Eliminate Unplanned Shutdown

With the IIoT enabled
Asset Reliability Management solutions

Neptunus Power Plant Services Pvt Ltd
www.neptunus-power.com

NEPTUNUS
The Machine Reliability Expert

The Context

Today's manufacturing industry:

- Industry 4.0 is catching-up with smart manufacturing

- Companies investing heavily in automation & capacity

- Experts say first upgrade to maintenance 4.0… *but how?*

- Market is flooded with high end data analytics platforms, *but no one shows where and how to get data!*

- Is anyone addressing the *real pain* of unplanned shutdowns?

Neptunus has the solution you are looking for!
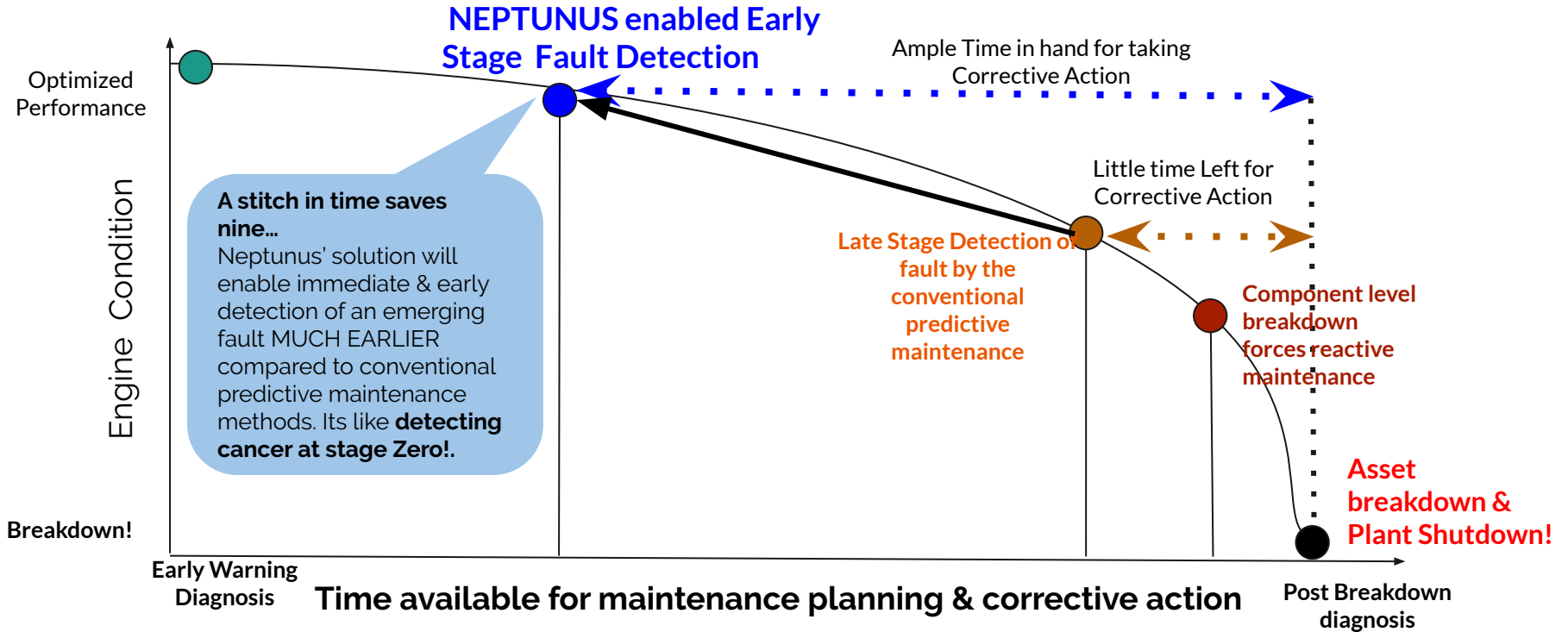
What makes Neptunus different?

