

Bearing Reliability – It's a Journey



Where are you headed?

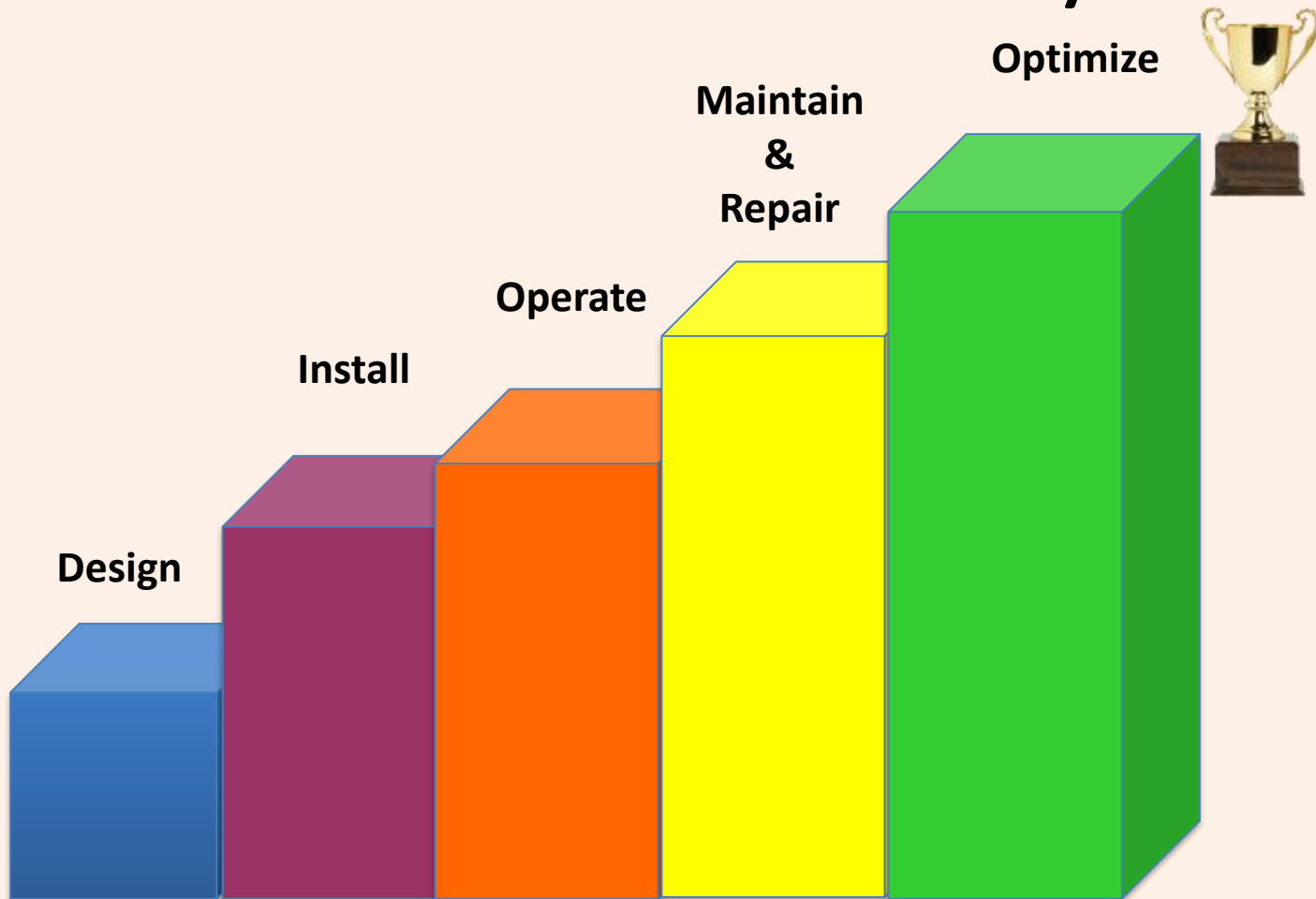
**“If you don’t know
where you are going,
then any road will get
you there”**

