Dr. Christopher Ganz, ABB Technology Ltd, Group Service R&D Manager
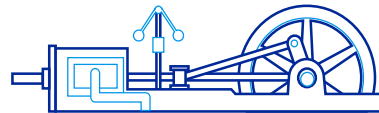
Internet of Things, Services and People
Opportunities for Advanced Services

The Internet of …
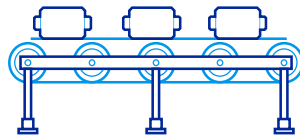## Global trend – 4th industrial revolution

Industry 1.0 – 1712
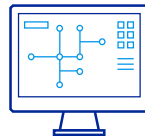First practical steam engine

Industry 2.0 – 1870
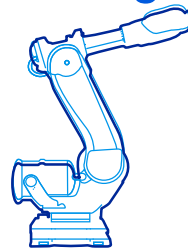First elevated conveyor belts

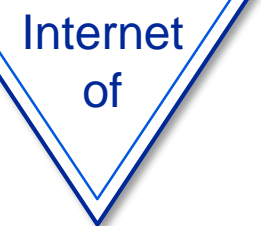**Industry 3.0 – 1969**
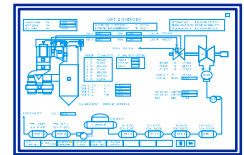Electronics / software based control

Industry 4.0 – today and tomorrow
Internet of …
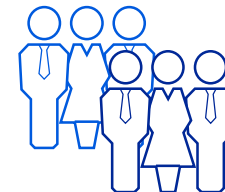
Things

Services

Internet of

People

ABB leads proactively with new connected offerings

The Internet of Things
ABB things

Things

The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data [1]

The Internet of Things allows objects to be sensed and controlled remotely across existing network infrastructure [2]

Smart, communicating devices by ABB

Robots

Motors

Switchgear

Controllers

[1] "Internet of Things Global Standards Initiative",
[2] https://hbr.org/resources/pdfs/comm/verizon/18980_HBR_Verizon_IoT_Nov_14.pdf

ABB

Optimizing maintenance and operations
Combining plant view with fleet view

Fleet view

Data analysis across a fleet of devices installed in different sites

Data analytics potential:

- Predictive maintenance
- Benchmark
- Asset lifecycle optimization
- Usage-driven product improvement
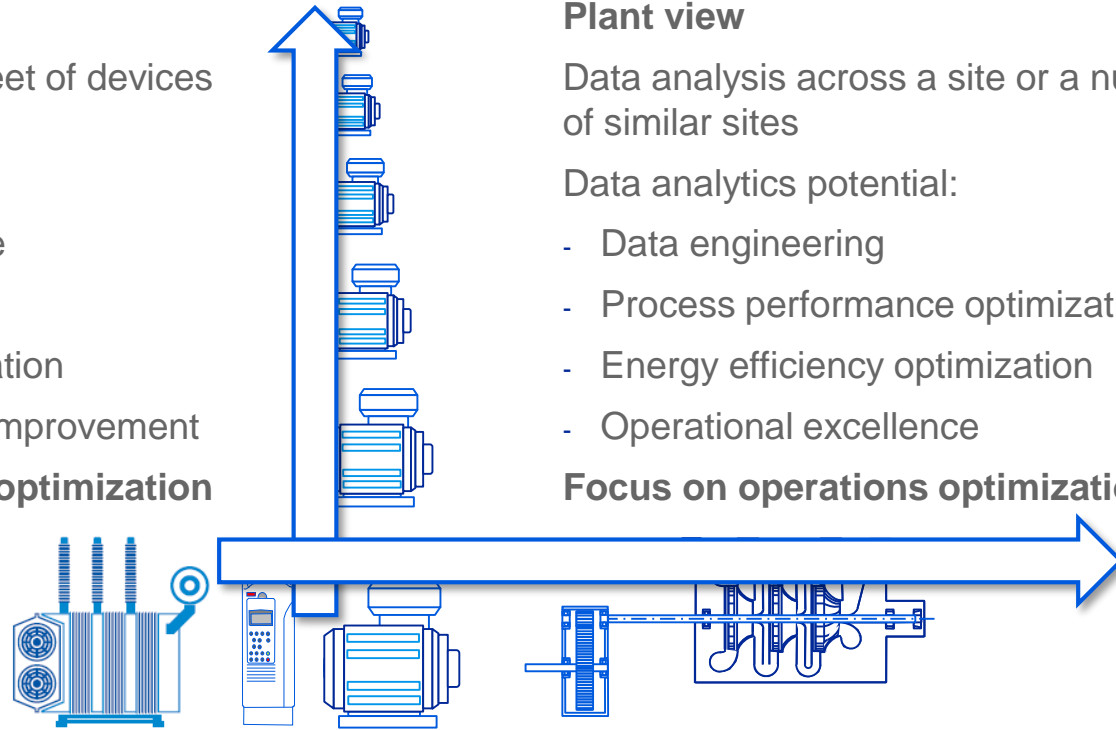
Focus on maintenance optimization

