



# Learn and Do: Real-Time Project Management



Coal-mining operations depend on heavy equipment to uncover coal seams, take the coal out of the earth, transport it to crushing facilities, and, finally, load it into railcars for shipment to customers—a continuous process of “just-in-time” delivery. To avoid breakdowns, planned maintenance—or outages—of such equipment must be scheduled on a regular basis. And maintenance must be completed within the allotted time. When an outage takes longer than anticipated, throughput is threatened. Workers may have to be paid overtime; usable equipment may have to be moved, at great expense and with great difficulty; rail shipments may have to be rescheduled; and—in the worst-case scenario—commitments to customers may not be met.

Heavy-equipment outages definitely require a world-class project management process, which is what Rio Tinto Energy America (RTEA) has put in place at several of its mines, including the Spring Creek Mine in Montana. Unsatisfied with traditional project management training, RTEA partnered with Kepner-Tregoe, Inc. to create a unique type of training, called “Learn and Do.”

Learn and Do is a process in which, during project management training, participants do not work on fictional or hypothetical cases. Instead, they apply real-time learning to an active project. Learn and Do involves three phases:

1. Project Definition
2. Project Planning
3. Project Implementation
4. One of the major projects accomplished at the Spring Creek Mine, using the Learn and Do process, was the successful outage of an electric shovel.
5. Such shovels are used to dig coal out of the coal seam — which at Spring Creek Mine is more than 80 feet thick — and load the coal into haul trucks. Electric shovels can be capable of scooping more than 50 cubic yards of coal in a single scoop. The boom of the shovel will often be more than 70 feet long.

### Phase 1: Project Definition

Project definition lays the foundation for successful implementation. Yet, unfortunately, it is the phase that most organizations fail to include, often, they believe, “in the interest of time.” Project definition includes four steps:

1. Create a Project Statement. In the case of the shovel outage, the Project Statement was “Repair #301 for \$500,000 in 30 days, starting May 20, 2006.”
2. Create Project Objectives. Some of the objectives for the shovel outage were:
  - Conduct complete outage with no accidents/lost time
  - Eliminate the need for any future outages >7 days for a period of 18 months to 2 years
  - Complete all planned maintenance activities
  - Complete project within budget
  - Shovel out of service no more than 30 days
  - Complete project within RTEA safety standards and regulations
  - Determine when the next outage will be required (better understanding of preventive maintenance)
  - Ensure that blasting does not cause project interruptions
  - Conduct the tasks within the specified project period
3. Develop a Work Breakdown Structure (WBS). This is a laundry list of all the work that must be completed.
4. Identify Resources. What will the project cost in terms of people, materials, equipment, etc.?



Once this information has been developed, management must weigh the benefits (a + b) against the costs (c + d) and determine whether or not to proceed with the project. In this case, the benefits outweighed the costs, and the shovel-outage project team moved to Phase 2.

### Phase 2: Project Planning

Effective planning requires the participation of the entire project team. For the shovel outage, the project team consisted of five or six core members, but the expanded team included the project manager, the maintenance manager, technical people such as electricians and mechanics, maintenance workers, and subject matter experts who specialize in this kind of equipment and supply information related to it. Others, such as safety officers, the operations officer, the mine manager, and the mine planner were brought in on an as-needed basis.

Their first goal was to construct a Responsibility Assignment Matrix (RAM) which provided details as to primary resource allocation: that is, which individuals, departments, or outside companies would perform the functions that were identified during project definition.



Next, the team was charged with determining the order of the work to be accomplished, including how much time (duration) was to be allotted to each task. Four major categories of deliverables were defined: pre-work, outage, closeout, and changing out the point. Within each group, details of very specific tasks, such as boom work, undercarriage work, electrical work, swing repair work, and removing suspension ropes were included, as well as who was going to do the work.

During this stage, the project management team also defined the critical path: identifying those tasks that would determine the duration of the project; pointing out those which, if not completed on time, would make the project late; and, finally, differentiating those tasks that had to be completed on time but were non-critical to the timeline of the project. A Network Diagram was used to visually communicate the order and duration of the tasks.

The team even spent time thinking through the number of calendar days it would take to complete each task, at a detail level that would allow them to identify on which days and during which hours the tasks would be completed. This enabled the team to quickly visualize and resolve conflicts with other work that the organization had to complete. Armed with this information, the team was able to evaluate the availability of resources on the dates that they would be needed.

Dwight Eisenhower once said, "The plan is worthless, but the planning is invaluable." Indeed, the planning process was invaluable for the RTEA team. Actual plans are often of less value than the process itself. Why? Because plans cannot ensure that things will take place as anticipated. Human beings are, after all, fallible and do not necessarily control all factors that can impact even the best-laid plans. However, the comprehensive planning process did allow the team to accurately examine the cost/benefit value

of the project, resource the project appropriately, anticipate potential problems, and create effective “what if” scenarios.

At the end of the planning stage, management was able to re-commit to the project with confidence, agreeing that the company and its staff were, in fact, capable of accomplishing their objectives and would proceed to Phase 3: Implementation.

### Phase 3: Project Implementation

Activities in the final stage begin with a project kick-off, move to monitoring the work, plan modifications as needed, and end with the closeout and evaluation of the project.

At the start, the team defined their guidelines for interacting, or rules of engagement, in order to ensure adequate internal communication among themselves and with outside contractors. In some cases, these “rules” were also incorporated into the terms of the contracts. The rules addressed key issues such as:

- What should be reported and how often?
- How will reports be made: formally and/or informally?
- How will concerns be reported?
- How will changes to the plan be made?
- How will team members work together?
- How much autonomy will the team members have?



Consistent monitoring was a key element in the process. At Spring Creek Mine, the process included a daily walk-through to discuss safety, measure progress, talk about concerns, and plan the next day. Each morning, the project manager would meet with the mine manager and provide a verbal report. The primary contractor had to supply a Gantt chart with every day's planned activities outlined.

The process worked well. Ultimately, the project was finished on time, \$18,000 under budget, and all objectives were accomplished.

### End Note

In today's environment, pressures on the bottom line can result in cost cutting and limited training. Time pressures often preclude any training at all! In addition, companies often do not see the full effect of formal training when it is conducted in a less practical and more academic setting than Learn and Do.

In all, Kepner-Tregoe has worked with RTEA on more than 15 different projects, in a variety of functions and with several different mine sites. In one unit, where four projects have been completed, key people

have been moved to full-time project management positions. Project management has become their sole area of responsibility. RTEA supports this effort by setting expectations and providing the time, structure, and feedback that project teams need to succeed.

### About Kepner-Tregoe

Founded in 1958, and based on ground-breaking research regarding how people think, solve problems, and make decisions, Kepner-Tregoe provides a unique combination of training and consulting services to improve quality and effectiveness while reducing overall costs. The KT methodology is used at every level of client organizations: to implement strategy, achieve continuous improvement, increase customer satisfaction, and drive effective issue resolution throughout the organization.

