

Metric Hierarchy Discussion

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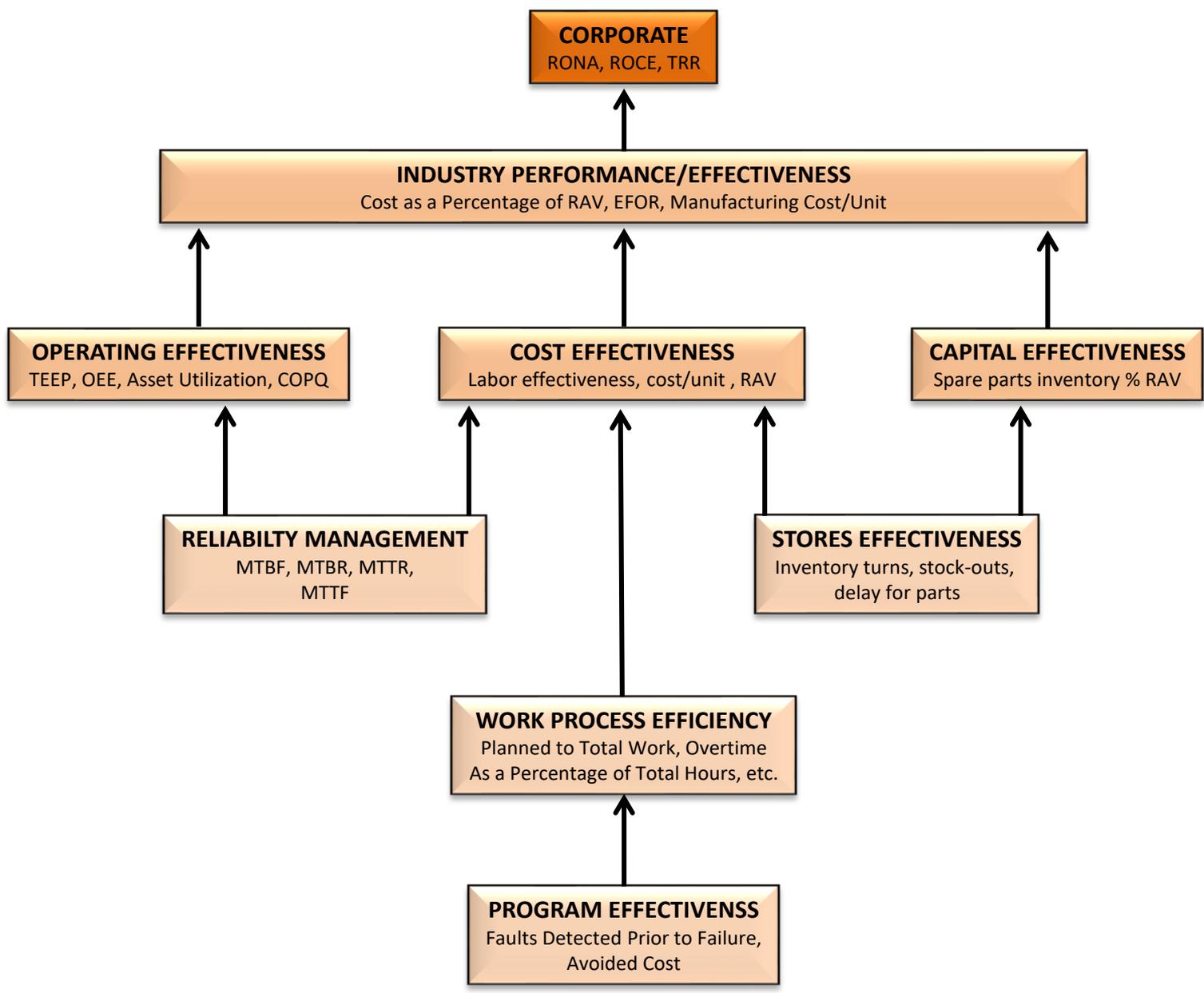
Metric Classification

Metric Hierarchy

Strategic

Operating

Effectiveness
(Tactical)



