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An organization must focus on sustainable results, not just cutting costs. Three case studies illustrate.

Results-oriented organizations focus first on the quality and volume of production throughput, followed closely by the cost to produce the required quality and volume. This approach will improve reliability performance, which will drive manufacturing costs down.

Most organizations focus more on cutting maintenance costs, and, as a consequence, maintenance costs go down temporarily, only to increase much more than the initial savings. In addition, reliability goes down, paving the way for losses that can be substantial. This behavior and results have been proven many times, especially in economic downturns. The root cause of this phenomenon is often shortsightedness and what the late quality leader Dr. W. Edwards Deming described as one of the most serious diseases in American industry: "the mobility of top management."

The three case studies that follow demonstrate what happened in two organizations that focused on cost reductions and in a third organization that focused on Results Oriented Maintenance.

Case 1: Cost and head count reduction

The accompanying graph shows a 3-year case study in a food processing organization with an aggressive cost reduction program. A key measure used in maintenance benchmarking exercises was the number of maintenance crafts people and first line managers such as planners and supervisors.

The head count reduction was done through attrition and layoffs. The major mistakes by this organization were:

- To cut costs by reducing only the number of employees and not considering reducing the need for maintenance or improving work processes.
- To focus on number of employees, instead of hours of maintenance work, including overtime and contractor hours.

Case 2: Aggressive cost reduction

The graph for this case shows results at a chemical plant, a high-cost producer in its market, where management decided to do whatever it took to cut costs, mainly in maintenance. When the cost-saving initiative started, market prices for the plant's products were low and profitability in a short-term perspective was low compared to other plants in the corporation. The fast-paced cost reduction actions included:

- Operations took over maintenance and only did maintenance work that was judged absolutely necessary.
- Planners were laid off and planning of work was discontinued.
- Scheduling was discontinued.
- Maintenance prevention activities such as shaft alignment were abandoned and lubrication was handed over to operators without training and implementation of a documented program.
- The preventive maintenance program was handed over to the operators, without training in what to do or how to inspect. The preventive maintenance inspectors were laid off.
- Shutdown crews were merged with another plant about 1 hr drive from the subject plant.
- Painting programs were abandoned.
- Training of crafts people was discontinued.

After realizing the catastrophic consequences of what had happened, the mill took initiatives to bring maintenance to world-class status. Results are very encouraging and the mill is today one of the top performers. Reliability is approaching 94 percent. Maintenance costs have gone up, so has quality production throughput, and manufacturing and maintenance costs per ton are lower.

The actions taken to bring maintenance to world-class status included:

- Reinstating preventive maintenance inspectors and revising the preventive maintenance program.
- Bringing maintenance back to a central maintenance function.
- Developing a partnership between maintenance and operations instead of a customer-supplier relationship.
- Focusing on planning and scheduling and front line implementation of these practices.
- Developing employees' capabilities toward joint goals.

- Making capital investments in new equipment and restoration of worn out equipment.
- Implementing front line management action indicators.

Case 3: Reliability improvements first, costs second

This plant manufactures the same product as the plant described in the previous case, but it decided to focus on reliability improvements instead of only cost reduction. This included:

- A clearly outspoken and established partnership between operations, engineering, and maintenance was forged.
- A change was made from a reactive to a planned and scheduled maintenance organization. Less than 10 percent of all maintenance work was planned when the initiative was launched. Ten years later more than 85 percent of all work is planned and scheduled.
- A strong vibration analysis program was implemented. When it started, the average vibration level was 0.23 in./sec. Today it is down to 0.11 in./sec.
- Lubricators were professionally trained. This resulted in better filtration and water removal, better seals, oil testing, and fewer types of lubricants. Cost for lubrication was reduced by 60 percent.
- All rotating equipment above 1000 rpm is balanced dynamically before it is put into service.
- Many equipment bases were improved and equipped with jack-bolts to improve alignment precision.
- Electric motors and rolls in storage are marked and rotated twice a month.
- Alignment training, standards, and execution were implemented.
- Stores inventory and services were analyzed and improved. Service level now stands at 96 percent and stores value has been reduced by more than 30 percent.
- Adherence to preventive maintenance schedules was increased to over 90 percent.

