Improving Reliability – A Holistic and Adaptive Approach that can help *Release the Hidden Organization*

A White Paper from MFG Analytic

Is Reliability a Capability or an Outcome?

Good reliability performance in manufacturing is an outcome of many different capabilities and processes working together to produce superior outcomes. In an industrial plant setting, these can include maintenance, monitoring, technical, operations, projects, and data management. When each of these capabilities specialize and focus on delivering superior results one outcome will be good reliability performance resulting in lower cost, higher utilization, and better yields.

Improving Reliability, a Holistic Approach

Consider these three main aspects to improving reliability performance:

1. Always execute work with efficiency and precision
2. Always develop and implement the "most profitable" job scopes
3. Always develop and implement the "most profitable" asset strategies

The term "most profitable" is used to define the point where the most value is created. This point will range from engineered solutions and high activity to simple solutions and low activity but seldom "gold plating" or "abandon in place". It is important to clarify this term as it sets the standard for applying judgement in developing job scopes and asset strategies. Contrast this with having "reliability" as the objective where the end point is vague and subjective often resulting in too much at a high cost by pursuing *perfection* over *good enough*.

Aspect #1 - Execute Work with Efficiency and Precision

The efficient execution of work means that each step in the process from work identification to job execution has only the steps required to meet the objective with each step having the minimum activity for each scenario. This results in less burden on the organization and imprints efficiency and entrepreneurship on those involved. To achieve this, each step needs to be *adaptive*. For example, only plan and schedule where it adds value, not planning and scheduling every single job as a rigid set of rules would dictate. In accomplishing this, mental models shift from rigid processes and rule obedience to adaptive processes based on entrepreneurial judgement. In the detailed rule environment, you find activity measures such as schedule compliance. In an entrepreneurial environment you find results measures such as work accomplished *which can release the hidden organization*. Work priority can also lead to inefficiency when it is either incorrectly applied or work is constantly reprioritized. One example is when work backlog is large with long delays to getting work executed so work is artificially elevated in priority to "cut in line" to increase the likelihood it will get done. Large backlogs create many problems and cause unreliability, the solution is to work down the backlog to a manageable level resisting the urge to simply delete work.

Executing work with precision or not building in defects will reduce repeat failures. As with changing priority, when work is being executed then halted to work on a higher priority job there is vulnerability for building in defects. By changing the craftsmen's mental model from "I just do what the boss says" to "I do not have the decision rights to not execute work with precision", healthy challenge can occur creating transparency of the risk in shortcutting or jockeying work priority *which can also release the hidden organization*.

Aspect #2 – Develop & Implement the "Most Profitable" Job Scopes

The scoping step in a maintenance work process is often overlooked, informal, or casual. As an example, work scopes defined by front line supervisors, planners, or the craft without adequate objectives, knowledge, or time will hinder reliability improvement especially when future job scopes are the same as previous job scopes. The objective of implementing the "most profitable" job scope requires more information, focus, and entrepreneurial judgement by:

1. Determining the causes of the failure using root cause analysis mentality
2. Understanding the functional expectations or how the asset creates the most value
3. Researching past performance and judging if the performance met expectations
4. Understanding improvement alternatives and weighing the cost and benefit of each
5. Deciding either to "fix it" or "improve it" based on performance and expectations

Implementing this process takes deliberate focus and attention on the scoping step. Seldom a single person has the comprehensive knowledge to understand asset expectations, past performance, and improvement alternatives so knowledge needs to "flow" into the scoping process. A bottom-up approach to this with the craftsperson originating the root cause analysis and starting the scoping step is beneficial. This approach continuously builds capability and leverages the organization to each roles comparative advantage and can help *release the hidden organization*.

Aspect #3 – Develop & Implement the "Most Profitable" Asset Strategies

Every asset in operation has a strategy, however each strategy may not enable the asset to create the most value. The most profitable asset strategy balances technology and cost with performance. If an asset's strategy is run to repair the cost to operate the asset will be lower however the asset may experience poor performance and reliability. In contrast, if the asset strategy is too much the resulting lifecycle cost can be unprofitable.

The most profitable strategy centers on the functional expectations, or how the asset will create the most value for each asset and the strategy develops from that vantage point. Using an FMEA approach, the strategy considers all probable (not possible) failure modes of the functional expectations then defines mitigating tasks to protect it. The mitigating tasks often include operating limits, predictive & preventive tasks, spare parts, and recently Advanced Anomaly Detection or Condition Monitoring where models are developed with artificial intelligence applied to identify oncoming failures well before they enter an active failure mode.

For further information on this topic contact Bob Gleichman Bgleichman@MFGanalytic.com