SMRP Metrics

Pillar 1 - Business and Management

- 1.1 - Ratio of Replacement Asset Value (RAV) to Craft-Wage Head Count
- 1.2 - Maintenance Unit Cost
- 1.3 - Stocked Maintenance, Repair, and Operating (MRO) Inventory Value as a Percent of Replacement Value
- 1.4 - Total Maintenance Cost as a Percent of Replacement Asset Value (RAV)

Pillar 2 - Manufacturing Process Reliability

- 2.1.1 - Overall Equipment Effectiveness (OEE)
- 2.1.2 - Total Effective Equipment Performance (TEEP)
- 2.2 - Availability
- 2.3 - Uptime
- 2.4 - Idle Time
- 2.5 - Utilization Time

Pillar 3 - Equipment Reliability

- 3.1 - Systems Covered by Criticality Analysis
- 3.2 - Total Downtime
- 3.3 - Schedule Downtime
- 3.4 - Unscheduled Downtime
- 3.5.1 - Systems Covered by Criticality Analysis
- 3.5.2 - Mean Time Between Failures (MTBF)
- 3.5.3 - Mean Time to Repair or Replace (MTTR)
- 3.5.4 - Mean Downtime (MDT)
- 3.5.5 - Mean Time to Failure (MTTF)

Pillar 4 - Organization and Leadership

- 4.1 - Rework
- 4.2.1 - Maintenance Training Cost
- 4.2.2 - Maintenance Training Hours
- 4.2.3 - Maintenance Training Return of Investment (ROI)

Pillar 5 - Work Management

- 5.1.1 - Corrective Maintenance Cost
- 5.1.2 - Corrective Maintenance Hours
- 5.1.3 - Preventive Maintenance Cost
- 5.1.4 - Preventive Maintenance Hours
- 5.1.5 - Conditioned Based Maintenance Cost
- 5.1.6 - Condition Based Maintenance Hours
- 5.1.9 - Maintenance Shutdown Costs
- 5.3.1 - Planned Work
- 5.3.2 - Unplanned Work
- 5.3.3 - Actual Cost to Planning Estimate
- 5.3.4 - Actual Hours to Planning Estimate
- 5.3.5 - Planning Variance Index
- 5.3.6 - Planner Productivity
- 5.4.1 - Reactive Work
- 5.4.2 - Proactive Work
- 5.4.3 - Schedule Compliance Hours
- 5.4.4 - Schedule Compliance Work Orders
- 5.4.5 - Standing Work Orders
- 5.4.6 - Work Order Aging
- 5.4.7 - Work Order Cycle Time
- 5.4.8 - Planned Backlog
- 5.4.9 - Ready Backlog
- 5.4.11 - Preventive Maintenance (PM) & Predictive Maintenance (PdM) Work Orders Overdue
- 5.4.12 - PM & PdM Yield
- 5.4.14 - PM & PdM Compliance
- 5.5.1 - Craft Worker to Supervisor Ratio
- 5.5.2 - Craft Worker to Planner Ratio
- 5.5.3 - Direct to Indirect Maintenance Personnel Ratio
- 5.5.4 - Indirect Maintenance Personnel Cost
- 5.5.5 - Infernal Maintenance Personnel Cost
- 5.5.6 - Craft Workers on Shift Ratio
- 5.5.7 - Overtime Maintenance Cost
- 5.5.8 - Overtime Maintenance Hours
- 5.5.31 - Store Inventory Turns
- 5.5.32 - Vendor Managed Inventory
- 5.5.33 - Stock Outs
- 5.5.34 - Inactive Stocks
- 5.5.35 - Storeroom Transactions
- 5.5.36 - Storeroom Records
- 5.5.38 - Maintenance Material Cost
- 5.5.71 - Contractor Cost
- 5.5.72 - Contractor Hours
- 5.6.1 - Wrench Time
- 5.7.1 - Continuous Improvement Hours

