

The 10-Minute Million Dollar Problem

By Kay Sever, Continuous Improvement Coach and Consultant, CQIA

When I meet with managers, superintendents, supervisors, or process improvement teams at mining operations, I find that every operation experiences similar types of recurring problems. Do any of these sound familiar?

- “**Shift change** always takes 10 minutes longer it is supposed to. It’s been that way ever since I started working here.”
- “This **chute plugs** twice every shift, but it only takes 5 minutes to clear. There are so many other things that seem more important to fix. We have a man assigned to clear it ASAP.”
- “Getting **PMs started on time** has always been a problem here because the right parts are almost always missing. We plan for this delay and schedule the equipment to be down 30 minutes longer, knowing that we will almost always have to go to the warehouse to correct the problem. That way operations is not expecting the equipment sooner than we can deliver it.”
- “For the past 3 months, **haul truck fueling** has been taking 10 minutes longer because the pump on Station One broke and I have to drive to Station Two. I heard a rumor that we may not fix Station One to save money.”
- “When this bin gets full, the entire **system shuts down** for about 3 minutes several times per shift. This is a short delay and is part of the system design, so it has very low priority.”
- “We used to get **water delivered to the drills** faster until other things took priority. Now the drills sit for at least 30 minutes longer before the water truck comes.”
- “**Third shift hand-off** does not go well here. It takes at least 30 minutes every night to understand where 2nd shift left off and confirm our priorities. It’s always been that way here.”
- “Everyone knows that **scoops** are last priority here. We never know where they are when we start our shift. We probably lose 3 hours per week looking for them. It’s just the way it is.”
- “Our shovel operators drive our busses at shift change. Since they arrive at their equipment last, we lose 10-15 minutes of **loading time** every shift. We budget for this loss, so it’s really not an issue.”

You have probably experienced at least one of these problems personally in your career, so you are probably asking “What’s so special about this list?” Here are 5 answers to that question:

1. These problems result in **lost tons** that could have been produced, **lost revenue** that could have been collected, and **excess costs** that could have been avoided.
2. The **financial impact of these problems is seldom calculated**, partly because the value of lost production does not appear on the general ledger. Since their impact is unknown, there may be no urgency to fix them.
3. These problems occur in planned activities and normal workflow and take the form of disruptions, delays, bad information or rework.
4. If not corrected, employees eventually change how they perceive these problems and accept them as “part of the process” or “part of the culture”.
5. When this happens, management and employees behave differently to accommodate the problems by:

- **developing workarounds** so that they can continue to function at a reduced level of performance each time the problem occurs,
- **accepting current performance** as the best they can do,
- **changing the goals** to accommodate projected reoccurrences, or
- **requesting unneeded expansion capital** to increase production when there is existing capacity hidden by problems viewed as unfixable or part of normal operations.

The acceptance of recurring problems in any culture is a slow process that develops over years as the result of:

- how success is measured,
- how budgets are built,
- how well KPIs and reports reveal opportunities for improvement,
- how much “fire-fighting” occurs on a daily basis,
- an unbalanced emphasis on short-term goals,
- a shortage of people to do the work, and
- a lack of focus on prevention and controllable activities.

This article was not written to place blame for this dynamic that compromises success with improvement initiatives. Instead, it is meant to enlighten management teams about

- where to look for hidden equipment capacity,
- how to create urgency to fix recurring problems, and
- why high cost problems may be missing from opportunity logs or project reports.

