

Total Enterprise Asset Management: A “TEAM” Approach to Equipment Reliability

This document describes the Total Enterprise Asset Management approach for Reliability.

By daring to operate their business based on a philosophy that everyone in the organization contributes to productivity, equipment reliability, and eventual profitability, one of the organizations described in this paper achieves a level of cohesive purposefulness that most companies only dream of. By refusing to lower their standard, this entity serves as a model for those brave enough to follow in their path realizing that perhaps this fairy tale can, in fact, become a reality.

Introduction

As a result of our competitive global marketplace and persistent economic challenges, it is imperative that industrial and manufacturing organizations optimize every competent resource available to collectively work toward achieving equipment and process reliability. By uniting various functional roles to optimize a reliable operation, innovative organizations realize that maintenance excellence translates to manufacturing excellence. In the end everyone wins, including end-user customers. What a concept to visualize, and even more exciting, what a concept to pursue!

Past

Let's go on a journey to a land not so far away, and to a time not so long ago. In this place we walk through the doors of a company, a manufacturer of widgets. As part of a corporate auditing team, we have been sent to this particular site to inspect their operations. As one of the laggards in the fleet of manufacturing sites, this location has one of the highest costs per ton with the least amount of throughput across the various sites.

In the lobby we encounter a flustered receptionist attempting to answer multiple calls from what sounds like unsatisfied customers inquiring about the status of their orders. After several minutes, there is a momentary break in the calls, and the attendant attempts to locate our host and the Plant Manager, Mr. Unaccountability. He is out in the plant reacting to a breakdown on one of the high-speed widget lines. Thirty minutes later Mr. Unaccountability appears and escorts us back to his office. After making introductions and reminding him why we are there, our host frantically attempts to reach a number of various plant personnel for us to speak to, with limited success. Most of them are out in the plant somewhere, off-site with other meetings, or on vacation. We are escorted to the break room to wait while Mr. Unaccountability tries to make last-minute arrangements to accommodate us.

While seated in the break room we witness a number of operators gathered around a table discussing a host of topics unrelated to work. Forty-five minutes goes by when one of them comments about how long it generally takes the Maintenance staff to get their machines repaired. The man next to him, Mr. Apathy I believe, remarked that he *did not care how long it took them to fix the equipment; he was just going to enjoy his well-deserved break.*

About that time what appeared to be a Purchasing specialist, Ms. Rush Order, burst into the break room and headed toward the far table where a Storeroom Attendant was seated. Sammy Stock-Out had no answers for Ms. Rush Order, so it appeared that she would be expediting another part on a next-flight-out basis. Meanwhile the table of operators just scoffed at the lack of organization.

Shortly thereafter, a young man entered the room and introduced himself as Peter Planner. Peter apologized for the delay. He said he was just told about our visit, and he was asked to give us a tour. Leaving our computers and coats in the break room, we followed Peter out toward the plant. On the way there our guide was stopped by three different people telling him about Maintenance work that needed to be done. Peter grabbed post-it-notes from nearby cubicles and jotted the requests down.

Once in the plant, even though we walked past a number of PPE labeled areas, we were never offered any ear plugs, safety glasses, or protective clothing. Our team was quite shocked to see the plant conditions, what little we could see through the poor lighting and build-up of dirt, dust, and debris. From missing guards and overflowing grease to oil leaks and numerous parts scattered everywhere, the conditions were a mess.

The Maintenance shop was in complete disarray with cabinets and drawers half opened and more parts and tools on the floor than in their proper place. The next stop on the tour was painful to see—the Storeroom. As we walked through a propped-open door with a sign that read "Authorized Personnel Only," we found several Maintenance personnel rummaging through darkly lit bins and boxes on the floor of most every aisle. There was not a computer available or a parts catalog to be found. Most of the Storeroom

patrons seemed to be in a state of frustration as they scavenged from one row to the next attempting to find their parts. The searching Maintenance staff was noticeably familiar with this procedure. It was clearly not a new phenomenon to them.

As we made our way back to the front office, the continuous chatter on the radio was telling a story that we had been observing for the past two hours while in the plant, Maintenance Shop, and Storeroom. We heard stories of maintenance personnel not being able to find common power tools and equipment manuals and confessions that numerous parts had been replaced on the same machine within the past week; my mind was racing wondering if my colleagues were coming to the same conclusions.

