Getting big mining projects right: Lessons from (and for) the industry

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Overruns and delays are common in big mining projects. Intelligent interventions can improve the odds of success—particularly on distressed projects.

More than four out of five mining projects come in late and over budget, by an average of 43 percent. One reason for the poor performance is that project leaders find it difficult to know whether and when to intervene. Although they almost always understand when a project is getting into trouble, they may hesitate to make changes because they hope that things will improve or worry that intervention will backfire—what if people get angry or feel too pressured and quit? These are legitimate concerns. In our experience, however, the biggest regret of leaders whose projects went wrong is that they waited too long to act and didn't go far enough when they had a chance.

Commodity prices are low and volatile, and fewer projects are being built. With profit margins slim, so is the room for error. In mining construction, productivity issues must always be addressed at the outset because sooner or later they will haunt the owners if they are not.

Drawing from our experiences with mining mega-projects around the globe, we present six ways to keep new projects on track—and to intervene quickly and effectively when they show signs of heading south.

1. Build a proven team

When a project is in trouble, many organizations attempt to turn it around by parachuting in individual experts rather than a cohesive turnaround team. This approach seldom works effectively. These may be accomplished leaders, but too often, the sum of their experience adds up to less than their individual skills. At best, they struggle to integrate their thinking and identify priorities. At worst, they develop ineffectual plans by consensus after prolonged debate.

Many projects in distress, it's worth remembering, reached that point because of flaws in the culture, management, and decision-making infrastructure of the companies that launched them. Individual experts can't fix those problems: they work in silos when what's really needed is an overall change in direction. An effective turnaround team must bring collective, integrated intelligence to performance problems and focus on identifying specific ways to solve them.

As early as possible once it becomes clear a project is in distress, the owners should create such a team with people, from inside and outside the company, who are willing to work together and have turnaround experience and complementary skills. A last-minute effort often produces teams whose members have different management styles, different perspectives, and even different ways of defining problems—one expert might want to use subcontractors extensively, another to rely on company crews. Each approach may have its merits, but the team needs to operate as a unit, with a single point of view and a clear understanding of the mission.

Example. A brownfield smelter-expansion project faced delays and cost overruns. The project team could not provide a good forecast for completion dates, so the operator didn't know when the plant was likely to come on line. The company assembled a team that had a mix of project veterans (including people brought back from retirement) and younger professionals who had deep analytical capabilities. It located all members of the team in the same place to ensure that they could share information easily, established clear goals, and defined roles. A project-control dashboard was developed to track costs and schedules, and regular communication channels were opened up to check progress and eliminate roadblocks. As a result, the team was cohesive and well informed, with transparent, real-time views into the project's progress. Because it could identify potential issues earlier, it could determine the best course of action to address them quickly.

2. Create a comprehensive view of the project

Distressed projects, by definition, need improvement in many ways. The issues, ranging from contractual disputes and technical problems to unrealistic targets and poor morale, are often deeply rooted and interconnected. Diagnosing what's gone wrong requires digging into the root causes of poor performance. Of course, there will be specific problems, but it's important to recognize that these are often—even usually—the product of broader issues. Turnaround leaders should therefore concentrate on the big picture. Yet all too often, they focus on one or two areas, convincing themselves, in a kind of cognitive bias, that if they can just fix these things, the whole project will be transformed. Usually, it won't. Systemic problems need systemic solutions.

One way to develop a broad picture of the changes required is to create a diagnostic framework that diagrams the organization of key construction activities, along with their supporting functions (contracting and quality, for example) and the way they interact, so people can visualize how related issues are connected. Since no turnaround team can do everything at once, it's important to identify the fixes that bring the biggest benefit in the shortest possible time.

Finally, a clear sense of where a project is can push the team to concentrate on finding solutions rather than debate why they are needed. It's all too common to see teams arguing over contractual change orders or just generally complaining about quality, without quantifying or qualifying potential fixes. There may be a place for this kind of criticism—but it needs to happen in the context of the search for solutions.

Example. The chief financial officer of an open-pit copper mine feared that a project was faltering, but its director was in denial. An outside team detailed its difficulties and then quantified the cost overruns and delays to show the full extent of the problems. At the same time, the team developed a broader picture of how these individual problems were related and where performance was falling short. Then, it identified possible solutions. After evaluating this input, the company decided to address specific productivity-related issues rather than overhaul operations. The priority was to get the plant operational as quickly as possible. While this approach did leave opportunities on the table, the company acted knowingly, choosing to score quick wins and to learn for the future.

3. Address productivity issues

Raising productivity is one of the best opportunities to improve a project's outcome and bring escalating costs under control. Productivity tends to deteriorate when problems accumulate and work becomes more complex. As the end of a project nears, tasks are congested and multiple trades try to work in the same spaces. To overcome these issues, project leaders must address factors such as work patterns, work flows, and the availability and skills of personnel. In addition, many complex projects are located in remote places, so every available work hour must be used well.

Ideally, construction projects should resemble well-run manufacturing facilities: one trade should complete an activity before the next trade follows, with no downtime. For this to happen, many different groups must be brought together to solve the problems of workflow planning, sequencing tasks, easing the access of materials and people to sites, and coordination among disciplines. Few projects meet this standard.