- **We address the pain - unplanned shutdowns!**
  Our End-to-end solution engineering approach delivers a process-wide solution and not just fix an equipment. We set the process right!
- **We know the machines better!**
  Strong mechanical background, hands on O&M experience and sound engineering design capabilities
- **We don't do different things, we do it differently!**
  Cutting edge technologies of Torsional Vibration and Holistic Real Time Oil Management, integrated with the IIoT & cloud capabilities
- **We deliver...**
  Asset Reliability Management (ARM) Solution

Industry segments we serve

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Metals

Cement

Mining

Offshore, Oil & Gas

Process Plants

Marine & Defense
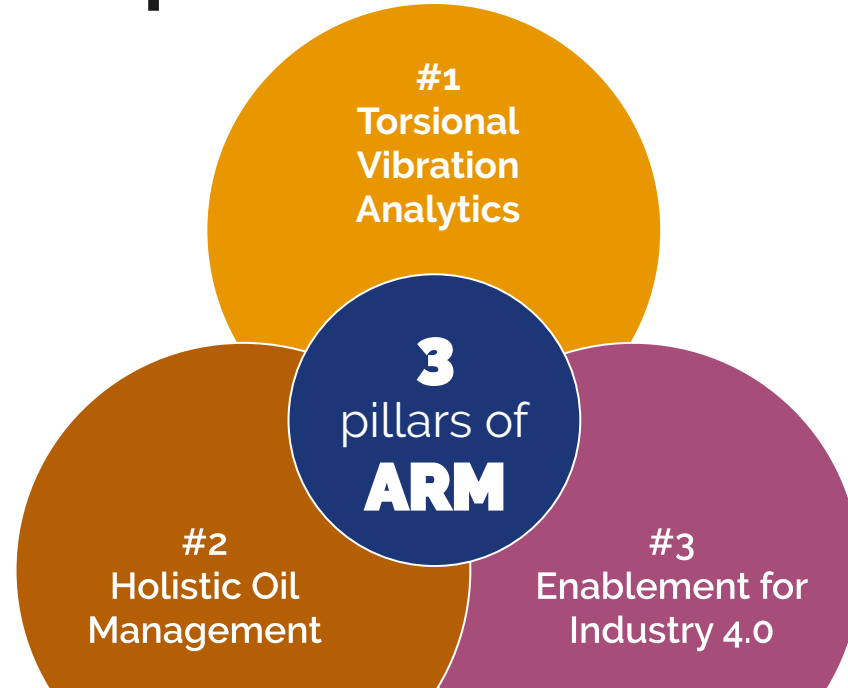
Easy Like Lego Block Concept

Torsional Vibration Analytics

Integration of other sensors (Pressure, Temperature etc.)

