

Taking Priority on Reliability- Centered Maintenance Solutions

| Agenda

1. Facts & Figures

2. Advantages of Proactive Maintenance

3. Meeting The Demanding Needs
of the Industry

1 | Facts & Figures



Industry Facts & Figures

Assets and Investments That Impacts You

70%

of uptime failures
are chronic

Source: Doug Martin, E.I. Dupont de
Nemours and Company.

25%

unplanned outages
are due to
equipment failure

Source: Improve Reliability with
Essential Asset Monitoring, Nikki
Bishop, InTech, June 2012

8-12%

of product costs
are maintenance
costs in a plant

Source: Constance E. Dyer,
Quality Digest.

Industry Facts & Figures

Assets and Investments That Impacts You

\$11,000
PER HOUR

of downtime costs
for a large natural gas
power plant

Source: KCF Technologies Blog,
March 2013

70%

of maintenance costs are
on valves, pumps,
compressors, exchangers,
piping, vessels and fired
equipment

Source: Improve Reliability with
Essential Asset Monitoring, Nikki
Bishop, InTech, June 2012

50%
HIGHER

failed assets repair
costs when not
addressed early

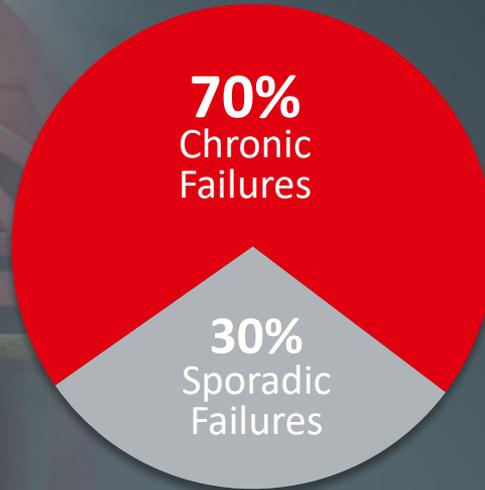
Source: Improve Reliability
with Essential Asset
Monitoring, Nikki Bishop,
InTech, June 2012

Reliability-centered Maintenance as a Top Priority

Taking a Toll on Assets and Investments



Production (Uptime) Losses

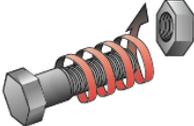
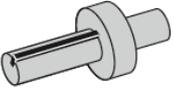


Non-stop operation needs increases the asset's susceptibility to inefficiency and breakdowns.

3 | Advantages of Proactive Maintenance



Top Preventable Downtime Causes In Industrial Maintenance

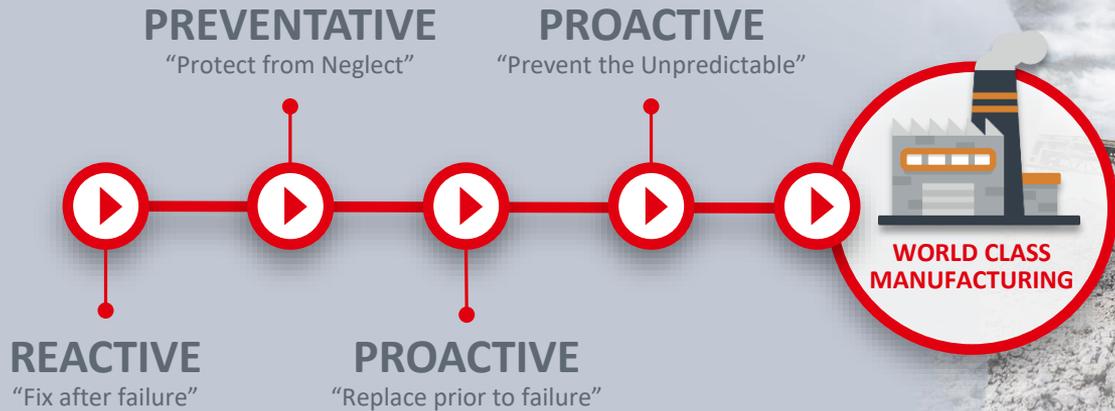
	<p>Fastener Loosening #1 Cause Of Catastrophic Failure</p>	<p>Hydraulic Leaks 1 drop per second @ \$5 per gallon = \$2025 per year per leak</p>	
	<p>Keyway Wallow Downtime + Replacement Parts</p>	<p>Air Leaks 1/16" 100 psi @ \$0.065 per kWh = \$842 per year per leak</p>	
	<p>Spun Bearings Downtime + Replacement Parts</p>	<p>Gasket Leakage Downtime + Replacement Parts</p>	
	<p>Fretting Corrosion Downtime + Replacement Parts</p>	<p>Delayed Repairs Downtime</p>	
	<p>Tape Fouled Valves Downtime + System Flush</p>		



Combat Unplanned Downtime

Putting a Proactive Plan in Place

By maintaining regular maintenance and accurate record of assets and equipment, companies can implement a 'plan of action' in case unexpected problems on the job site occur.



