

Lake States **TAPPI**



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Uptime – Benchmarking and Considerations for Improvement

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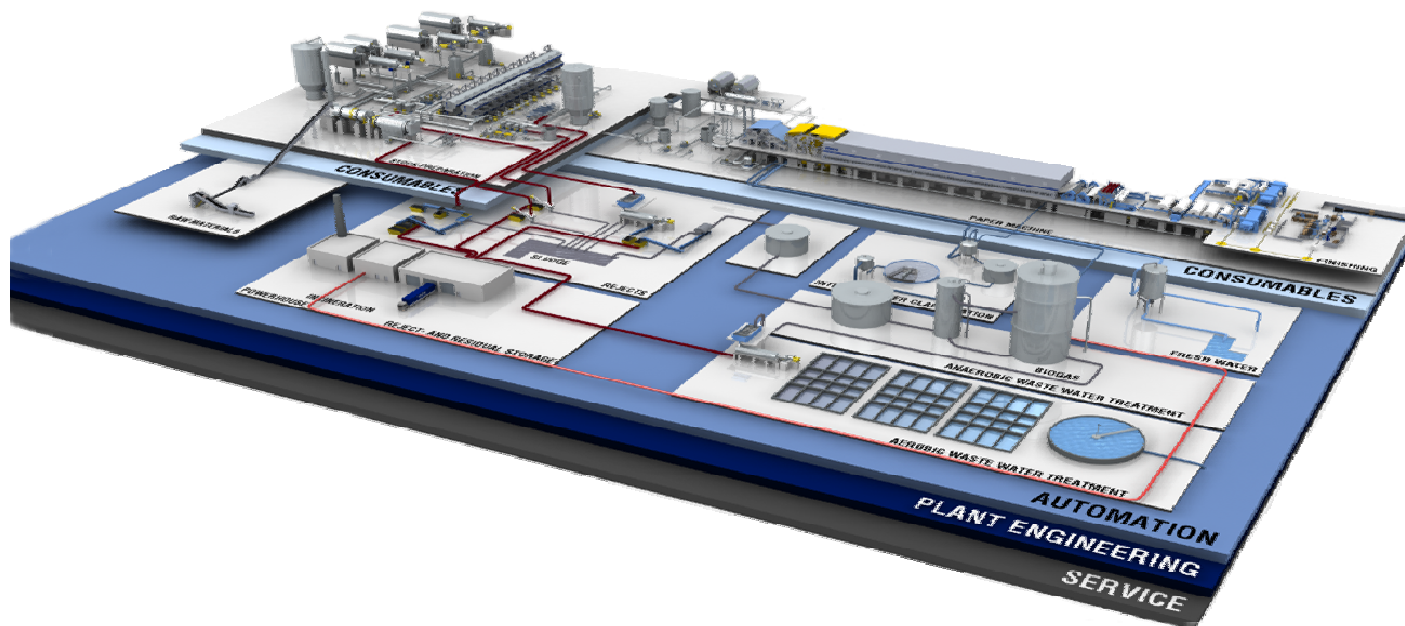


Uptime – Benchmarking and Considerations for Improvement

Agenda

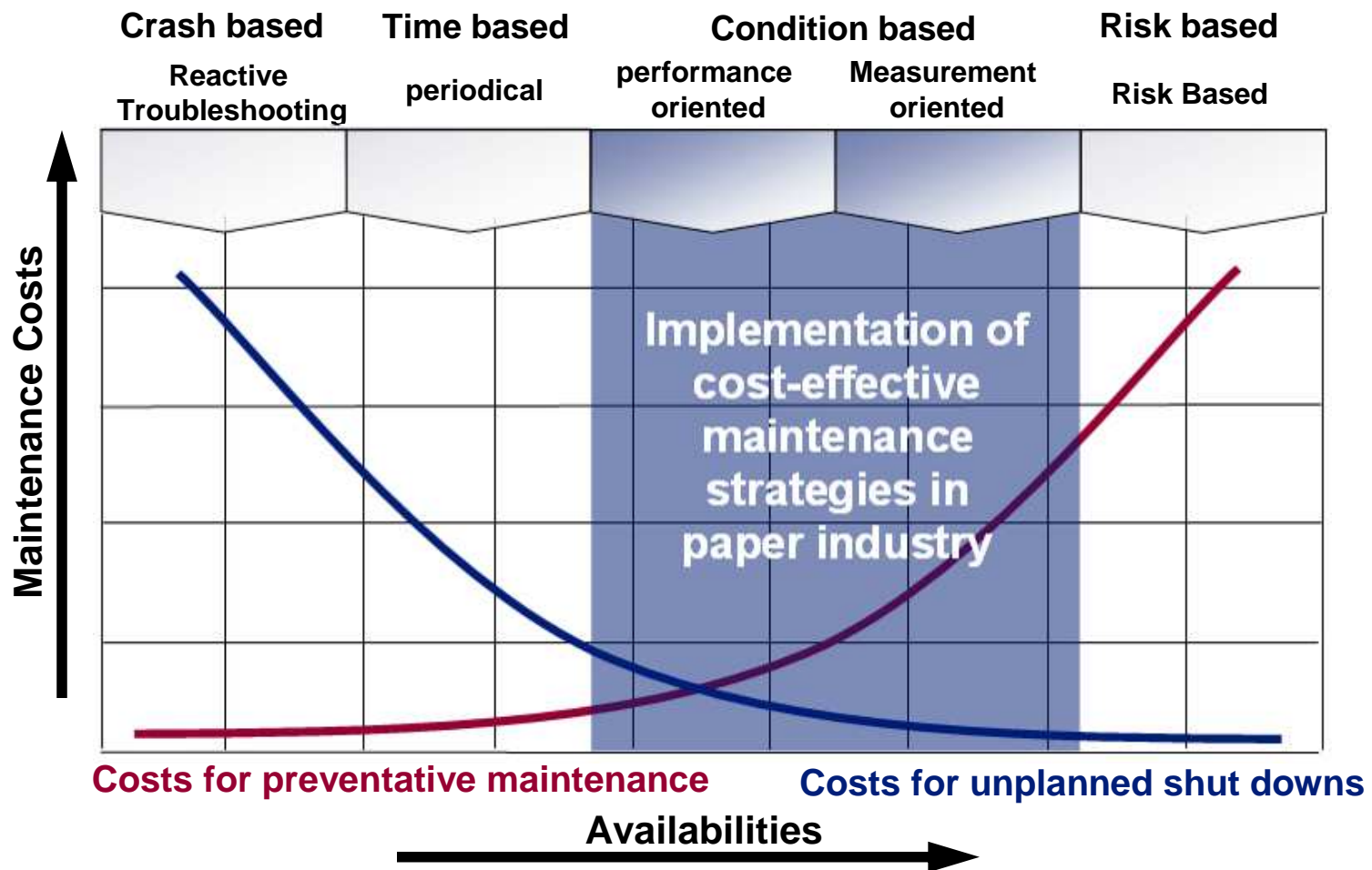
- Mill Environment & Definitions
- Benchmarking
- Tools for Successful Maintenance

Operational Objectives for Mill Maintenance



- Maintain acceptable product quality.
- Keep on the production schedule.
- Minimize production losses, breaks and unplanned shutdowns