Holistic Oil Management

Conveyor belt monitoring solution

IIOT Enabled & cloud connected
Ready for Industry 4.0
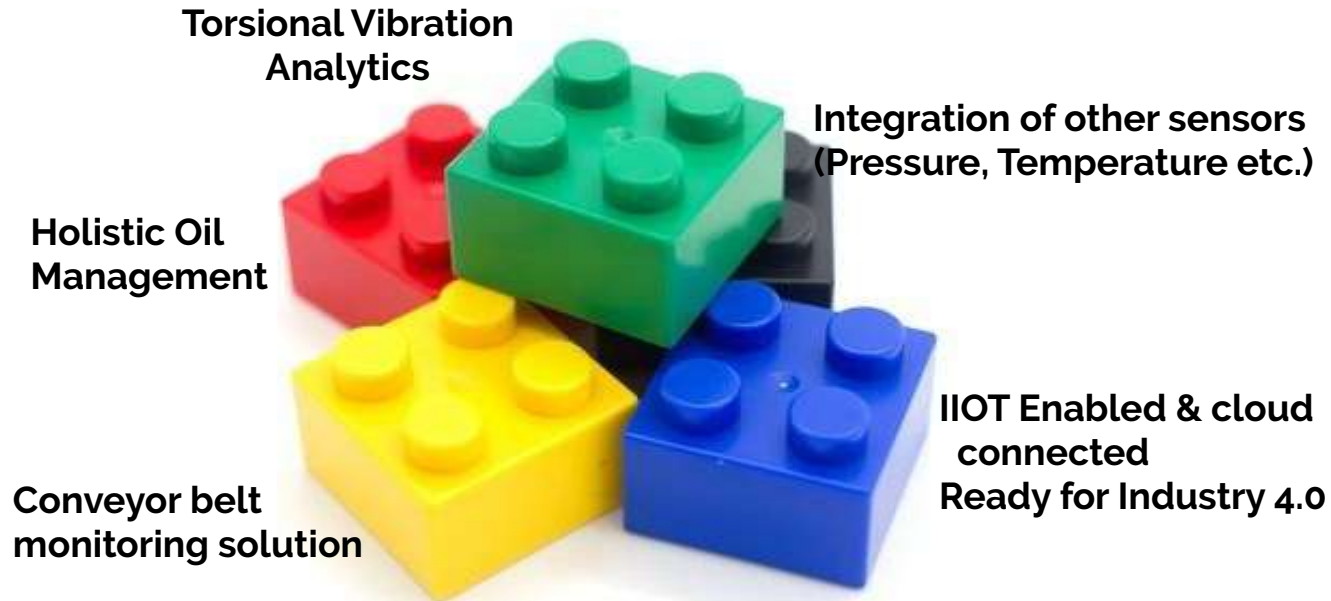
#1 Torsional Vibration

- **FIRST to detect emerging fault**
  - Measures at the root of vibration
- **Component level protection**
  - Application specific software modules
  - Localized fault detection & alarms
- **Simple configuration**
  - Just ONE sensor is enough!
- **Easy to understand and act upon.**
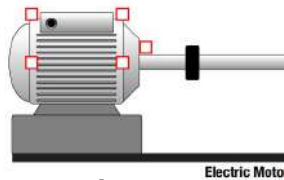 - No need of experts!

Linear vs Torsional Vibration

No Predictive Alerts

For Ml/AI to even starts it will need past data to learn and further forecast possible failure

Only Equipment Level Alerts

-Equipment Level Alerts only where component such as bearing might have failed.

Linear Vibration

Complex System

Electric Moto

Multiple Sensors used to get data

Sensor Challenges - Cannot Measure --

- Vibration at Low Speed
- Gearbox Torque
- Vibration in Journal Bearing

Early Fault Detection
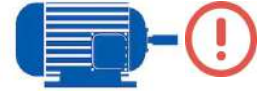
- Due to its working principle based on Torsional Vibration
- Simple Plug and play system

Equipment + Component Level Alerts

- Overall Health of Equipment
- Pinpointing Component failure
- Direct Measurement of forces

