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Radix: Preventing Unexpected Equipment Shutdowns with Digital Twin Results in Cost Savings

Real time surveillance in oil and gas critical equipment

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Radix is a global, technology solutions company delivering the most innovative industrial solutions to scale and accelerate your transformation journey as life-long partners turning challenges into opportunities.

155+

Valued
Customers



30+ Years of
Industrial &
Engineering
technology expertise

3,625+

Unique
Projects



Strong global presence
with a multidisciplinary
team of industry
leaders

1500+

Dedicated Team
Members



Best-in-class
partnerships focused
on sustainability &
profitability impact.

30+

Countries
Worldwide

Global Energy player prevents shutdowns in oil & gas platforms by monitoring critical equipment

Challenge

- 3 FPU's to be monitored: 36 critical equipment with ~ 2.2 k trip related instruments
- Identify abnormal behaviors with the proper time to action
- Communicate effectively equipment situation
- Prioritize the equipment under the riskiest situation
- Reduce / eliminate human-error

Solution

Leveraged AVEVA PI System Asset Framework to implement KPIs to monitor equipment condition, notifications workflow, and proper visualization to allow identifying and solve issues on time to avoid equipment trip and asset shutdown.

Results

- **Better visibility of critical equipment integrity variables, pro-active monitoring**
- **Increased productivity and less time to identify trips**
- **MTBF increased 35% and 10 shutdowns avoided in the first year**
- **Scalable solution**



Overview: Real-time surveillance in oil and gas critical equipment

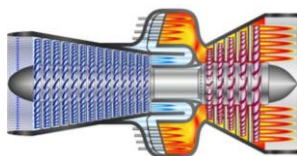
Assets and Equipment



3 Platforms
430k Total BPD
 Processing capacity



A single 12-hours (minimum) shut-down in one of the platforms decreases the production in 35,000 Bbls



Gas Turbine sectional view

36 Critical equipment

- 10** Gas turbines
- 15** Compressors (LP and HP)
- 3** Boosters
- 8** Diesel-generators



SME Group

A group of turbomachinery operation SME monitors the equipment remotely

Their mission is to ensure the stability of operation and avoid trips in the power generation system that could lead to asset shutdown