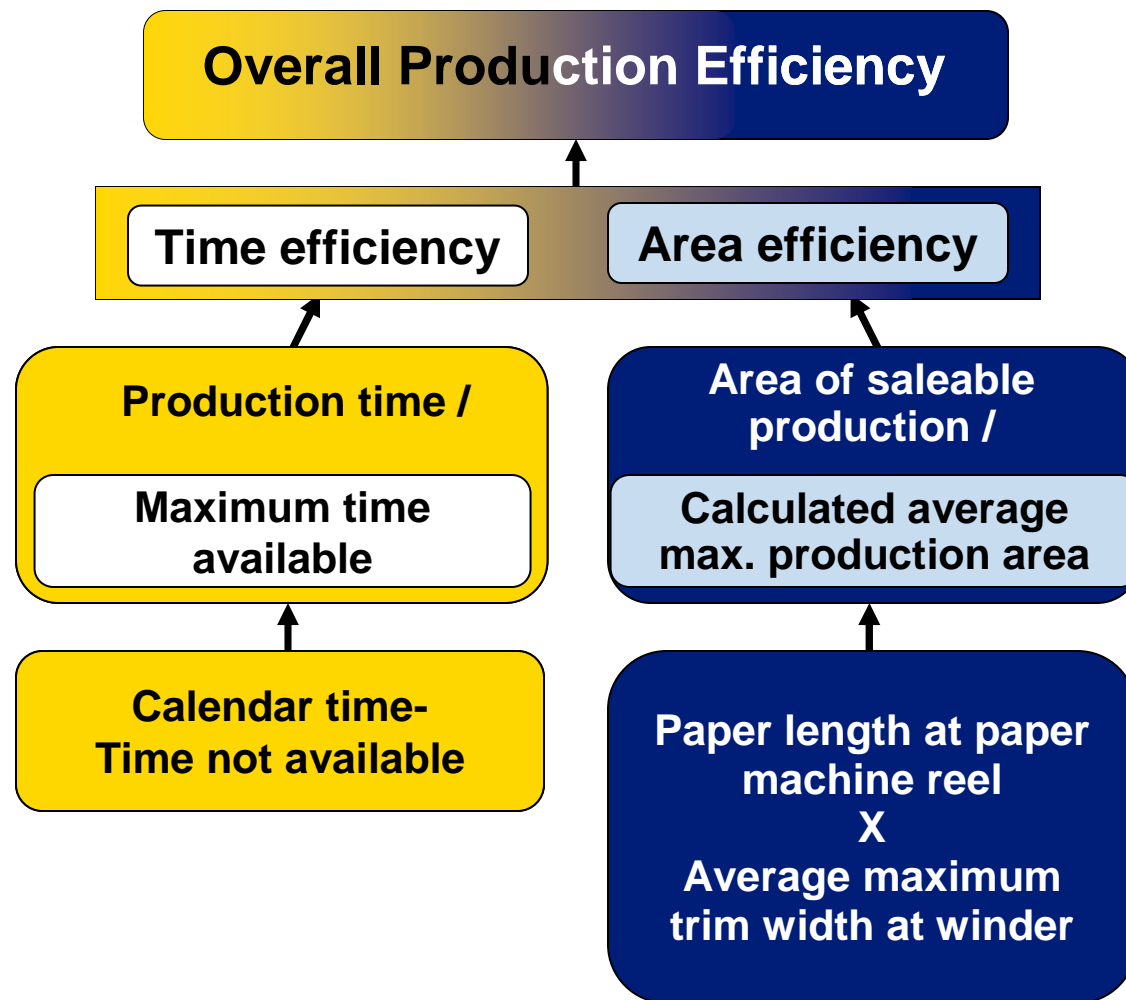
Maintenance Strategies



Paper Mill Maintenance Department Current Status?

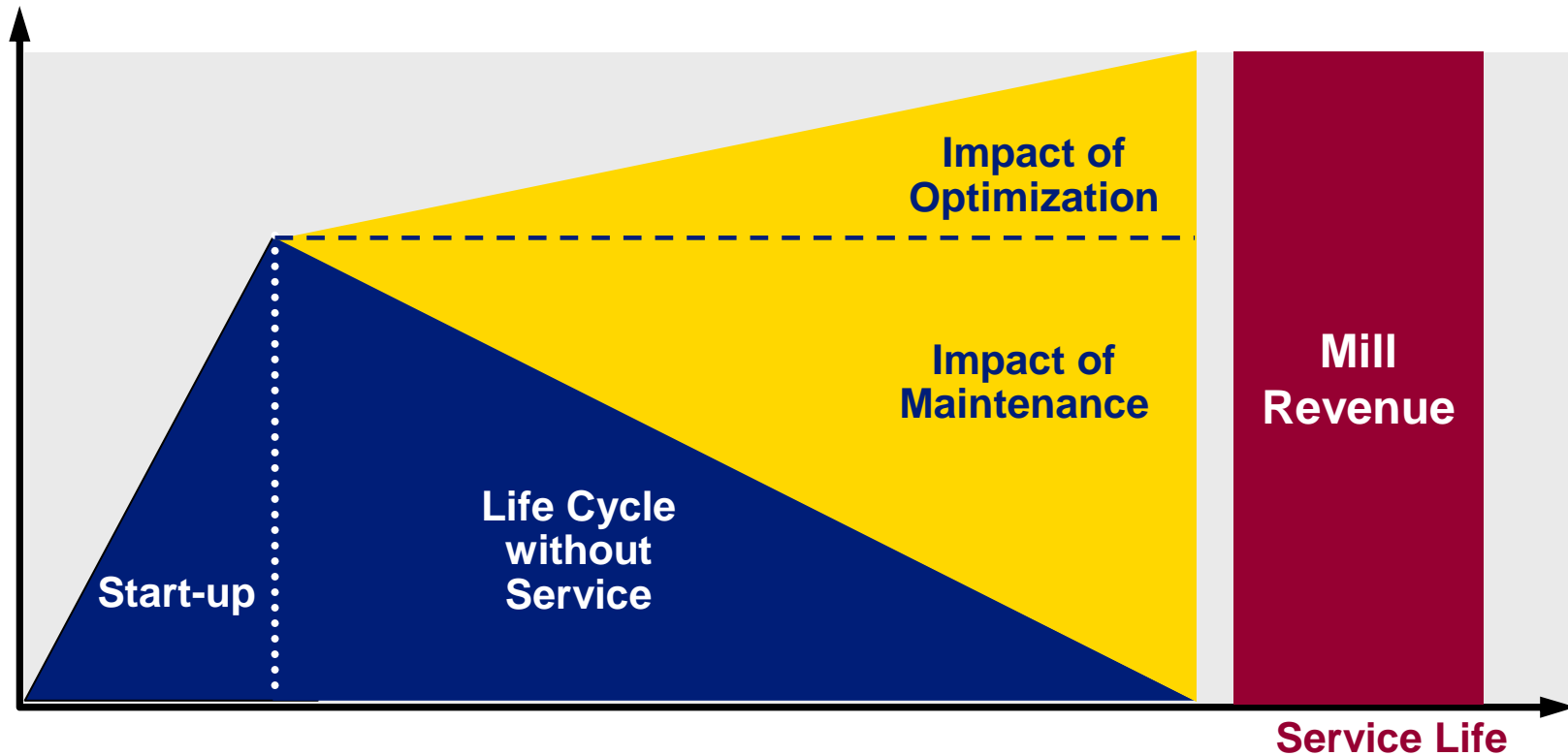
- Budget cuts and changes in personnel structure.
- Preventive maintenance measures have been reduced over time.
- Scheduled maintenance procedures often do not take place and running times stretch beyond their usual limits.
- By necessity, even the practice of running to failure found support again in some paper mills.
- The result >> a decrease in the functionality of the machines and an increase in unplanned downtime.

