# Transforming Conservative Maintenance Practice to Reliability Culture

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## Background

An engineering product/asset life cycle will start from a solution conceived to solve a particular need, design, development, construction/production, useful operational life and then the imminent obsolescent either through the normal life expectancy or sometimes prematurely. A good product/asset ensures the maximum utilization for the period of useful life especially when the product reaches the decline stage. By doing this the user will reap the maximum benefit from the asset.

In a well engineering design, factors in product life cycle will be balanced between the fit of purpose and the financial requirement. Unfortunately, striking the optimum balance is not an absolute science but base subjectively on objectives of the producer and/or the needs of the user. Normally any engineering product will pass through many parties before its actual demise. Hence without proper understanding of the product design, operations and maintenance requirement, most likely the user will face early loss of the product functionality. In some cases the financial loss of not being able to fully utilize the asset can be enormous.

It is not uncommon that management is excited over new development of asset or construction of new facilities but give less attention in the maintenance of the asset. There are higher focus towards the design and construction of a building compared to how effective to operate or maintain the equipment. In a way the society place maintenance to a lesser significant in their priority. This is evidence as we see maintenance team is usually located at a far corner in a factory lot or at the basement of a building.

Should engineers then be blamed when there were numerous reports in the news about poor maintenance existing in the society from public toilets to hospital operating theatres to mammoth infrastructures project? Some ridicules that we are a society of grand builders but not able to effectively maintain the asset.

## Maintenance Mindset

So how would we want to change the society conservative perspective on maintenance function? Engineers would first have to understand that all aspect in asset life cycle is important to ensure maximum benefits are derived from the purpose of asset. If possible we should be able to extend the usefulness and evolve the asset as the requirement changes.

More importantly the stake holders especially the management of the asset must understand the benefits of having the asset fully utilized and the consequence of action or

in action to upkeep the asset to its intended purpose. The understanding of the overall asset life cycle will bring to the concept of reliability in which we not only measure the fit for purpose but how assured are we that particular asset is available when needed and satisfy the user requirement.

The management needs to be convinced that the cost of acquiring the asset is about the whole asset life cycle and not the initial investment only. In order to maximize the profit than the asset must be able to be fully utilized effectively and efficiently.

The organization must have a competent reliability team to manage the asset life cycle. The team not only repairs but also properly maintains the equipment to ensure predictable performance and reliability of the product. The team must clearly understand the objectives of asset reliability. They must be able to translate them to clear action points that can be followed by the whole organization. It is a cultural shift from the conservative repair and maintenance concept where maintenance/reliability is the responsibility of maintenance department only. Now reliability is a concern for the whole organization.

Reliability should be taken to the forefront of the organization mission. It has to be part of the business strategy. Reliability has to propel together with quality system or a supply chain system. To succeed in the long term the organization must have reliability key performance index (KPI) which must aligned with the organization business objectives.

Currently there are many concepts that an organization can adopt to manage the asset life cycles. Activities such as Total Productive Maintenance (TPM), Six Sigma, Lean Maintenance, Predictive/proactive maintenance concept etc are amongst the concept on asset management. To measure the effectiveness, KPI such as overall equipment effectiveness (OEE), mean time between failures (MTBF) or mean time to repair (MTTR) can be used. There are numerous other KPI that the organization can used such as breakdown hours, number of on call or unexpected repairs or manpower utilization. However it is important to align the key performance index (KPI) with the overall organization objective and to choose only few KPI’s that give the most impact to the reliability of the asset.

**The strategy**:

So how would we transform the maintenance culture to be in class with the world standard? Below is a suggestion of a strategy to be adopted:

a. Management commitment

Any successful endeavor can only be successful if the top management is in full support of cultural change initiatives. As the main stake holder, the management must fully understand that a good reliability system will allow production to operate efficiently or the asset functioning as expected. This can directly be translated to positive financial bottom line. However, management must understand that the result of reliability initiative cannot materialize overnight as it requires structural and

behavioral changes to the organization. Therefore getting the management commitment is prerequisite for reliability program to become successful.

b. Proper system and knowledge

The maintenance and reliability team must develop a proper strategy to improve their maintenance approach. Since reliability culture has to be embraced by the whole organization, everybody must buy in to change their perspective and understanding of the importance of asset/reliability management. The organization must conduct a gap analysis to measure the difference between their current practice and the industry standard. With clear KPIs than the organization will be able to chart a road map for the initiative. The plan will ensure that the organization is on the right track and allow regular tracking of achievements.

0ne hurdle to tackle is the resistance to change especially from the shop floor. The organization has to develop an approach to handle the conflict that may arise as a result of the initiative. A good communication channel will allow all parties to share their concerns and excitement. It is best that the champion of the initiatives is well trained to lead the team.

c. Systematic development of training

Having relevant skills set for the maintenance and reliability teams are vital to ensure that the team can operate effectively. Reliability team must have the technical expertise in proper asset maintenance and the philosophy to be adopted for maintenance practice. More importantly they should develop the passion to do the reliability work effectively. Thus the organization could never be successful if they do not adopt the learning culture or expect only minimal competencies from the team. The organization must continuously train the employees on new knowledge to ensure that they keep on improving their skills. This is important as rapid technological advancement in certain equipment or asset design/construction demand for new knowledge to be learned for efficient and safe operation of the asset.

d. Retention of skills set and useful information

The organization need to develop a system to retain experience reliability personnel in order to ensure continuity of the initiatives. Though attrition of employees is normal in any industry either through voluntary separation or retirement, the organization must established a mechanism to retain the vast knowledge and the skills. One method of retention is by developing standard operating procedures and recording the best practiced. A good standard will avoid unnecessary failures to be repeated by another person. It will ensure conformity to good engineering practice.

To deal with enormous data and information, there are many computerized maintenance management systems (CMMS) or enterprise asset management (EAM) system to assist in planning and managing the workflow processes. The data will become a good historical event that allow easy understanding and ensure proper perspective on any particular asset especially during trouble shooting during

breakdowns. The systems can provide easy and quick reference for measuring the effectiveness and efficiency of the reliability activities.

Lastly a good succession planning or proper transition period is vital to keep the activities in the right mode. There are many reliability initiatives that have failed simply by not having an effective transition between the project champions.

e. Getting the right skills team

It is important for the organization to have people with the right skills and attitude for the job. The wrong people are liability to the organization. It doesn't mean that the organization must attain all the skills needed for effective maintenance. What the organization need is to be able to manage the skills needed by either developing their own internal skills or acquire the resources from third parties. The right skills and advice will ensure success in the initiatives.

f. Benchmarking against the best in the class.

Lastly, we can never improve the reliability system if we do not benchmark our practice against the best in the industry. Benchmarking will revealed the strengths and weaknesses and provides sense of direction to the plan. An objective assessment either by a train professionals or an honest opinion from the organization itself will ensure that the organization continue on the right track for reliability improvement.

**Conclusion**

Changing the maintenance practice to reliability framework is not impossible to achieve. It requires understanding of the principles, commitment from the management, support from the whole organization, right maintenance or reliability team in term of skills and attitudes, proper planning, execution and evaluation of the initiatives. In many organizations, the initiatives will involve a cultural changes or even sometimes some structural modification. It is the necessary evils and a painful process. But the reward is plentiful both personally and to organization. With reliability concept, we shall improve on the asset life cycle and not be bolted down to conservative maintenance concept. If we do not embraced the idea we will lose our competitiveness against the best in the world.

*Reference*:

1. Maintenance Management Legends, Torbjorn Idhammer, Maintenance Journal, May 2005.