Operational Excellence Services

Smart O&M Solutions

INTEGNANCE TR

Predicting Failure of Rotating Machinery

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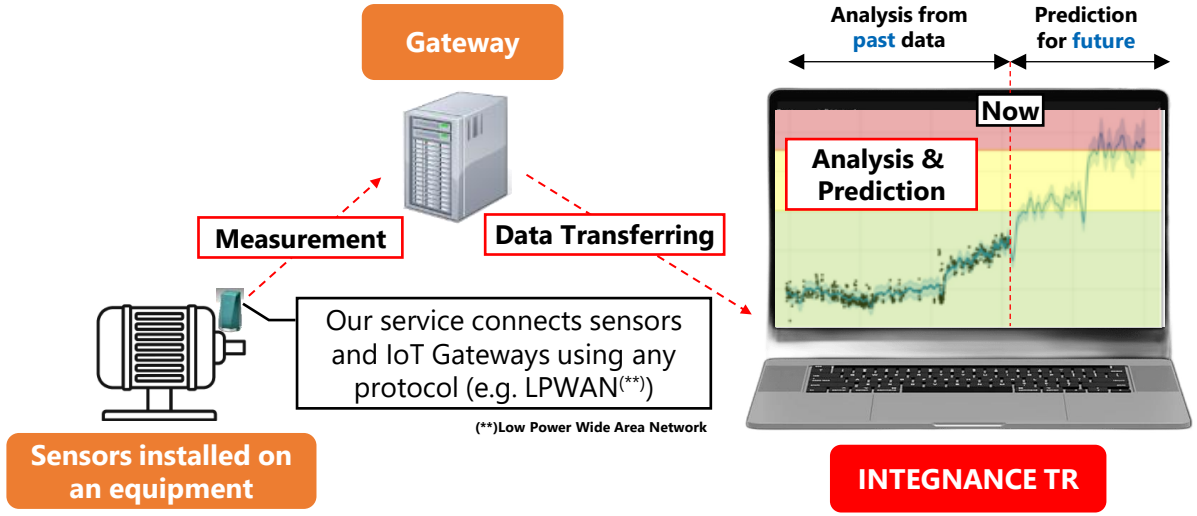
Access to Our Homepage

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

INTEGNANCE TR-Predicting Failure of Rotating Machinery

Do you have any of these issues?

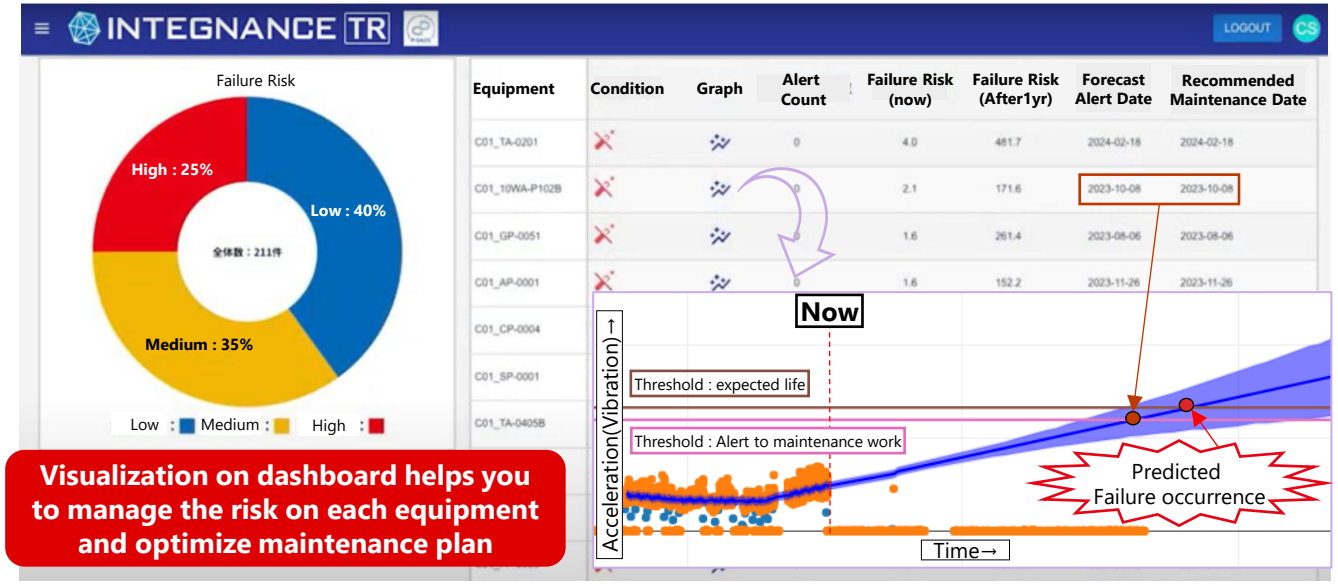
- **Need to predict failure event to minimize production loss**
- **Need to optimize maintenance plan and cost for rotating machinery with or without existing sensors**
- **Struggling to accumulate maintenance knowledge**



What is INTEGNANCE TR(*)

- **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.

