the EPA and will be developed in conjunction with local EPA offices and local state health departments. An important part of the agreement will consist of the remediation milestones. Developing these milestones and defining the resources to meet them represent key components towards meeting the commitments and avoiding the payment of penalties. The Rocky Flats planning and scheduling program will develop a system of coordinated commitments and milestones, will apply resources to these commitments, and will provide a computerized means of tracking the commitments and their budgets.

## ROCKY FLATS RCRA/CERCLA PROGRAMS

The RCRA/CERCLA Program group of Rockwell International Rocky Flats Plant is responsible for all environmental compliance under RCRA, CERCLA, and

subsequent environmental legislation. The RCRA/CERCLA programs group is organized into three major areas of responsibility: Environmental Restoration program, the RCRA Compliance Program, and the RCRA Closure program. A separate function addressing the National Environmental Policy Act (NEPA) and the Toxic Substance Control Act (TSCA) compliance requirements resides within the group and interacts with these three programs. The RCRA/CERCLA group is also coordinating design and implementation of a computer based Waste and Environmental Management System to track all waste forms and laboratory analyses through the system from generation to disposal.

The Environmental Restoration Program addresses inactive hazardous waste and materials management sites determined to be addressable by CERCLA regulations as opposed to RCRA rules. The Compliance program consists of actions necessary for bringing the plant into compliance with RCRA in the areas of documentation and continuing waste management activities. The Site Closure Program entails the investigation, design and construction activities required for the closure of inactive hazardous waste management sites within the Rocky Flats plant boundaries.

#### **SCHEDULING AND BUDGETING PROCESS**

The primary goal of the RCRA/CERCLA programs is to complete major restoration activities by the year 2003, with continuing operations extending well beyond that date. Program scheduling is an evolving process requiring continual modification and refinement as new regulations are promulgated and priorities are shifted to meet budgetary and regulatory constraints.

The magnitude and complexity of the RCRA/CERCLA programs are such that only a sophisticated computerized system can adequately organize and manipulate the scheduling and budgeting data. The scheduling and budgeting of these programs is being approached in a new, phased approach, utilizing state-of-the-art project management PC based software.

Rockwell has contracted with the S. M. Stoller Corporation to evaluate and select the appropriate software, develop the schedules and budgets, and analyze and refine the schedules and budget estimates. A comprehensive scheduling and budgeting process began in August of 1988. The software system was selected and a preliminary schedule has been developed and resourced. Additional tasks currently underway include analysis and refinement of the schedule and resource leveling.

#### **Selection Of Tools**

The first step of the process involved a systematic evaluation of various project management software packages. The Primavera Project Planner (P3) package was selected as the most powerful and flexible in the field. P3 combines ease of use with a large schedule database capacity. The selection was also based on the perceived strength of the technical support offered with the system. Primavera runs on IBM PC compatible systems. Freedom from mainframe systems was a significant factor, given the

cost and inaccessibility, particularly in the DOE Weapons Security environment of Rocky Flats.

The P3 system is provided by Primavera Systems, Inc., which also provides ancillary software packages which provide high quality plotter and printer graphics (Primavision), extensive resource consumption and budget analysis (Parade), and a system which tracks contract and design documents (Expedition).

#### **Developing The Schedule**

The schedules for the various programs were developed through a series of interviews with the RCRA/CERCLA personnel responsible, an assessment of regulatory requirements, and an assessment of commitments made to regulatory agencies. Each program manager had their own schedules, which had to be incorporated into the schedule logic of the P3 system. The primary challenge consisted of integrating the three major programs into one consistent representation of the overall program.

Once all scheduling information had been incorporated into the system, detailed precedence bar charts were generated, showing four levels of Work Breakdown Structure. The plots were submitted to the DOE Rocky Flats Area office for review, and comments were incorporated. As a side benefit, the combined plots were sufficient in size to completely wallpaper the RCRA/CERCLA group's conference room.

The initial effort required three months and resulted in the generation of more than 2000 discrete activities requiring over 1 megabyte of hard disk storage. An IBM PC/AT class machine was utilized for the task. Time required to calculate the schedule ranged from five to ten minutes.

#### **Resourcing The Schedule**

The second major task of adding resource consumption estimates to the schedule required a modeling approach, where less than 100 unique representative activities were used to make manpower and budget estimates. These estimates were applied to all remaining activities with adjustment factors used where possible. Construction estimates were taken from existing engineering studies, also where possible. The resourcing task required another two months of time.

The Parade system was utilized to calculate the combined manpower and budget requirements for three levels of the Work Breakdown Structure. No attempt was made to levelize manpower or constrain the budget.

The addition of the resource data significantly impacted the storage requirements and processing time of the schedule. The file now occupies 2.5 megabytes of hard disk storage capacity and processing time on a 80386 based machine operating at 20 megahertz can run from half an hour for a schedule calculation to over two hours for certain types of manpower loading reports.

#### **Future Tasks**

The next phase of the project will entail the refinement and analysis of the schedule. Schedule and budget analyses will focus on the impacts to the schedule of a variety of

budget scenarios and program prioritizations. Regulatory deadlines and timeframes will be incorporated and analyses will be performed to determine what budgets and activity durations are needed to meet them. Refinements are essentially on-going as greater details for a given program are prepared and incorporated. Additional steps must be taken to reorganize certain aspects of the schedule to establish a higher degree of consistency between the three major programs.

An important additional on-going task consists of establishing procedures and guidelines for maintaining the schedule. Aspects of maintenance include the incorporation of actual data to track progress, and regular updating of the schedule.

#### **PRELIMINARY RESULTS**

The first set of results from the preliminary scheduling and resourcing efforts has provided estimates of the total budget and manpower requirements. These estimates will be refined through the resource leveling exercises to follow. The entire schedule extends through the year 2003.

One very important result of the scheduling process was the ability to quantify the impacts on scheduling of the various review cycles by the federal and state agencies. By

adding relatively conservative estimates of time required, and the number of review bodies involved, some of the programs were stretched out by a number of years.

#### **CONCLUSIONS**

The RCRA/CERCLA group's scheduling effort currently underway at Rocky Flats is effectively establishing a means of setting realistic milestones, budgets and manpower requirements towards compliance of all the applicable environmental laws and regulations. Additionally, the effort will give DOE and regulators a good grasp of what time periods will be required. The entire time frame necessary for the development, refinement and implementation for the scheduling capabilities now appears to exceed a year, and may approach two years by the time all the necessary procedures and guidelines are established for on-going utilization. However, the effort is well worthwhile for the greatly increased control it will lend to the programs.

The Primavera Systems software has proven to be very effective in handling the complexities and magnitudes of the environmental program scheduling requirements. The ability to utilize the software on a PC based system has provided a much needed element of convenience and flexibility.