Successful workflow planning relies on predictable schedules—both daily and weekly—and on cooperation. Collaborative problem solving among trades and between contractors and subcontractors is essential to reduce variability.

Example. A coal-mine project was significantly behind schedule, and the company figured it had to hire an additional 1,000 people to catch up. An analysis of field operations found that construction crews were completing only half of the planned work. Hiring more people, the company realized, could add costs without addressing the core productivity problem. First, it overhauled its planning operations to ensure that it was proceeding in the right way to finish the project. Then it installed mechanisms to ensure that crews were implementing the plan. Thanks to better on-site productivity, the company didn't have to bring in nearly as many new workers. It not only saved money but also improved the outcome.

4. Establish an information infrastructure

To manage a major project effectively, managers must know what's going on across all phases and scopes of work, so complete, constantly updated information should flow to everyone who needs it. One of the biggest challenges in today's mining sites is that despite technological advances, critical data (such as cost and schedule metrics) reside in separate systems that don't communicate. A comprehensive dashboard that aggregates and analyzes data can give management teams the intelligence they need when they need it.

Think of such a dashboard as a control tower that sends out crucial data to both management and on-site teams. It can be located in a space near the work site, with up-to-date progress metrics, graphs, and drawings for the construction teams to consult. Ready access to information about a project's progress and risks actually helps the various actors to improve their decision making—an essential step to improving outcomes.

Here's another information issue: when projects fall behind schedule, daily kickoff meetings are often among the first things to be shortchanged or eliminated. That's a mistake; such meetings are critical to ensure that the trades, the project manager, and the superintendents all review what

happened yesterday and what's planned for today—and to address any issues. Weekly conversations should discuss what's been achieved so far and which problems remain. Regular but less frequent meetings ought to address the way longer-term plans, over the next few months, fit into the work.

This kind of information infrastructure can help managers make better day-to-day decisions, adapt to changes and difficulties, and maximize the use of field hours across all phases of work.

5. Actively manage the transition from construction to operations

Mining companies often attach too much importance to meeting construction milestones and underestimate the effort required to commission and start up a plant. It's a familiar tension. Those who build a project emphasize completing the work and moving on to the next assignment. Those who will actually operate the facility don't know the details of construction and, perhaps, how the project was designed or decisions were made along the way. It's a case of handing over the keys without an instruction manual. At this point, many promising projects take a turn toward disaster.

Planning for successful transitions has to begin at the start of a project and remain part of the workflow throughout its duration, so that the operations team becomes familiar with facilities as they are built. Close interaction between construction and commissioning leaders is required to get systems and subsystems safely across the completion line. Contractors need to communicate their progress, and operators need to work with them to implement a structured system for testing each element of the project. While most teams agree with this approach in theory, they often falter in execution. Leadership should establish a commissioning organization early on to help plan for the project's completion. Without thorough planning from the start, the participants will have different finish lines—and that is costly.

Example. The owners of a new copper mine began building facilities without consulting the commissioning team. When it finally became involved, it found that the construction sequence didn't connect with commissioning activities. There was a real risk that expensive equipment would be installed with no way to start it and nothing for it to do. In addition, critical tests were omitted, and the organization didn't have the right people in place to begin operations. As a result, the start-up was piecemeal. The mine did open on time, but the plant didn't reach full production capacity until well after the budgeted start date.

6. Define success

Projects don't stop when they are in trouble. They are often well into the execution phase when problems arise—materials are on-site, camps built, equipment mobilized, crews at work. So when a project owner must intervene to turn a project around, it should recognize that contractors and managers, working against long-established execution plans, are probably already invested in past decisions and practices.

That gives large-scale projects a degree of both inertia ("we don't want to change") and momentum ("we're busy"), which can slow progress. The improvement plan must include a significant change-management program, and the intervention leaders should be skilled at driving cultural shifts in project teams. Clear, ambitious, and achievable goals that come from the top must define what the transformation will accomplish and why it's worthwhile. Ideally, one or two items can be dispatched relatively easily, for such quick wins

boost morale and confidence. If it's necessary to slay some sacred cows, this isn't a bad thing—an industry that delivers more than 80 percent of its projects late and over budget could use fresh thinking. The larger point is that articulating a vision is essential if employees are to believe in—and feel personally accountable for—reaching the stated goals.

Example. During the feasibility stage, a nickel underground-mining project seemed uneconomic. The project team had several ideas about what to do but didn't know how to identify the best options or bring them into the design and execution plan. Some promising ideas were literally sketched on paper and stashed in an engineer's drawer. All that changed when the project sponsor set a target. This goal, expressed as the internal rate of return, energized the team, which not only retrieved ideas that had so far been ignored but also came up with new ones. When these were incorporated into the project's business case, they showed that the rate of return could double.

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In an era of high costs and low, volatile commodity prices, the need for great project management is acute, but many big mining projects still suffer from poor execution. Thoughtful interventions like those described here can shift their direction fundamentally—for the better. ■

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