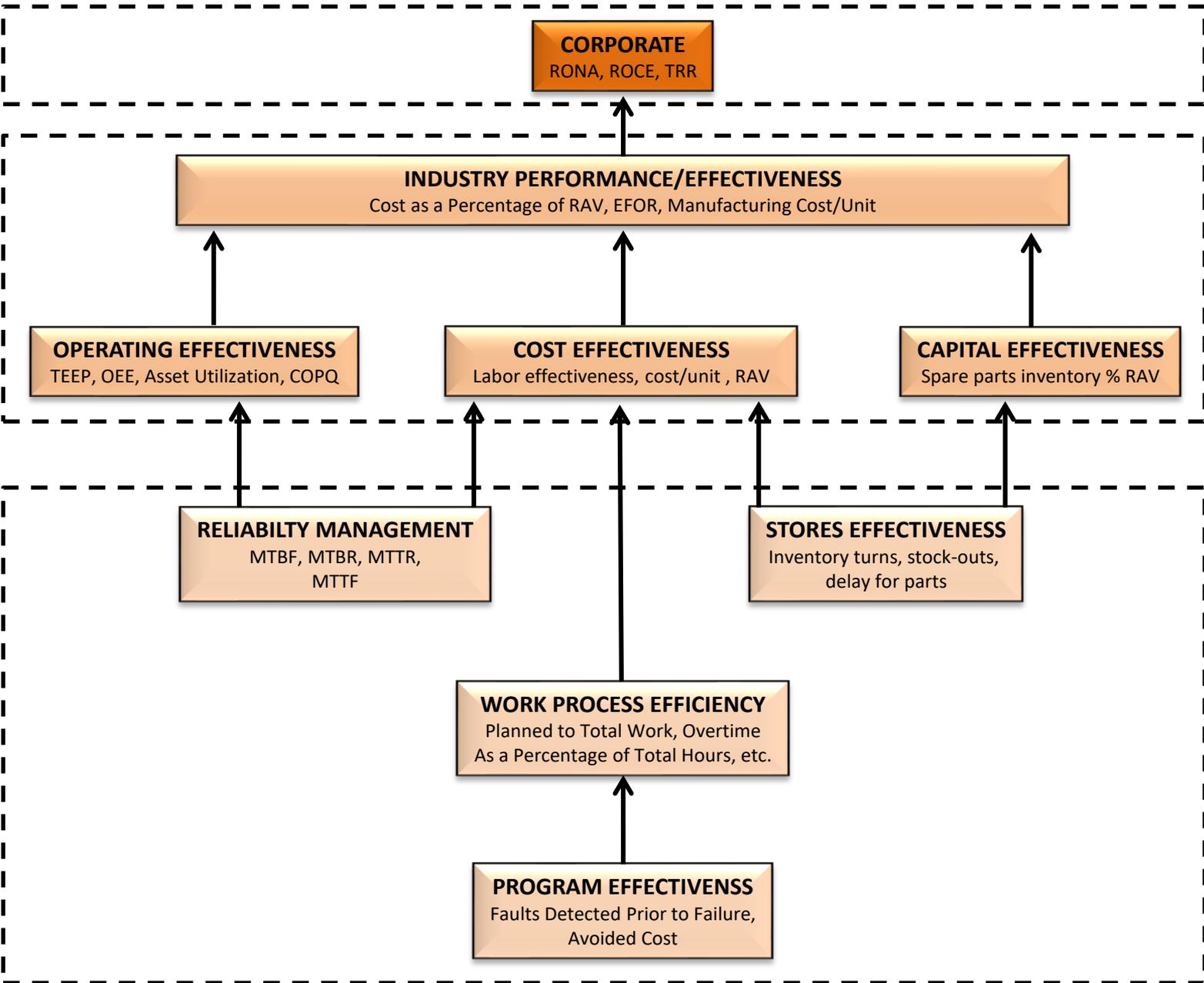
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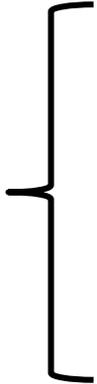
