Are You the Weakest Link?

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Abstract

In a world that already has a Maintenance and Operations department established, how do we fit a Reliability program into this mix? How do we join these existing departments and get them to see the value in Reliability Engineering? We need to view Reliability Engineering as the link that can complete this organizational chain. There are several ways we can achieve this that can simply change how the reliability department is perceived.

Introduction

On August 14th, 2000, a show called The Weakest Link aired for the first time. The show starts with eight players who are trying to build the jackpot by answering as many rapid-fire questions correctly as they can. At the end of the round, the players vote on who is “The Weakest Link” and that contestant is asked to leave the stage.

In a similar vein, organizations are made up of several departments that are all competing for the prize of production. When the bottom line is production and productivity, it is important to establish the added value of any change you bring to the table. This can make it especially difficult to build a new department when others do not yet recognize the value it adds to the bottom line. When it comes to reliability engineering, we must make sure that we are not seen as the weakest link or a non-value-added department. Instead, we need to relay how invaluable reliability engineering is to the overall productivity of an organization. Through this article, I want to share ways we, the reliability engineering department at Baxter Healthcare at North Cove, have taken those steps to ensure we are seen as a valuable asset.

When I started this career, I resented tasks that felt unproductive. This ranges from showing up to a meeting that I didn’t think would be value added to picking up a project that has nothing to do with reliability work; I used to look at this as a waste of my time. However, over time, I gradually began to understand the value of being seen as a team player. Confidence and trust were quickly fostered between other departments and our own. One simple way to build trust for your department is to have reliability representation in daily production meetings. A lot of information is shared in these meetings that might not be included in the daily shift notes or on work orders. Having someone present in those meetings allows them to take note of the process defects and address the root causes of the situations. Another advantage of this representation is being able to step up and take ownership of projects and improvements from these meetings. When we do this, we are saying that operations matter, and that we are here to make a difference. We give them the well-needed voice they deserve in Asset Care.
Continuous improvement teams are a great way to get other departments involved and for them to see the value we bring to the table. Our plant manager held a meeting and asked us to focus our efforts on one asset so we could improve the Overall Equipment Effectiveness (OEE), as it was only producing 10,000 units per shift. We were struggling to meet the production demands for the product. The plant manager was ready to pull the asset out and install a new one. I remembered that when I previously worked at Baxter Healthcare several years prior, this asset was operating effectively. I decided it was time to go out and look at the equipment for myself. I found that it was completely different from the old style; this new design had several flaws, and I was selected to be on a continuous improvement team. Before the first meeting, I spent time watching the asset operate, which gave me the chance to work through the different faults with operations. Because I was in the trenches with operations, it gave me a more comprehensive understanding of the struggles they were facing. During our first meeting, I was able to suggest that we go after three specific faults that would boost the morale of operations. Boosting the morale of operations was a priority because it let them know that we will address the concerns they have. All too often, the operations department is overlooked. They should be our first line of defense and should be encouraged to bring up improvement ideas or talk about the issues they are seeing with assets. Addressing these issues required me to work with engineering, maintenance, and operations and slowly gain the trust of these departments. By the end of this effort, we had boosted the morale of the operators and increased the OEE by 20%. This production line is no longer considered the “problem child” thanks to the improvement team that was put in place.

A Root Cause Analysis (RCA) program is a fantastic way to show the power of the Reliability Department as it gives us the opportunity to challenge and address the reactive mindset of the maintenance department. For example, I conducted an RCA on an air-handling drive motor failure that cost us half a day of production loss across two lines. This motor was housed in a confined space, and this area has strict guidelines for gaining access to it. Once the motor was out of the confined space, I went to spin the shaft and it seized up. I had a good idea that the failure mode was improper lubrication, so we began taking the motor apart to help paint a picture of what happened. I hypothesized that the motor failed due to under-lubrication, but it was over-lubrication that caused the failure. Not only was it over-lubrication, but it was also the wrong lubrication type. Once the lubrication blew the seal out of the inboard bearing, it coated the windings of the motor, causing them to degrade. Once this occurred, it overheated the motor and melted one of the windings into a copper ball. The copper ball was able to work its way into the bearing housing and hit one of the bearings, leading to the explosion of a ball bearing and a catastrophic failure. This failure turned out to be an opportunity to discuss the importance of proper lubrication and how the Ultrasonic Grease Caddy can help assist with making sure we are lubricating our critical motors properly. Take advantage of breakdowns to show the power of reliability processes and tools.

Root Cause Analysis is not a program that can be led solely by the reliability department. As a department, we should be taking the lead in facilitating RCAs. Involving other departments is necessary if we want to address latent and systemic issues. Conducting an RCA with a cross-functional team is vital if we want to address the main causes of a failure. While working as a consultant, I had the opportunity to facilitate RCAs across diverse facilities. Facilitating an RCA
in an unfamiliar facility meant that I had a very limited understanding of the asset and failure being discussed; I was only able to conduct these meetings because I had the subject matter experts in the room. When we pull together operations, maintenance, and engineering into one room, a clearer picture is painted of all the factors that can lead to a particular failure.

