



Inspired Blended Learning[™] Case Study

Probat Roaster Reliability Improvement Project

Version 1.0



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INSPIRED BLENDED LEARNING™ CASE STUDY

The Jacksonville, Florida Maxwell House Plant is the company's largest and highest volume roasting plant with over 80% of the division's North American volume. The North American coffee market has grown substantially in recent years as a result of new roasting companies, packaging technologies and an expanding wholesaler base. The recent market growth has put additional stress on the Jacksonville plant to reduce cost and increase efficiencies in order to maintain favorable profit margins. The heart of the coffee manufacturing process is "roasting", and specifically the Roasters themselves. Jacksonville has numerous roasters including ten model G240 Probat roasters that were installed in the 1950's. With the company's focus on driving roasting line Overall Equipment Effectiveness (OEE) up 40%, Maintenance and Engineering were called upon to deliver instantaneous Probat roaster performance improvement.

Understanding their own skill gaps, Jacksonville chose Eruditio, LLC as the preferred provider of a Reliability Engineering core skills development program designed to guide the plant through the reliability improvement initiative while developing the internal skills necessary to sustain the gains. One of the first students to engage in the *inspired* Blended Learning™ (iBL™) program was Joe, the Plant Manager. This case study is written by Joe and provides his perspective of how iBL™ supported the direction of the Jacksonville plant, and the skills and benefits gained along the way.

Strategic Alignment of Operational Reliability

Eighteen months prior to the reliability improvement initiative, the company launched an enterprise wide "Integrated Lean Six Sigma" (ILSS) business model that led to the deployment of "Asset Owners" throughout the Jacksonville plant who were responsible for OEE and leading cross-functional continuous improvement teams through problem solving and solution selection. Although ILSS was a plant-wide strategy aimed at zero accidents, zero breakdowns, and zero defects, "Packing" was the pilot area and Roasting had not yet begun improvement efforts. However, the reliability improvement charter focused on reducing undesired stops, base lining equipment conditions and eliminating breakdowns through Root Cause Failure Analysis (RCFA) which resulted in leadership's recognition of alignment between ILSS and Reliability. Over the next two to three years, culturally, the focus will be narrowed to reducing stops and breakdowns, and keeping equipment at base lined condition through the elimination of defects and sources of contamination. Improving stop reduction to 95% OEE and reducing downtime from 30% to 5% in five years will earn Jacksonville over \$6 million in contribution margin gains.

The Improvement Process

The overall reliability improvement scope for the Roasters will be implemented over a 3-year timeline. Improvements made to date have been maintenance-centric, but plans are in place to introduce Operator Asset Care routines, as a result of engineered Equipment Maintenance Plans, that will coincide with the rollout of Integrated Lean Six Sigma (ILSS) in the roasting area.

The reliability improvement and iBL™ learning process began with the selection of an improvement team of subject matter experts and the development of a project charter. Project goals included increasing Roaster OEE, reducing maintenance costs, and having effective preventive, predictive, and Operator Asset Care programs ready to implement by 2014.

An asset catalog, including Bill of Materials (BOM), was completed on the first Roaster by walking down the equipment to identify and tag all major components, grouped by functional subsystems. This led to a total revamp of our Bill of Materials (BOM) in SAP and was then replicated across all other Roasters. The asset hierarchy in SAP for the roasters was in good shape and did not need updating.

Asset criticality assessments were completed for all assets using the company's Criticality Assessment Tool, which was created in collaboration with other students enrolled in the iBL™ program. From there, a detailed Reliability Centered Maintenance (RCM) blitz was completed down to the component level that led to proposed changes in the existing preventive maintenance program and the future addition of Operator Asset Care and condition monitoring routes based on failure mode probability, detectability and severity of failure consequences.

Spare parts were also analyzed using the ABC Classification method and improvements targeted lead-time reductions and adjustments to inventory Min/Max levels in an effort to integrate with Just-In-Time inventory management models of ILSS and reduce Jacksonville's total inventory value to \$3.5MM or 1.75% of the total Replacement Asset Value (RAV), with a longer term benchmark of 1%.

Next, the Equipment Maintenance Plan (EMP) was reviewed and adjusted based on the RCM blitz findings for mechanical, electrical, and stationary assets. The existing preventive maintenance programs were updated to provide precision, repeatability, and discipline. One of the existing quarterly mechanical outage "PM" routines was updated from a single-page document, with little in the way of directions, to an 11 page, detailed, quantitative procedure and video library of technicians performing the PM. The video observations and focus on standard work led to repeatable, efficient work procedures for



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critical maintenance and an overall 30% reduction in the quarterly mechanical outage PM labor hours.

Additionally, as a result of the engineered EMP, redesigns were made to a troublesome Roaster exhaust fan configuration, including drivetrain, ducting, refractory replacement, main basket replacement, new front door assemblies, and new bearing applications. Three of the ten roasters have been refurbished to date at a cost of approximately \$100,000 each with only 5% capitalized.

Results

The results have been well received. OEE data in 2012 prior to the project starting was 54%. By November of 2013, OEE is consistently above 79% and unplanned downtime has reduced from 30% to less than 10%. The results have been so encouraging that capital has been approved to upgrade the remaining seven Roasters, based on the proven improvement process, in 2014. Having the roasters run at these improved OEE's will yield an additional 29 million pounds of product per year out of these assets and ensure Jacksonville's ability to dominate North American market shares for many years to come.

Sustainability

In order to maintain the reliability focus, a "Progressive Maintenance Pillar" has been established in the Jacksonville plant as a community of practice. Tools that were used within the core skills development program will be used on other asset platforms as standards of practice. The Leadership Team is actively engaged in aligning Integrated Lean Six Sigma with the Progressive Maintenance Pillar. Next steps are to prioritize key assets based on cost and reliability measures and attack the opportunities in the same manner as the Roasters. The overall goal of the plant is to achieve 95% OEE in five years and reliability is a key part of that journey.