



Strategic Plan for World Class Reliability

Kate Kerrigan
Operations Director, GPAllied



Doing More With Less

- less expense budget,
- less capital,
- less manpower.

The only way to do more with less is to do it differently.



Learning Objectives

1. Define World Class Reliability
2. Evaluate Current State
3. Define Future State
4. Develop a plan to close the gap



Reliability Operating Systems

- Total Productive Manufacturing (TPM)
- Toyota Production System (TPS)
- Total Quality Management (TQM)
- Lean
- Six Sigma
- Benchmarking
 - Society for Maintenance & Reliability Professionals
 - Institute of Industrial Engineers
 - Amazon Books



Common Elements

- Set Vision
- Define Organizational Structure
 - Roles
 - Responsibilities
 - Decision Making Rules
- Set Tactical Goals
- **Implement; Start; Change the Way You Operate**
- Measure Tactical Goals
- Prioritize and Fix Defects as They Arise
- Continuously Improve



Vision

Clear

Concise/Repeatable

Personally Meaningful

Visual/Observable

For The Boss

Improve Uptime

Optimized Cost

No Repeat

Failures

Zero Breakdowns

For Yourself

Weekends Free

No Emergency

Calls

- From Crew

- From Boss

Planned Week

Real Vacation

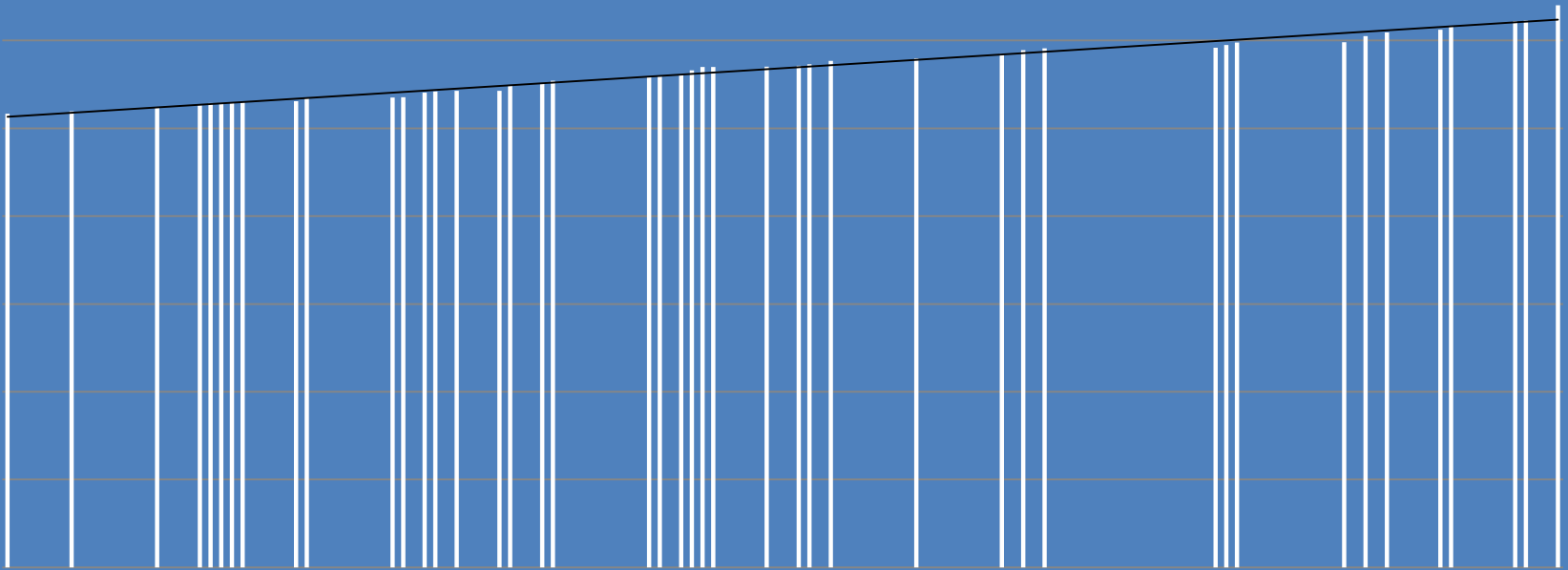
Personal

Development

Time



Performance Improvement 19.3%





Believe

- Commit to the change
- Practice the new operating system
- Do not let anything interrupt the vision
- Be visible and constant cheerleader for strategy
- Welcome feedback



