

# **Smart O&M Solutions INTEGNANCE TR Predicting Failure of Rotating Machinery**



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https://www.jgc.com/en/business/epc/operation-maintanance/service/

# **INTEGNANCE TR-Predicting Failure of Rotating Machinery**

# Do you have any of these issues?

- Need to predict failure event to minimize production loss
- Need to optimize maintenance plan and cost for rotating machinery with/without existing sensors
- Struggling to accumulate maintenance knowledge

# What is INTEGNANCE TR<sup>(\*)</sup>

- Web-Based Analysis Tool: INTEGNANCE TR, one of JGC in-house software, analyzes and visualizes the predicted condition of rotating machines by modeling time series data from sensors (e.g., vibration, temperature).
- One-Stop Service:

Provides comprehensive services, including the installation of sensors and gateway devices to connect equipment to the cloud, AI modeling, and cloud-based visualization, all with secure data transfer protocols.





#### Enhancing planetary health

# **INTEGNANCE TR-Predicting Failure of Rotating Machinery**

Quick identification of equipment with

high failure risk

# Linkage to Virtual Reality

# VR-Linked Monitoring

Track equipment failure risks with INTEGNANCE VR.

# Quick Anomaly Response

Technical staff can quickly act on alarms and share equipment status and location.



INTEGNANCE TR

# **Our Strengths**

INTEGNANCE VR (Fast Digital Twin Maintenance Viewer)

MINTEGNANCE VR 🔁 See Details

• Customized AI Algorithms:

Leveraging extensive plant engineering expertise, we develop tailored AI algorithms for specific equipment and situations.

• Flexible Integration:

Our system seamlessly connects with sensors from any vendor.

Cost-Effective:

We offer low implementation and licensing costs.

# **Future Features of INTEGNANCE TR**

• Al Navi<sup>(\*)</sup> Integration:

Get advice based on past failures, actions taken, and operating data.

# Prescriptive Maintenance:

Combining INTEGNANCE TR and AI Navi for proactive solutions.

# Knowledge Standardization:

Al Navi captures and standardizes expert knowledge for sustainable transitions.

 $\ensuremath{^{(*)}}\ensuremath{\mathsf{AI}}$  Navi is under development by JGC



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# **INTEGNANCE TR-Predicting Failure of Rotating Machinery**



# **Use Case : Failure Prediction in Oil Refineries**

#### **Client: Japanese oil refinery**

- Predictive maintenance for the rotating machinery in offsite area
- Approximately 300 rotating machinery (e.g., pump, mixer) without sensors monitoring its condition

#### **Client benefit**

Prevent Unexpected Shutdowns:

Timely maintenance prevents unexpected equipment failures.

- **Remote Monitoring:** Expanded from 300 to 800 rotating machines monitored remotely.
- Reduced Maintenance Costs:

Optimize maintenance schedules to reduce costs.

# **Pilot Implementation**

### **Initial Setup**

- Vibration Monitoring: Connected sensors to monitor vibration acceleration.
- Al Model Development: Developed and trained an Al model using past operating data.



### Validation of AI model

- Trend Detection:
  Identified increasing vibration
  acceleration trends in various types
  of rotating machineries
- Condition Check: Client inspections confirmed failure symptoms actually in these rotating machineries which trended to increase vibration



# **Full-scale Operation**

### Go Live and Roll Over

#### • Go Live:

Full-scale operation of INTEGNANCE TR has been commenced.

• Roll Over:

Expansion of INTEGNANCE TR in the Client's other 2 plant as well and monitored approximately 800 rotating machinery totally.