Enterprise Asset Management
(Providing Plant Wellness)

Welcome to Section 3 – ***Putting it Together***

Sam and Bill make a plan for getting plant wellness and maximum life cycle profits

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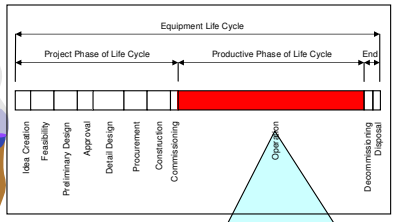
Lifetime Reliability Solutions

Because a long, healthy equipment life requires integration of humans, machines, systems and technology, the field of Enterprise Asset Risk Management is a massive topic. There are many subject issues to understand and do well. But of all that needs to be done, which are the most important? Which deliver the greatest returns for your efforts?

Plant and Equipment Operation

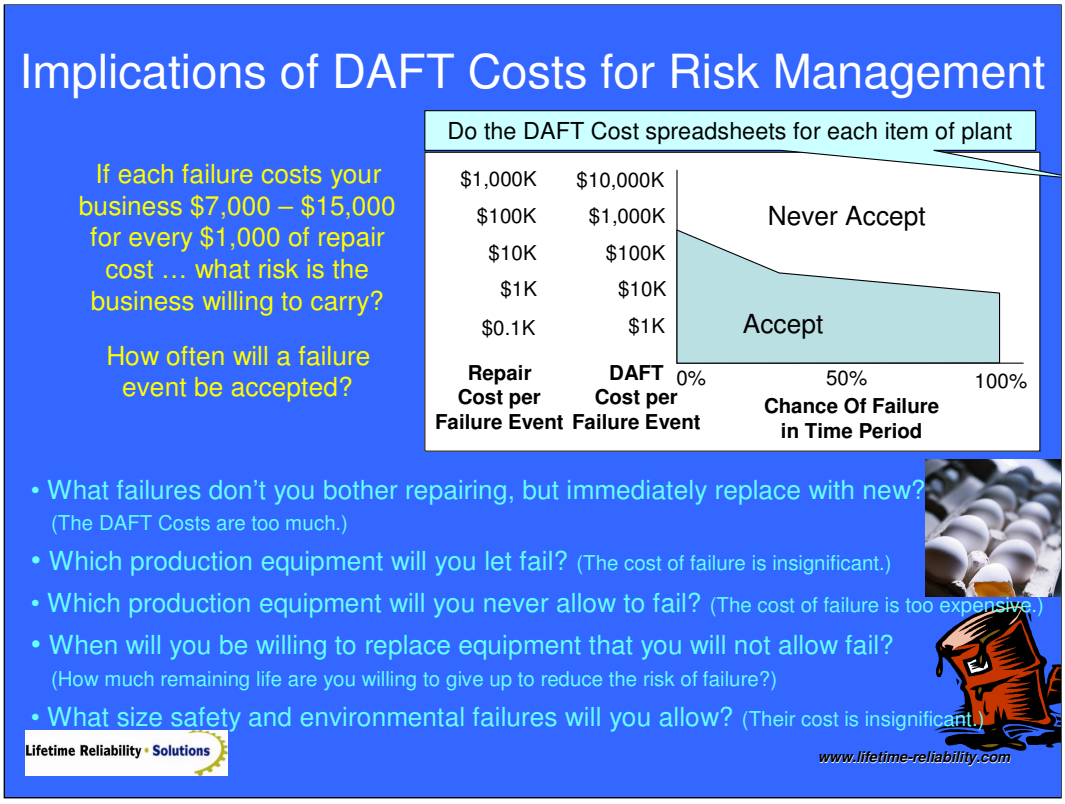


Plant & Equipment Operation

- Integrated Quality Management System
- 3T Operating Procedures
- 3T Maintenance Procedures
- Precision Maintenance
- Maintenance Planning & Scheduling
- Shutdown Planning
- Occupational Health and Safety
- Emergency/Disaster Management
- Lean Waste Reduction Principles
  - TPM/Operator Watch-keeping
  - 5S Workplace Discipline
  - Value Stream Analysis
- Rotating Equipment Integrity
- Lubrication/Wear Particle Management
- Predictive/Condition Monitoring
- Preventive Maintenance
- Opportunity Maintenance
- Energy Optimisation
- Training/Refresher Training
- Supply Chain Management
- RCFA/Six Sigma DMAIC
- HAZOP

For the entire operating life of your plant and equipment you want high plant reliability and availability. You will need to adopt excellent operating and maintenance practices. The 'human error rate' table makes it clear that we humans make mistakes. But we make far fewer mistakes when our processes and practices become simple and routine.

If we want to control the risk in 'human-dependent processes', it sounds like we will need ACE 3T procedures for all operations and maintenance work.



Each operation can identify its risk boundaries for its production plant once it knows the DAFT Costs of its equipment failures. The chance of a equipment failure is determined from the equipment history in the CMMS, or from industry expectations and experience.

In the slide we have set a DAFT Costs limit of $10,000 per time period (usually a year). That means we will not accept any failures that cause us to spend more than $10,000 a year on that piece of equipment. To prevent spending more than that much money we must introduce risk prevention strategies to limit our risk to $10,000 per period. This approach forces us to look seriously at what is causing the risk and to develop solution to limit and control it.

The 'bent' line at the top of the 'Accept' area is there because we have limited risk to $10,000 for the whole time period, regardless of what causes the failure and how expensive it ends up becoming. Since 'Risk = Chance x Consequence', it means that for the Consequence to stay at $10,000 we have to change the Chance of a failure event happening. An example is when the DAFT Cost is say $100,000 (i.e. anytime the repair cost is $10,000 – which is easy to spend these days) we must reduce the Chance of the event happening to 0.1 (i.e. 10%) of a $10,000 event happening. In that case 'Risk = $100,000 x 0.1 = $10,000' and we are still at our acceptance boundary.