-Lewis Carroll

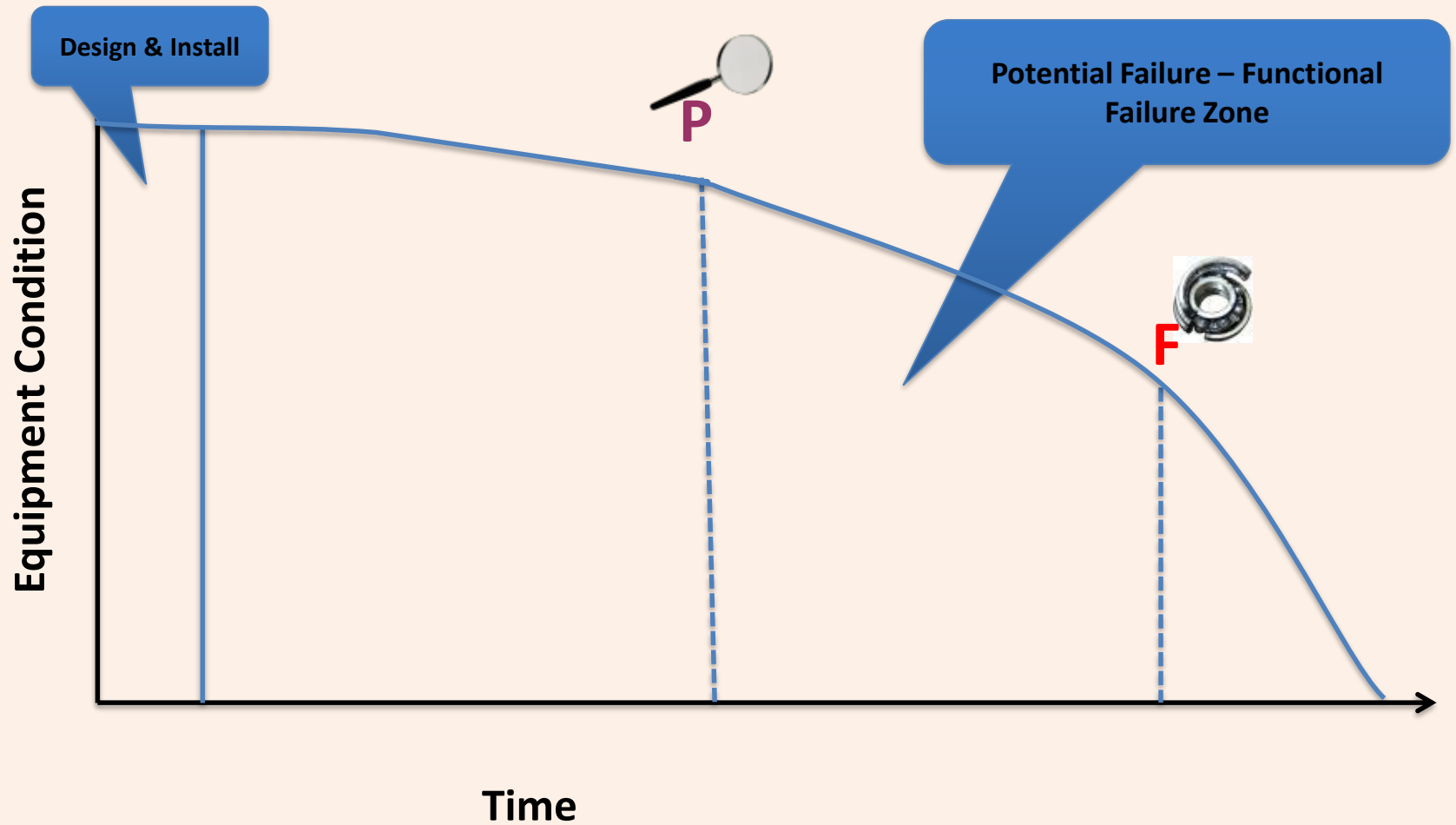
- Corporate Objectives
- Assess Current State
- Develop KPI’s
- Monitor & Adjust



