

Do you really want to go to court, or jail?

Society's tolerance is shrinking when it comes to wrong-doing in cases of industrial accidents, particularly when they harm people or the environment. Profits do not matter more than people and our planet, yet companies don't always behave that way. Increasingly more industrial incidents are resulting in criminal charges and conviction of executives and managers who were involved. That "involvement" includes negligence – failing to act when warned or failing to take steps to even check on conditions, failing to provide the right training so accidents can be avoided ... and more.

Proactive Steps vs Catastrophic Losses:

Man-made, avoidable disasters keep occurring and they usually involve equipment failing to perform its functions:

- Jan 2023 – TEPCO executives acquitted in Tokyo court 12 years after 2011 Fukushima nuclear disaster.
- Sept 2022 – two Vancouver executives found guilty of involuntary manslaughter in West African Mine Disaster.
- Jan 2020 – ex-Vale CEO charged with homicide for Jan 2019 Brumadinho mine disaster that killed over 250 in Brazil.
- July 2018 – mining executives convicted for roles in the May 2014 Soma mining disaster in Turkey that killed 301 people. The longest sentence was for the mine manager, 22 years.
- April 2016 – Former CEO of a US mining company sentenced to prison after 2010 mining disaster that killed 29.
- July 2010 – 8 former Union Carbide executives guilty in 1984 chemical leak in Bhopal India that killed 3,000 immediately, and affected upward of 578,000. The company paid a settlement of \$470 million

If you do a quick online search, you'll find many other examples. Indeed, many of these involve mining operations and chemicals but there have been disasters that killed people in many other circumstances: Dam and electrical grid failures, train derailments, overpass collapses, natural gas leaks, oil spills, refinery fires, paint plant explosions, poisoning in food plants and their products, are all examples of equipment and systems failures, where poor operating and / or maintenance practices were factors in those failures.

Maintenance is not there just to fix things. It is there as a mechanism to eliminate, reduce or at least manage the consequences of failures bringing them to levels that are tolerable.

Most equipment and system failures can be identified before they occur. Some can be prevented, many can be predicted, and in protective systems they can be detected before they are needed to act. Yet they keep occurring due to one or more of three causes that we control: inadequate design, operational practices, or maintenance.

High performing companies avoid failures by managing proactively, foreseeing potential problems and avoiding either the failures or their consequences by deciding what to do about them in advance. The cost of doing that is low and should be a “no brainer”. In most industries, proactive maintenance is a small percentage of operating costs. In contrast, the cost of failures can be huge. Consider the damage to assets, the costs to repair, the added costs of parts and deliveries for items being rushed in, and don't omit the opportunity costs which can easily dwarf the direct maintenance costs. What's the value of production and revenue lost in downtime, the value of harm to reputation with customers and even your own employees. What about the increased risks to safety and environmental compliance and their attendant fines and legal costs, when failures occur and consequences are serious?

Being proactive is all about reducing risks; and managing the consequences of asset failures to avoid major business impact due to equipment breakdown. High performing companies manage proactively by foreseeing and avoiding problems. They forecast what is likely to happen (failures) and decide in advance about what to do about it using a well-established and highly successful method – Reliability Centered Maintenance – Re-engineered (RCM-R®).

In the International Standards Organization standards on Asset Management: ISO 55000, 55001 and 55002, the word “risk” shows up often. Managing assets is all about managing risks. If you consider how many business, operational, safety and environmental risks arise from failures of physical assets, as well as their control and safety systems, then you can see why reliability is so important.

The world is very aware of risks and consequences. Yet man-made and avoidable disasters keep occurring. Most of these failures can be predicted and the risks managed with methodologies that already exist, have been proven effective, and are widely available. So why do these disasters keep occurring?

We hear about mining, chemical and nuclear disasters in the news. You might think that your industry can't suffer such disasters. But think again. The potential for harm is there in most operations. Food manufacturers have sickened and killed customers with tainted products. Processing plants have injured and killed workers and by-standers with fires and toxic releases when protective devices and systems failed. Electric utilities have killed bystanders when transformers exploded. Trains have derailed due to excessive speeding on corners, wheel bearing and brake failures, and head on

collisions due to signal failures. This list is long. Think of the potential in your industry and your operation, and realize that even one injury or fatality will earn you a lot of unwanted attention.

Legal reactions to events that may be repeated due to our collective failure to use what we know and have available to us, are understandable. Regulations often result from accidents and lessons learned. But regulations only deal with situations that have already occurred. They also add a huge burden to companies. If did the right things we would be less tied up in regulations and litigation. What is the most efficient, effective way to do this?

Equipment and system failures are a natural reality that can be managed. Reliability Centered Maintenance (RCM) is a method that was developed in the aircraft industry and has achieved significant cost and reliability improvements. Today it is more than 120 times safer to fly, and maintenance costs are an order of magnitude less than before RCM was introduced. RCM is now used in many industries with a diverse array of physical assets. When it comes to managing failures and their consequences it is unbeatable. Why?

It leverages the results of extensive studies of how things fail with an understanding of the context sensitive consequences of those failures. It uses a structured and logical decision-making process to technically feasible failure management policies that are also worth doing from cost and risk management perspectives. RCM produces decisions about maintenance tasks, operator checks, training recommendations, procedural changes, and modifications.

By identifying what can fail and what can happen as a result, RCM helps us avoid and mitigate risks to the environment, safety and production. Avoiding disastrous consequences will keep you out of court.

Case Study:

One customer, a large electrical distribution utility in a city of over 2.5 million, used RCM to re-define their maintenance program for all of their 200 + installed asset classes.

In that case, we trained their staff (engineers, technicians and field supervisors) in the analysis method. We selected 7 to be trained as facilitators and mentored them through 8 pilot projects, each of which targeted a different class of troublesome assets. Across those projects we averaged a 34% cost savings over the old, traditional maintenance program. For those 8 assets alone, we identified \$958,000 in maintenance program savings (that would be close to \$1.5 million today). Reliability also improved and some of the asset failures were all but eliminated. By the time we finished, they had spent only

\$200,000 on our services in less than a year. That money had already been repaid almost 5 times over.

Those facilitators continued with the remainder of their assets. Over the next 2 years they averaged 22% in maintenance budget savings, and improvements in reliability as measured in customer interruptions and average interruption duration across their distribution system. The cost of that program was a tiny fraction of the overall savings, and those savings will endure for years to come.

That program remains in place, largely intact, to this day. Some changes have been made as the operating context has changed (e.g.: densification of population in high rises within the city's core). Once those changes are recognized, a review of existing programs is triggered and changes applied using the same logic with which the programs were defined.

Is that enough to keep them out of court? Yes. One incident did occur, and the utility did pay a settlement, but there were no charges. That incident also made them aware of a context change that no one had thought of – the impact that time-of-use billing can have on assets in an electric distribution system. It triggered another review and program changes.

Curious about what we can do for your organization? Click on the links in our online blog posting or contact us.