Torsional Vibration

alphamotor

Motor

Simple System

- One sensor per motor for overall Health plus bearing diagnostic

Onsite Analytics

- Local Display
- Operator Friendly
- In-situ real time diagnostics
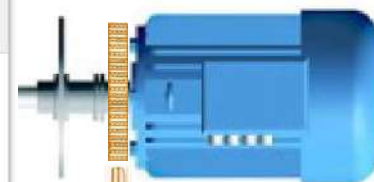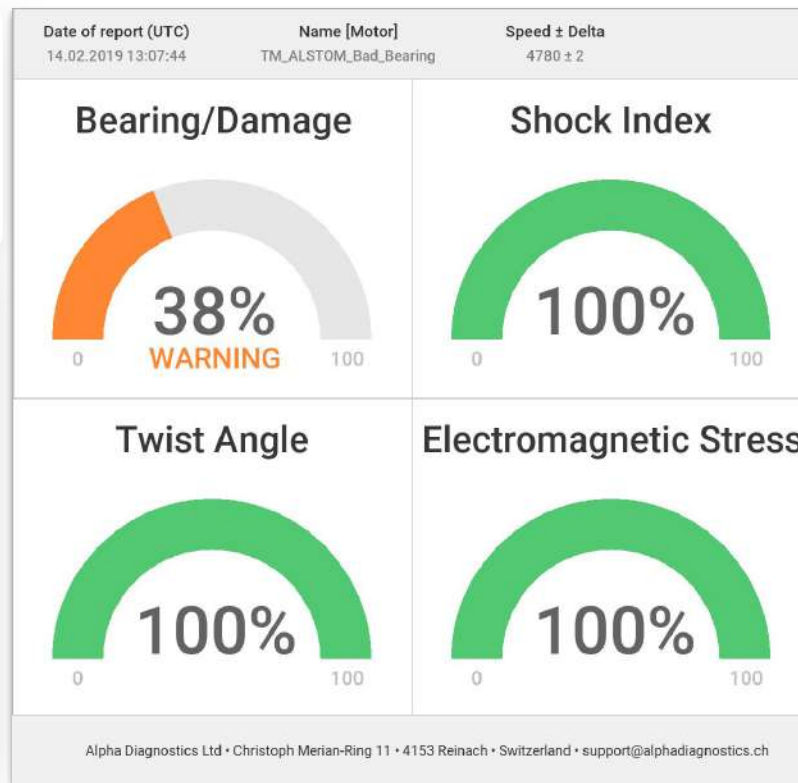
Example: Motor Diagnostic

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Requirements

- **Just One speed sensor** & encoder (gear wheel/ pole band) on the shaft drive end

How it works?

- Sensor & encoder measure instantaneous speed variation (torsional vibration - TV)
- TV data is processed by the motor diagnostic algorithm in the alpha box
- Real-time operator friendly indication of fault on the system Dashboard

Date of report (UTC)	Name [Motor]	Speed ± Delta
14.02.2019 13:07:44	TM_ALSTOM_Bad_Bearing	4780 ± 2

Bearing/Damage
38%
WARNING
0 — 100

Shock Index
100%
0 — 100

Twist Angle
100%
0 — 100

Electromagnetic Stress
100%
0 — 100

Alpha Diagnostics Ltd • Christoph Merian-Ring 11 • 4153 Reinach • Switzerland • support@alphadiagnostics.ch

Runs application firmware
alphamotor

Suite of solution for all machines

alphamotor
- Diagnostic system for traction and other electric motors

alphatorque
- Torque measurement and diagnostic system

alphagearbox
- Diagnostic system for gearboxes

alphabearing
- Bearing diagnostics system for rolling-element (ball and roller) bearings, plain (journal and sleeve) bearings

alphaengine
- Combustion engine diagnostics
- Any type of diesel, natural gas and petrol engines
- 2/4 stroke, inline/V type, up to 30 cylinders

alphacompressor
- Diagnostic system for compressors, e.g. integral reciprocating compressors.

alpha system

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#2 Holistic Oil Management

- **Oil management = Real time Oil Quality Monitoring + Offline cleaning with Filtration**
- You cannot manage what you do not measure, so first measure, then filter
- Remove sources of oxidation and keep the oil continuously clean
- Follow the optimal oil replacement period
- Get detailed oil quality data based on several key oil quality indicators.
- Provide remote accessibility of oil health data

The Neptunus Solution

Detect any change in oil quality in real-time

Real-time oil condition monitoring sensor is calibrated for the given oil type and is continuously sensing the change in oil quality due to **16 possible parameters**. Detects when it's **time to change the oil** and also indicates the **useful remaining life** of the oil

Maintain the oil quality & protect your machine

Offline cleaning of oil with the Depth-filtration system that provides absolute filtration till 3μ with ß3 >400 and removes all types of contaminants (including water)

Impact of Oil Management

- Enhanced Machine Reliability
- Increase MTBO
- Reduced costs
- Cleaning Oil from NAS 12 levels to NAS 6 levels
- Increase equipment life by 2 to 3 times!
- Remote + Data + Trends
- Real Time!

