

INVESTIGATOR'S SUMMARY¹

Nomination 2007-13

Investigator: Charles R. Glagola, PhD, PE²

ROCKY FLATS CLOSURE PROJECT

The Innovation

This innovation involves planning, decision-making, and concern for the greater society in developing a contracting strategy that would lead to project success in meeting the stated requirements of the owner while incorporating innovative methods that address the greater good as well. This innovation does not result in a tangible patentable product, although significant technical innovations resulted from the contracting strategy, but does result in a unique and successful method for addressing projects holistically which will help define the future of contracting.

The project was a second and final phase of the environment cleanup from one of them most contaminated cold war weapons development sites in the country. The first phase of the site cleanup began in 1995. During this initial effort, the contractor, Kaiser-Hill, employed traditional contracting methods in dealing with establishing priorities, sequencing work, dealing with the public, employing unions and subcontractors, risk and reward options and other requirements. The results of this early effort was less than expected or desired and caused Kaiser-Hill to reevaluate what was needed for success on the second phase of the contract involving the most significant part of the cleanup and a complete closure of the base was signed in 2000.

Learning from this first phase effort, Kaiser-Hill negotiated an aggressive first-of-its-kind incentive-based accelerated closure contract. Incorporated into this contract were non-traditional contracting methods that resulted in total project success, development of innovative technologies for environmental cleanup, and completion of the project 14 months (nearly 25%) ahead of schedule, and \$500+million under budget. These results were achieved by employment and execution of innovative contracting strategies and method. The essences of these are represented by:

§Negotiating a new regulatory framework with the owner, the Department of Energy, DOE. This was tied to an incentive-based schedule of closure for 16,000 activities.

§Developing a unique and socially conscious workforce strategy whereby the local production-era workforce from the base was retained to work on the closure contract. This workforce employment is highly unusual since there is literally no place for these workers to go after the completion of the project and, historically, it is difficult to motivate workers and maintain any reasonable productivity under such circumstances. Because these workers were being asked to work themselves out of employment, Kaiser-

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Hill set aside a \$5 million dollar program to help 4,000+ workers transition into new jobs at the close of work. This program was and is unique and addresses an important social issue in regard to conventional management and labor relations.

§Establishing objectives with a program stressing safety, innovation, quality, and productivity by sharing profit with the workforce. Over \$100 million dollars was shared with the workforce for meeting internal incentives related to important program objectives. The byword was to work “faster, safer, and smarter.” This program resulted in a motivated workforce and won the respect of stakeholders and regulators.

§Development of new technologies to deal with treatment and cleanup requirements never encountered before. Kaiser-Hill developed an innovative chemical decontamination process that removed radioactive contamination that resulted in \$100 million dollars in savings while also reducing risk to workers.

§Establishing a unique safety program where safety was everyone’s concern and a worker could individually shut down a process or operation if he or she felt that safety issues were a concern. The workers thus being empowered were constantly concerned with the safety of fellow workers.

§Development of lasting and cooperative relationships with all stakeholders. This unique approach resulted in a multitude of benefits. It first created an element of trust which was so important in this hazardous cleanup effort. With the histories of nuclear waste disposal being secretive at best and dangerous at worst, public trust was an extremely important issue for Kaiser-Hill to establish. This resulted in a public/private partnership between Kaiser-Hill and the primary stakeholders comprising the DOE, local unions, the U.S. Environmental Protection Agency, State of Colorado, U.S. Congress, state regulators and local communities. Perhaps one of the most successful of these open relationships was with the establishment of the “Rocky Flats Citizens Advisory Board and the Rocky Flats Coalition of Local Governments, a group formed by seven municipalities surrounding Rocky Flats. This gave local governments greater leverage over the federal site cleanup and included the input and concerns of a group ordinarily ignored on projects of this type and magnitude. The understanding and support of these local communities was critical to Kaiser-Hill’s success on this project.

The ultimate affect of these unique contracting methods resulted in a highly successful project. Ordinarily when a statement such as this is made it means a satisfied owner and satisfied contractor, however, in this case it meant a highly successful project for all of the project stakeholders who shared a concern with and had a stake in the project outcome.