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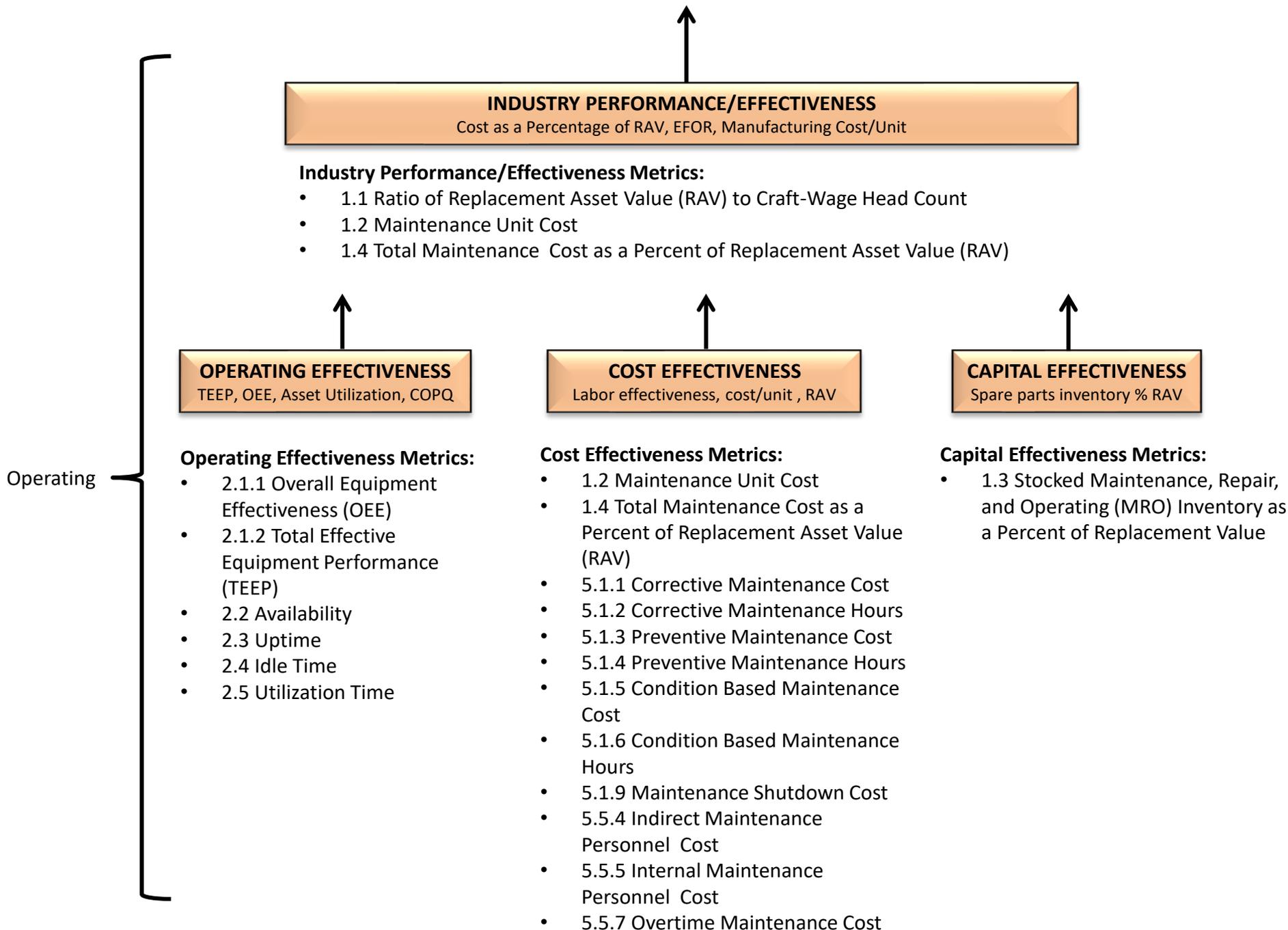
Metric Hierarchy