Plan Elements

- Asset Data
- Equipment Maintenance Plans
- Work Execution Management
- Staffing / Work Roles
- Materials Management
- Continuous Improvement
- Vendor Partnership / Management

Asset Data

- Identify all assets
 - Infrastructure (ISO 14224 defines the standard for equipment taxonomy when establishing your equipment hierarchy)
 - ASTM F2446 - 04(2010) Standard Classification for Hierarchy of Equipment Identifiers and Boundaries for Reliability, Availability, and Maintainability (RAM) Performance Data Exchange
- Parent/Child Relationships
- Components
- Bill of Materials
- Repairable/Swappable Equipment
- Rank Equipment



Equipment Maintenance Plans

- Inspect to Detect
- Time-Based Repair/Replace/Rebuild
- Run to Failure
- Develop asset health plan for all equipment
- Balance the work load across all equipment

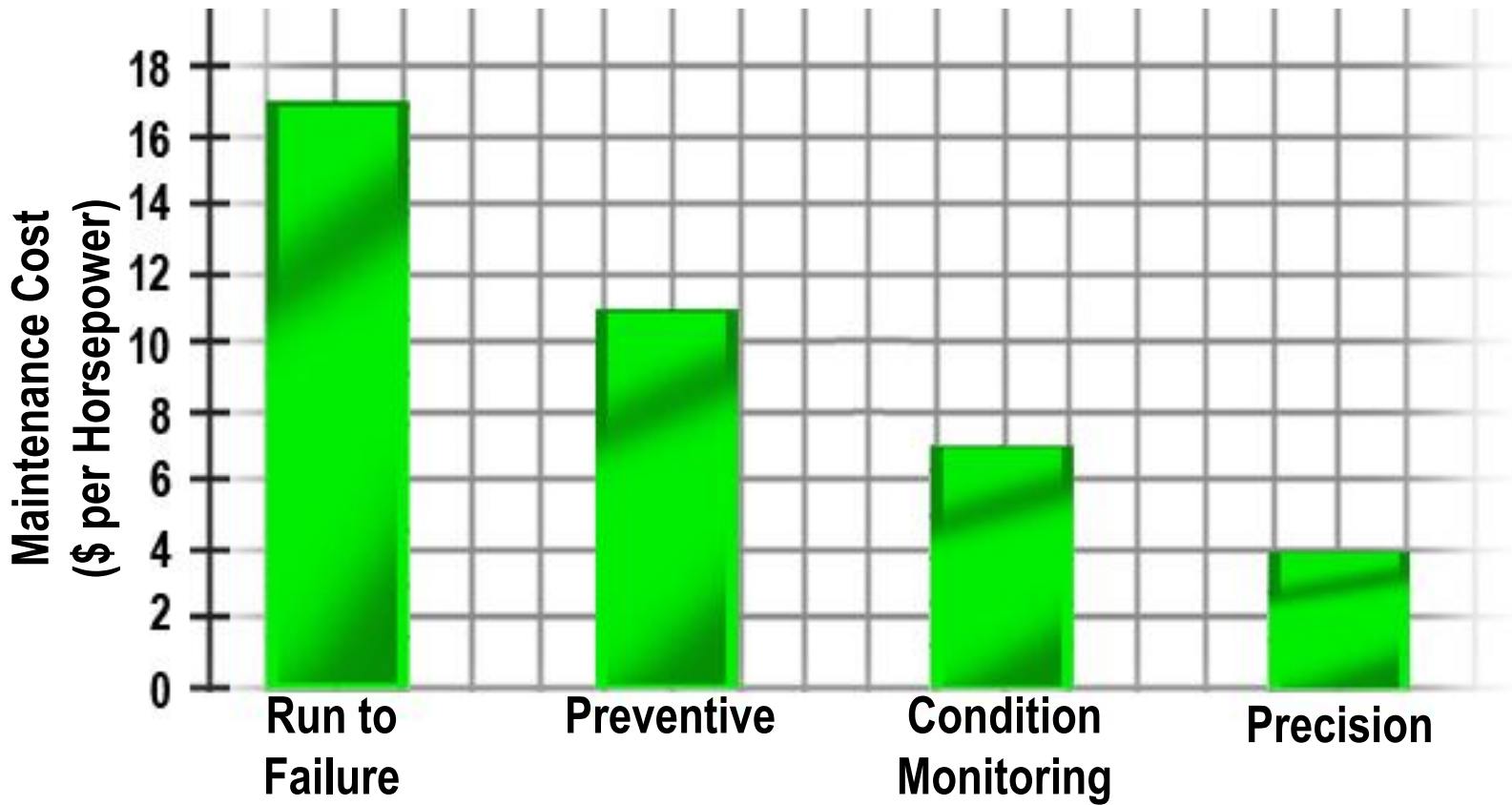


Equipment Maintenance Plans

- Preventive Maintenance
 - Replace/Rebuild based on historical expectations
- Inspections
 - Monitor until equipment defect occurs



