

TIMKEN

Timken Industrial Services



“Mission critical asset uptime”



Agenda

- Main Focus of Producers
- Major Concerns
- FOCUS on the CoreOutsource Non-Core
- Timken Service Business model
- Operating benefits
- Case Studies



Main Focus of Producers

- **Output Maximization**
 - Increase productivity
 - Reduced downtime
 - Maximize efficiency
- **Cost Minimization**
 - Reduce running Maintenance Cost
 - Reduce asset failures – Repair cost
 - Reduce Purchasing cost
- **Quality optimization**
 - Maintain acceptable quality levels of finished products.
 - Reduce defects on Finished Products
 - Stringent quality audit checks





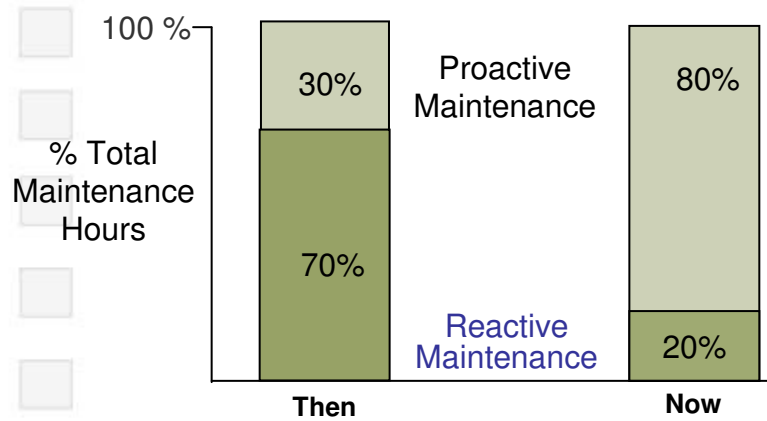
Customer concerns

- Availability and retention of skilled manpower
- Technical understanding of specific equipments for superior maintenance.
- Maintaining Discipline in scheduled maintenance activities.
- Implementation of Predictive maintenance tools
- Using Predictive maintenance data to attend concern areas.
- Following technically correct maintenance practices.
- Identify correct time of Repair.
- Identify the right Vendor for Repair and maintenance
 - Reliability – not Price
 - Response / on-time attendance
- Repair vs New
 - Performance
 - Total Lifetime Cost – not Price

