BPR-BECHTEL PLANS AND CONSTRUCTS A POTLINING CENTER ON TIME AND UNDER BUDGET

ALCAN ALMA PLANT BENEFITS FROM EXPERTISE OF EXPERIENCED PROJECT MANAGERS

Project Background

Alcan is a company that makes aluminum, which is produced in carbon-lined pots. Producers must reline these pots when the carbon is exhausted. Alcan asked BPR-Bechtel, a plant-engineering company, to design and build a new potlining center as well as maintenance, storage and personnel buildings. BPR-Bechtel was to plan and complete the project within 30 months. The project budget was $55.4 million (US).

Challenges

Potlining center construction and operation presents myriad environmental, health and safety risks. BPR-Bechtel established a zero tolerance policy on risks to those constructing the center, those operating the center, and to the surrounding community. The BPR-Bechtel project team had to ensure that it maintained cost and schedule objectives while adhering to this zero tolerance policy.

The schedule presented additional challenges. Originally, BPR-Bechtel and Alcan agreed that the project would be completed by 15 December 2004. However, due to increased demand, Alcan found it necessary to move the completion deadline to 15 October 2004.

Project Management Solutions

The BPR-Bechtel team used standard project integration, time, communication, cost, quality, risk and procurement management processes to overcome challenges and complete the project on time and under budget. These processes are described in *A Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*)–Third Edition, published by Project Management Institute (PMI).

Integration management helps project teams to clarify the project's objective. The BPR-Bechtel team used project integration management methodologies to define the scope of the project, identify the relevant stakeholders and ensure that all stakeholders agreed upon the project objectives, costs, and schedule.

Time management helps teams to work efficiently by determining resources, activities, and time needed to complete a project. First, the BPR-Bechtel team identified the activities needed to construct the potlining center and its facilities. Then the team determined the sequence of activities, identifying where it was necessary for one activity to be completed before another activity could begin. Next, the BPR-Bechtel team identified which resources would be necessary to complete each activity. The team also estimated how much time was necessary to complete these activities. Finally, the team created the project's schedule. Throughout the project, the team also closely controlled the schedule through the use of progress reporting and performance measurement to determine any scheduling concerns that needed to be addressed before they turned into crises.

The BPR-Bechtel team also used communication management processes to help communicate the correct information to the correct audiences. These processes include communications planning and performance reporting. The BPR-Bechtel team conducted

communications planning activities by first determining the project stakeholders' information needs and communications frequency preferences. The team then established a status and performance reporting schedule to satisfy those needs. This helped to keep stakeholders informed and also helped to ensure that the project stayed on track and received all resources necessary for its timely completion.

As an additional communications management measure, the project director prepared a three dimensional model of the completed project for reference by the designers, contractors and other stakeholders. This model helped everyone involved in the project understand how each activity would contribute to the final product. The team also used this model to review conditions affecting construction, the environment, health and safety. In addition, the team used the model to train Alcan personnel in operation and maintenance.

Cost management helps project teams to complete projects on budget. The BPR-Bechtel team used cost estimating, cost budgeting and cost control methodologies. Cost estimating helped the team to estimate how much each of the project's resources would cost and used these estimations to determine the project cost baseline. The team controlled costs throughout the project through use of performance reviews and forecasting of potential issues that could bring additional costs.

Quality management processes help teams to ensure that the products resulting from their projects are of high quality. The BPR-Bechtel team used quality planning methodologies to establish quality standards for the Alma potlining center and to determine how to reach those standards. Quality assurance methodologies, such as quality audits and process analyses, helped the team to determine whether their processes were sufficient to meet the quality standards. Then, throughout the project, the team used quality control measures to monitor project activities for problems and help fix problems before they could adversely affect the project.

Alcan and the BPR-Bechtel team had identified risk management as one of the most important initiatives in the execution of the Alma potlining center project. Risk management processes include risk management planning, risk identification, qualitative and quantitative risk analysis, risk response planning, and risk monitoring and control. In accordance with its zero tolerance policy, the BPR-Bechtel team used these processes to identify the mechanical and environmental problems that could accompany the project and analyzed these risks in order to determine risk responses.

The BPR-Bechtel team used procurement management processes to help maximize resources and help manage contractors and vendor relationships. Among these processes, the BPR-Bechtel team employed screening system and contract negotiation methodologies in the selection processes to ensure that each of the vendors would provide quality goods or services and that the contracts were negotiated to align with schedule and budget goals. Contract administration methodologies helped ensure that the project managers formed a cohesive team with the vendors and contractors on the project.

Results

The BPR-Bechtel team achieved, and in some cases surpassed, all objectives set for the completion of the Alcan Alma potlining center project. Below are several key achievements:

- The Alma potlining center was completed without any lost-time accidents during 180,000 hours of construction.
- The final cost of the project was 21 percent lower than the original budget.
- The BPR-Bechtel team completed the project five months ahead of schedule. On average, the construction contractors completed their work in 23 percent fewer hours than had been originally proposed.
- Risk management for environmental, health, and safety concerns was successful; surrounding communities and plant and wildlife were unaffected.
- The PMI Montreal Chapter awarded the Alcan Alma potlining center project team its 2005 Project of the Year award.