Cost Comparison of Maintenance Programs





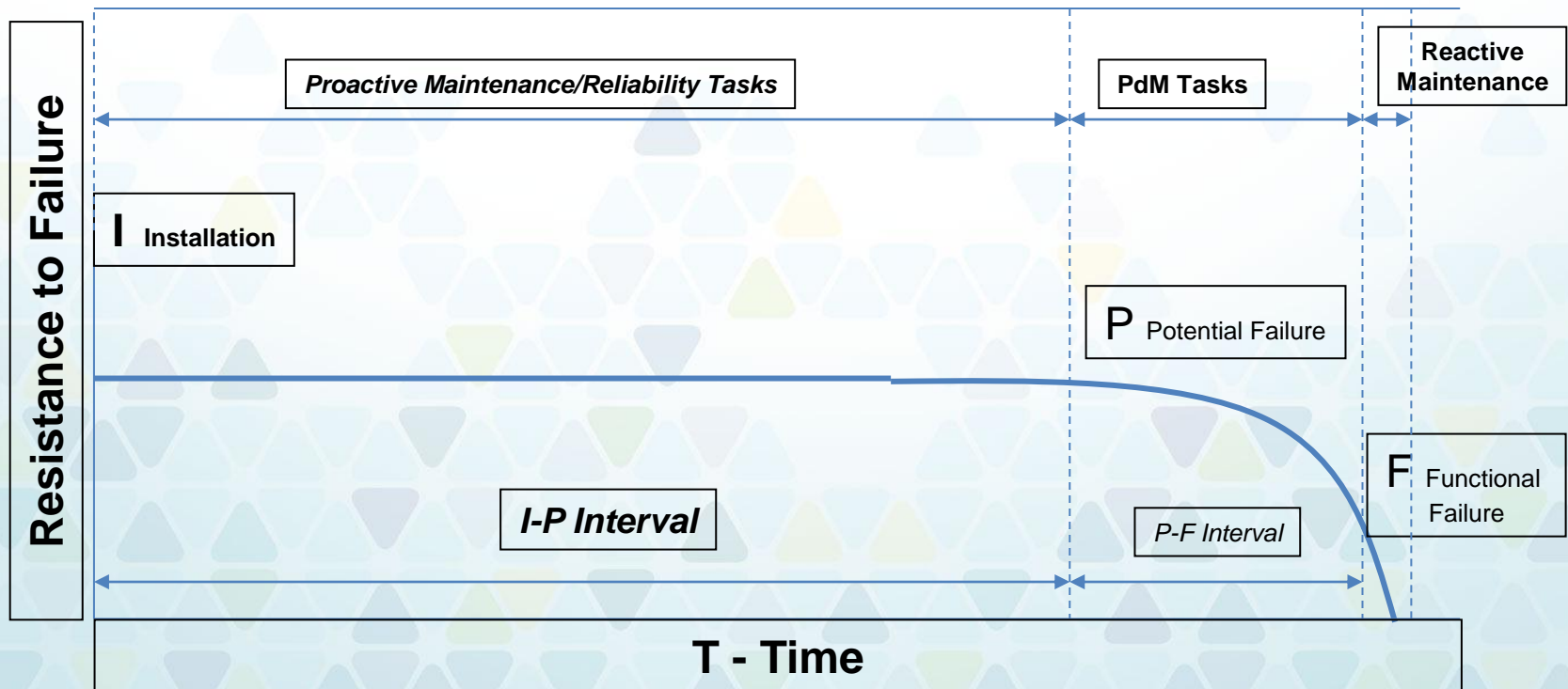
Inspections / Condition Monitoring

- Continuous Monitoring
 - Algorithm for alarm
 - Alarm Reporting
- Tool Inspections
 - Vibration; Infrared; Ultrasound; Thickness NDT
 - Training Criteria / Qualification
 - Frequency
- Sensory Inspections



