How are you doing?

• *Where do we want to go?*
• *Where are we now?*
• *Where are we going? What direction?*
• *How fast are we going?*
Our Organization

Where do we want to go?
- What are our company’s business goals?
  - Are they good goals?
Where are we now?
- Are we achieving our company’s business goals?
  - How does the outside world affect us?
Where are we going? What direction?
- Are we progressing toward those goals?
  - Are we better positioning ourselves to compete?
How fast are we going?
- Are we making adequate progress?

How do we get to where we want to go?

"Measurement is the first step that leads to control and eventually to improvement. If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it."

- H. James Harrington
So, what are Metrics?

Metrics - a system of parameters or ways of quantitative and periodic assessment of a process that is to be measured, along with the procedures to carry out such measurement and the procedures for the interpretation of the assessment in the light of previous or comparable assessments.

- Wikipedia
Metrics - Purposes

1. Indicate performance on a comparative basis with company goals and industry statistics, and
2. Highlight areas for improvement (weaknesses), and strengths, within the O&M processes

Metrics (KPIs) indicate how well behaviors and processes are functioning, they DO NOT drive behavior or processes

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Metrics – Benefits?

- Communicate with Management
- Motivate Stakeholders
- Prove the Benefits
- Diagnose Problems and Point to Solutions
- Respond Appropriately to Change & Allocate Resources

- Innovation Metrics – Tara Keithley
It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.

- Charles Darwin

Leading and Lagging KPIs

**Leading Indicators** - Indicators monitoring the performance of systems/processes, allowing for proactive actions.

**Lagging Indicators** – Indicators that show how systems/processes have performed, allowing for reactive actions.
Metrics are Multi-Level

- Corporate
- Financial
- Efficiency & Effectiveness
- Tactical
- Functional

Metrics Linkage

- Corporate
- Financial
- E & E
- Tactical
- Functional
Utilization

Level 1
Cost to Produce Too High

Level 2
Maintenance Costs Too High

Level 3
Planned Equipment Uptime Too Low

Level 4
PM Schedule Compliance Too Low

Level 5
Number of Overdue PM Tasks High

WHY?
Operations does not release equipment for PM’s

Opportunities become more difficult to identify as levels move from 5 to 1

Opportunities easily identified at this level

Scope?
Reliability - The *probability* that a system or process will perform its *intended function*, either at any particular instant at which it is required or for a planned length of time, *and under specified conditions*.

So, what does this mean in regards to scope?
Our organization will let us know:

1. How well it’s doing, and

2. How well our O&M processes are working,

**IF WE LISTEN PROPERLY.**

“Garbage In, Garbage Out”

- Processes/Practices/Procedures Must Be In Place to “Listen” to the Organization
- Processes/Practices/Procedures Must Be Strictly Enforced

Just scales and full measure injure no man.

- Chinese proverb
Some Rules to Live (or Die) By

1. Consensus on Objectives
2. Understand the Metrics/KPIs
3. Align Reporting to Objectives
4. Champion the Process
5. Respond Properly to Results
6. Use the Numbers Properly
7. The Numbers Are What They Are

Analyzing Results

- Analysis of “the numbers” on an industry comparison basis can be a gray area at times.
- Conclusions should be heavily weighted within the context of the user’s organization.
Response to the Numbers

- Targets in Place
- Metrics Linked
- Procedures/Processes in Place

"Without a standard there is no logical basis for making a decision or taking action."

- Joseph M. Juran

Developing Metrics - Steps

1. Form Multi-Disciplined, Cross-sectional Team(s) and Obtain Consensus on Objectives/Goals
2. Utilizing C&E Methodology, Brainstorm a Structure of Contributory Factors and Determine Factors to Monitor

3. Review/Establish Maintenance Best Practices and Data-Gathering Processes in Subject Areas
4. Establish Reporting and Monitor KPIs.
5. Adjust Practices and Processes Accordingly. Continuous Improvement

Safety

Goal – No One gets hurt
What should we monitor?
• Accidents - Lagging
• Safety Training & Meetings
• Safety Audits – Compliance, PPE, LOTOs, Permits, etc.
• Safety-Driven Maintenance Program Performance
• Improvement Recommendations
• Safety-related RCFAs and Near Misses
Environmental

Goal – *No unintended releases*

What should we monitor?

- Violations - Lagging
- Environmental Training & Meetings
- Audits – Compliance, PPE, LOTOs, Permits, etc.
- Environmental-Driven Maintenance Program Performance
- Improvement Recommendations
- Environmental-related RCFAs and Near Misses

OEE- Overall Equipment Effectiveness

- Availability
  - Downtime
  - Reliability Program Performance
  - Reactive Work
- Productivity
  - Run Rate
  - Waste
- Quality
  - Rework
  - Rejection Rate
Work Process Control

• Backlog
• Planned vs Unplanned
• PM Compliance
• Schedule Compliance
• Wrench Time
• Planner Training

Reliability Program

• Failures
• PM/PdM Effectiveness
• Critical Equipment Performance
• Failure Response Process
  – RCFAs Performed
  – Follow-Through
• Reliability Training
Example – Let’s be Doctors

Our Patient – Big Guy

Problems
• Overweight
• Heart Conditions
• Fatigue/Endurance
• Weakness

Goals
• Lose x lbs
• Lower cholesterol to y
• Build endurance
• Get stronger/maintain

Example – Big Guy
Let’s Look at Our Organization

What do we want to know about ourselves?

1. Are we operating safely - personnel and environmentally?
2. How much are we spending to operate? (O&M costs)
3. How much are we losing? (1 - OEE)

### Example - Maintenance Cost per Unit

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<th>MAINT COST PER UNIT</th>
<th>MAINTENANCE COSTS</th>
<th>CORRECTIVE WORK</th>
<th>DEPARTMENT FAILOVERS</th>
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Example - OEE

Problem: Below target OEE due to low Availability

• What if?
  OEE = 65% What does this tell us?

• What if?
  (Avail) 70% x (Prod) 95% x (Qual) 98% = 65%

• What if?
  Unscheduled Downtime = 65%

Example – OEE (ctnd)
Summary

• Performance needs to be frequently monitored.
• Performance measurements (numbers) are required.
• Our organization will give us all the information necessary to succeed.
• KPIs need to be logically linked to goals via a C&E relationship.
• KPIs should not drive behavior and processes, Best Practices drive behavior and processes.
• KPIs let us know if our processes are good, or being implemented properly.
• The Numbers are our friends.

Questions
Thanks for your attention

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