Definition of Paper Machine Production Efficiency



Service is the Key to Extended Life & High Productivity

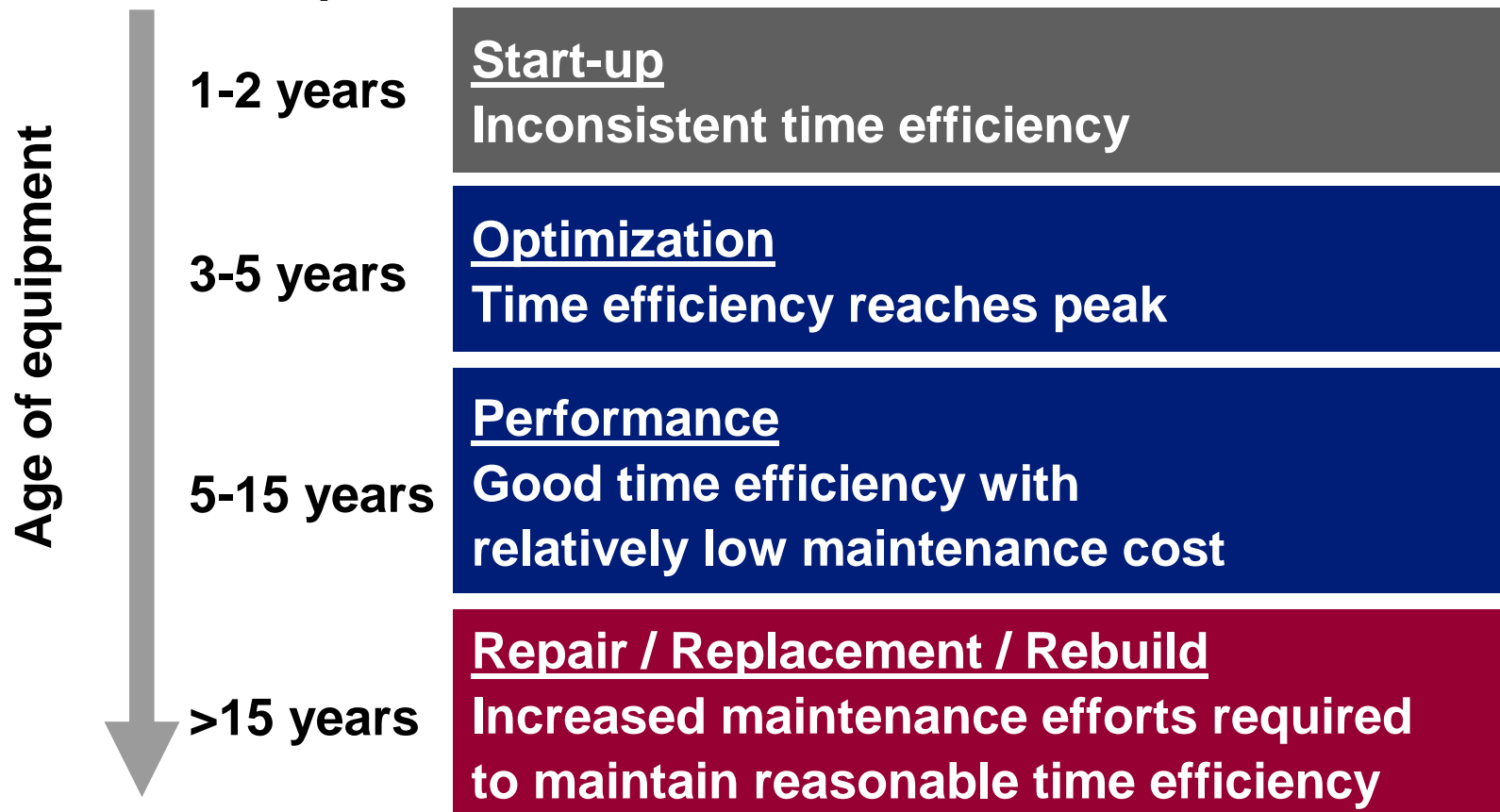
Availability & Production
/ Performance



Service Performance is Key to Overall Performance

Typical (ideal) Time Efficiency during PM Lifecycle

Initial Start-up

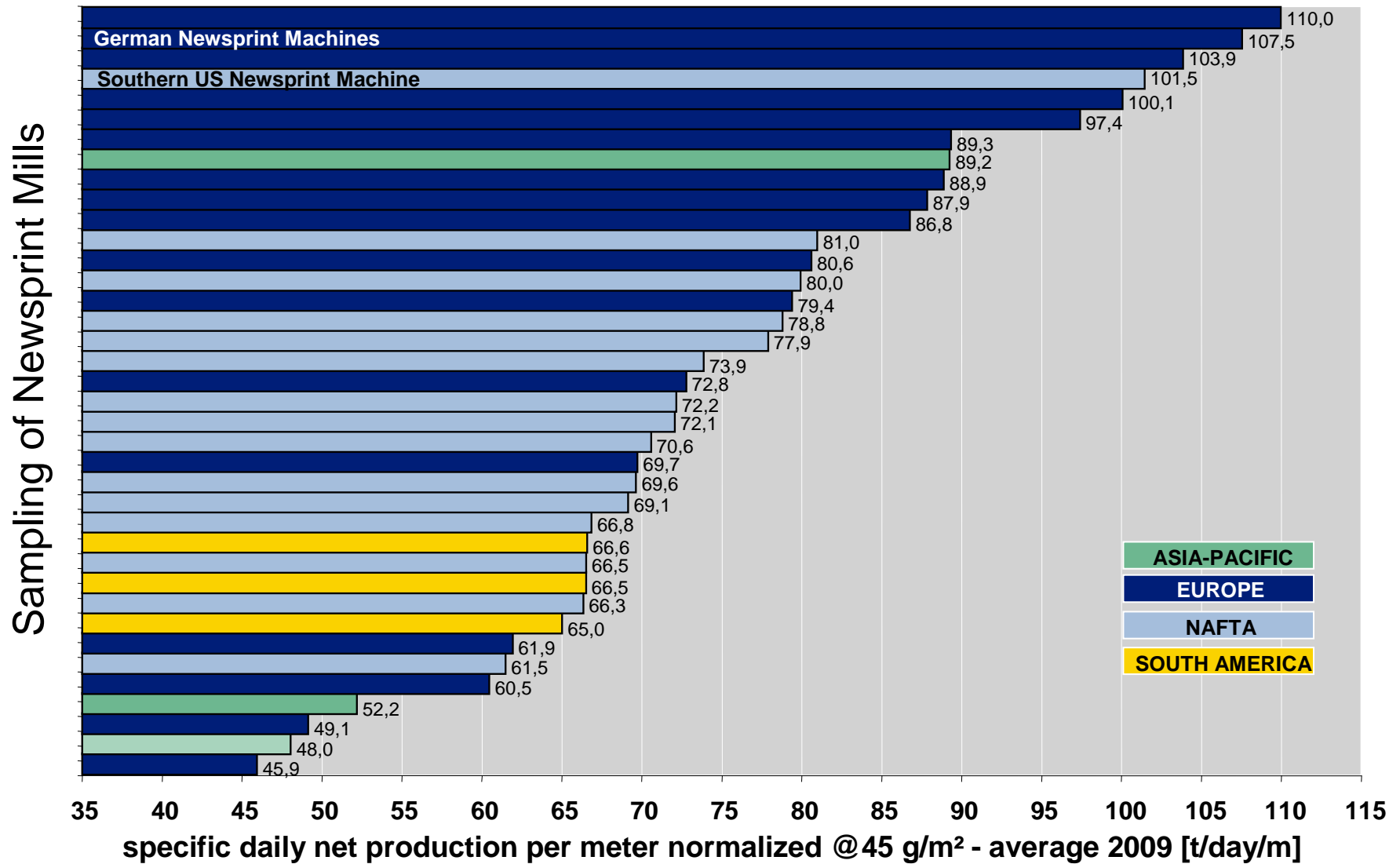


Performance Indicators for Maintenance

- Mechanical Availability / Time Efficiency
- Planned vs. unplanned downtime
- Net production per web width
- Maintenance cost per ton production