Reliability pays

Reliability improvements increase production throughput and drive down maintenance costs. Maintenance cost reduction is a consequence of reliability performance; it is never the other way around. **MT**

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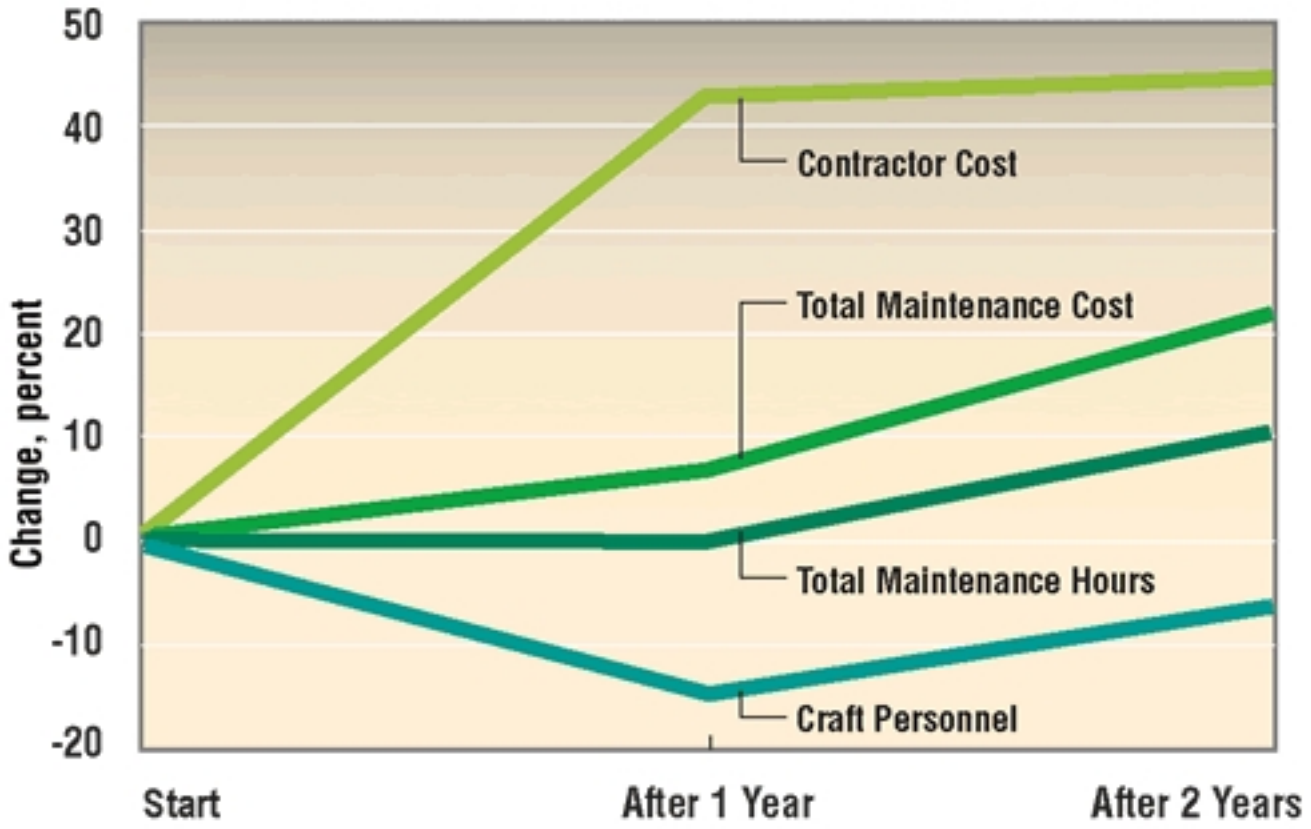
Case 1: Moving maintenance resources to operations and cutting craft personnel



The number of crafts people was reduced by 14.3 percent the first year. After 1 year, 6 percent were hired back. In the same period, contractor spending went up 88 percent. Total maintenance hours including overtime, contractor hours, and in-house hours went up 10.5 percent. Total maintenance costs went up 29.2 percent. On top of that, reliability and production throughput decreased 6 percent. This plant is now investing in hiring and training more maintenance people, implementing lost maintenance practices, and moving all maintenance resources back to professional maintenance management after initially decentralizing maintenance to operations.