Strategic



Strategic Corporate Metrics:

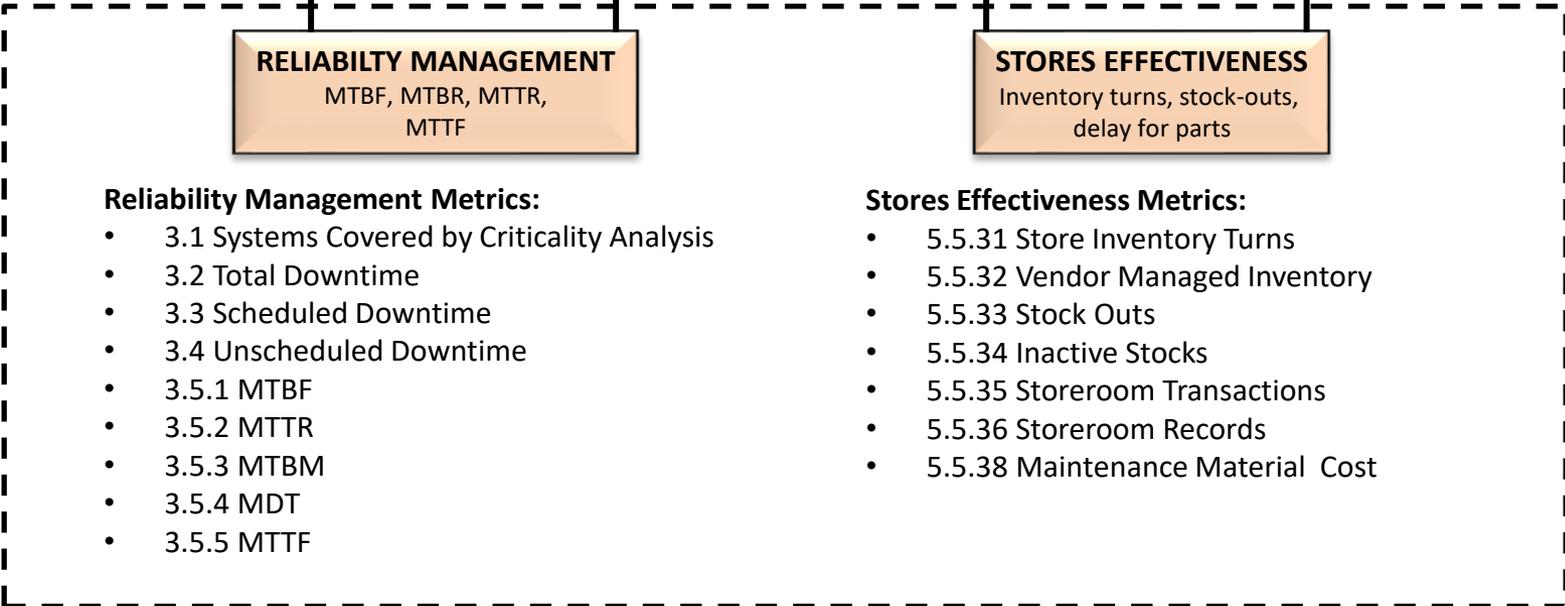
- Return on Net Assets (RONA)
- Return on Capital Expended (ROCE)
- Return on Assets (ROA)
- Return on Active Capital Employed (ROACE)
- Return on Average Assets (ROAA)
- Return on Invested Capital (ROIC)
- True Reject Rate (TRR)



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RELIABILITY MANAGEMENT
MTBF, MTBR, MTTR,
MTTF

Reliability Management Metrics:

- 3.1 Systems Covered by Criticality Analysis
- 3.2 Total Downtime
- 3.3 Scheduled Downtime
- 3.4 Unscheduled Downtime
- 3.5.1 MTBF
- 3.5.2 MTTR
- 3.5.3 MTBM
- 3.5.4 MDT
- 3.5.5 MTTF

STORES EFFECTIVENESS
Inventory turns, stock-outs,
delay for parts

Stores Effectiveness Metrics:

- 5.5.31 Store Inventory Turns
- 5.5.32 Vendor Managed Inventory
- 5.5.33 Stock Outs
- 5.5.34 Inactive Stocks
- 5.5.35 Storeroom Transactions
- 5.5.36 Storeroom Records
- 5.5.38 Maintenance Material Cost

Effectiveness
(Tactical)
Continued