Performance indicators need to be long-term
(e.g. yearly average)

Net Output per Meter of Web Width



PM Time Efficiency Benchmarks

Part 1 – PMs for commodity graphic grades

Paper grades:

- wood-containing: Newsprint, directory, SC base paper, LWC base paper
- wood-free: WFU, WFC base paper

Top Performers

>95%

Good / Average

90-95%

Below Average

<90%

PM Time Efficiency Benchmarks

Part 2 – PMs with “online” graphic grades

Paper grades:

- LWC with coating and calendering online
- WFC with pre- and top-coat online

Top Performers

>87%

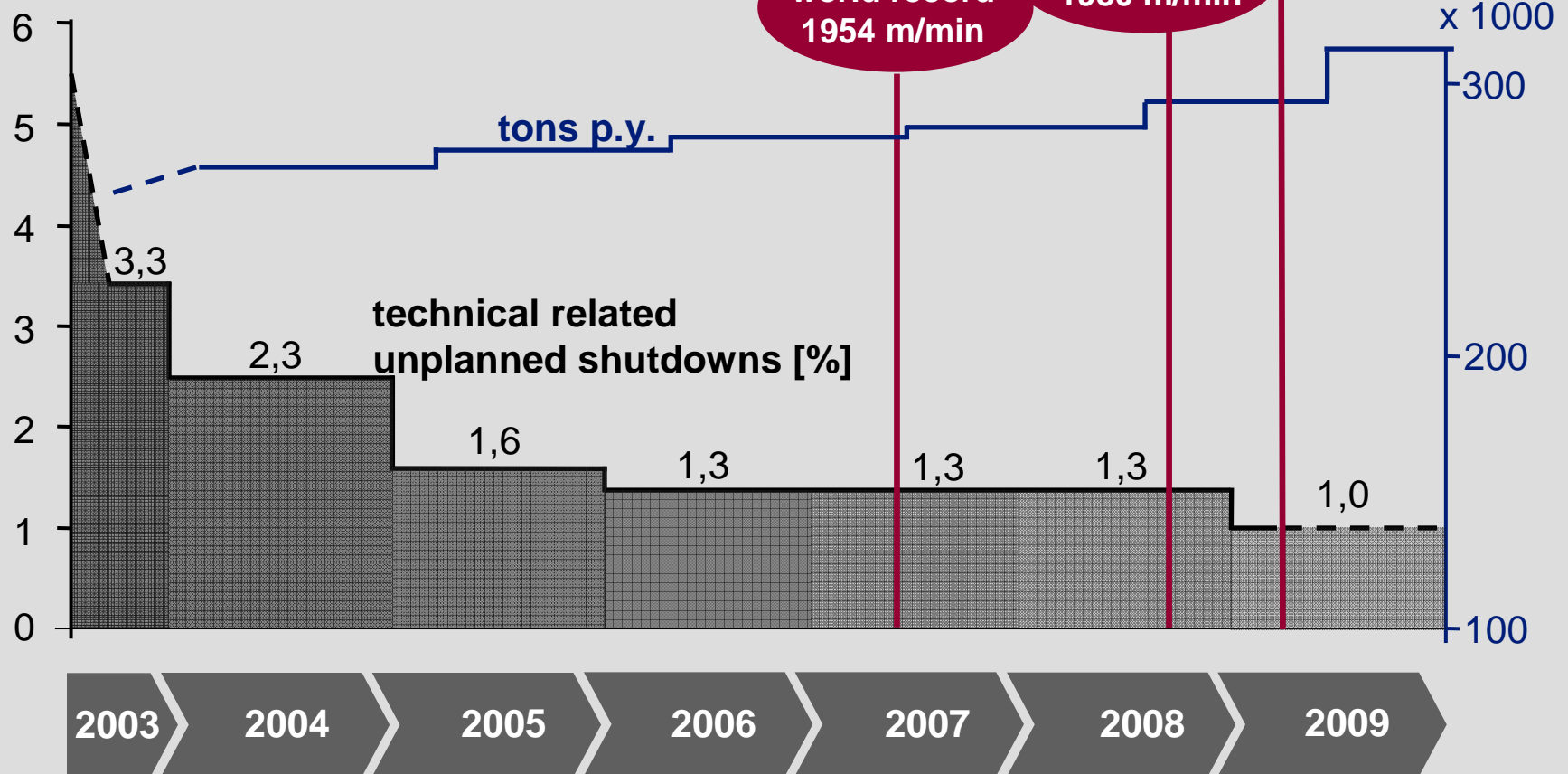