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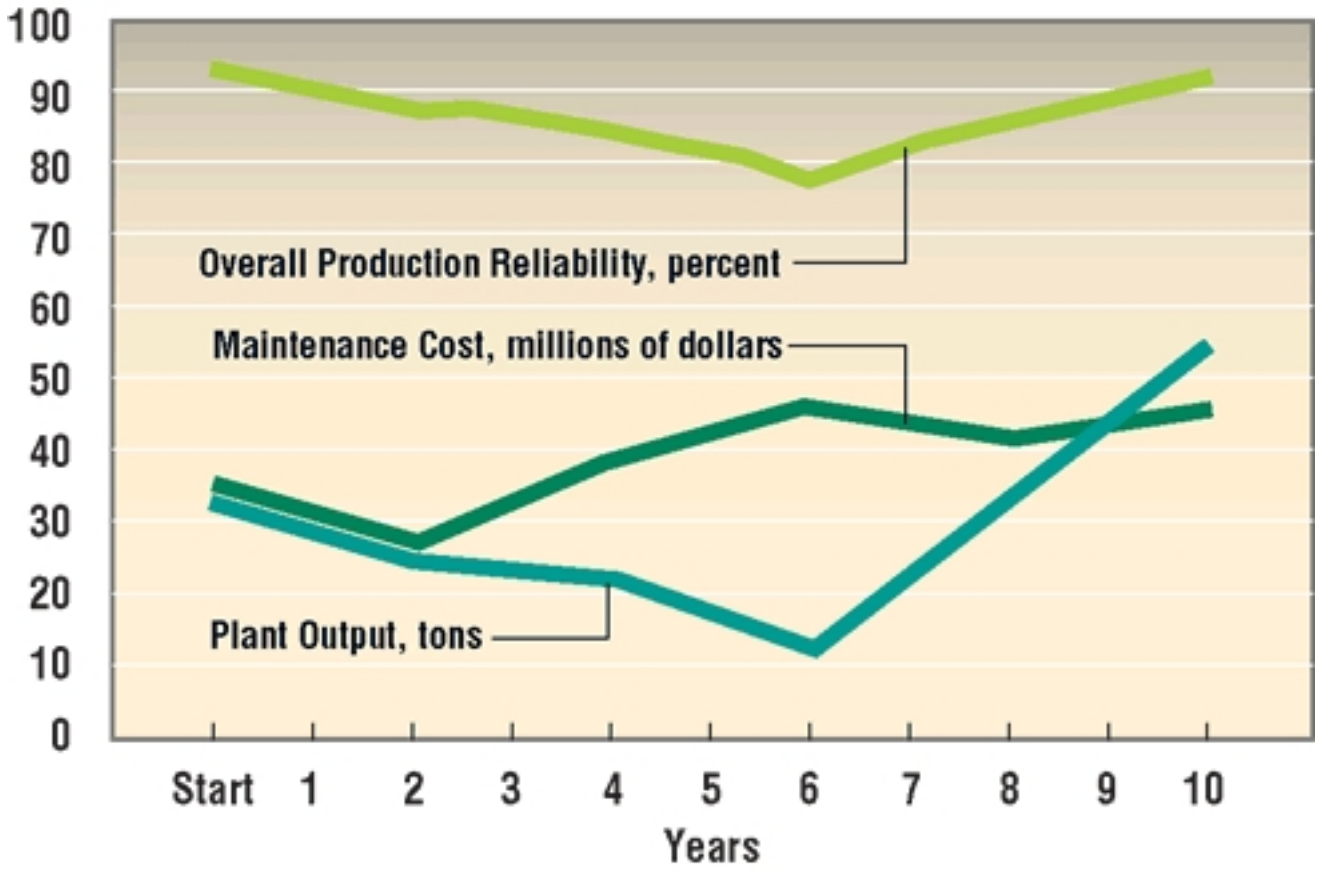
Case 2: Lingering effect of 2 years of cost cutting



In the first 2 to 3 years maintenance costs dropped from $35 million/yr to $27 million/yr and results were hailed as good. However, reliability started to decline. When beginning this initiative, overall production reliability (OPR)—the product of quality performance, time performance, and speed performance—was 93 percent; it bottomed at 78 percent 6 years after the start of the initiative. At this time the market price for the plant's products had doubled. The drop of 15 percent in OPR and quality production output corresponded to a loss of over 300,000 tons during some very good years when product could be sold at top prices. Financial losses because of low OPR resulting from shortsighted maintenance cost savings are conservatively estimated to exceed $1.2 billion over a 3-yr period.