More than once our guide Peter was approached by contractors looking for assistance with hot work permits, fall protection gear, or simple direction from plant personnel who were nowhere to be found. As we rounded the corner, next to a row of pumps I witnessed a contractor tugging with all his might on a come-along mounted to an I-beam to force the pump into alignment. This image was quickly erased when I passed an area that seemed to have a number of compressed air leaks screaming at the caretakers of this system. Their cries appeared to be landing on ears that had long been conditioned to hear their appeal for attention.

Back in the Plant Managers office, our inspection team was discouraged to hear that there would be no interviews this week with the key plant personnel we had asked to speak with a month before when the site visit had been arranged. *“Due to the line stoppages taking priority today, you will have to reschedule your discussions. Besides, the Maintenance personnel are the only ones really responsible for our equipment and systems here...”* said Mr. Unaccountability,

“... You can just call them sometime next week to finish conducting your audit.” Our inspection was over.

Present

Now accompany me on a journey to another manufacturing site. Although this plant is part of the same company as the first site we visited, we were told it operates under a vastly different management methodology. The culture, attitude, and performance are starkly different than the previous site. I was curious to see if two operations in the same company can really be that different.

As we walked into the lobby we were met with a much different attitude. The greeting sign said *“Welcome Corporate Auditing Team. We are glad you are here and look forward to your contribution to our continuous improvement.”* Above the pleasant receptionist hung a large framed picture of the *“Total Enterprise Asset Management Team (TEAM)”* that incorporated about 30 key individuals. As I took a step closer I could see where they had signed the *“Pledge,”* and functional roles were listed under each photo. The roles included Maintenance and Production, Engineering and Purchasing, Safety and Stores, Training, Human Resources, and a number of others. The ownership of equipment reliability really seemed to be spread throughout the organization.

We were promptly greeted by Mrs. Visionary, the site Manager who genuinely seemed delighted to see us. After escorting us to a modest but well-equipped conference room where we were told to make ourselves comfortable as we would have sole use of that room for as long as we needed it, we were taken to Mrs. Visionary’s office to share a cup of coffee as we discussed the day’s agenda. She shared with us that an eager team of 20 key team members would be meeting in the large conference room in 15 minutes for a kick-off meeting followed by a thorough plant tour. Then we would interview more than 15 key personnel, representing different functional areas, who were committed to equipment reliability as well as a number of key site metrics.

Needless to say, the enthusiasm with which we were met was quite impressive. From the kick-off meeting to the plant tour and the individual interviews, we were surprised to witness a cohesive commitment to continuous improvement and doing things right the first time.

Our auditing team was very impressed with the various plant personnel we spoke with including our first interview with the site Manager. Mrs. Visionary shared the story about how this site is undergoing a transformation. Where there used to be blame and finger-pointing now there is a real sense of teamwork and unity. When she first assumed her plant leadership role, Mrs. Visionary was surprised to find that her financial incentives, while very attractive, contradicted investing in the operation and seeking long-term gains. The short-term incentive plan had enticed her predecessor to forego such programs as Maintenance and Operator Training, Predictive Maintenance services, etc. She shared how those selfish and short-sighted decisions had hurt the value of the company assets and, in turn, the company itself. She was in the process of implementing a much different approach.

In addition to investing in plant personnel and equipment, one of the first things Mrs. Visionary did was hire a professional Maintenance and Reliability consulting firm to perform an evaluation of the site's program and processes. As a result, a strategic improvement plan was developed and agreed to by all department leaders within the organization. While the consulting firm has been retained for certain activities, plant personnel has stepped up and agreed to assume responsibility for select initiatives. Working in concert with outside subject matter experts, the site has been meeting project milestones for the past two years of the four-year improvement plan. To her additional credit, it should be noted that there was a period of about nine months in which customer orders slowed down; however, she worked closely with the consulting firm and prepared a business case to corporate leadership that allowed her to continue investing in improvement initiatives.

