Key Performance Indicators for Facility Managers in a Lean Environment

Lean Maintenance = Radical Change

• New processes must begin with radical change

“Continuous improvement is exactly the right idea if you are already the world leader in everything you do. It is a terrible idea if you are lagging. It is probably a disastrous idea if you are far behind the world standard. I believe that we have made a major mistake of our advocacy of continuous improvement….we need rapid, quantum leap improvement.”

-Paul O’Neil, Former Chairman of Alcoa

Core Lean Business Aspects

Revenue Growth
- • Market differentiation
- • Price
- • Quality
- • Response
- • Cash Flow

Increase ROA / RONA

Increase Asset Utilization

Reduce Total Delivered Cost

• Availability
• Occupancy rate
• Quality
• Capital effectiveness
• Materials & Spare Parts
• Management

Lean Maintenance
**Objectives of Lean Maintenance**

- **Design**: Root Causes
- **Buy**: Root Causes
- **Store**: Root Causes
- **Install/Comm**: Root Causes
- **Occupy**: Root Causes
- **Maintain**: Root Causes

**Root Causes**
- **Losses**
  - Unnecessary Work
  - Uptime & Necessary Work
- **Defects**
  - Minimum Unit Cost of Maintenance

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**Objective of Lean Maintenance**

**OPTIMUM ASSET UTILIZATION**

- Total Cost of Reliability
- Optimum Asset Utilization
- Cost to Improve Reliability
- Cost of Unreliable Assets

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**Competitive Advantage**

- **High**
  - Proactive: Solve Root Cause
- **Low**
  - Primitive: Fix it when Broke
  - Predictive: Collect data, Assess Conditions
  - Preventive: Perform Time-Based Tasks

**Value Creation**

- **Low**
- **High**
Causes of Maintenance & Repair

Construction 7-13%
Management 10-17%
Occupancy 15-46%
Maintenance Errors 12-23%
Design & Engineering 25-32%
Non Preventable 31%

Preventable Work

- Almost 70% of all maintenance work does not need to happen and can be eliminated “in a perfect world” and in consideration of the entire life cycle
- Estimates associated with this are broken down as follows:
  - Design/Engineering 25-32%
  - Construction 7-13%
  - Damage (Occupancy) 15-46%
  - Maintenance Error 12-23%
  - Management Strategy 10-17%

Core KPI's
Performance Dashboard

KPI's

- Availability
- Occupancy
- Damage
- Cost
- Cost/RAV
- Cost/Unit
- Efficiency
- MTBF
- MTBF affects availability and cost
- Panels to identify distribution
- Equipment

Business Unit

Effectiveness by Asset or Group of Assets

MTBF affects availability and cost

KPI's

- MTBF
- Cost/Unit
- Cost/RAV
- Efficiency
- Work Effectiveness

Maintenance Core KPI's

Reliability Excellence

Mission, Vision, Goals

Strategy

Processes & Activities

People

Technology

Environment

Allocation of Maintenance by Type

Current Objective

- Eliminated Maintenance
- Reactive Maintenance
- Preventive Maintenance
- Condition-Based Maintenance

A survey disclosed the following objectives:
- Reduce total maintenance by 50%
- Shift the proportion of maintenance:
  - Reactive: 50% → 15%
  - Preventive: 20% → 30%
  - Condition Based: 15% → 55%

(1) Thomas Marketing Information Center, Dec. 1997

MTBF affects availability and cost

Work Effectiveness

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Work Effectiveness
Improvement Process

- Asset Effectiveness Assessment
- Business Critical Operating Objectives

Benchmarking

- People
- Processes
- Systems
- Technology

Best Practice Objectives

- Current Conditions
- Opportunities for Improvement

Prioritize by Impact on Objectives

- Form Strategies, Develop Metrics

Gain Approval, Obtain Resources

Implement

Measure Results, Metrics

Continuous Improvement

"Best Practice" Objectives

Current Conditions

Formulate Tactical Action Plans

Benchmarking

People

Processes

Systems

Technology

Business Critical Operating Objectives

Operating Objectives

Business Plan

Capital Projects

Expense Projects

New Investment

Improve Existing Assets

Breakdown

Repair

Preventive Maintenance

Corrective/Preventive Repair

Corrective Maintenance

Predictive Maintenance

Proactive Maintenance

Proactive & Special Maintenance

Training

Mgmt Support

Turnaround/Shutdown Improvements

Modifications

Tech Innovations

Regulatory Mgmt Support

Maintenance Repair Condition Monitoring & Inspection

Training

Emergency

Work Order Breakdown Structure

Cost "Buckets" per Work Order Breakdown Structure

Identifies

 Supports or Helps to re-direct

CMMS Report

CMMS information = Basis for Change

Shortens Budgeting Cycle

Identifies "Base Load" MTCE

KPI's at your Fingertip

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