Application of the Innovation

The application of the innovative contracting strategies and methods devised for this project by Kaiser-Hill and the project team resulted in the complete satisfaction of the owner and the contractor as outlined above. The most significant success, however, is in the inclusion of concerns for and achievement of success all stakeholders. Open communications between the contractor and owner is always a goal, but not often achieved. Open communications between all parties to the contract and the stakeholders

outside of the contract is truly unique and innovative and this was achieved on the Rocky Flats Project. This total stakeholder involvement occurred due to the foresight of the project team to recognize that including these partners in the drive for quality and success would breakdown traditional barriers and result in all parties working toward the same goal and not working against one another due to suspicion, innuendo, and mistrust.

Because of the success of this project, the groundbreaking contact model has since been used for the majority of the DOE sites that have cleanup and closure missions, including the Idaho Closure Project, Mound Closure Project, Oak Ridge Closure Project, and Savannah River Site Closure Project.

Background of the Innovation

In February 2000, DOE awarded Kaiser-Hill a first-of-its-kind incentive fee contract to complete the safe, accelerated clean up and closure of the Rocky Flats Plant, a highly contaminated, former nuclear weapons production facility located 16 miles northwest of Denver, Colorado. Upon contract award, Kaiser-Hill immediately chartered the Rocky Flats Closure Project to accomplish what many thought was impossible; to close Rocky Flats by December 2006 within the Closure contract's target cost of \$3.06 Billion. The idea thus, originated from Kaiser-Hill in collaboration with DOE and input from stakeholders. The people responsible included Frazer Lockhart, Rocky Flats Project Office Manager, Nancy Tuor, Kaiser-Hill President & CEO/ CH2M Hill Vice Chairman of the Board, and John Corsi, Kaiser-Hill Project Manager, among many others.

Part of the success was due to development and application of a unique leadership strategy. Because of the high level of risk inherent in work at Rocky Flats, Kaiser-Hill made safety compliance the foundation of all work. Kaiser-Hill Project manager Nancy Tuor calls Kaiser-Hills leadership paradigm "a learning organization," which is an organization that can (1) continuously improve strategy in action, (2) learn quickly and move learning to the floor (i.e. the front lines of cleanup work), (3) take bounded risks, (4) engage workers as problem solvers, and (5) recognize that acceleration results from completing work correctly the first time, not necessarily from speed.

Validation of the effectiveness of the unique management methods employed on this project was accomplished with Kaiser-Hill's project management control system utilized common Work Breakdown Structure, WBS, as the key relationship field. Integrating with scheduling, estimating, and financial accounting software, this system, a home-grown, powerful, desktop computer-based tool provided real-time cost and schedule data to project staff, managers, DOE staff as well as all other stakeholders and was comprised of fully integrated cost, schedule and other databases necessary for effective project controls. This system of controls allowed managers to forecast and identify potential problem areas early and drill down through the WBS using the system's powerful querying tool to identify root causes. This real-time reporting allowed project managers to deal with potential problems before they became critical and to keep the project ahead of schedule and within the budget. All of this information was made available to the stakeholders.

Responsibility for the Innovation

The people primarily responsible for developing the innovation are:

Frazer Lockhart, Rocky Flats Project Office Manager who was responsible for implementation of project control systems, communication between project participants and insuring that the management systems were continuously reviewed and adjusted to meet project goals.

Nancy Tuor, Kaiser-Hill President & CEO/CH2M Hill Vice Chairman of the Board was part of the partnership that developed the unique contracting methodology and organizational structure that resulted in the success of this project. Ms Tuor was also responsible for development and implementation of the leadership paradigm described earlier.

John Corsi, Kaiser-Hill Project Manager was responsible for the “ground level” success of the project with implementing the unique communications initiatives between Kaiser—Hill and its subcontractors, workers, and with local and regional stakeholders.

These three individuals contributed uniquely to the success of this project and should all be recognized for providing the necessary leadership and initiative essential to the success of this innovative project.