While leading an RCA on a repeated failure on one of our extruders, I had the opportunity to demonstrate this need for collaboration. The extruder would back-feed molten plastic into the hopper which would cause it to harden and lead to a plugged situation. There was a severe plug and maintenance determined that the root cause was a failed encoder card. This failed component was indeed a contributing factor, but not the main root cause. Having operations and maintenance in the same room gave us a chance to take a deep dive into the daily routines of operating this equipment and review the best practices associated with running it. We found that operations did not have a clear understanding of how to perform a certain task and were able to review the process and make the appropriate changes to help mitigate this failure in the future.

Another excellent way for your company to see the value that your department brings to the table is to celebrate the wins. When we do not celebrate the wins, no one knows about the great work we are doing. People always tend to focus on the negatives of situations: failures, downtime, decreased production, etc. Production will not know about the failures that were caught before they failed; they only care about when the machines are not performing as desired. This gives us a chance to escalate our findings and celebrate the wins. For example, at a previous employer, we had a clarifier rake fail and my management asked me to conduct an RCA. During my investigation, our team found that the clarifier was running in reverse, and so were three additional clarifiers. As a manager, it’s an opportune time to broadcast such a finding to communicate proactive success. That single RCA prevented several catastrophic failures that production would have never known about. At Baxter, there are posters throughout the plant that highlight the major wins for the month. These posters allow our reliability department to show its value and highlight its accomplishments. The Reliability Engineers also send out updates on all their projects with detailed information on their findings and solutions. With a new program implementation, you cannot over-communicate about the value that it brings. I am convinced that a key factor in reliability programs failing is a lack of communication with other departments. We want to be seen as an essential asset to the company, not as a department that flies under the radar.

At Baxter, we are very fortunate to have a Predictive Maintenance (PDM) department and have established remote vibration sensors that constantly prove the need for this type of monitoring. Last year, we were able to prevent 54 catastrophic failures. Once these sensors are installed, they start a machine-learning process. It will set the alarm levels based on how the asset runs and then it will start trending the data. When a sensor hits an “alarm state”, it sends out a message, and then the department will go and investigate in greater detail. We have found things like broken couplings, worn shafts, mechanical looseness, and improper lubrication. These sensors are set to take readings for twenty seconds out of every hour. There are a few limitations to these sensors, but this is the first generation, and we have the privilege of working with the supplier in developing the next generation of sensors. Overall, we are
establishing confidence in the measures we take, the data we collect, and the failures we prevent.

Planning and scheduling meetings are another great way for the departments to see our value. It’s not often that operations and maintenance are in the same room discussing the health of their assets, but it’s important that both have a voice in the planning process. Operations have a production demand to meet, and maintenance has the equipment to maintain. You must make operations aware of what equipment you need and how we can work with them to achieve this goal. For example, plan simple tasks that can be conducted while operations are on break for lunch; this is an opportunity for your department to show the value of kitting jobs. Through smaller tasks like these, we can show the significant savings associated with planning and scheduling compared to running the equipment until failure (which costs seven times that of a planned preventative job). A robust planning department will also make operations feel included by making sure their concerns are addressed. When operations suggest that something needs to be replaced, and then see a planner walking down the equipment and getting this job ready for execution, they know that their input is valued. All too often operations get tired of bringing up the same issues and seeing no action taken. To earn their trust, we must address and value their concerns.

Lastly, we must build trust with the operations department. There are several ways that we achieve this, but one simple way to demonstrate this trust is by following through on what we say we will do. For example, if I plan a job to be completed and say that it will take the maintenance department an hour and forty-five minutes, then I better be able to deliver on that timeline to operations. This shows the power of a well-kitted and planned job. To achieve this kind of detail, we must work with maintenance to ensure we have the correct tools and parts on hand to complete this task. If we return assets on time to operations, then they are more likely to give us the time needed for repairs. Another great way to build trust is to jump in and work with operations and maintenance on repairs or machine faults. People love to share knowledge. There is nothing wrong with asking a question you might already know the answer to just to make that employee feel like they have the knowledge to impart. Helping operations and maintenance on repairs and machine faults allows us to see the pain points that they truly face, which in turn allows us to dive into issues that are causing major headaches across departments.

In a nutshell, I believe that if you implement “celebrating the wins”, root cause analysis programs, take on small projects, and coordinate planning and scheduling efforts, people will see the value that your department brings to the company. Don’t sit on the sidelines and wait for someone to ask you to get in the game. As leaders, engineers, and professionals, you oversee your reliability destiny and can easily influence how your value is perceived.

Bio:

Bobby Lee is an Engineering Technologist for Baxter Healthcare at North Cove with a combined time of eight years. Starting as a Maintenance Apprentice, he worked his way to a Maintenance
Technician. As a technician, he obtained his RMIC and laid the foundation for the reliability program at Baxter. This experience helped him move into the consultant world where he was able to be exposed to a variety of reliability programs and helped other companies on their reliability journeys. Bobby Lee has earned his RMIC, CMRP, and other professional certifications with an emphasis on Predictive Technologies. He is currently enrolled at Western Carolina University where he will obtain his bachelor’s degree in engineering technologies.