+2,2k Trip-related field instruments being continuously monitored

Legacy Diagnostic Performance

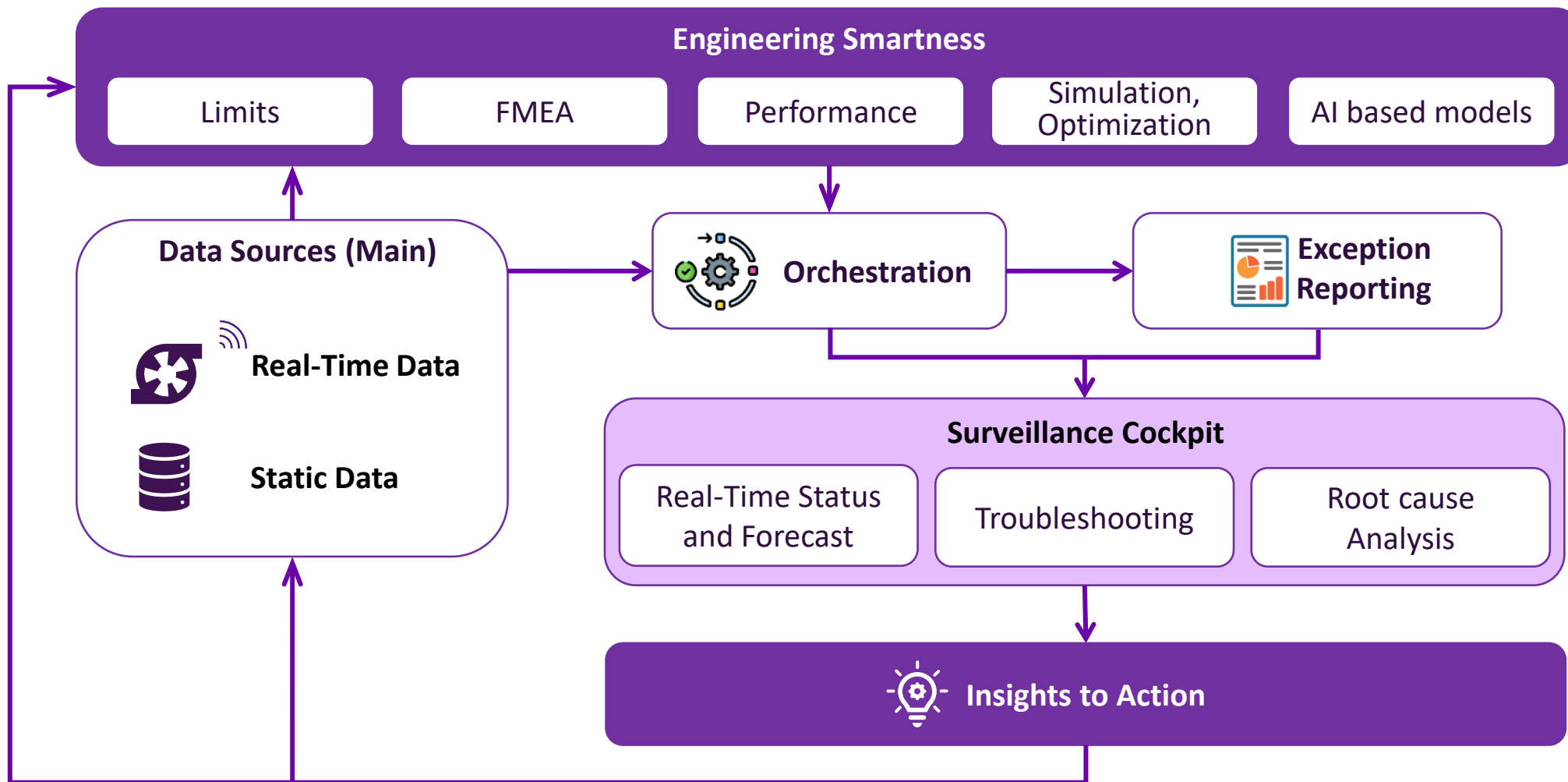


Previously, remote monitoring and diagnostic was being done by identifying issues using trends and charts.

