



Initiating a Condition Based Maintenance Training Program

Tire Manufacturing Plant - North Carolina



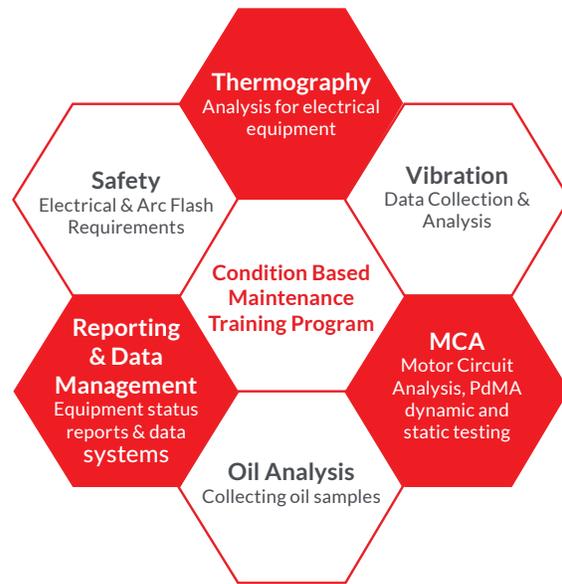
What Provided Momentum to Start up Condition Based Maintenance Training?

Maintenance management identified a need to establish a condition based maintenance program using condition monitoring. The corporate mandate came with a requirement to complete the program in six months. EECO was contacted to consult on program development and facilitation.

This large North Carolina plant manufactures car and light truck tires and covers 60 acres under roof, producing 32,000 tires a day. The plant has produced approximately 40,000,000 tires since start up in 1977.

A large, aging population of equipment plus the sheer size of this sprawling facility provide daily challenges for the maintenance team. Obsolete equipment such as breakers, switches, MCCs and panels with dial gauges must be maintained, or used for spares. Critical motors are part of every tire machine and other systems in the plant.

Initial consultation with the team identified program goals and the equipment to be included in a pilot training, plus technologies for use in condition monitoring, technician skill sets and training requirements. A launch schedule and cost estimate was established for the training program.



Training program content was determined by the following:

- An assessment of maintenance personnel skills sets
- Audit of equipment in the facility and its current condition.

Training topics were then arrived at by analyzing the above factors, including the type of equipment in the plant.

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Company goals for the program included the following-

- Achieving basic competency in personnel safety
- Data collection
- Analysis
- Reporting and data management using identified technology on pilot equipment systems

The plant had tried to start a predictive maintenance program in the past; they even had a PdMA testing machine, but lacked the personnel, training and commitment necessary to launch the program. Finally, the burden of unscheduled repairs, and excessive maintenance time provided the impetus to action. The training program was successfully completed and launched in six months, by the end of 2014.

Corporate reliability advanced standards for condition based maintenance that specified frequency of testing by class of asset.

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Class 1 assets are motors of 200 HP or more are vibration monitored on a monthly basis and quarterly testing is conducted for all other testing methods.

The company calculates the cost of downtime by counting the number of tire machines impacted by the downtime, multiplied by the cost per hour for each machine times the number of hours of downtime.

The cost of scheduled downtime versus unscheduled downtime ranges from several thousand dollars for scheduled downtime to hundreds of thousands of dollars for unscheduled downtime.

What Was Challenging in Starting a Condition Based Maintenance Program?

The biggest challenge that maintenance faced was getting department managers on board. The attitude was more or less summed up as 'It's been good for 40 years, why do we need this now?'

As plant equipment ages, failure becomes more likely and more critical. Maintenance works long days to keep Class 1 assets operational, leaving little time for more reliability testing that would predict failure.

The greatest frustration on the part of maintenance is time. "Everything seems to take forever. 'Currently using a contractor for repairs of equipment and they are starting to do some testing and analysis, but it's not enough.' Presently, the maintenance team is two people but they say they could use five to six persons to support this massive facility.

What Has Been the Impact of CBM Thus Far?

There is growing acceptance of the CBM program among department heads as critical maintenance issues are identified, repaired and reported to the management team. The bottom line is the enormous savings realized by conducting maintenance on equipment at the right time (condition based) rather than managing failures.

Both the plant manager and the plant engineer are on board. The program is young, but growing as more documented cases of scheduled downtime savings are logged.

What Does a Successful CBM Program Provide?

The training program EECO created has successfully created a two-man condition based maintenance team that is able to maintain the 100 Class 1 assets. They have engaged in additional training via internet based tools, a smart phone app (Mobius) and hands-on experience.

Advice to Others Wishing to Start Up a Condition Based Maintenance Program?

Maintenance personnel told EECO that you have to determine whether the company is willing to invest in a reliability program at the start. Personnel are a big part of the picture – having adequate maintenance personnel, and the right personnel are keys. At the plant, the preference is for moldable people who are willing to work. “We want the guy who is taking notes during class.” Sell-in is also key to success. That process started with the maintenance manager and is growing, but it has taken time to get all department heads on board.

How Did EECO Help Get the Program Started?

EECO training proved to be the foundation of the maintenance program. A training schedule consisting of four days training per month was given to plant maintenance personnel over the course of six months. The maintenance knowledge base is continually updated with new repair data and asset information.

Weekly meetings capture scheduled and completed repairs, including the costs of unplanned maintenance. Maintenance has created a database to record these costs for future reference and justification.



There is always a fight for maintenance dollars. We have to submit a business case for every major maintenance activity. There is a little reserve money for ‘just in case’.

- Maintenance Representative

How to Fund Maintenance Activities

The win for maintenance is anything that is tied to CO₂ reduction. “If we can show how reducing energy usage equates to tons of CO₂ reduced, we have a high chance of getting the funding.” The company has a goal to significantly reduce CO₂ levels by 2020.