Opinions of Persons Contacted

The response from Ms Nancy Tuor, President and CEO of Kaiser-Hill, provided a wealth of information regarding the project planning and operations. One of the management techniques applied that has not been mentioned helped keep the project on schedule and budget. This management tool was the application of *Variance Analysis* as an indicator of change. Changes on this project were inevitable, and management of change was planned into the project. Kaiser-Hill implemented a disciplined process to continuously evaluate the scope, cost and schedule variance which supported identification of change. The project team identified and reported issues and barriers to performance with cost and schedule variance analysis. For example, several waste treatment and disposal facilities slated to receive waste from Rocky Flats were closed. Early identification of this issue allows sufficient time for Kaiser-Hill to perform a cost and schedule “what if” alternative analysis before waste disposal became a critical path item. This disciplined approach to project management supported DOE’s and Kaiser-Hill’s decision-making and provided leverage to proactively address external factors that impacted the project.

Investigator’s Comments

Construction projects are difficult to plan and control because of inherent risk. Inherent risk deals with the unknown, unknown conditions, unknown contracting relationships, unknown interested parties, unknown workforce productivity, unknown subcontractor abilities, and it goes on-and-on. Large construction projects are projects that require dealing with unknown and risk on a much larger scale. Mega-projects such as Rock Flats are much like jumping off a cliff on a pitch dark night and not knowing how far down the bottom is in regard to being able to predict and outcome. This analogy can be seen from the estimates from the General Accounting Office, GAO, who reported in 2000 that Kaiser-Hill had a 1% change of closing the Rocky Flats site by 2006 and in 2001 they revised their estimate to give the project a 15% change of finishing by 2006.

Through its innovative contracting and management methods, Kaiser-Hill was able to complete the project on time and under budget.....significantly. I am very impressed with their aggressive approach to making sure that the project was a success for everyone. Instead of simply taking the conventional way of pulling a curtain around the project and letting everyone know when it was finished, Kaiser-Hill, along with the DOE, included all persons, groups, agencies, and others as stakeholders. This turned out to be a tremendous “win-win” for everyone concerned and resulted in what could be termed total satisfaction while also provided the local community with a wildlife refuge. We need more projects like this one and hopefully other federal and state agencies will take a lesson and begin to insist on contracting methods and strategies similar to those developed and implemented so successfully at Rocky Flats.

SELECTED INTERVIEW SUMMARIES

David Abelson

Executive Director

Rocky Flats Stewardship Council

Boulder, Colorado

Telephone interview by Charles Glagola, 6/28/07

Mr. Abelson, representing the Rocky Flats Stewardship Council was directly involved with the project through representation of the external stakeholder communities and other effected parties. The Rocky Flats Stewardship Council, over which Mr. Abelson presided, was formed in March 2006 to provide ongoing oversight of Rocky Flats. The mission of the Rocky Flats Stewardship Council is:

1. To provide continuing local oversight of activities occurring at the Rocky Flats site, to ensure that local government and community interests are met with regards to long-term stewardship of residual contamination and refuge management;
2. To provide a forum to track issues related to former site employees, including but not limited to long-term health benefits and pension programs;
3. To provide an ongoing mechanism to maintain public knowledge of Rocky Flats and to educate successive generations of ongoing needs and responsibilities regarding contaminant management and refuge management; and
4. To provide an ongoing forum to address all other issues pertinent to Rocky Flats, as determined by the Stewardship Council Board of Directors.

Mr. Abelson indicated that the formation of the Stewardship Council was a tremendous help in providing the local communities with a partnership role in this project. This gave the local citizenry a voice for input into decision making that would have long-lasting effects after the project was finished and the contractor and owner were gone. One of the significant results was to reclaim the site location for a wildlife refuge that would be of considerable benefit to area. Had it not been for the innovative management process that included complete and open communication between the local communities, the owner, the contractor, and the regulators, this would probably not have happened.

SUPPORTING EXHIBITS



The Rocky Flats Environment Technology Site, a Superfund site located 16 miles northwest of Denver, CO, consisted of more than 800 structures located on 6,200 acres.



Almost 40 years of nuclear weapons production left behind a legacy of highly contaminated facilities, soils, and groundwater. Rocky Flats was the largest, most complex nuclear cleanup of its kind in the world.