Good / Average

82-87%

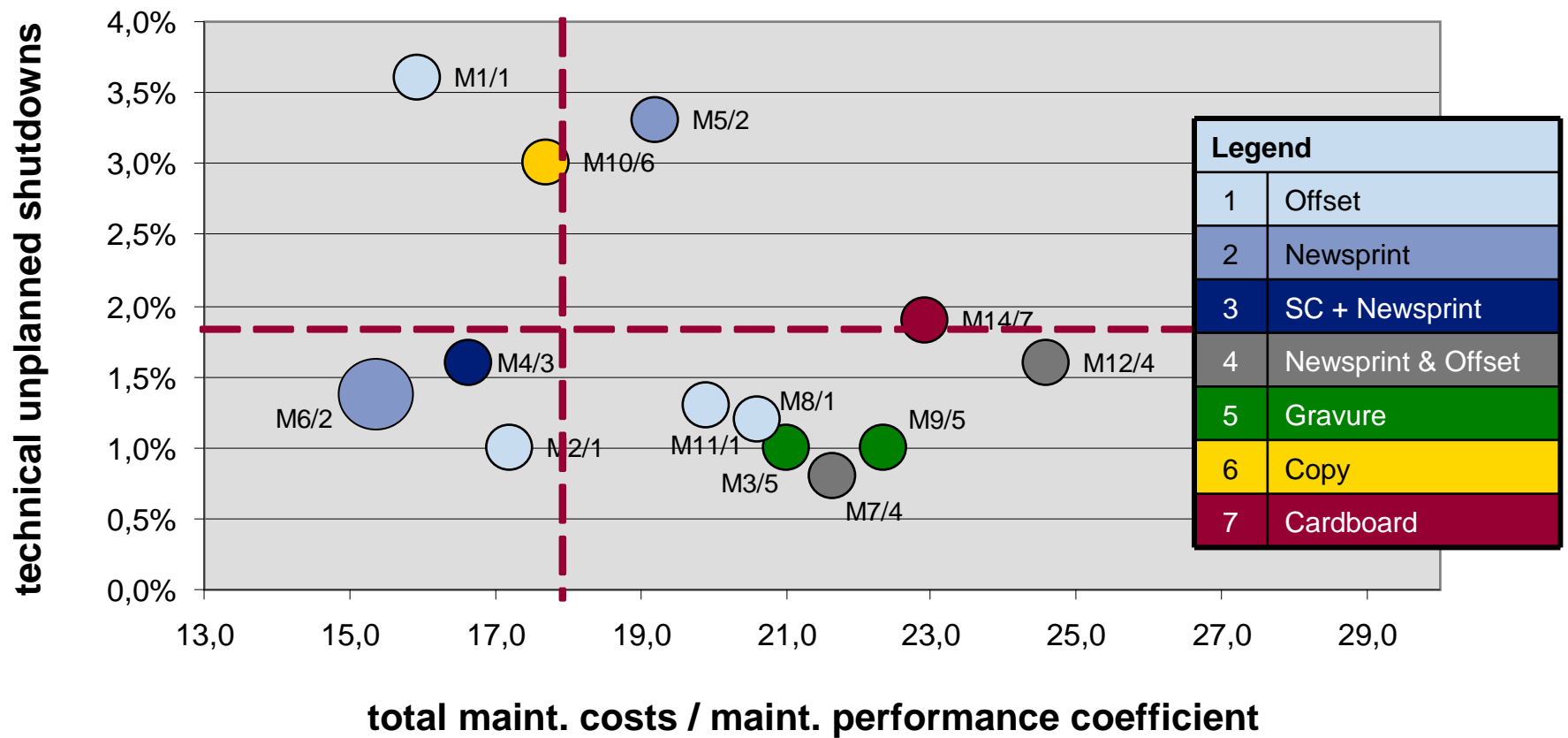
Below Average

<82%

German Newsprint Machine Production & Cost Efficiency

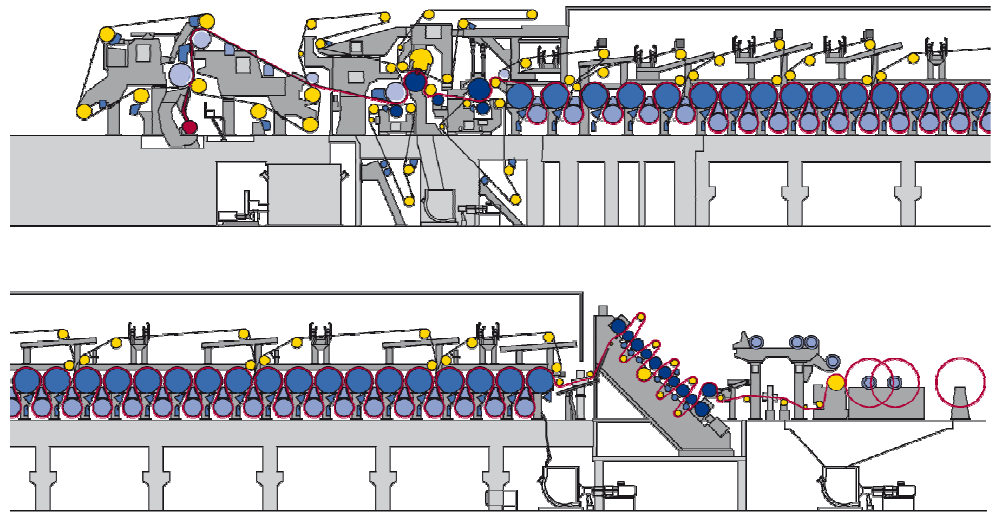


Maintenance Performance Audit – Benchmark



A Tale of Two “Sister Machines“

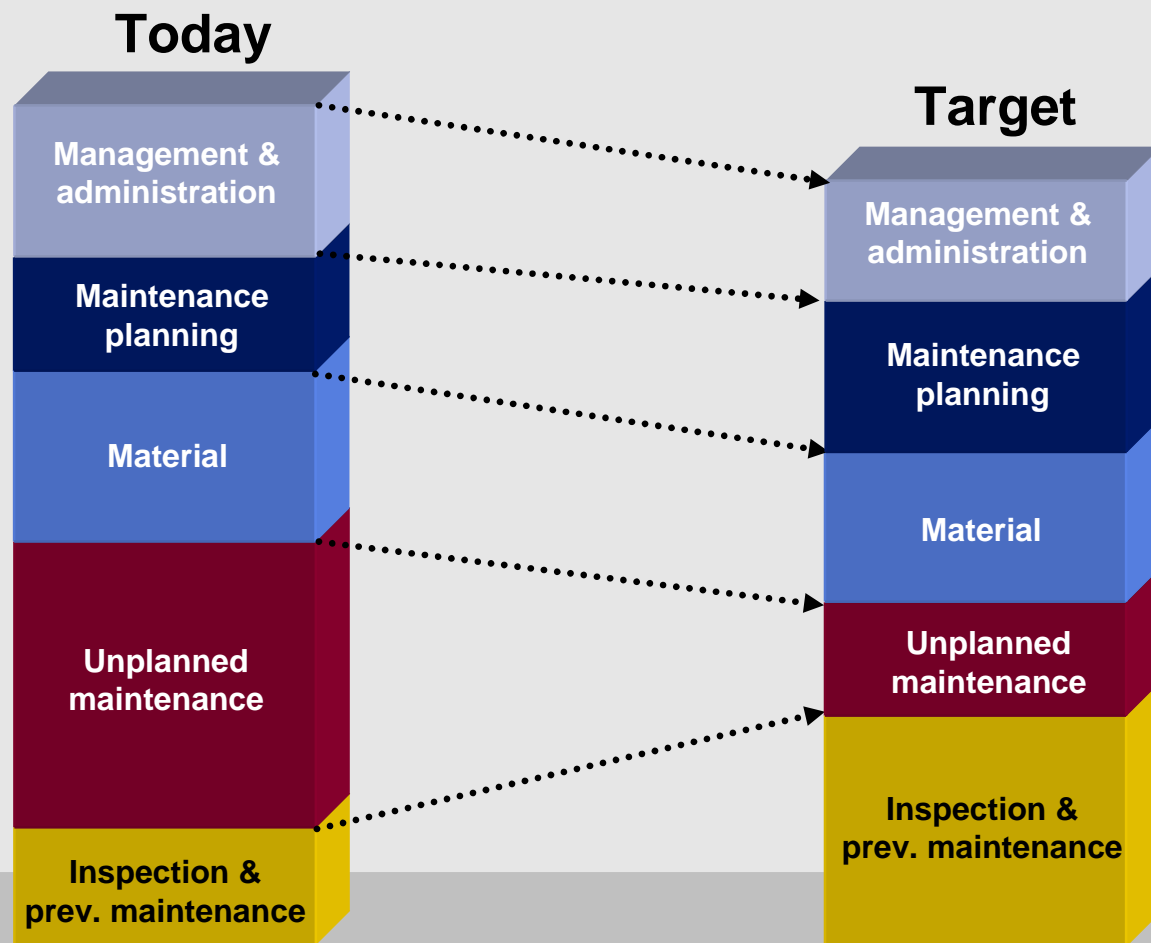
- Same machine concept and supplier
- Same product mix (SC-B) and base weight range
- Very similar furnish mix
- Similar web width and speed range
- Started up within 18 months of each other (~7 years ago)
- Both machines installed in Southern Germany