Proactive Plan Benefits Mining Industry

IMPACT OF UNPLANNED DOWNTIME



Poorly maintained concentrator increases energy and maintenance costs



Lost production



\$8M annually

Productivity improvement spending per concentrator



Hydraulic power and belt drive failures cause up to **47%** downtime cause in mining industry

BENEFITS OF PROACTIVE MAINTENANCE



Increased stability



Increased profitability = lower energy and maintenance costs

SOURCE: The Power of GE Predictivity™, No Unplanned Downtime 2014

Proactive Plan Benefits

Power Generation Turbine and Generator

IMPACT OF UNPLANNED DOWNTIME



Lost production



Addition maintenance cycles



\$1M per day

Lost revenue per power plant



For a utility, with average spark spread of \$13.15/mwhr, the lost profit opportunity is **\$45k per day**

BENEFITS OF PROACTIVE MAINTENANCE



Identifying parts that are starting to degrade



Lower maintenance cost and improved availability and utilization

SOURCE: The Power of GE Predictivity™, No Unplanned Downtime 2014

Proactive Plan Benefits

Refinery Processing Technologies

IMPACT OF UNPLANNED DOWNTIME



Cost of repairs for unplanned events = 10 x planned maintenance costs



Interrupted production



Capital asset replacement



\$800k per day

In lost profit for a refinery processing 200,000 barrels per day of crude

BENEFITS OF PROACTIVE MAINTENANCE



Extended production runs



Minimized cost for cleaning and repairs

SOURCE: The Power of GE Predictivity™, No Unplanned Downtime 2014

Proactive Plan Benefits Railway Industry

IMPACT OF UNPLANNED DOWNTIME



Lost train availability
& crew costs



Loss per train per
year



Customer order
fulfillment misses



Network congestion and failures

\$400M per year

In reliability costs due to
mainline failures

BENEFITS OF PROACTIVE MAINTENANCE



Improved network
velocity and capacity



Lower maintenance
costs and improved
availability and
utilization

SOURCE: The Power of GE Predictivity™, No Unplanned Downtime 2014

Proactive Plan Benefits Food Manufacturing

IMPACT OF UNPLANNED DOWNTIME



Breakdown in packaging line



Increased inventory and labor costs



Lost production



\$35 per minute
for every minute a packaging line, running a product contributing 10c each at 350PPM, is stopped

Ten minutes per day
= \$87,500 annually
in lost profit
= 40 hours
in production loss

BENEFITS OF PROACTIVE MAINTENANCE



Reduced energy cost per unit



Reduced maintenance cost



Reduced labor cost

15% Inventory reduction

30% Improved overall equipment effectiveness

SOURCE: The Power of GE Predictivity™, No Unplanned Downtime 2014

| Increasing Reliability

The Number #1 Goal



“Cost reduction does not improve reliability.
Improved reliability results in lower costs.”

-- Christer Idhammar, CEO Idcon.Inc.

3 | Meeting the Demands of the Industry



► Our MRO Coverage



Henkel Provides Complete Solution for Your Industry

Repair, rebuild, maintain and protect your assets with LOCTITE revolutionary solutions, reaching far beyond a single application.



Henkel Provides Complete Solution for Your Industry



Our solutions reduce cost
and increase reliability.



 THREADLOCKING	 THREAD SEALING	 GASKETING
 RETAINING	 ANTI-SEIZE LUBRICANTS	 INSTANT BONDING
 STRUCTURAL BONDING	 PRIMERS AND ACTIVATORS	 RUST TREATMENT & CLEANING

Henkel General Industry Maintenance, Repair and Overhaul (MRO)