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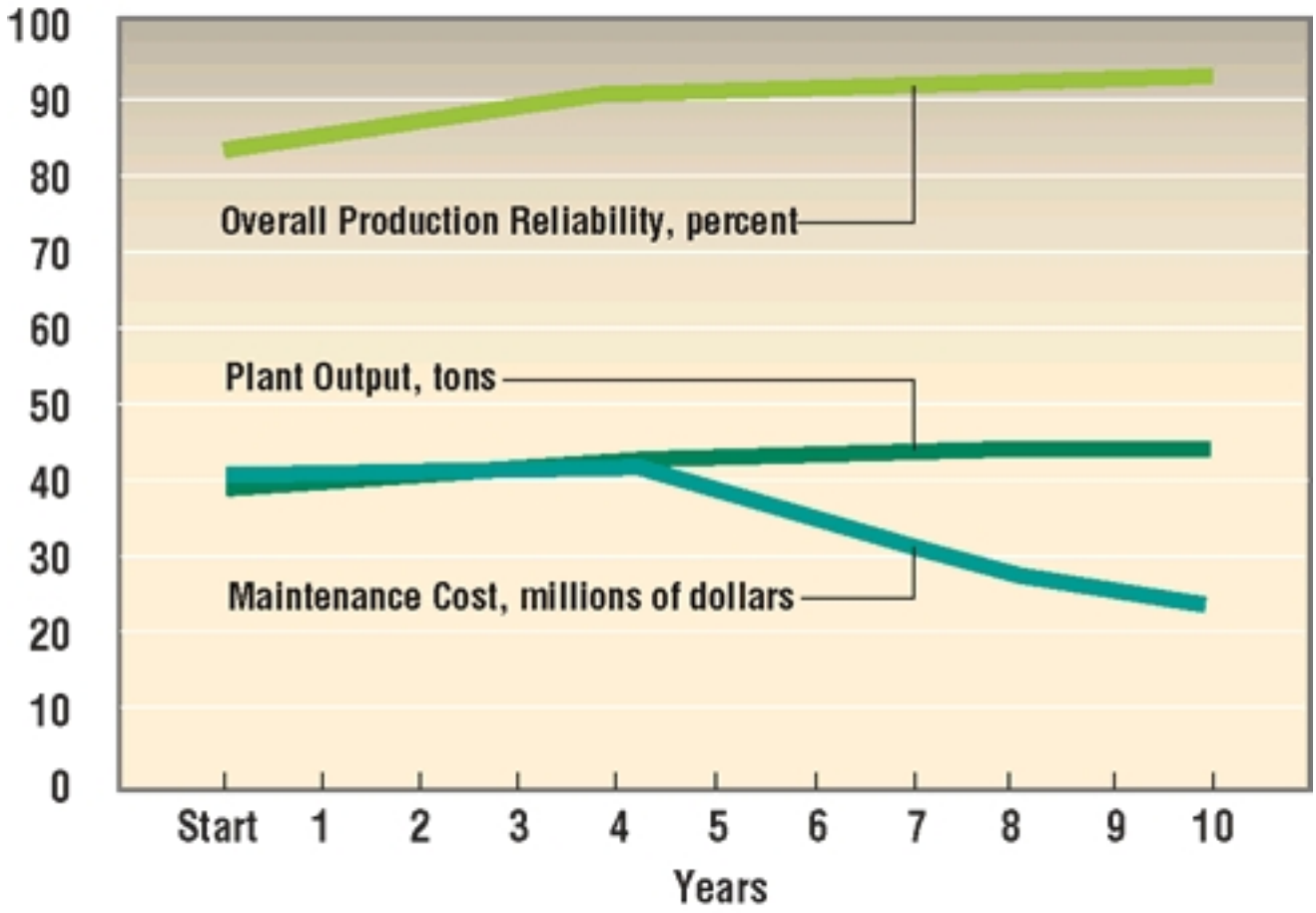
Case 3: Focus on reliability



During the first 3 years, maintenance costs increased 8 percent (2.5 to 3 percent/yr). During the same period, reliability as measured by OPR, and consequently also production throughput, increased steadily from a low of 83 percent to 90 percent. Reliability continued to increase to 92 percent. In financial terms, a short-term increase in maintenance costs of about $3.3 million resulted in savings of $17 million annually. The value of increased and sold production represented $18 million annually. Total maintenance costs were reduced by 40 percent. Today this plant survives another economic downturn because of the reliability initiative it initiated and implemented.

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