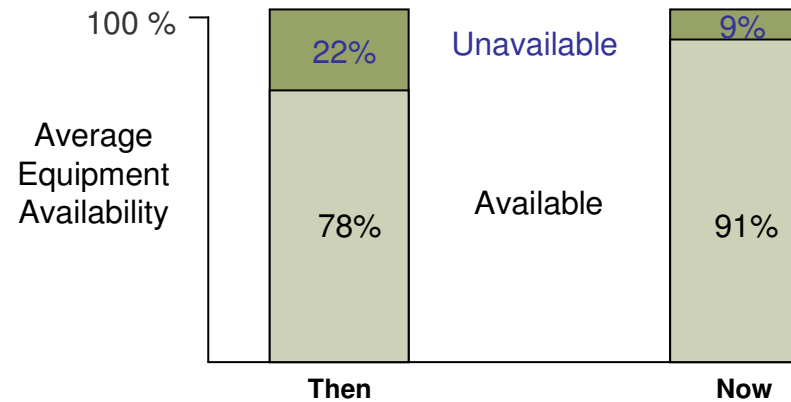




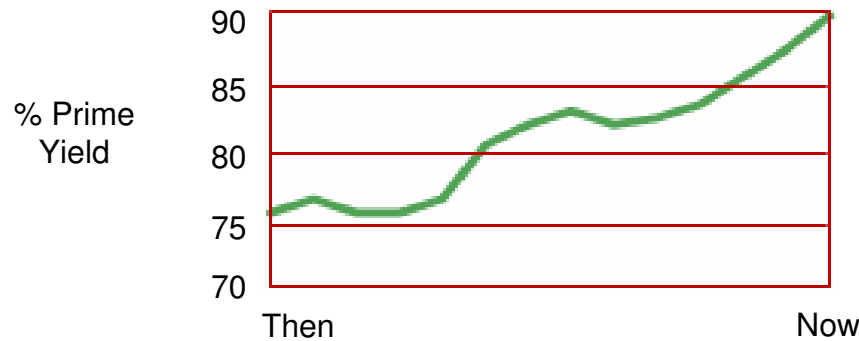
Steel Industry Asset Reliability



Proactive maintenance practices increased from 30% to 80%.



Equipment availability improved from 78% to 91%.

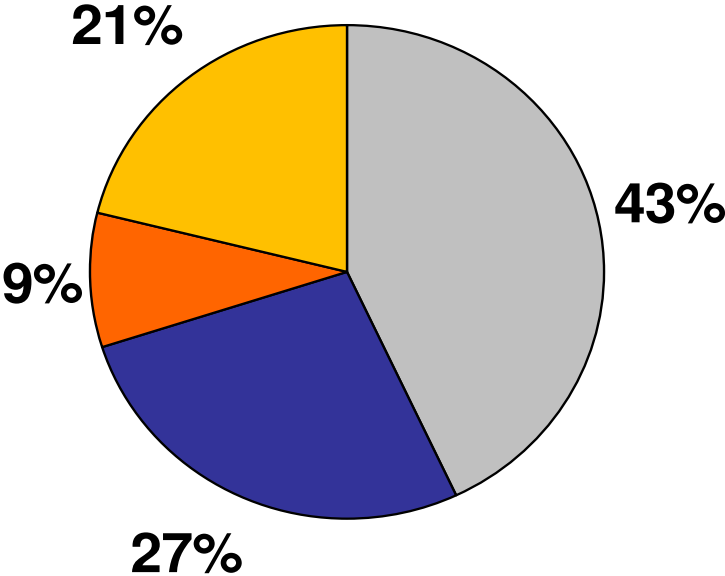


Quality increased from 76% yield to 91%.



Bearing Failures Modes

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We address 91% of Failures through our Services

- Improper Lubrication
- Improper Mounting
- Metal Fatigue
- Vibration, Unbalance, Missalignment



Focus on Core- Outsource Non-Core

- **Concentrate on Core activities (offload non-core activities)**
- **Leave specialized areas to experts**
- **Non-Core activities tend to have peak loads when done inhouse. (Outsourcing allows experts to distribute loads and give cost benefit)**
- **Address skilled manpower recruitment and retention issues.**
- **No need to think about utilization of manpower.**
- **Leverage on supplier's expertise**
- **Recovery is much faster when outsourced due to high level of competency of experts, who have been doing it day in and day out.**