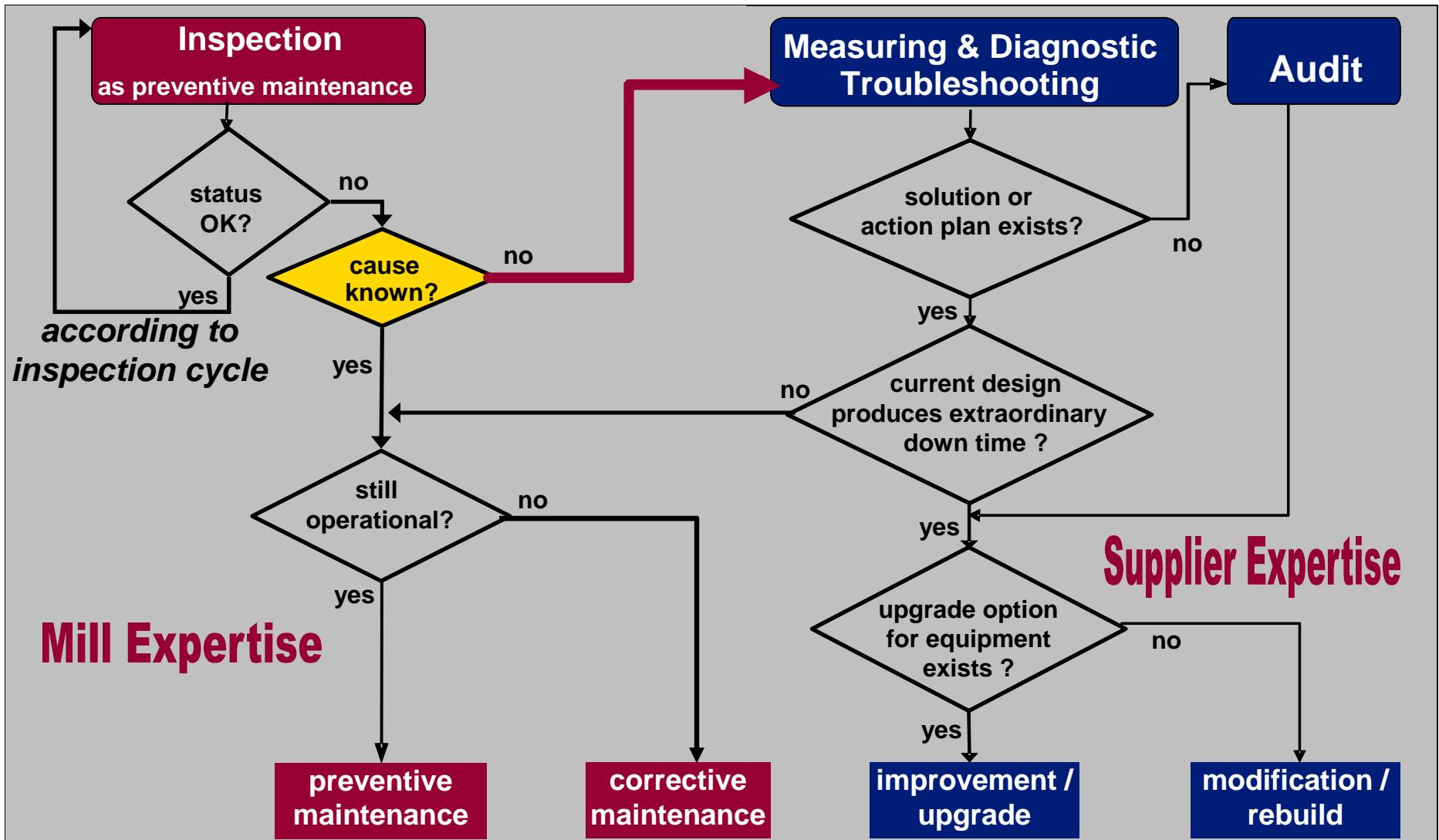
In 2009, Uptime Δ between both PMs was 8% points!

=> Uptime greatly depends on “soft factors”!