(*)Time series regression forecast for Rotating machinery



Visualization on dashboard helps you to manage the risk on each equipment and optimize maintenance plan

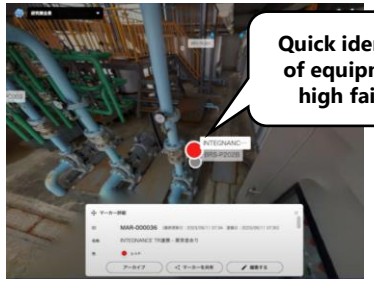
INTEGNANCE TR-Predicting Failure of Rotating Machinery

Linkage with Virtual Reality

- **VR-Based Visualization (INTEGNANCE VR)**
  Visualize equipment and failure risks from INTEGNANCE TR in a 3D plant.
- **Faster Anomaly Response**
  Technical staff can quickly identify issues and take action using 3D visualization.

INTEGNANCE TR

INTEGNANCE VR See Details



INTEGNANCE VR
(Fast Digital Twin Maintenance Viewer)

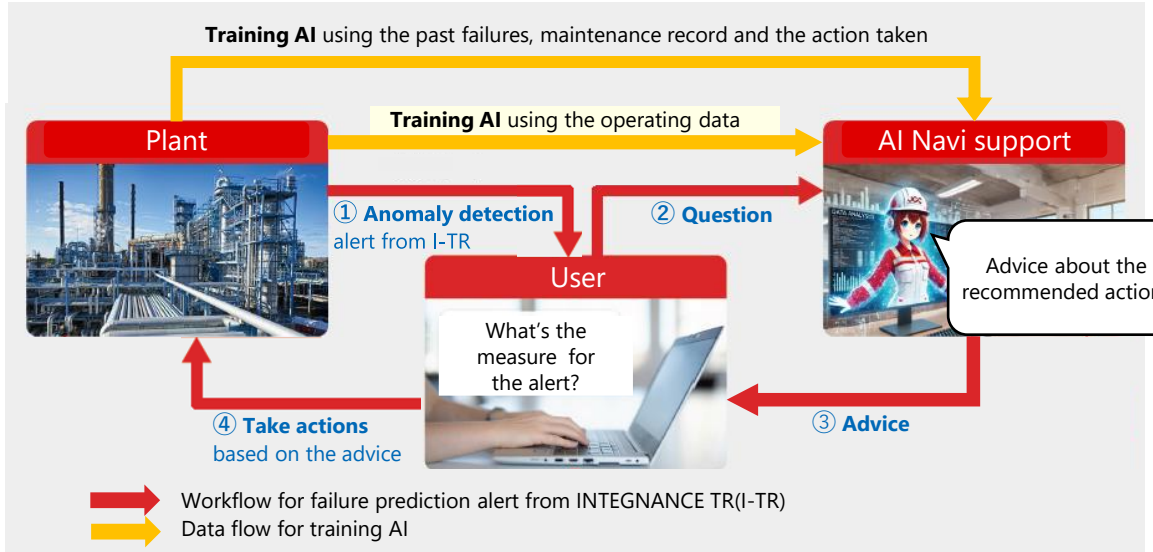
Our Strengths

- **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

- **AI Navi (*) 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:**
  AI Navi captures and standardizes expert knowledge for sustainable transitions.

(*)AI Navi is under development by JGC



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Use Case : Failure Prediction in Oil Refineries

Client: Japanese oil refinery

- Requires a maintenance for the equipment in offsite area
- Approximately 300 rotating machinery with a sensors which cause alarms when their value is over the threshold.
- The alarms included non-critical alarms such as spike noise, false alarms.

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 → **Full-scale Operation**

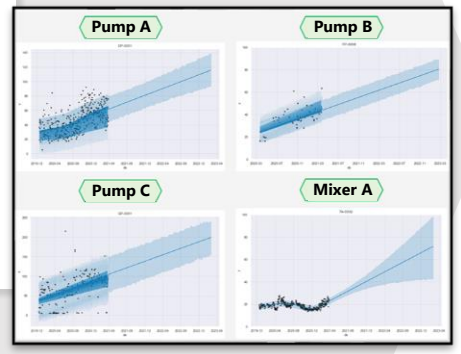
Initial Setup

- **Utilize Existing Sensor:**
  Identified a vibration acceleration was most valuable data and utilized existing sensor.

- **AI Model Development:**
  Developed and trained an AI model using past sensor 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.



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 two plants as well and monitored approximately 800 rotating machineries in total.