Plant view

Data analysis across a site or a number of similar sites

Data analytics potential:

- Data engineering
- Process performance optimization
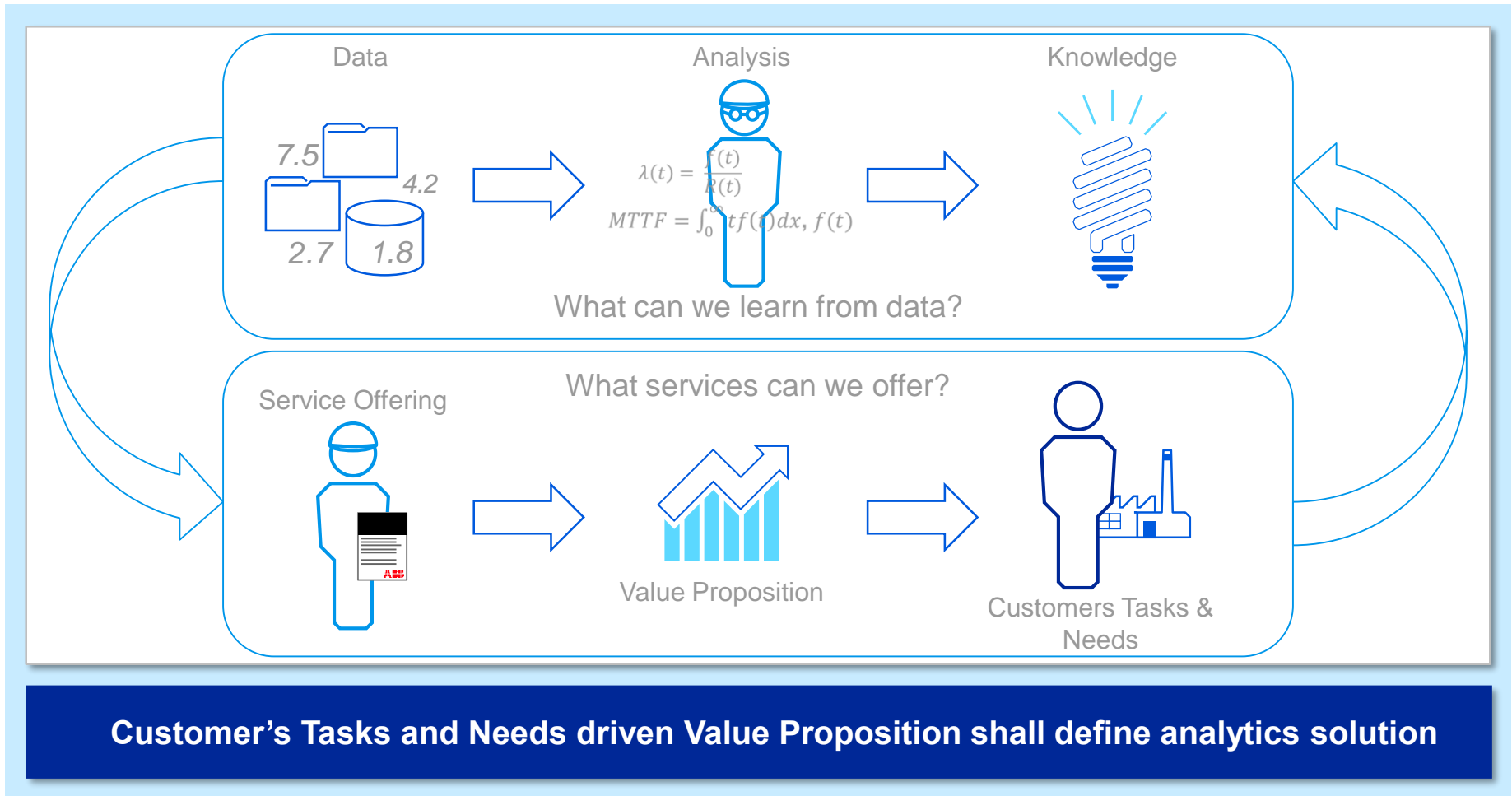- Energy efficiency optimization
- Operational excellence