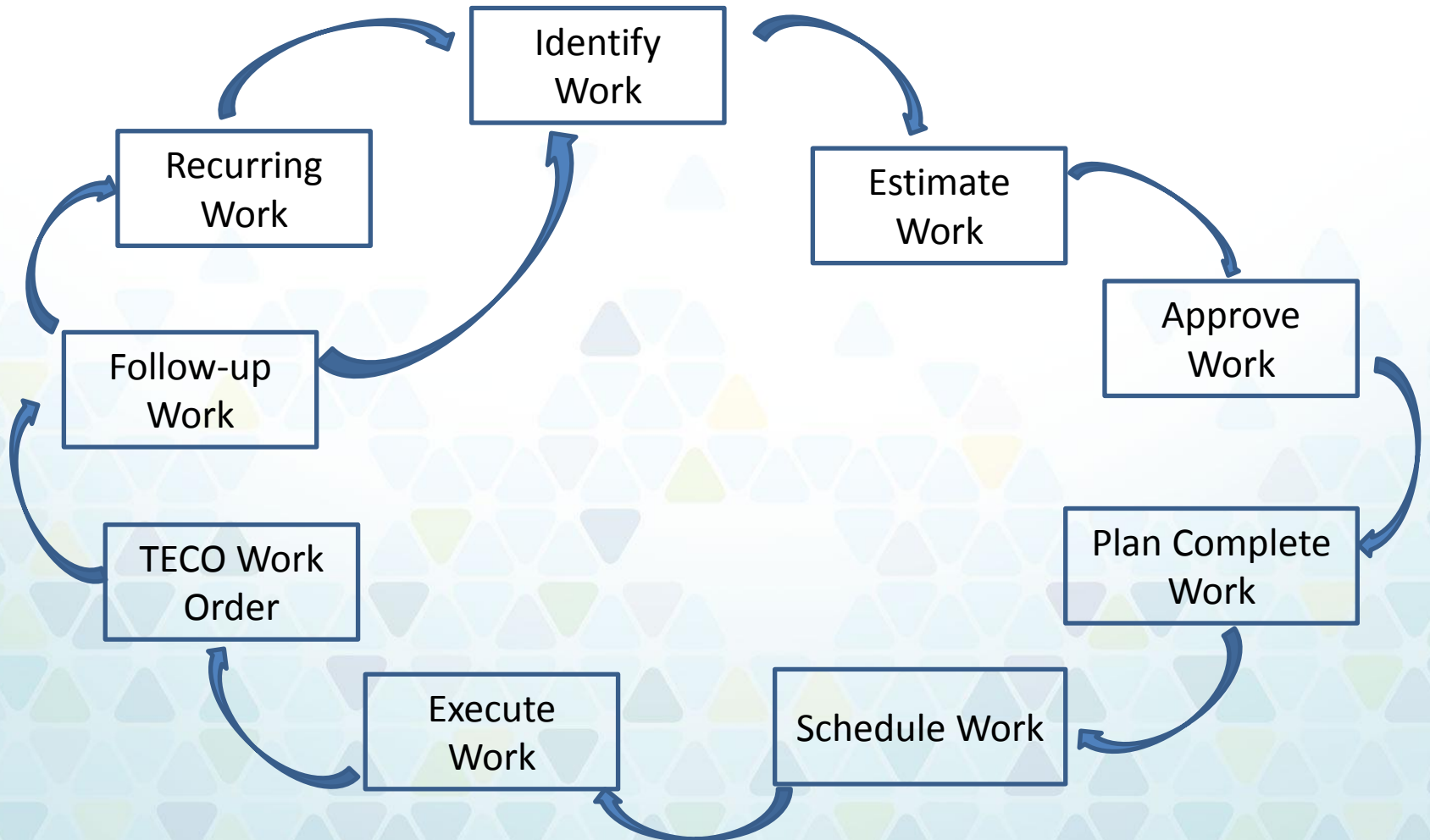
Uptime / Availability

- Mean Time Between Failure (MTBF)
- Mean Time to Repair (MTTR)





Work Execution Management



Organizational Structure

- Staffing/ Work Roles





Business Processes

- Map RACI / Swim Lanes
 - Responsible
 - Accountable
 - Consulted
 - Informed
- Reliability Plan
 - Involve everyone in understanding the system
 - Expectations
 - Publish metrics



Continuous Improvement

- Precision Maintenance
- Engineering
- Data Mining
- Root Cause Analysis
- Metrics / Steering the Ship
- Communication Plan



Current State

- Determine barriers to vision
 - Equipment Health
 - Access to Equipment
 - Organization / Responsibilities
 - Skills
 - Organizational Support



Define Future State

- Write down plan
- Define trigger to move to next step
- Constantly refer to the playbook
- Be prepared for resistance
- Short-term vs. long-term costs



Determine Metrics

- Set up CMMS to give them
 - Mean Time Between Failure (MTBF)
 - Schedule Attainment
 - On Time Work Completion
 - % Work Emergency
 - Downtime
 - Mean Time to Repair (MTTR)
 - Number of Stops/Defects



To Pilot or Not To Pilot

What Good Looks Like

- Is there enough coverage?
- Is the frequency correct?
- Is there a Process Quality standard?
- Is there a Personnel Quality standard?
- Is there consistency of execution?
- Is it efficient execution?
- Is performance improving?
- Is there an innovation or corrective action process?

Everyone Involved

- Is everyone included?
- Do all colleagues have a role?
- Is success critical to everyone?
- Are pilot boundaries reflective of overall operation?
- Is work prioritized to reflect new goals?
- Do you have the manpower resources to manage the entire operation?



Data Mining

- MTBF
- Bad Actors
- Population
- Continuous Improvement

Metrics are essential to tracking progress and determining when to make corrections to the activities around reliability



Develop a Plan

- Write down the plan
- Publish metrics regularly
- Organize to the new work rules
- Believe in your plan
- Budget for initial costs



Strategy to World Class Reliability

- Define your Vision
- Project plan to achieve vision
- Organize resources to support plan
- Train to meet expectations
- Define triggers to ensure progress



Questions?

Kate Kerrigan
Operations Director