Maintenance Cost Reduction Effects by Preventive Maintenance

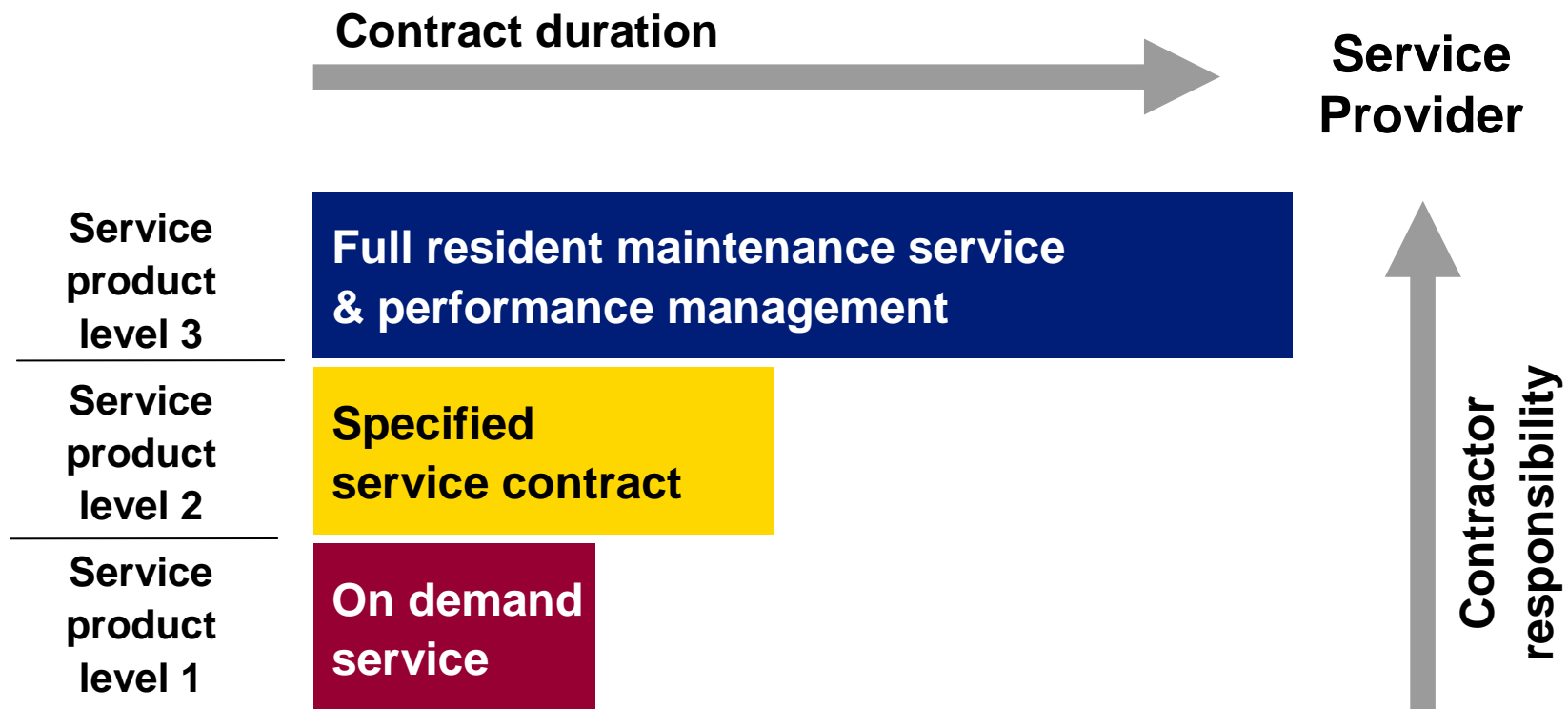


Maintenance & Optimization – Supplier Involvement



Service Level Structure

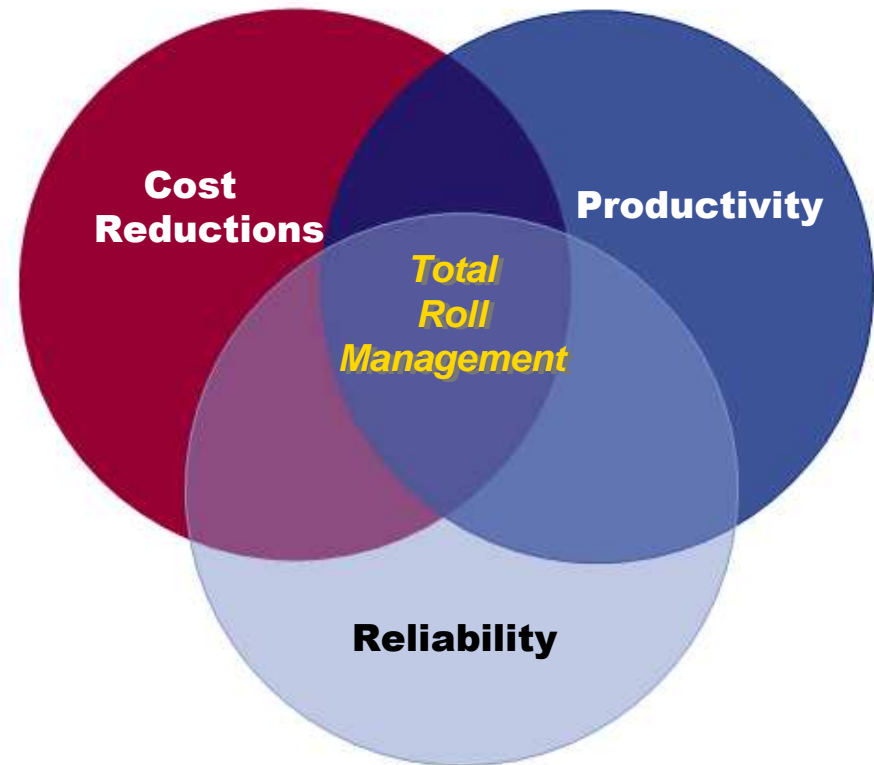
Service Product Levels and Responsibilities



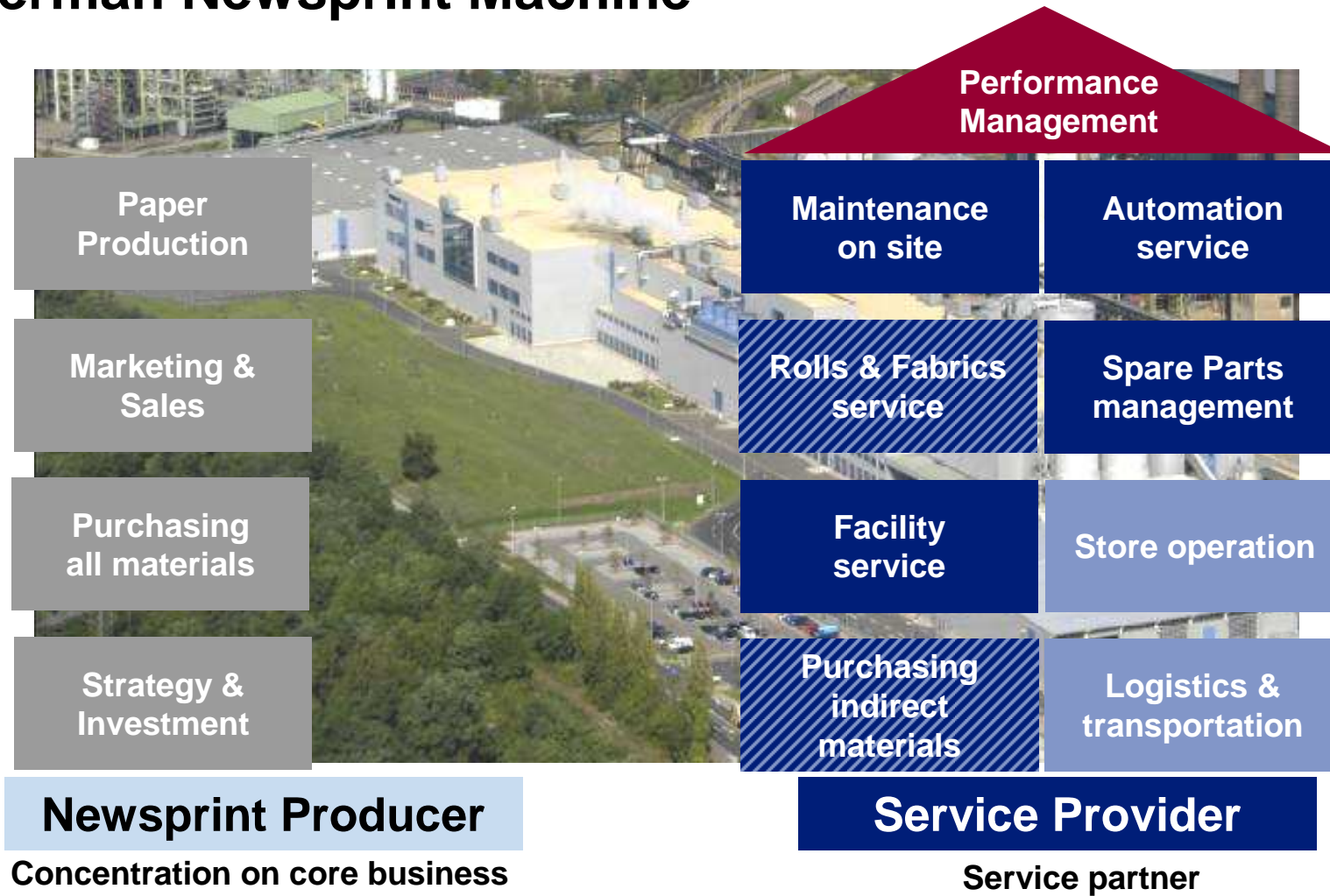
Total Roll Management™

Turn your complete roll care over to the industry's roll expert

- Reduce costs & increase productivity
- Improve roll reliability through consistent repair and roll tracking
- Decrease downtime due to roll failures
- Achieve faster turnaround on roll work
- Benefit from overall process and quality improvements
- No capital required to upgrade or maintain grinders