Eight Factors that Cause Problems to be Overlooked

Recurring problems may be overlooked when continuous improvement programs are implemented. To understand why this occurs, let’s analyze the drivers that form beliefs about improvement potential and what is possible to achieve. Based on 11 years of implementing improvement initiatives and facilitating over 25 process improvement teams, I have identified 8 factors that shape workforce beliefs about opportunities to improve and the ability to change:

1. If a problem has been reoccurring for a long time, the workforce may believe that a) it cannot be fixed (if it was fixable, it would have been fixed by now), or b) management does not want to fix it. Neither of these may be true.
2. If managers, superintendents, and supervisors have to change the way they communicate or their level of involvement to fix a problem, employees may erroneously believe that management is unwilling to do this and may avoid suggesting the problem as an improvement opportunity. If management really is unwilling to change, they may omit the project from the list. Either way, a value-added project could be overlooked.
3. If a problem was supposed to be fixed and it reoccurred, employees may be afraid to acknowledge it as an improvement opportunity due to the anticipated reaction from management. This factor would be culture-specific.
4. FACT: Incentive plans are a stronger driver of performance than improvement initiatives. For this reason, incentive goals must be aligned with improvement potential. This alignment also encourages process improvement work for

processes co-owned by multiple departments, and prevents conflicting messages and unintended consequences across the organization when employees are challenged with executing a budget that is not achievable. Example:

If incentive plans reward individual or plant performance over and above value stream (i.e., site-wide or division-wide) performance, plant managers will be more concerned with their own plant's performance than acting in the best interest of the value stream. If this happens, several recurring problems within the value stream may occur, such as:

- excess material or poor quality material cannot be processed,
- no storage for excess material-in-process, or
- no market for excess or downgraded material, postponing the collection of revenue to cover sunk production costs.

5. Problems in sending the required quantity or quality of product downstream may not have been addressed effectively in the past, creating a belief that future cooperation is not possible between the mine, plants or conversion facilities. The same perception can occur when multiple departments are involved in executing a single process where there are causing missed deadlines, wasted resources, excess costs, and incorrect or confusing communications.
6. If management limits the scope to cost reduction, then opportunities to increase production and capture lost margin with existing equipment will not be examined. Recurring problems causing these losses will be overlooked or ignored and millions of dollars in potential profit will be forfeited.
7. Single events that cause large production losses and significant excess spending are often perceived as the biggest problems, while small events that briefly disrupt or delay day-to-day activities are often overlooked. Example:

A problem that caused 3 days (72 hours) of downtime was perceived as a huge issue. Its impact on results was widely discussed, and for that month, it WAS the biggest problem. If this operation listed events that caused them to miss budget, they would remember problems like this, but would miss more frequent problems that have a smaller individual impact but a greater overall cost.

8. People try to prevent problems in their personal life to limit emergency spending and allow them to save more of their own money. If the workforce understands the basics of losses for delays, rework or wasted supplies (i.e., opportunity costs), they often respond with urgency when asked to help reduce costs and improve productivity. Likewise, management teams can benefit from using opportunity costs when building achievable budgets, avoiding expansion capital, and focusing the workforce on the most important opportunities.

I have personally watched employees and managers change their focus and priorities in one afternoon when opportunity costs are calculated for recurring problems. The site's focus changes from reactive fire fighting to planning for loss reduction, which creates a new paradigm from which to execute day-to-day activities and work processes. Costs will go down and production will go up as a result of this focus.

How do you miss a Million Dollar Problem?

Let's see how excess time for shift change could be overlooked as an opportunity for improvement.

At an operation that I worked with, shift change always took 40-45 minutes for a variety of reasons (poor communications between drivers, no standard for pre-inspection, no consistent route, lack of vehicles, etc.) The production staff had tried various approaches to shorten the total time but were unsuccessful, so **they accepted the extended time as the new "normal"** and were looking elsewhere for improvement projects to add to their opportunity log.

After some discussion, there was agreement that there may be an opportunity to shorten shift change by 10 minutes, which equated to a potential gain of 30 minutes of productive time per day at a 3-shift operation **OR 180 hours per year OR +2% availability or utilization** (assuming 90% availability). This loss was **2.5 times bigger** than the impact of the 72-hour event that made the list of biggest problems discussed above.

