



**We Know When
Machines Fail**

The Prognostics Company

CASSANTEC

Cassandra

Prophet of critical future events in Greek mythology

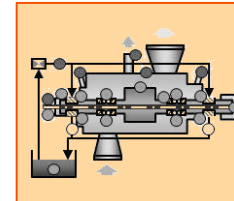
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Prognostics for Predictive Maintenance

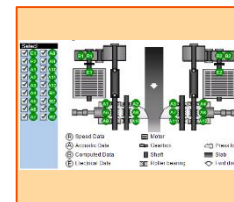
What it is

- ➔ A **condition-based prognostic solution** for industrial asset operators
- ➔ Allowing to **minimize scheduled and unscheduled downtime**
- ➔ Based on advanced mathematical techniques **backed by a proprietary methodology**

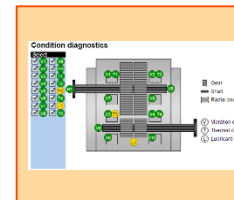
And where it is applied (examples)



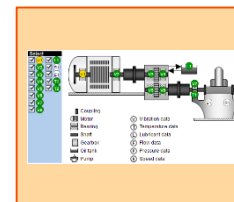
Fossil-fired power plant: all mission-critical components including the boiler feed pump to enable market-driven availability and cycling of plant



Steel plant: prognosticate malfunctions, especially on the bearings, of a slab upsetting press



Gearbox of a compressor in a refinery: eliminate unscheduled malfunction events, provide operations support and organizational learning

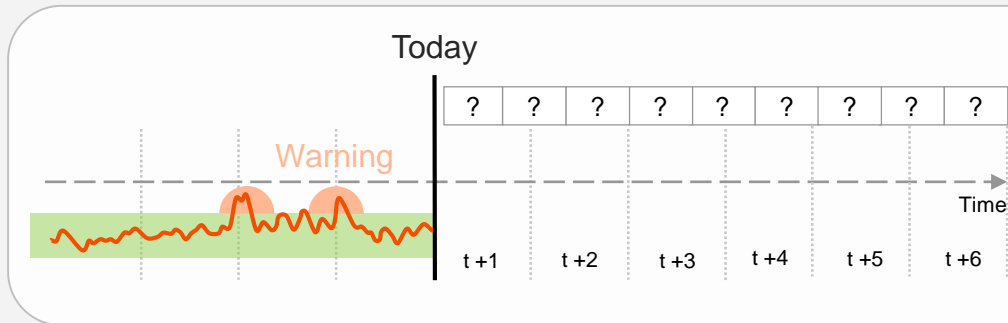


Cyclone pump set in mining processing plant: malfunction risk forecast to enhance safety and optimized maintenance cycles

Flexible and optimized scheduling & scoping of maintenance intervals

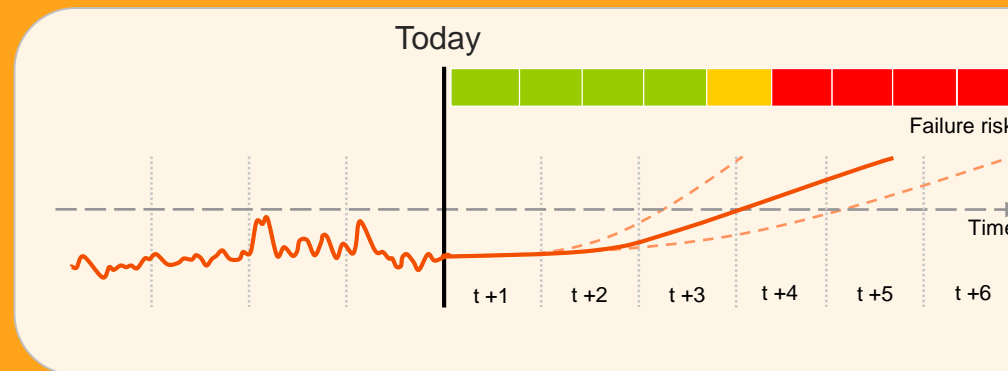
Predictive Analytics generates early warnings – Prognostics delivers true foresight

Predictive Analytics



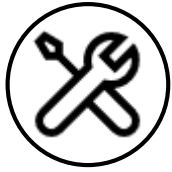
Know that something will happen at some point in the future

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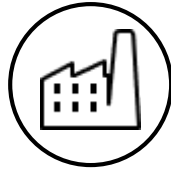