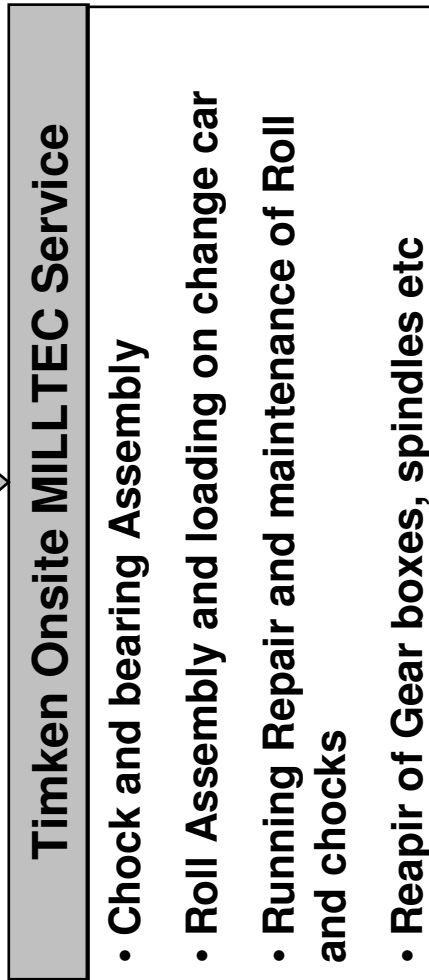
What can be offloaded

- **Predictive Maintenance Services (Reliability based)**
 - Vibration & Temperature
 - Thermography
 - Oil Analysis
 - Online systemsetc.
- **Coolant management system**
- **Comprehensive Roll Shop Management system.**
- **Caster segment maintenance**
- **Repair and Maintenance:**
 - Power transmission system
 - Bearings
 - Machine Tool Spindlesetc.
- **Machine Shop Maintenanceand many more**



**AIM IS TO CONCENTRATE ON CORE ACTIVITY AND OUTSOURCE THE
NON-CORE TO RELEVANT EXPERTS**

SERVICES Model



IBS Facility

- Bearing Repair
- Chock Repairs
- Gear box, spindle and other repairs

Supplies

- Bearings
- Seals
- Grease
- UJ & Other PT Parts

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Reliability Based maintenance

- Reliability Products
- Reliability Services
- Reliability Training

Total Process ownership with the expert / Single contract



The Work Flow

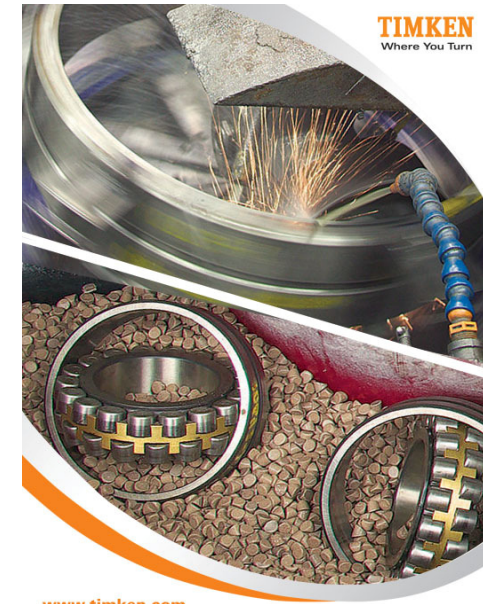
- **Application Engineering**
 - Works with OE for appropriate bearing selection
 - Select the correct Fitting practices and clamping designs (mating component designs)
 - Select Appropriate Lubricants and Sealing
 - Prediction of Bearing Lives
- **Service Engineering**
 - Works with OE and End user in initial Training on various maintenance practices
 - Helps resolve performance issues if any





Industrial Service group

- **Onsite Maintenance Service**
 - Maintenance of various Bearing systems (Housing, Shaft and bearing, Gear Boxesetc.)
 - Supplies of various MRO items – Bearings, Lubricants, Seals, Couplingsand so on.
- **Reliability Service**
 - Implements predictive maintenance tools using appropriate Condition monitoring products.
 - Predicts various damages and helps to take appropriate measures in advance
- **Repair and Rebuild Service**
 - Provides service of repair and rebuild of Bearings and bearing systems like Bearing Housings, Journals, Gear Boxesetc.
 - This can be integrated with the Onsite Service or can be a stand alone service.



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Other Services

- **Training**
 - **Off-site Training at our facility**
 - Design and Fundamentals
 - Application Specific training
 - Reliability Consulting
 - Condition Monitoring
 - **On-site Training at Customers facility on:**
 - Maintenance oriented training
 - Application specific maintenance training
 - Reliability based training
- **Inspection and Certification Service**





Operating benefits

- Single point contract with expert covering supply as well as maintenance.
- Budget on contract charges frozen at the beginning of the contract – no additional outflow due to any consumption abnormalities or currency fluctuation or government Levis.
- Customer concerns addressed:
 - Skilled manpower recruitment and attrition
 - Utilization of skilled manpower
 - Minimizing equipment downtime due to
 - Improper inventory planning
 - Inappropriate maintenance practices
 - Sudden breakdowns
 - Predicting inadvertent failures in advance using predictive maintenance / reliability tools.