Focus on operations optimization

Unique combination of asset focused maintenance optimization vs. plant focused operations optimization

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Remote services
Data driven services

Customer's Tasks and Needs driven Value Proposition shall define analytics solution

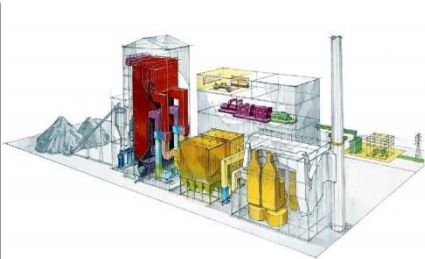# Plant Fingerprinting, how it looks like: Fleet level

Plant Fingerpriting

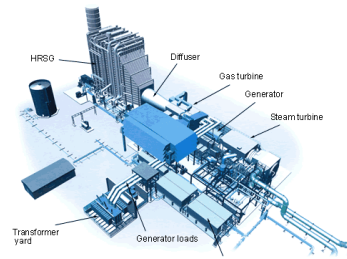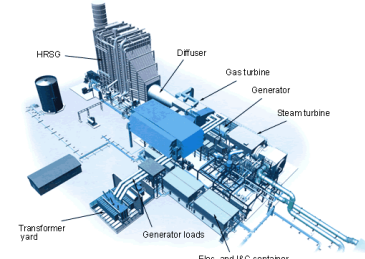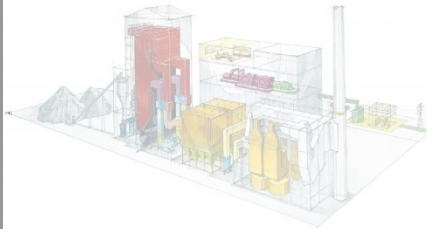| Plant and Fleet | Diagnostic | Operations | Financial | Support |
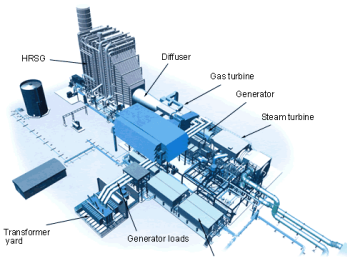
COAL 1   **Click!**   CCPP α   CCPP β   CCPP γ