It was probably during the plant tours that we noticed the greatest examples of commitment to Maintenance and Manufacturing Excellence. Take note of the many different functional areas that were involved in some of the following highlights:

- **Safety:** After viewing a site safety video and being issued safety glasses, hearing protection, and the appropriate PPE, we were asked to sit in on the daily safety session.
- **Continuous Improvement:** It was nice to see such clean, well lit, and well marked production areas. There appeared to be a 5S program underway with a number of visual aids, process flows, and performance measurements displayed in visible areas.
- **Operations:** We witnessed, on more than one occasion, operators who were engaged in equipment cleaning and light maintenance as well as collaborating with the Maintenance team in troubleshooting machinery condition.
- **Data Management:** Our audit team was pleased to see so many people using the site's Computerized Maintenance Management System. Users ranged from operations personnel requesting work and planners reserving parts to Maintenance personnel looking up the location of spares and various leaders running pertinent reports. We even stumbled across the system administrator performing training on the CMMS as part of the site's new-hire orientation process.
- **Maintenance:** It appeared that a commitment to thorough Maintenance practices was in place at this site. We witnessed numerous examples of this from the use of strobe lights and calipers to torque wrenches and laser alignment systems. A spirit of do-it-right the first time was observed coupled with a seemingly genuine desire to improve the condition of the plant equipment. There was no evidence of tools being left at the job site, and not only did they clean up after the work was completed, but they were seen following up with the operators later in the day to see how the repaired machinery was running.
- **Materials Management:** The enthusiasm with which the Storeroom personnel greeted and assisted their customers in Maintenance was refreshing to see. They demonstrated an ownership of the materials process in the way they organized and maintained the inventory as well as in the way they provided signage and labeling to aid in locating parts. It was rumored that they had recently implemented vendor-managed inventory for certain items and were about to undertake point-of-use vending machines throughout the site.
- **Information Technologies:** It was also encouraging to see the IT department taking an active role in working through the firewall bugs to get hand-held scanners in place to assist the Storekeepers with issuing parts and in implementing a cycle count program to avoid stock-outs.
- **Planning & Scheduling:** It was apparent that the Planners were focused on providing quality job plans as they were seen in the plant walking down the jobs, interacting with Stores to ensure the right parts were on hand, and communicating with operations to gain access to the equipment over the course of the next few weeks. This resulted in very few Maintenance personnel standing around waiting for machines, parts, or special tools.
- **Human Resources:** One member of the audit team reported that she received a copy of a very thorough and applicable job description from the Human Resources team. They were diligent in screening applicants that were qualified for various plant roles and were very proud of the recent skills assessment and customized gap analysis training program that was being implemented to ensure that all site employees were clear, comfortable, and capable of performing their duties.
- **Purchasing:** We were surprised to discover that the Purchasing department seemed to take a much different role at this site than at the first plant we audited. A spirit of teamwork prevailed as they worked to understand the details of the requirements needed for critical components and avoided taking the cheapest route. They were leading the charge in facilitating the development of new motor and pump purchasing specifications, and motor and gearbox repair specifications, to name a few.

Total Enterprise Asset Management:

- **Process Engineering:** The engineering team was actively overseeing the development of new commissioning and decommissioning standards, engaging a number of relevant parties within the organization.
- **Reliability Engineering:** The equipment reliability team assumed the role of facilitating the PdM and RCFA efforts. They worked to ensure that any equipment or process redesign efforts were acted upon. It was also reported they played a leading role in measuring and reporting key M&R site metrics.
- **Energy Management:** Although the individual leading the charge in this area was off-site, we understand he was working with the local electric provider on documenting the rebates they were entitled to from the recent implementation of energy-efficient motors. In addition to just completing a lighting project, we were told he was working with various plant personnel to implement an ultrasonic compressed air and process gas leak survey as well as a thermographic steam trap audit.

Future

When looking at manufacturing trends, it's clear that implementing a team-based approach toward equipment reliability leads to greater throughput, increased customer satisfaction, and correlating higher profits. In the first plant discussed in this paper, we witnessed a very reactive culture that was being addressed in silos within the organization, namely the Maintenance group. Companies are beginning to see the flaws in this culture and are recognizing the significant benefits of a team philosophy. As a result, we're seeing an evolution occurring in the successful manufacturing site of the future. Through this evolution, functional roles within the organization are standing accountable to key initiatives and attaining greater productivity, reliability, and eventual profitability. The second site discussed in this paper clearly practiced the "T.E.A.M." concept, and the entire enterprise participated in the pursuit of asset reliability, resulting in a much better environment than the first site.

Which organization will you aspire to be?

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