SINGLE POINT LESSON- MAINTENANCE & RELIABILITY KPI DASHBOARDS

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WORLD CLASS MAINTENANCE

Single Point Lesson - Maintenance and Reliability KPI Dashboards

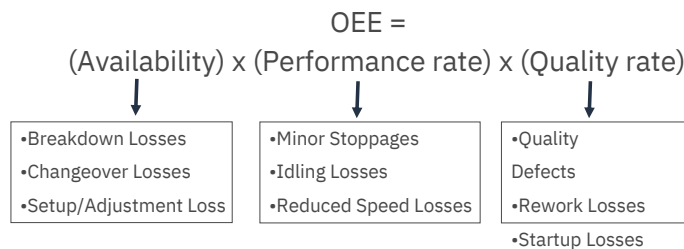**By Ricky Smith CMRP and Keith Mobley**
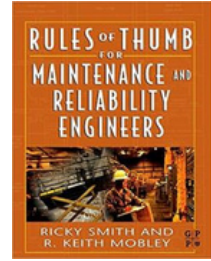
KPI Dashboards are the alignment of KPIs for specific positions which allows a specific individual or group of individuals the metrics required to manage the process which they are responsible.

1.Plant Manager Dashboard

a. Total Cost per unit

b.OEE (overall equipment effectiveness) - Total plant (combination of all lines or production areas together providing a "plant score")

<u>DEFINITION</u>:

OEE =
(Availability) x (Performance rate) x (Quality rate)

•Breakdown Losses	•Minor Stoppages	•Quality
•Changeover Losses	•Idling Losses	Defects
•Setup/Adjustment Loss	•Reduced Speed Losses	•Rework Losses
		•Startup Losses

oDefinitions for OEE

- **Availability** is measured by calculating any action or inaction that takes away from 24/7 time period is loss of availability –this identifies the "hidden plant"

- **Performance** rate is the best rate ever sustained in a production process or design rate which ever is greater.

- **Quality rate** is calculated is as "first pass quality" only

oWARNING: It is acceptable to have a low number in any of the categories.

2. The objective of KPIs is to provide management with "REAL" numbers to manage with and not beat up people with.
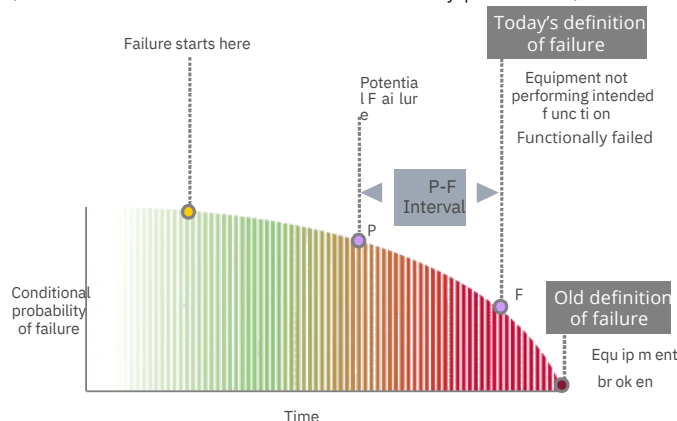
Plant Management Team (maintenance, production, purchasing, accounting, etc)

a.Total Cost per unit by production area or line

a.Maintenance cost per unit
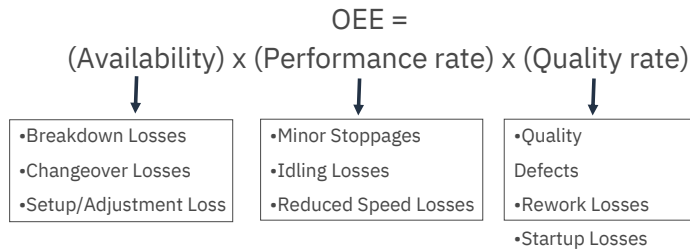
b.Production cost per unit

b.MTBFF (Mean Time Between Functional Failure – by production)

c. OEE (overall equipment effectiveness) by production area or line

DEFINITION:

OEE =
(Availability) x (Performance rate) x (Quality rate)

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OEE Example:
Plant XYZ – one production line

- Production line is scheduled to operate 5 days times 8 hours a day or 40 hours per week

