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Hidden Treasure: Eliminating Chronic Failures Can Cut Maintenance Costs Up To 60%
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Every year, U.S. industry spends well over \$300 billion on plant maintenance and operations. An estimated 80% of these dollars are expended to correct chronic failures of machines, systems, and people that occur daily, even hourly, in plants across the country.

Based on my experiences and observations over 40 years in hundreds of plant situations, eliminating these chronic failures can reduce maintenance costs between 40% and 60%. And that savings to industry of up to \$115 billion annually can be realized without major restructuring, employee layoffs, or sacrifice of product quality. However, it does require changes in existing mindsets about how to maintain and operate facilities on a day-to-day basis.

Despite American industry's attempts to reinvent the workplace through a long list of fashionable management techniques, millions of employees still go to work every day and perform the same tasks the same way they did last week and last year.

These men and women are keeping our plants operating. Their jobs are vital to efficiency and productivity, yet they spend much of their time correcting deviations in normal plant processes and fixing routine breakdowns. Often, they spend hours conforming to outmoded, time-consuming administrative rules and procedures.

This drain on corporate assets is caused, in large measure, by mindset that accepts these failures as routine and normal. It is a self-limiting paradigm that says machinery breaks, people make mistakes, and systems fail. However, by challenging this belief and taking steps to eliminate unnecessary failures, managers can increase productivity, reduce downtime, and increase profit dramatically.

The issue is not the once-in-a-corporate-lifetime catastrophe. Although dramatic and costly, such failures are sporadic. When they occur, there is a dedicated effort to discover the causes. Investigations are conducted to uncover the root causes of the failure. The outcome may be design improvements, enhanced safeguards, or more disciplined procedures to ensure the event does not recur.

Because they occur infrequently, the high cost of catastrophic failures can be amortized over many years. On the other hand, chronic failures are characterized by low cost and high frequency. They are small and often invisible, but they occur repeatedly and are far more costly than a catastrophe.

Sporadic failures are dramatic deviations from operating norms. When they occur, they are readily apparent. When repaired, they restore the norm. Solving sporadic failures restores the status quo. Chronic failure and delays represent the status quo. Reducing chronic failures raises the status quo to a higher level of productivity.

Once the inevitability of failure is rejected, what actions can be taken to bring about productive change? The first step is to identify opportunities for improvement. Where are failures occurring and which represent the greatest potential for reducing costs?

Here, the well-know 80/20 principle comes into play; typically, a relatively few problems account for 80% of a facility's losses. These are best identified and solved by trained analysts. The remaining 20% can be resolved by field personnel.

Failure occurs on three levels. First are physical root causes. What components are failing? More importantly, why? Second are human errors or inappropriate interventions. Finally, management systems to address chronic failures may be poor or nonexistent. Analyzing management systems may well be the most important activity because it frequently uncovers paradigms that impede a plant's ability to perform.

Too often, managers are more concerned with a rapid return to operations than with identifying the causes of chronic problems. "How soon" is asked more often than "why". Under this pressure, supervisors and workers are inclined to apply Band-Aid fixes. Quality thinking, craftsmanship, and analysis are sacrificed for speed. A manager that asks for speed gets it. A manager that seeks thoughtful solutions is generally rewarded with higher quality and lower long-term cost.

We have found the need for maintenance can be reduced 40% to 60% for those who have the courage and drive to pursue this goal. For example, a large, mid-Atlantic producer of polymers doubled its output over a 10-year period while reducing maintenance.

Before it expanded, the operation employed 300 mechanics. Two years, later, it had 200 mechanics. Then years later, the plant still had less than 200 mechanics even though it had doubled its capacity. This achievement resulted from vigorously investigating and eliminating chronic failures.

A west coast refinery recognized that a 2 year mean time between failures (MTBF) for pumps was unacceptable. It put in place a policy to perform a failure analysis on any pump with an MTBF of less than 2 years. As a result, the MTBF has increased to 6 year saving approximately \$2 million a year.

These examples illustrate the opportunities that are available. Returns of as much as 800% are reasonable with proper training processes in place. Of course, there is the question of what happens to workers made vulnerable by these improvements. In the examples here, no one was laid off. If anyone had been the facilities would have lost the sincere involvement of the remaining mechanical staff.

Staff can be reassigned to perform work that ensures production continuity, which is the greatest revenue generator when markets are demanding product. Such workers perform advanced problem solving, participate in root cause failure analysis, and improve the precision of repairs and installations - activities that are beginning to be the center of attention in today's manufacturing facilities.

From the standpoint of job security, what executive is not going to direct financial resources to the areas that provide the greatest potential for return? Such action spells growth. As productivity gains are realized from solving chronic failures, producers will again invest in America. And such enhanced growth means employment security for the nation as a whole.

Charles J. Latino, (1929-2007) Founder of Reliability Center, Inc., was a chemical engineer with a background in psychology and human factors engineering. He was a leader in the development of an integrated approach to achieving greater reliability in manufacturing and industrial systems and processes. He served as consultant to many companies in the United States and abroad. He is the author of *Strive for Excellence. The Reliability Approach*. He has left his Reliability legacy to his wife and five children who continue to spread his visionary Reliability Approach to companies throughout the world.