My Fleet KPIs

$20.0M

$32.2M

65
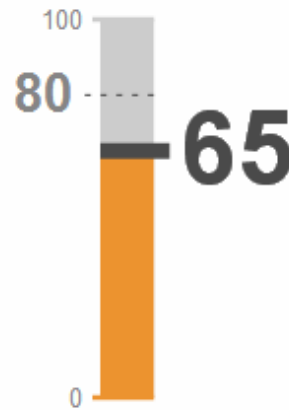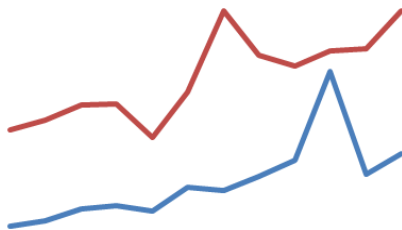
Today Goal
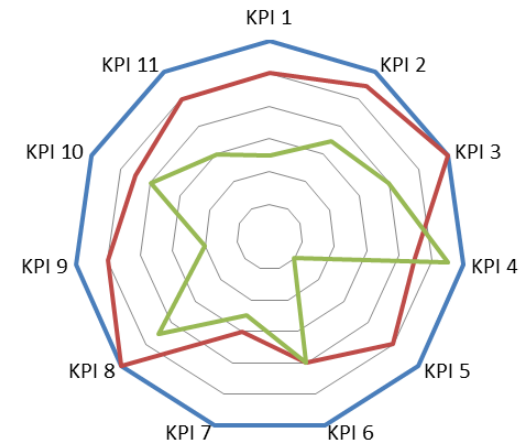
My fleet positioning

© ABB

| Slide 6

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Plant Fingerprinting, how it looks like: Plant level

Plant Fingerpriting

Plant and Fleet | **Diagnostic** | **Operations** | **Financial** | **Support**
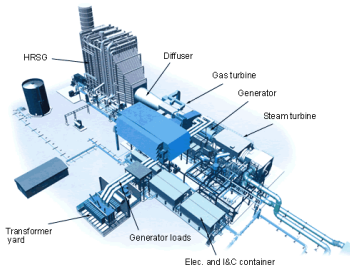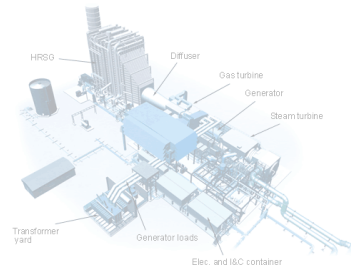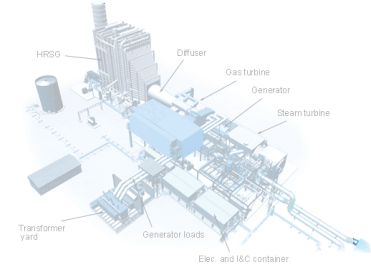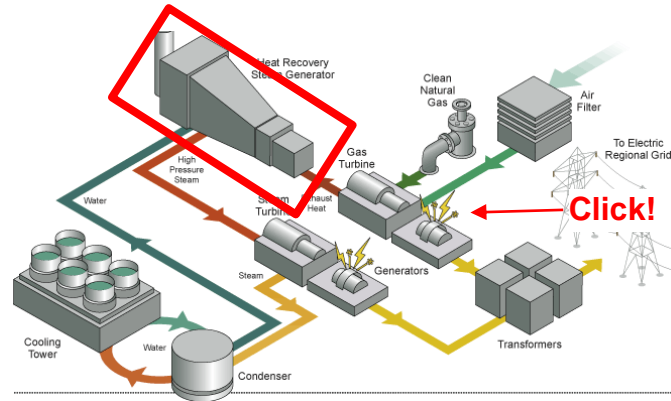
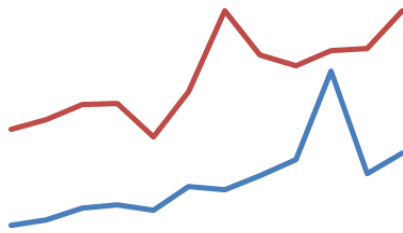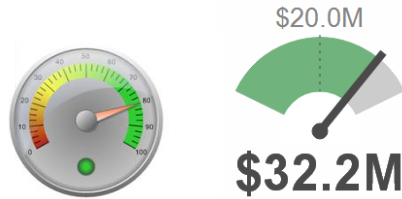Coal 1   **CCPP α**   CCPP 2   CCPP 3

CCPP α – My Best Combined Cycle Plant

$20.0M

$32.2M

Click!