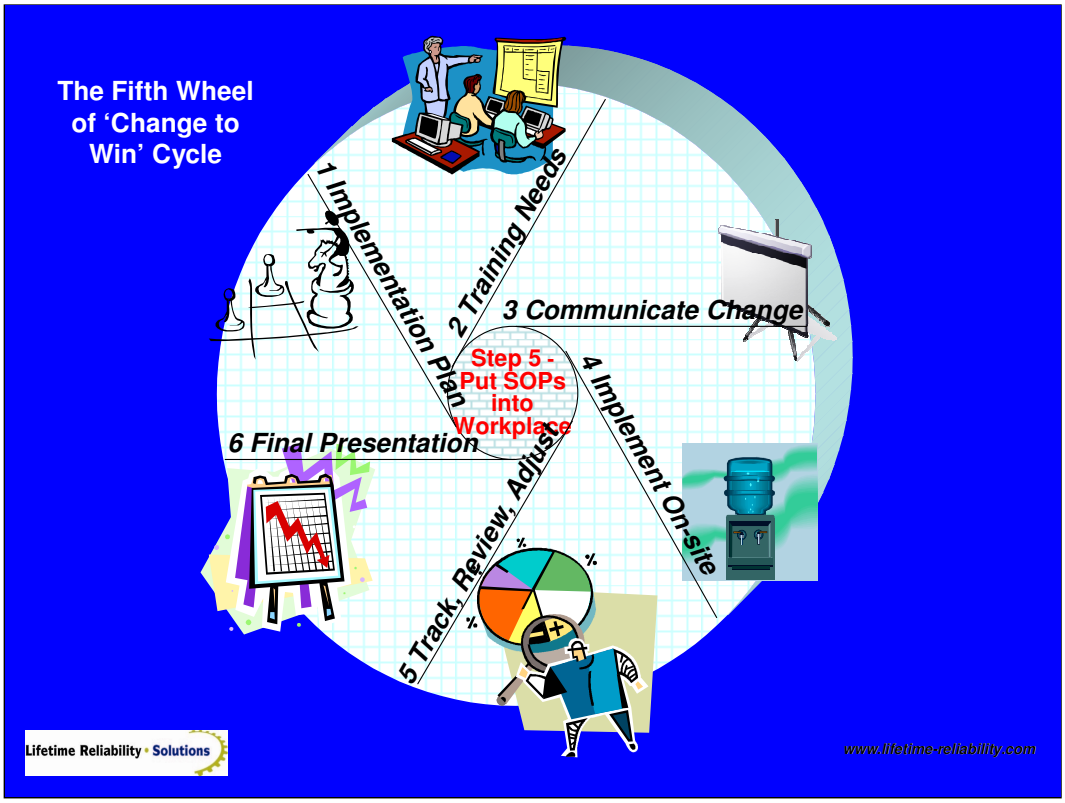
You can also look at the risk boundary in another way. A more complete version of the risk equation is:

'Risk = Consequence x Number of Events x Chance of Event'

With risk in this form you can see that to keep to $10,000 a year total, you cannot

'Change To Win' is a structured change management program used to introduce needed changes, best practices and innovative improvements into an organisation. A 'Change To Win' team consisting of managers, supervisors and people from the workplace is assembled to implement the changes and is responsible to plan how the organisation will adopt the changes, to trial them and then implement them into standard practice.

The 'Change To Win' process is not used for problem solving, though it can be adapted to do so. It is a behaviour change process that improves business performance by introducing and integrating higher standards of performance into business processes. It is used to change the way things are done in an organisation by introducing better practices into the workplace. You would use the 'Change To Win' program to bring your industry's, or other industry's, best practices into your organisation. Examples are introducing TPM (Total Productive Maintenance) into Operations; introducing Lean Manufacturing into a manufacturer; introducing a new software system into a business; introducing an ISO9001 quality system into a company and introducing a 5S good workplace habits program into a factory or office.



Step 5: Make Best Practices the Standard Operating Procedures in the Workplace

During the remainder of the project the team tests the new ACE 3T procedures, makes necessary changes, and proves that they consistently deliver better results. This is a stage of experimentation, discovery and learning. Careful planning, tight control and vigilant monitoring are required when testing in order to be certain that the results are truly caused by the ACE 3T procedures.

At the end of this Step a final presentation is given to Management during which the results of the test, and the learning from it and the project, are presented.

Implementation Plan

About five to six weeks remain in the project timetable. During the time remaining the team must put the procedures into use, measure their effect on performance, if necessary refine them and retest. To be effective in the time remaining, an plan implementation needs to be developed, including time to review progress and learning. As with previous project plans, a bar chart is the preferred planning tool.

Time is the most limited resource. The assumption is often made that following the decision to implement the procedures, there is time to do it. However, many of the necessary actions can fall to a few team members who are already busy unless a workable plan is agreed. The team needs to identify all of the necessary manpower resources, the required parts, materials, and equipment not already close-at-hand, and then make sure that they are available for the project. Any special training required to implement the new procedures must be identified and this may mean bringing in additional resources to complete the project, and to do training.

Training

The team needs to consider whether there is a need to train employees on changes to processes or procedures, especially if new test equipment is being used. Training should be simple and straightforward, done on–the-job, face-to-face if at all possible. Short training period of 15 to 20 minutes should be used to cover most issues involved with implementing the new procedures, especially since ACE 3T procedures have a clear and simple layout to follow. Also consider:

- Plans to retrain existing employees
- Competency check lists for employees being trained in the future
- Training records to ensure that everyone has been through the necessary training.