- Production design rate was 40,000 units per hour
- Current rate = 22,000 units per hour

- Quality losses are at 8% with second quality product (which is sold) is 11%

- OEE for one week =
- **Availability** (measured 24/7) = 24hrs x 7 days = 168hours (100%)
  - ➢ Current operate 8/5 = 8 hrs x 5 = 40 hours
  - ➢ Availability = 40 divided by 168 = **23.8%**
- **Performance** = design rate – 40,000 units per hour
  - ➢ Current rate = 22,000 units per hour
  - ➢ Performance = 22,000 divided by 40,000 = **55%**
- **Quality** = % of first pass quality only
  - ➢ Current quality losses to include second quality = 19%
  - ➢ Quality = 100% minus 19% = **81%**
- **OEE** = 23.8% x 55% x 81% = **10.6%**

Warning = the number is the number and will provide the plant with identifying it current operating health so if smart decisions can be made to make the plant successful. Never use a modified OEE. Many companies fall into this trap and leads to believe a number which is not the "real number". Many companies do not like a number under 90% so they develop a "modified OEE". It does not work.

3. Production Manager – Plant Level KPIs specific to production

a. Production Cost per Unit Produced – reviewed and trended weekly
- Total % of time product "Change Over" standard met
    - Total % of time production equipment is operating less than standard throughput

o Line speed, units per hour, etc.
- Total # of units produced (measured against budget)
- Total % of off quality (less than 1st pass quality, anything less not measured)
- MTBFF (Mean Time Between Functional Failure – total plant)
- Overtime - %
- Absenteeism - %
- # of discipline violations
- # of safety incidents
- # of days without loss time accidents

4. Production Supervisor

a. Production cost per unit of production produced by production line or production area
- Total % of time product "Change Over" standard met
    - Total % of time production equipment is operating less than standard throughput

o Line speed, units per hour, etc.
- Total # of units produced (measured against budget)
- Total % of off quality (less than 1st pass quality, anything less not measured)
- MTBFF (Mean Time Between Functional Failure)
- Overtime - %
- Absenteeism - % (by shift)
- # of discipline violations
- # of safety incidents
- # of days without loss time accidents

5. Production Operator

- Total % of time product "Change Over" standard met
    - Total % of time production equipment is operating less than standard throughput

o Line speed, units per hour, etc.
- Total # of units produced (measured against budget)
- Total % of off quality (less than 1st pass quality, anything less not measured)
- MTBFF (Mean Time Between Functional Failure)
- # of safety incidents
- # of days without loss time accidents
- # of environmental incidents

6. Maintenance Manager - Plant Level KPIs specific to total plant

a. Maintenance cost per unit produced
b. Maintenance cost as a percentage of RAV, return on asset value
- MTBFF (Mean Time Between Functional Failure – total plant)
- Maintenance labor cost (measured against target)
- Maintenance material cost (measured against target)
- Maintenance contractor cost (measured against target)
- Overtime - %
- Absenteeism - %

- # of discipline violations
- # of safety incidents
- # of days without loss time accidents
- # of environmental incidents
- Capital maintenance cost per unit produced

7. Maintenance Supervisor – area of responsibility only
a. Maintenance cost per unit produced
- MTBFF (Mean Time Between Functional Failure)
- Maintenance labor cost (measured against target)
- Maintenance material cost (measured against target)
- Maintenance contractor cost (measured against target)
- Overtime - %
- Absenteeism - %
- # of discipline violations
- # of safety incidents
- # of days without loss time accidents
- # of environmental incidents

8. Maintenance staff – area of responsibility only
b. Maintenance cost per unit produced
- MTBFF (Mean Time Between Functional Failure)
     - Total % of time production equipment is operating less than standard throughput
o Line speed, units per hour, etc.
- Total # of units produced (measured against budget)
- Total % of off quality (less than 1st pass quality, anything less not measured)
- # of safety incidents
- # of days without loss time accidents
- # of environmental incidents