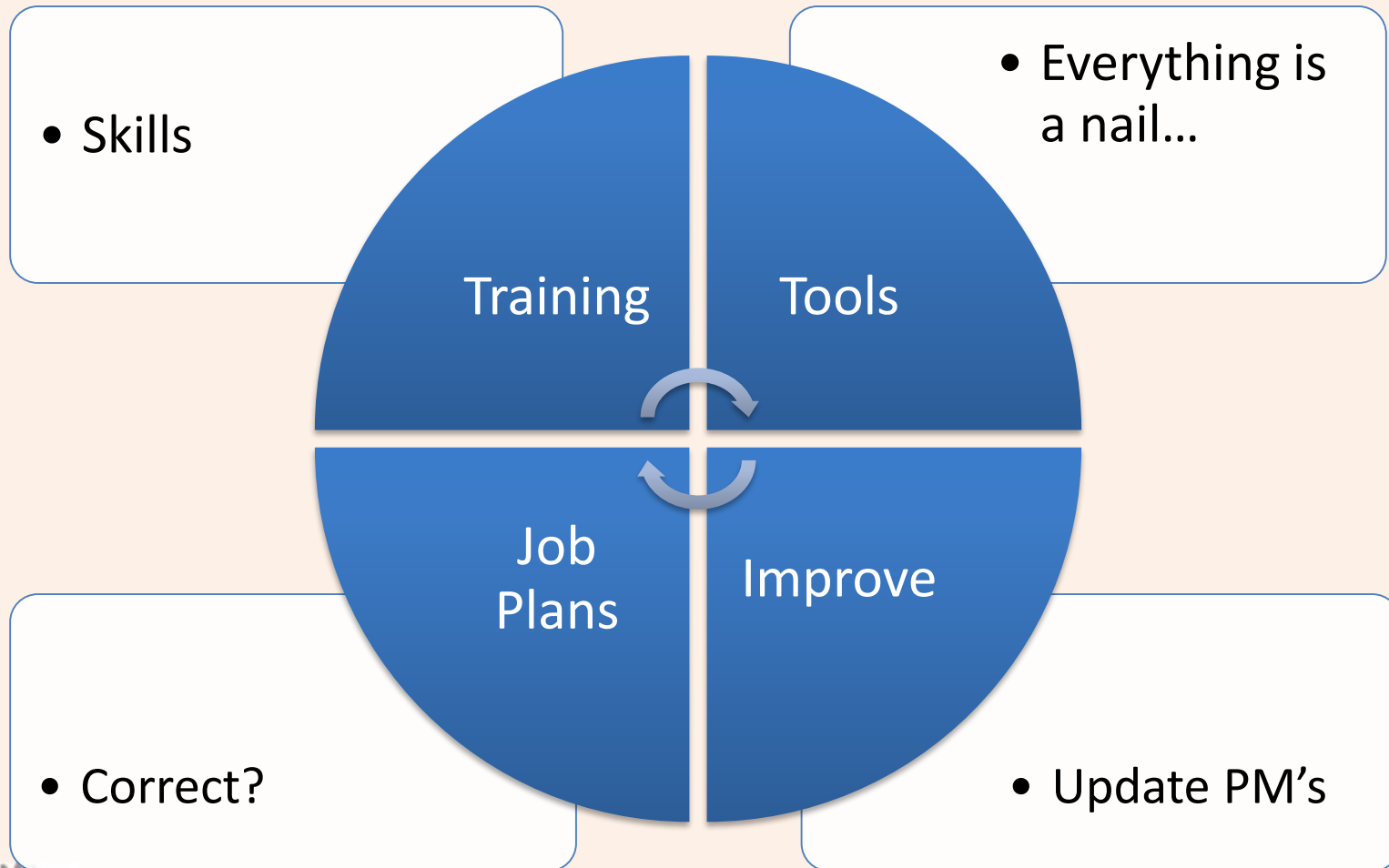
Elements of Reliability



P-F Curve



Precision Maintenance



Design & Install

- Up to 95% of TCO is determined by design & install stage
- Improper bearing selection can contribute up to 10% failures
- Improper bearing installation can contribute 6 – 20%
- Proper training – Bearings, alignment, grouting, etc.
- Target bad actors with local Distributors and Application Engineers
- Feedback from Operations & Maintenance to Central Engineering & Purchasing



Operate

- Overload around 10% of bearing failures
- Lubrication related 50 – 80% of failures
- Misalignment 10 – 15%
- Operations, BEP, Belts Precision Balancing
- Sealing, Lubrication Type, Frequency, Method
- Shaft & Pulley



Maintain & Repair

- Lubrication related can contribute more than 50%
- Assembly errors
- Acceptance Testing
- Complete Program
 - Type
 - Storage
 - Routes and/or Automation
- Precision Maintenance
- Vibration Testing, Electrical



Optimize

- Lubrication
- Design Upgrades
- Online Monitoring
- Reliability Methods
- Automatic Lubrication
- Bearings, Lubricants
- Wireless
- Review effectiveness (and ROI)



Horizon

- Sensorized Bearings
- Cloud Based Support – Remote
- Prognostics
- Vibration, Load, Temp, Lubrication, Speed, Op Hours
- Information anywhere & Additional Support
- Life Extension, not just Defect Detection!



Summary

- Decide where to start your Journey & where you are headed
- Advance technology with no maintenance fundamentals results in money wasted – Like a Cell Phone with no Carrier Service!
- Priority is to push out incipient failure as long as practical (economic considerations)
- Learn from “Bad Actors” & strive to Optimize - Proactive
- Conference Agenda is loaded with practical information on these issues
- Email: dbcg@cox.net