Assigning Value Increases the Urgency

Let's revisit Factor #8 and our personal lives for a minute. We make lots of decisions based on how much money we are willing to spend and how much money we will make. We consider the balance between quality and price in almost everything we buy or build. We believe in spending a little to save a lot. We prevent problems before they occur because our lives will be easier, we will be safer, and we will save more money (examples: locking the front door, airing up our tires, changing the oil in our cars, researching contractors before remodeling our kitchens, asking our friends if they know of a good doctor, etc.)

What if your entire workforce used the same criteria when executing its work activities and identifying opportunities for improvement? Assigning dollars to process problems can turn on these same thought processes in the workplace. Valuation is the step that prioritizes a problem so that you know what to fix first, second and third and adds an element of common sense to the execution of day-to-day activities. Lost opportunity dollars related to lost tons, pounds and ounces can be applied to downtime, throughput and recovery losses. Excess costs can be calculated for overtime, contractor costs, operating supplies, or premiums for purchased product to ship to customers.

Calculating the value of lost tons, pounds or ounces can be an eye-opener. Converting these losses to a value per hour or value per ton helps the workforce relate more directly to the losses and what they control. If we do this calculation for a copper operation using current metals prices, assumed ore grade and recovery, the value of one operating hour could equal \$150,000 using a conservative lost margin of \$2.00 per pound. Applying this value to a 10-minute production loss at shift change would yield a value of **\$25,000 per shift change** or \$28,000,000 in annual lost margin. The 72-hour event would be worth about \$11,000,000 per event (lost production impact only, excludes cost impact).

When I help mining operations do these calculations, the response is always "This opportunity is worth so much more in time and dollars than we thought." **Immediate urgency is created** to allocate resources and reprioritize projects and capital spending.

Based on the earlier assumptions made about what qualifies as an improvement project,

- The 72-hour event would have been added to the opportunity log.

- The shift change project would have been overlooked.
- Significant capital may be required to prevent another \$11,000,000 dollar event.
- **The \$28,000,000 shift change opportunity could be captured with little or no investment.**
- The unfortunate part of this scenario is that shift change had been stealing millions in lost margin every year for several years and until we did this exercise, management was not aware of the value being lost.

Perception is 9/10 of Reality

This one phrase encapsulates the greatest challenge in implementing continuous improvement at every company because it extends its fingers into every aspect of implementation and sustainability. Perceptions of management teams and employees have a huge impact on the projects that surface and the value delivered. **An honest discussion about the power of perceptions** needs to be part of the implementation plan for every improvement initiative.

It is important to value all suggestions for improvement before rejecting them or assigning low priority. Valuation helps change the perception of the most important problems and helps an organization invest money and resources in the projects that deliver the most value.

Building an “Opportunity Culture”

Language used when building an **“opportunity culture”** is key to success.

- Criticizing improvement ideas can stifle future suggestions, especially when they relate to controllable events, problems that were supposed to be fixed, or processes that have been out of control or poorly managed for some time, such as planned delays for operations and maintenance.
- **It takes courage for managers to admit that a process could have been managed better**, especially in a culture that is quick to criticize but seldom praises good work. When managers are trying to drive and sustain improvement initiatives, it is not the time to make them feel bad about not taking action earlier.
- **This is the time to congratulate managers and employees** on their new level of responsiveness or urgency to correct a chronic problem.

Employees will tell you what you need to hear, especially when they understand the value being lost. Don't let your “10-Minute Million Dollar Problems” escape your focus. Be sure that your workforce knows that you welcome every opportunity discovered (even if you wish some of them had been fixed earlier) and adjust your language to reinforce this message. Remember that culture change takes time, so give your company the time to change without reverting back to a reactive short-term focus. Your long-term goals for maximizing opportunities to improve operating and financial results will help create a culture that thrives on fixing your most important problems first.

NOTE: Kay Sever implements continuous improvement with a focus on value creation and a balanced approach between continuous improvement concepts/tools and the people side of improvement. She works with every organizational level and all departments to identify and value hidden opportunities to increase production, reduce costs, improve quality, meet customer specs and remove the barriers that prevent sustainable change. She also coaches management teams on Improvement Leadership and helps

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