Reference German Newsprint Machine



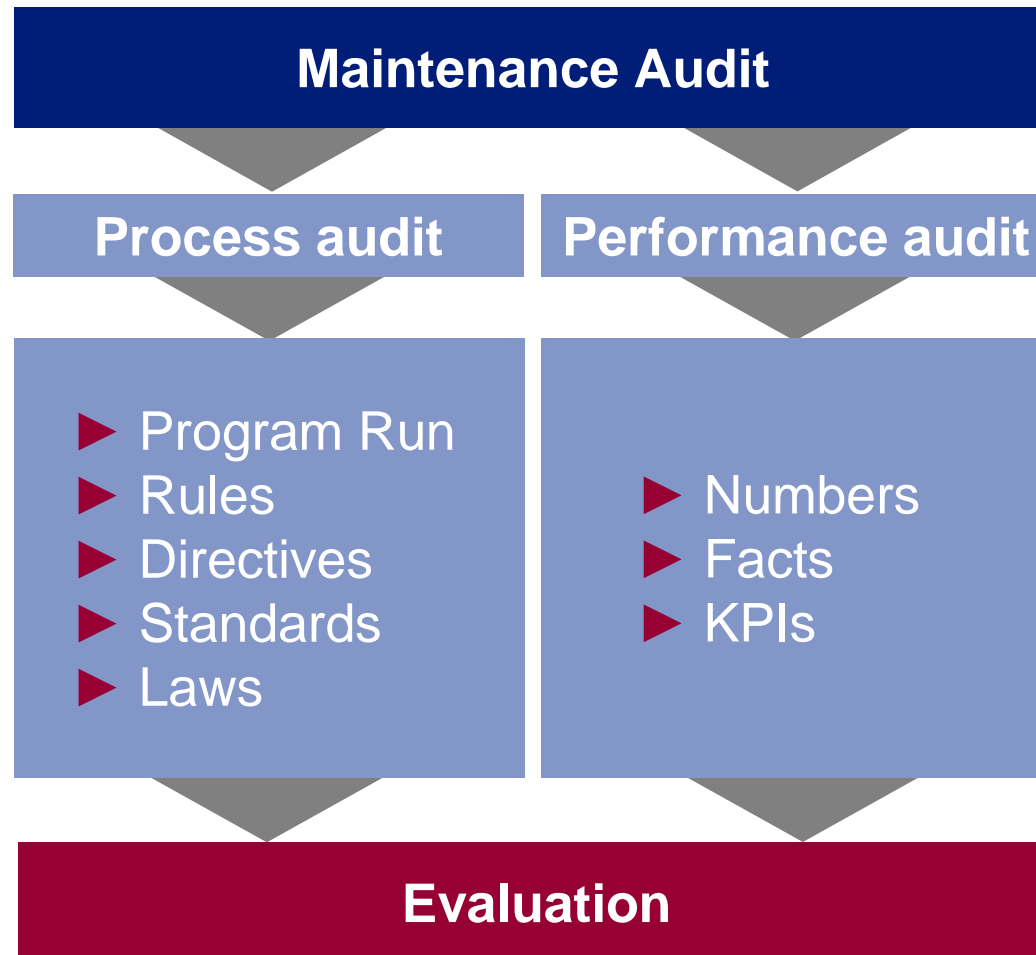
Aspects Influencing Overall Machine Efficiency

- Process stability (fibers, chemicals, broke)
- Right consumables for fabrics, roll covers, doctor blades
- Process monitoring with normal, high & low limits
- Setup of KPI's for each process section, shift, team, each person
- Cleanliness of primary processes: approach flow, headbox, forming, press, coating
- Cleanliness of secondary processes: stock prep, drying, calenders

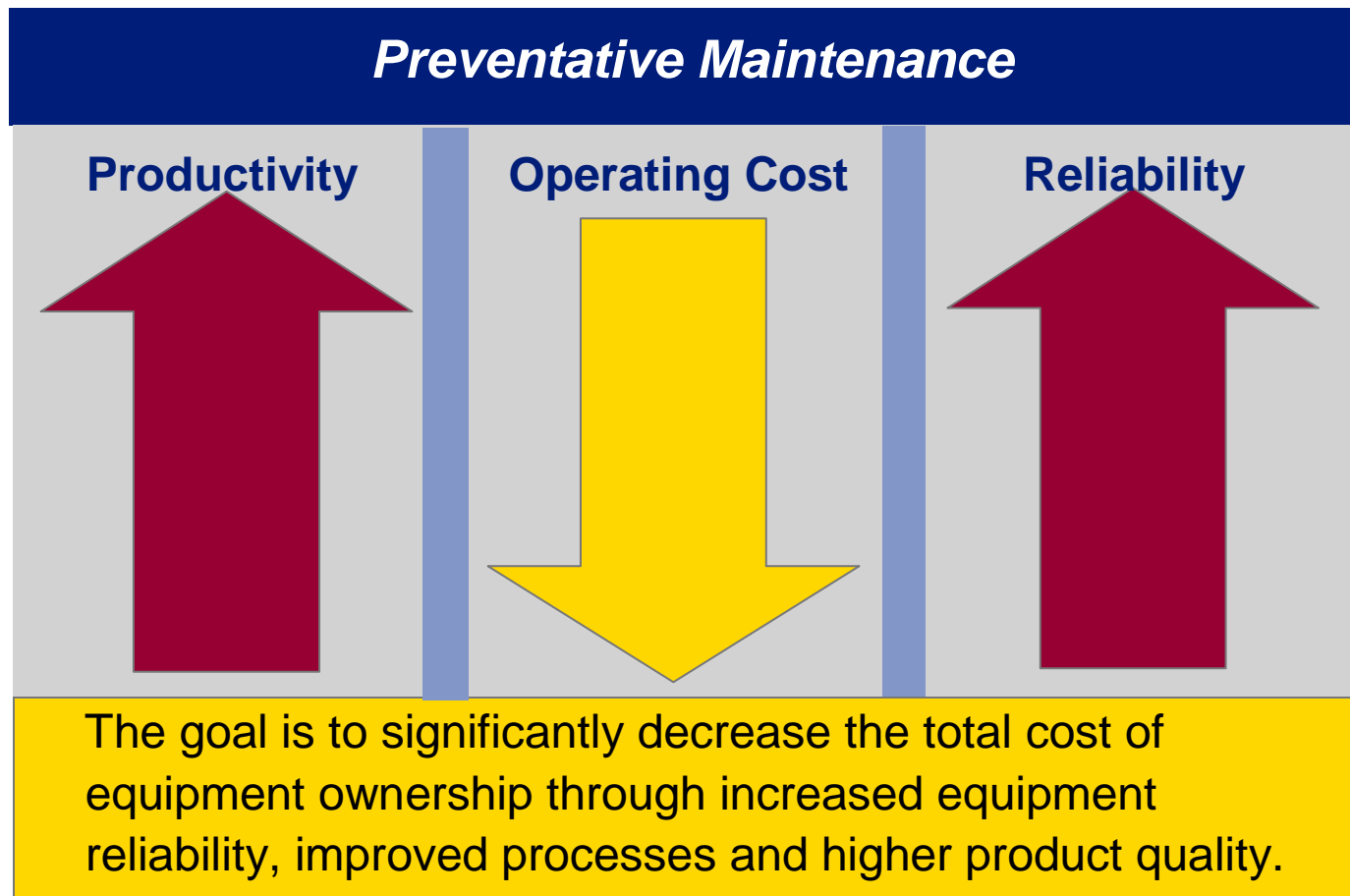
Aspects Influencing Mechanical Availability

- Management priorities (short-term vs. long-term)
- Workforce setup (e.g. multi-trade, operators participate)
- Skills / Training (frequency & quality)
- Relationship with vendors (transactional vs. partnership)
- Preventive maintenance programs
- Effective downtime planning
- Software support (e.g. SAP CMMS)
- Vibration monitoring (permanent sensors or manually)
- Availability of spare parts
- Age of equipment

Audit Procedure



Goals of Preventative Maintenance





Thank You