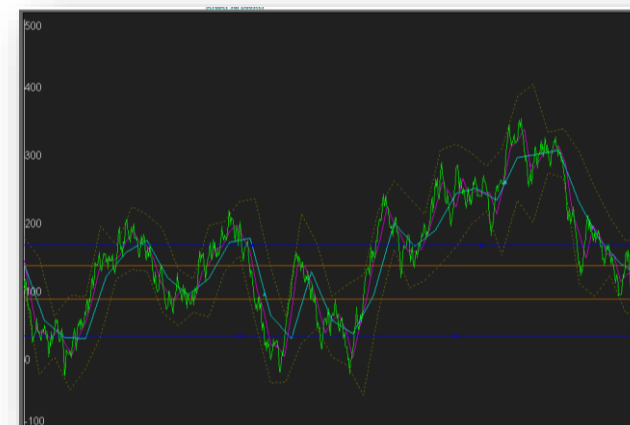
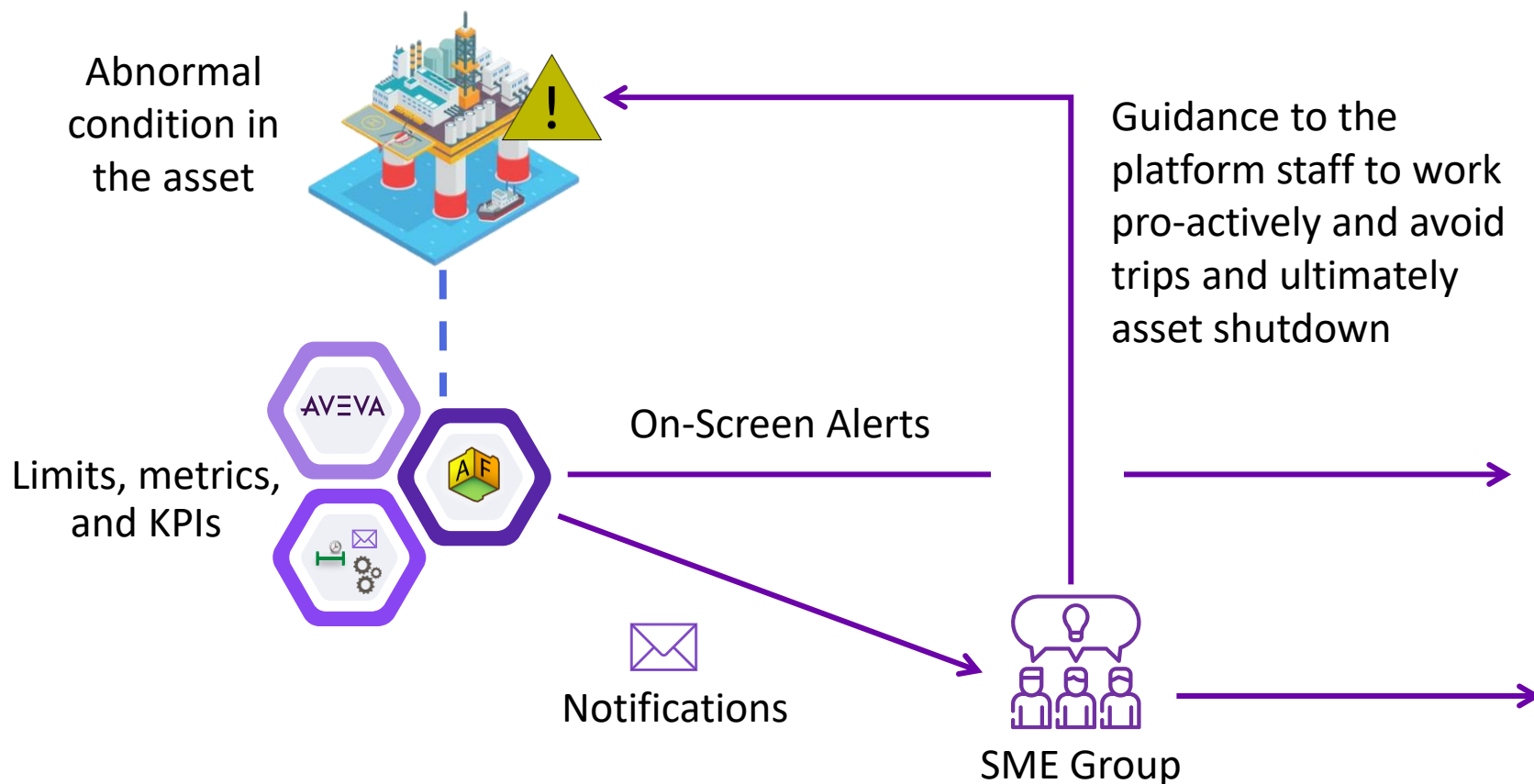
The SME team has great experience in turbomachinery operation and maintenance. Once they identify issues, they contact the FPU personnel to troubleshoot the equipment.

This activity demands high data analysis skills.

Solution Mind Model



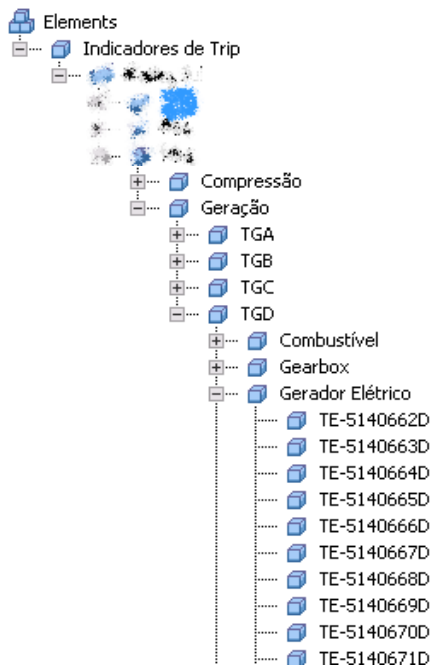
Applying the solution mind model to the O&G platforms case