Operating benefits

- Timely Repair and Rebuild to control operating costs and maximize lifetime cost of equipments.
- Backend Application Engg, Service Engg & Training support to address performance / maintenance concerns.
- Total Process ownership since failures if any can be addressed by one single party.
- No compromise on supply quality – usage of top class P1 Brand products.
- Easy Billing methodology dependant on Production and hence less complication
- No liability in terms of:
 - Maintenance staffing
 - Replenishment of inventory for optimum performance and minimal downtime.

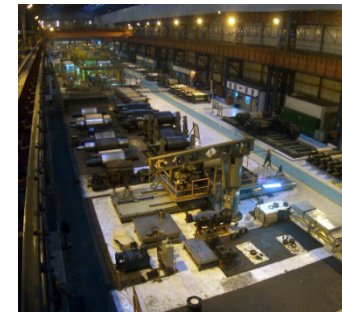


MILLTECSM Improve Asset uptime

The Problem

One of our major Integrated Steel Plant was facing a chronic problem of very frequent bearing failure causing:

- Huge payout towards bearing buy
- Heavy losses in Production due to Downtime
- Damages of adjacent mating components leading to increased Cost



The Solution

- Timken offered a solution of complete Roll shop management service including supply of bearings, lubricants and seals.
- This service was offered on a Price per ton basis.
- Customer accepted the solution and placed a comprehensive supply and maintenance contract on Timken
- Timken supported the mill through the situation to restore the unit to full operation.
- Supported through Application and Service Engineering to enhance maintenance practices as well as altered certain simple design parameters.
- A true partnership to provide the custom solution for the mill.”



The Benefit:

- Bearing Consumption reduced by 78%
- Asset uptime improved by 11% of which 2% was a direct impact of the Service
- Increased Revenue to the tune of Rs 650 Cr of which 125 Cr was a direct impact of the Service
- No major impact on Price increases associated to MRO buy over the years



Timken Finds Cost effective way to improve Coal Pulverizer Journal performance

- **The Problem:**

- One of our Power Plant customer was encountering frequent rejection (within 6 months) in their Pulverizer Journal Assembly
- Equipment Downtime
- Cost of Journal rectification, New Bearings, Seals ...etc.

- **The Solution:**

- Complete Rebuilding of Journal Shaft and Housing
- Replacement of Bearings with new ones
- Correct Setting and Assembly was done
- Complete Rebuild Journal Assembly supplied back to Customer for trial

- **The Benefits:**

- Supplied Journal performed without any signs of failure for 1 year and put back into service after inspection.
- Downtime reduced - estimated gain in production 11 MW
- Cost of Purchase or New Journal Assembly / Journal rectification with Seals and Bearings was saved – Estimated savings Rs 10 Lacs





Timken Reliability Service increases the uptime.

- **The Problem:**

- One of our Power Plant customer was having an abnormal sound at low level in one of its ID Fan, which assists in controlling Furnace pressure thereby removing flue gases from furnace. The ID Fan was running at 480 RPM with 60% Operating point.

- **The Solution:**

- The spectrum of the ID fan Motor drive end as well as pillow block was taken.
- The spectrum showed the looseness harmonics at turning speed Associated with resonance.
- Immediately a shut down was initiated and the load was Shifted to the other ID fan.
- On opening it was found that a bolt was sheared at The cooling fan of the disc resulting in disc displacement creating those Harmonics.
- Appropriate rectification was done and problem closed.

- **The Benefits:**

- A 5 Hr downtime could be avoided
- We could also avoid a potential damage of the whole furnace System due to choking
- A possible environmental hazard was also avoided.





QUESTIONS????