Know the explicit time window until failure

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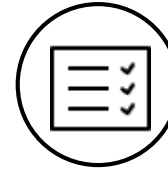
Optimized maintenance & repair



Improved production planning



Retention of critical knowledge



Enhanced reporting transparency



Financial benefit levers

Demo version

Report no.: DEMO-DEMO-HPP-TUR3-SUMMARY-20160314-00
 Date: 04.Oct'18
 Version: 1.20, Release: 0.2

Prognostic report

Provided by CASSANTEC

English
Deutsch
Français
PTBZ
Pycckий

▼ DEMO

- ▶ WF
- ▶ CMP
- ▶ SSP
- ▼ HPP
 - ▼ TUR1
 - Data TUR1_
 - Data TUR1_
 - Data TUR1_
 - Data TUR1_
 - Data TUR1_
 - Data TUR1_
 - Latest para
 - ▼ TUR2
 - Data TUR2_
 - Data TUR2_
 - Data TUR2_
 - Data TUR2_
 - ▼ TUR3
 - Data TUR3_
 - Data TUR3_
 - Data TUR3_
 - Data TUR3_
 - Latest para
 - ▶ GNR1
 - GNR2
 - GNR3
 - TSF1
 - TOCC

Equipment specification

Operator name	Demo
Unit name	HPP
Unit location	Switzerland
Contact person	Don Demo
Phone	123-456-0987
E-mail	don.demo@examplecorp.com
Component type	Built turbine
Component OEM & model	OEM demo, model demo
Component group	TUR3
Serial number	TUR3
Elements monitored	Shaft, bearings, impeller disk
Alarm owner	Don Demo
Phone	123-456-0987
E-mail	don.demo@examplecorp.com

View Specification Location

Condition diagnostics

Select

V1 T1

V2 R1

V3

- Impeller
- Impeller feedback
- Shaft
- Coupling
- Radial bearing
- Hydraulic cylinder
- Vibration data
- Temperature data
- Rotation data
- Electrical data

Appendix

Malfunction prognostics

Select	Malfunction modes	Data sources	Oct'16	Jan'17	Apr'17	Jul'17	Oct'17	Jan'18	Apr'18	Jul'18	Oct'18	Jan'19	Apr'19	Jul'19
<input checked="" type="checkbox"/>	M1.1 Shaft crack	T1 V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<input checked="" type="checkbox"/>	M1.2 Coupling pin crack	T1 V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<input checked="" type="checkbox"/>	M1.3 Impeller blade crack	T1 V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<input checked="" type="checkbox"/>	M1.4 Impeller disk crack	T1 V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<input type="checkbox"/>	M1.5 Impeller disk wear	T1 V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<input checked="" type="checkbox"/>	M1.6 Guide vane defect	V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<input type="checkbox"/>	M1.7 Oil inlet duct wear	T1 V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<input checked="" type="checkbox"/>	M1.8 Radial bearing defect	T1 V1 V2	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Total risk			Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

Next maintenance: 04.Oct'16

Prognostic horizon (zoom): Short (12 days) Long (12 weeks) Maximum (12 quarters)

Vary load and data history: Load min: 0.01 l/min | Load max: 100.92 l/min | History start: 15.May'08 | History end: 04.Oct'16

View Percentages

Condition

Critical

Marginal

Normal

Schedule

Risky

Bear

Safe

Downtime risk: >15%

Downtime risk: 5% - 15%

Downtime risk: <5%

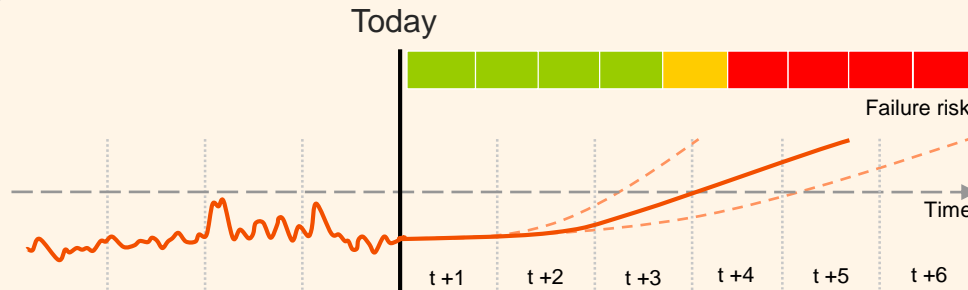
High prognostic strength

Medium prognostic strength

Low prognostic strength

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**Know the
explicit time
window until
failure**

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