Learnings from Practical Use Cases in Proactive Asset Performance Management

Dr. Ananth Seshan
Chairman, 5G Technologies.
Chair, MESA APM Working Group
Brief Introduction to MESA

Global community for improving Operations Management with IT

Best practices & guidance to drive productivity & profitability

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- Guidebooks
- B2MML and BatchML XML instantiations of ISA-95
- Other presentations or webcasts
- GEP modules

100’s of materials available to Premium members at no additional charge
Asset Performance Management Working Group

APM 2.0

Extended Life of Assets

Availability of Assets

Return on Assets

Reliability of Assets

Asset Intelligence System

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APM 2.0 - Proactive Asset Life/Health Maintenance Using Asset Intelligence

Asset Intelligence System
Rules Based Asset Health Monitoring and Orchestration of actions

Asset Lifecycle and Maintenance information
Real time & Historical Asset conditions
Work orders/ Schedules/ Root Cause Updates
Emerging failure conditions, Opportunistic Predictive Maintenance, Opportunistic PMs, Operational Metrics, job plans/dispatch info, Maintenance reports

EAM/CMMS
Key Metrics’ Updates

Senior Management

Maintenance Supervisor
Plant Supervisor
Plant Floor

Maintenance Personnel

Work Order Closure

Work Order
Mobile or Web based approval of Work Order

Maintenance Supervisor

Emerging failure conditions, Opportunistic Predictive Maintenance, Opportunistic PMs, Operational Metrics, job plans/dispatch info, Maintenance reports

Asset Availability/ Operational KPIs/ Maintenance Status Updates

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Use Case 1: Proactive Reports

Learning 1: Real time and unified visibility of asset health helps in proactive decision making.
Use Case 2: Schedule Proactive Asset Health Maintenance

Learning 2: Cultural change required to move from date based to usage based PMs
Use Case 3: Download Work Order Details, Perform Work Order, Close & Notify

**Work order:** WO9876
- **Asset:** Pump 101
- **Location:** Lift Station 02
- **Description:** Pump stopped
- **Priority:** High
- **Type:** Corrective

**Asset Failure Condition:**
- Motor Current >25% Average,
- Flow < 5% before failure

**Job Plan:**
- Check for clog in inlet pipe.
- Clean Filter
- Bolt-Lubricate Bearing
- Check Motor Current

**Work order:** WO9876
- **Status:** Complete
- **Close**

**Job Plan:**
- Complete Work Order
- Update Status
- Other Stakeholders Receive status update

**Learning 3:** Knowledge of the problem and corresponding job plans at the time of dispatch reduces MTTR.
Use Case 4: Create/Open Opportunistic Work Orders to Correct or Prevent Potential Failures

Today’s Plan
Lift Station 02
Pump 101 – Oil Change – SR00345
Lift Station 03
Generator – Oil Change – SR00456
Wet Well – Rag Removal – Inspection
Last Updated 2 minutes ago

Suggestion to check another problem in a different asset – Pump 201 seal imminent failure!

Work Order
Asset: Pump 201
Location: Lift Station 02
Description: Pump seal replacement
Priority: HIGH
Type: Predictive
Create

Start Day
Reach Location
Perform Job Plan
Discover another problem during maintenance.
Create a new Work Order

Learning 4: Opportunistic, proactive asset health care can eliminate future costs.
Use Case 5: Update Root Cause

Work Order: WO67541

Asset: Pump 103
Location: Lift Station 42
Description: broken pump
Type: Corrective
Cause: impeller wear ring damage
Action: replaced wear ring

Update Root Cause

Learning 5: Ease of updating root cause allows for subsequent useful strategic analysis.
Use Case 6: Advance PMs to Optimize

Lift Station 57
- Wet Well Level Alarm at 80% of threshold.
- Pump 2 – PM Job due in 27 hours.
- Compressor - Seal Leakage observed at 3σ of MTBF

Wet Well - Open Service Request
Pump 2 – Advance PM
Compressor – Open PM work order

Learning 6: Dynamic decision making on PMs optimizes interventions/costs.
Use Case 7: Spare Parts Opportunistic Reordering

Compressor AS2354 Bearing 23087 deterioration – imminent failure!

Look up Spares for Bearing 23087

Plant Supervisor receives alarm

Reviews Spares

Requests Reorder choosing status option as “urgent”

Spares not available!

Bearing 23087 Reorder Qty. 3 Status - Urgent

Purchasing reviews and initiates reordering

Bearing 23087 Reorder Qty. 3

Approve

Learning 7: Vertical integration improves efficiency.
Use Case 8: Machine Failure Prediction

Machine failure data + Predicted weather data for the next 15 days + Machine MTBF

Real Time Data from Disparate Sources

The probability of failure of compressor 1 is 45%
Thank You