MAINTAIN

MACHINERY
ADHESIVES

REPAIR

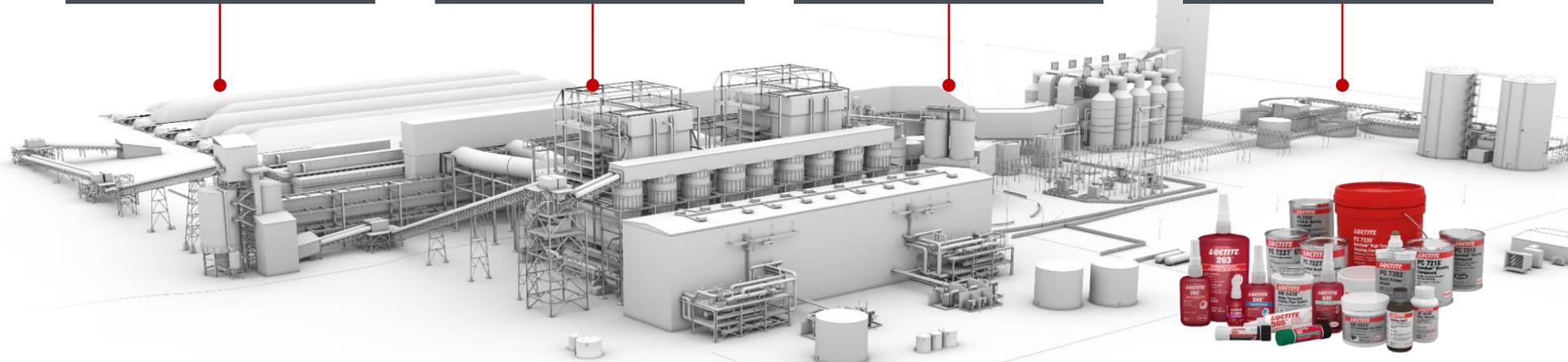
BONDING
& SEALING

REBUILD

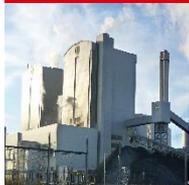
REBUILD & WEAR COMPOSITES

PROTECT

COATINGS, LUBRICANTS
& CLEANERS



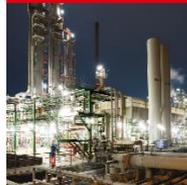
POWER
GENERATION



MINING



OIL AND GAS



STEEL



RAILWAY



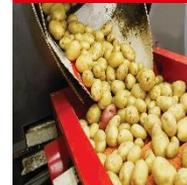
WATER
UTILITIES



PULP AND
PAPER



FOOD
PROCESSING



► Our Expertise



| Our Expertise

See how LOCTITE has proven to be reliable to meet the demands



STANDING UP TO THE HARSHTEST

Failure-free Weapon in Maintenance Toolbox



CUSTOMER	TASK	SOLUTION
A mining company in North America	Machinery, subject to demanding conditions, has to be reliable and withstand running 24/7	LOCTITE 2047 the dual-function threadlocker fastener and lubricant can extend equipment life and withstand harsh environments

| Our Expertise

See how LOCTITE has proven to be reliable to meet the demands



LEAK PREVENTION

Fast, Reliable and Reduction of Downtime



CUSTOMER	TASK	SOLUTION
An oil & gas company in Western Europe	To prevent the leakage at the flange of the gearbox housing	LOCTITE 577 Thread Sealant was used to prevent the leakage and ensure a reliable seal

| Our Expertise

See how LOCTITE has proven to be reliable to meet the demands



WITHSTANDING CONSTANT HIGH IMPACT

Reducing Unscheduled Downtime and Repairs



CUSTOMER

A cement manufacturing plant in South Africa



TASK

A solution is needed to secure the crusher base to withstand continuous high impact vibration



SOLUTION

LOCTITE Backing Compounds withstand crusher vibration and eliminate downtime due to constant repair of the crusher base

Our Expertise

See how LOCTITE has proven to be reliable to meet the demands



WITHSTANDING EXTREME CHEMICAL CORROSION

Reliable Protection of Pipelines



CUSTOMER	TASK	SOLUTION
A leading steel mill account	High costs of replacing pipes due to corrosion that leads to leakage	LOCTITE Polypoxy PS provides excellent UV resistant properties plus good adhesion to prevent corrosion

Our Expertise

See how LOCTITE has proven to be reliable to meet the demands



PREVENTION AND PROTECTION ARE KEY

Reliable Protection from High Temperatures



CUSTOMER

A leading coal power plant



TASK

Prevent seizing of threaded fasteners of turbine casing subjected to high temperatures



SOLUTION

LOCTITE Heavy Duty Anti-Seize prevents seizing and allows disassembly when needed

Our Expertise

See how LOCTITE has proven to be reliable to meet the demands



PREVENT IMPACT AND DOWNTIME

Reliable Protection from High Frequency of Use



CUSTOMER	TASK	SOLUTION
A leading mining account	Nuts of the crusher must be disassembled for disarmed of equipment and could be seized	LOCTITE Nickel Anti-Seize prevents seizing and allows disassembly when needed



BENEFIT NOW

- Is the LOCTITE maintenance reliability solutions something you are interested in?
- If so, reach out to the email at the following slide and you will be contacted back.
- Schedule a plant survey.
- **We will then join you in your efforts to make your plant more reliable, efficient and safe-with reduced costs!**