9. Reliability Engineer
     - Bad Actors Report **–** Top 5 Critical assets with the highest total maintenance cost and worst reliability (MTBFF, Mean Time Between Functional Failure)
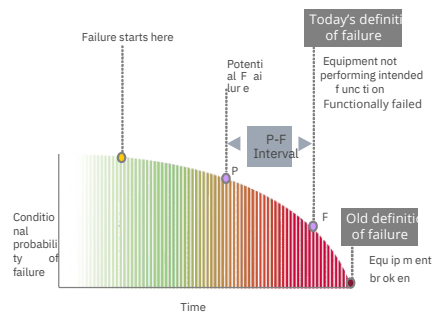
- MTBFF by production line and area
- % of critical assets with a maintenance strategy developed using an RCM Methodology
- % of new assets with a maintenance strategy developed

oUsing RCM methodology
oRanked based on risk to the business

10.Engineering Manager

•% of total projects completed on budget
•% of total projects completed within 10% of budget
•Dollar value overspent budget for total projects by month / by year
•% of projects started up on time / full capacity
•Dollar value of change orders by month/project/year
•% of projects started up on schedule with Maintenance Strategy developed with an RCM methodology
•% of projects started up on schedule with all prints updated and in native language
•Downtime % of new project for one year
•Throughput losses for new project for one year
•% of projects with 80% of operating procedures developed prior to scheduled startup
•Total MTBFF (mean time between functional failure)of all new projects for one year, two years

11.Purchasing Manager

•% of time vendors deliver on time (standard = 98%)
•% of time vendors deliver what was requested (type and quantity)
•Mean time to order emergency parts (standard = 30 minutes)
•Mean time to order normal parts (standard = 1 hour)

12.Maintenance Stores Manager

•# of Stockouts
•# of times an employee waits longer than 5 minutes for parts (24/7)
•Inventory accuracy (standard = 99%)
•Maintenance material as a percentage of RAV, return on asset value (World Class = .25 to .75%)
•% of stores PMs completed on time by month
•Stores value by month

Conclusion

Remove the black windshield and manage with Leading Indicators and not with Lagging Indicators. Leading KPI's should be used to drive your decision-making process. Remember Leading Indicators (KPI's) are manageable, while Lagging Indicators just tell us how well we managed. If you want to be the best in your business, step up to the plate and manage in the most efficient manner by following my recommendations.

Join me "LIVE" in Nashville, TN May 9-11, 2023

Need information email me at rsmith@worldclassmaintenance.org

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★★★★★   **Paul D, Health and Safety Coordinator**
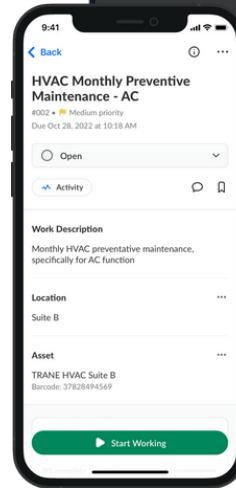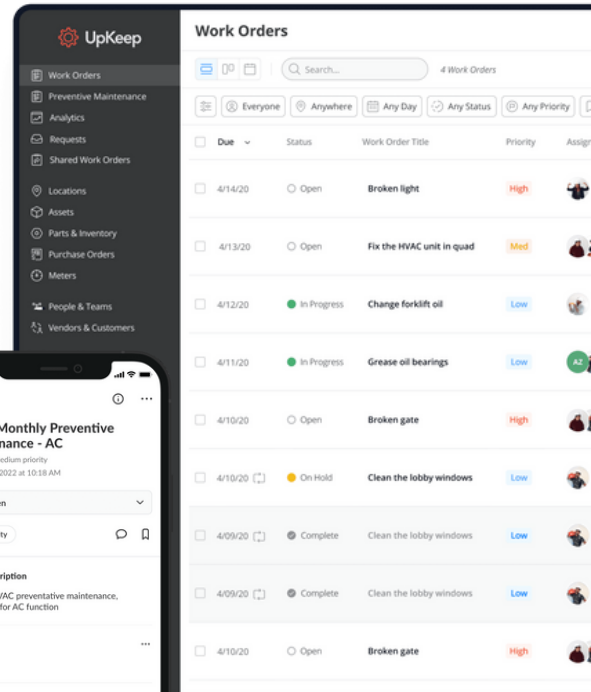
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The Maintenance Community Coalition was founded on the belief that working together will benefit everyone within our community

Committed to helping each other thrive in our individual professional journeys by sharing resources and expertise, granting scholarships, hosting events, and unlocking knowledge – always at no cost.

TMCC
THE MAINTENANCE COMMUNITY COALITION