Overall info

- **Critical alarms #: 3**
- **Today issues #: 0**

12 Calls ⚠

-10   10 Calls   20

KPI 1, KPI 2, KPI 3, KPI 4, KPI 5, KPI 6, KPI 7, KPI 8, KPI 9, KPI 10, KPI 11
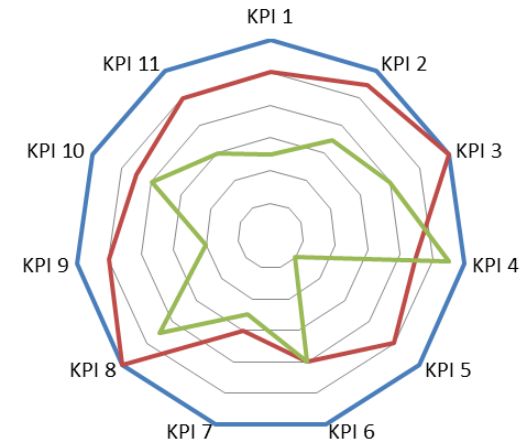
Plant positioning

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Plant Fingerprinting, how it looks like: Process level

PLANT FINGERPRINTING — ☐ ✕

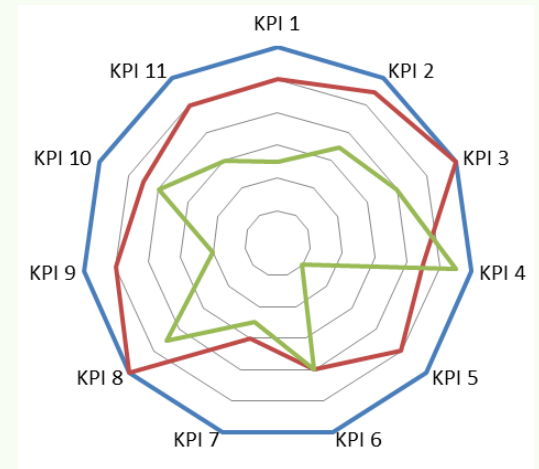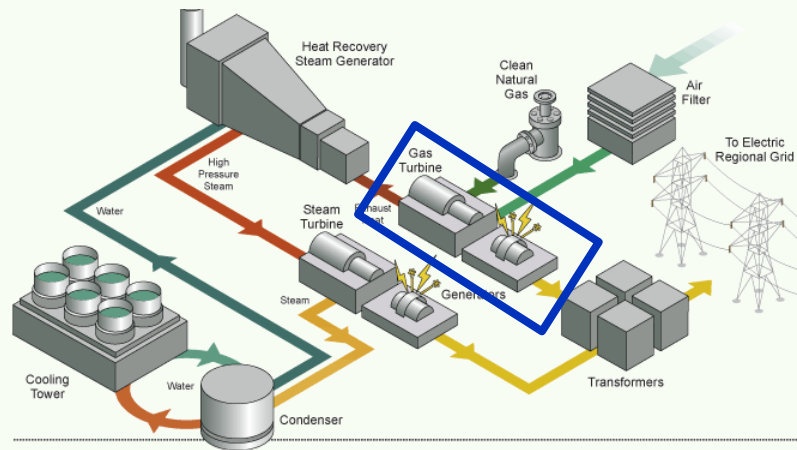| Plant and Fleet | Diagnostic | Operations | Financial | Support |

Gas Turbine Process

✕
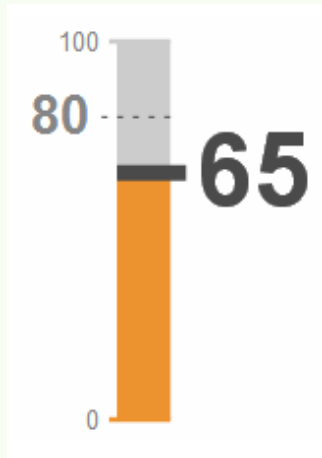
Throttle

Performance and positioning

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Plant Fingerprinting, how it looks like: Component