Enhanced visualization to facilitate easy identification of issues and support on troubleshooting

Main elements of the solution implemented

Asset Hierarchy

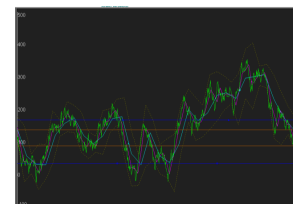


Limits, Metrics, and KPIs

- Rate of change
- Statistical limits (max and min)
- Span in a certain interval
- Min, max, and average values
- Forecast
- Comparison with redundant instruments when available
- Vibration and critical temperature analysis
- Running time
- Energy Efficiency

Enhanced Visualization

- Drill down view
 - Field / Assets
 - Equipment
 - Instrument

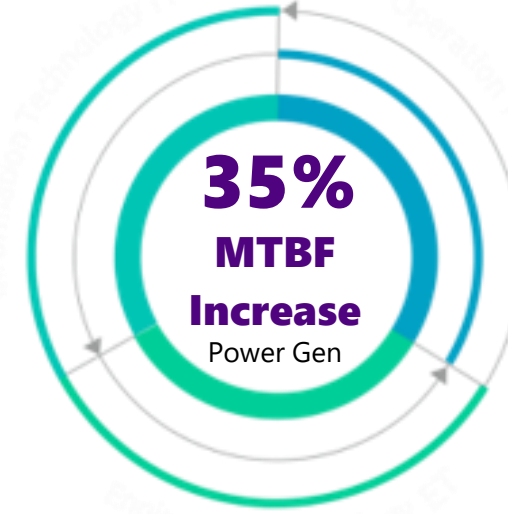


- Equipment status
- Insights to action
- Troubleshooting

Exception Reporting

- Notifications via email
- Escalation mechanism

Immediate Business Impacts- Within 12 months



Cash-flow

- Higher uptime, plant throughput, and profitability
- More agility to identify issues and respond to them
- Higher stability in the power generation system
- Reduced mechanical damage and unplanned downtime
- Increase equipment longevity
- Less cost with maintenance and staff

Productivity

- Augmented surveillance capabilities
- Enhanced diagnostic and root cause analysis
- Measure equipment performance
- Reduce team workload
- Higher collaboration between teams

Solution evolution with Our Clients

Chemicals

Summary

Main Results

CHALLENGE	SOLUTION	RESULTS
<ul style="list-style-type: none"> Provide a solution that enables real time and historical data analysis on the Equipment Health conditions. Lack of instruments: costs and timing (search for more competitive sensors) Dashboard supervision 	<ul style="list-style-type: none"> PI Asset Framework and PI Asset Analytics; Dashboards in PI Processbook; Excel to historical data for analysis and reporting; PI Event Frames to detect and present information with start and end conditions. Notifications by email to maintenance team when the health score reduces below 50%. 	<ul style="list-style-type: none"> Maintenance cost reduction (Preventive and Corrective Scope) by 55.2% (one-year evaluation) of Pilot. Increased communication between the Maintenance and Production areas. Increase in the number of work orders related to the basic condition by 360%. Increase the knowledge on equipment by the Maintenance team

Chemical Equipment Performance

How Solvay reduced emergency work from 16% to 5% by implementing a platform to monitor the performance of the equipment in real-time.

ARC Advisory Group

In operation

The dashboard displays various performance metrics and charts, including:

- Overall Performance: 19
- Process Book: 51
- Energy Efficiency: 99.1%
- Production: 94.6%
- Consumption: 93.1%
- HC/Stream 4: 11.4%
- HC/Stream 10: 13.1%
- HC/Stream 1: 5.9%
- HC/Stream 2: 5.2%

Asset Performance & Digital Predictive Maintenance

How Braskem delivered financial results by implementing a Predictive Platform to optimize their Operations and Maintenance



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