Results of the Studies done by Noria Corp, USA

1) By reducing average moisture levels from 2500 ppm to 156 ppm, the machine life (MTBF) is extended by a factor of 5

2) Improvement of oil cleanliness level (measured as per ISO or NAS standards) can lead to enhanced machine life (MTBF) by a factor of 1 to more than 10

#3 IIoT & cloud enabled solutions

Remote monitoring of plant-wide assets enabled by IIoT & cloud connectivity under Neptunus' Asset Reliability Management solution
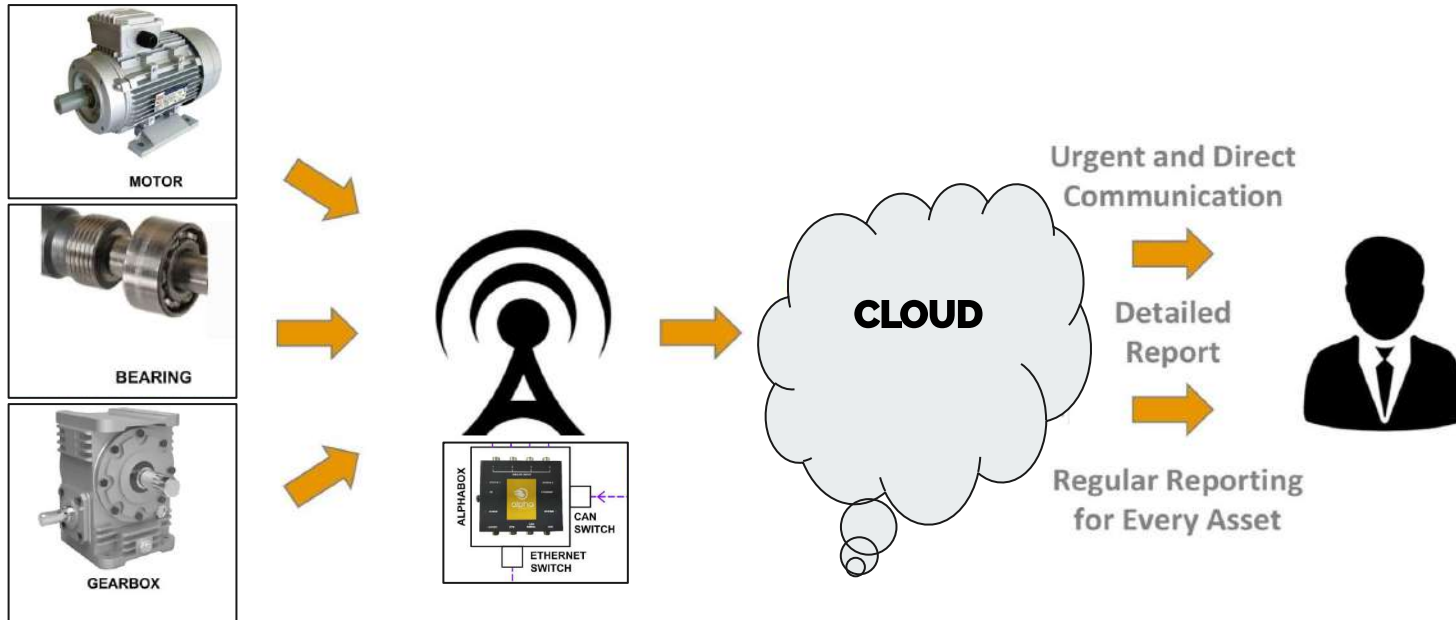
Customized dashboards

Why Neptunus?

- **The Machine Reliability Expert**

- **23+ years** of delivering reliable engineering solutions

- More than **2000 assignments** completed across segments

- A strong & committed team of ~**100 people**

- Customers in **25 countries** across Europe, Asia & Africa

- ISO 9001:2015 certified by LRQA

- Rated BBB long term and A2 short term by ICRA and Crisil

You can count on us for delivering **RELIABLE** solutions!

For more details, contact **Neptunus Power Plant Services Pvt. Ltd.**

Email : info@neptunus-power.com
Call : +91-95944-10707
Website : www.neptunus-power.com

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