PLANT FINGERPRINTING

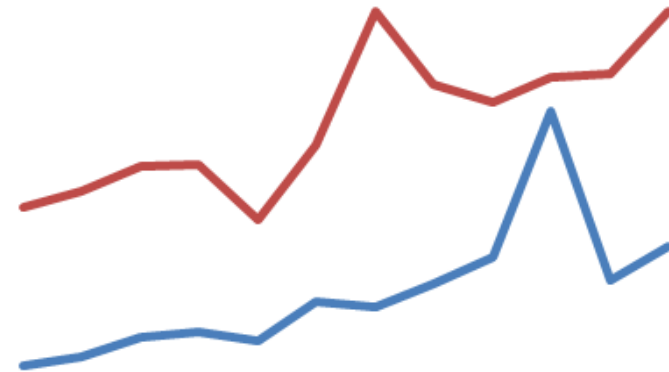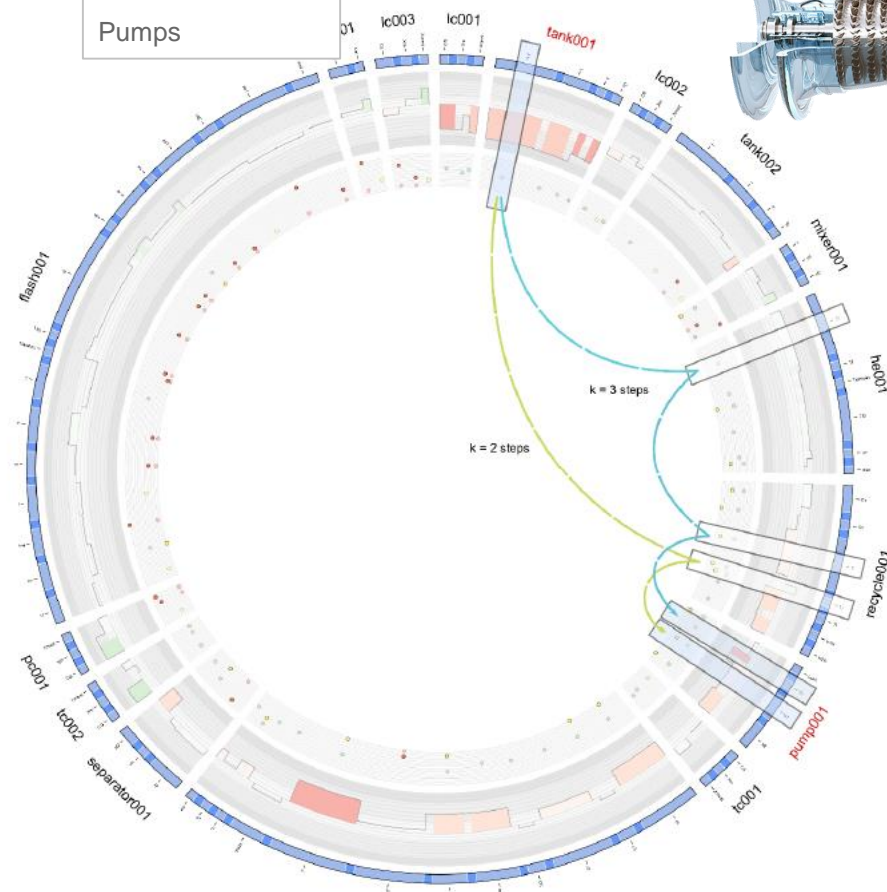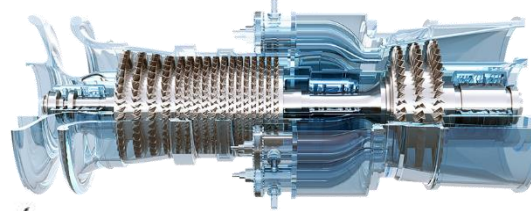| Plant and Fleet | Diagnostic | Operations | Financial | Support |

Gas Turbine component analysis

- Gas Turbine
- HRSG
- Valves
- Pumps

k = 3 steps

k = 2 steps

Dependencies and causalities

Failure prediction for components:

- **Bearing A**
- **Turbine blades**

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for a better world™

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