Condition-Based Maintenance (CBM) 
Continuous Monitoring Strategy

David Ammons
Sr. Manager Engineering - Maintenance
Nissan North America - Canton, MS

Abstract

Review the steps required for implementation of an effective CBM / Continuous Monitoring Program for monitoring critical asset health.

Understand how we can improve our safety record and increase maintenance efficiency through better planning and execution of critical equipment repairs.

Presentation: Review real-life examples of CBM / Continuous Monitoring “Success stories” based on data analysis (current, vibration, torque, temperature, time, etc...).

Opportunity Identified:
Every industry is tasked with improving safety and efficiency and increasing competitiveness in today’s business environment. Increased knowledge and understanding is needed to formulate an achievable strategy to continuously monitor asset health. Early detection of asset health issues allows for improvements in safety and work efficiency, and improved asset performance through equipment downtime reduction.

Learning Objectives:

1. What is Condition-Based Maintenance (CBM) / Continuous Monitoring?
2. How can an effective CBM Strategy improve your safety record and improve your planned / reactive work ratio?
3. What are the process steps required to implement an effective CBM / Continuous Monitoring program?
Information: What is Condition-Based Maintenance (CBM) / Continuous Monitoring?

Condition-Based Maintenance focuses on real-time asset performance and conditions. Sensors located on the asset monitor this select performance data and alert you when a monitored parameter is outside of pre-determined control limits.

Solution: How Condition-Based Maintenance works
CBM consists of a standard series of 3 steps: 1) capturing sensor data, 2) communicating / analyzing sensor data, and 3) planning / performing maintenance work based off of the CBM data collected. Sensor data is captured from devices (some examples - accelerometers, infrared cameras, fluid condition sensors, tank level sensors, pressure transducers, ammeters, and timers) while critical assets are in operation. When analysis shows a measured parameter exceeds or is trending towards a pre-determined control limit, the Maintenance team is notified by some standard means. Upon notification, the Maintenance Team can effectively prioritize action based on the information received.

Conclusion: How can an effective CBM Strategy improve your safety record and improve your planned / reactive work ratio?
Thorough investigation into the cause of a measured signal will generally promote more effective and efficient planning of corrective maintenance activities. Better planning will result in a safer work environment. Efficiency can be improved through better job prep, resulting in increased wrench-time due to better kitting of repair parts, tools, and supplies.

The process steps required to implement an effective CBM / Continuous Monitoring program are:
1. Prioritize the Asset List
2. Determine What Asset Health Metric to Monitor
3. Determine Best Technology to Collect Sensor Data
4. Install Sensors and Establish Data Collection Process
5. Analyze Collected Data (Internal or External)
6. Effectively Plan and Execute Asset Inspection and Correction
7. Analyze Failure - Root Cause
   1. For Recurrence Prevention
   2. To Identify Horizontal Deployment Opportunities
Biographical Note

David Ammons  CMRP
Sr. Manager Engineering Maintenance: Nissan North America - Canton
Sr. Expert Global Maintenance Reinforcement (GMR): Nissan Motor Limited

35 Years of Manufacturing and Industrial Maintenance Experience
- Injection Molding
- Ceramic Manufacturing
- Die Cast Manufacturing
- Electronics Manufacturing
- Automotive Manufacturing

22 Years of Automotive Manufacturing Maintenance Experience (Nissan – Canton)
- Fascia Injection Molding
- Body Paint
- Stamping & Body Assembly
- Current role: Global Maintenance Reinforcement (GMR)
  - Window-person for all Global Maintenance communications
  - Lead PdM/CBM strategy for Nissan Canton Maintenance