Operational Excellence Services

Smart O&M Solutions

Plant Smartification with AI Technology

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Technology Inquiries | Contact Us | JGC HOLDINGS CORPORATION

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

Plant Smartification with AI Technology

Do you have any of these issues?

- ☹ Lack of specific expertise for O&M improvement
- ☹ Decline in productivity due to plant aging
- ☹ Accumulated large amount of data but not being used
- ☹ Knowledge gained through the experience of senior O&M personnel is not shared well with other members of the team.

Why choose an AI Solution with JGC

Know your Process Design	Extensive achievement in process engineering for various types of EPC project
Longstanding O&M Service	Our team has wide knowledge and experience in O&M service
Multi-field Engineers	Our engineers can propose AI solution with multiple fields including process, pressure vessels, rotating equipment, static equipment, electrical, instrumentation, HSE, etc.
Excellent AI experts	Extensive successful experience in providing AI solutions and well-developed implementation methodology.
30+ Cases	Prediction of catalyst degradation, Digital systemization of O&M, Equipment Failure Prediction System…etc.
Various Types of Facilities	Oil Producing, Power Plant, LNG Plant, Chemical plant, Space station, Waste treatment plant…etc.

Plant Smartification with AI Technology

Our Solution

Operation Visualization

Visualize plant operation data to intuitively determine operating conditions

Anomaly Detection

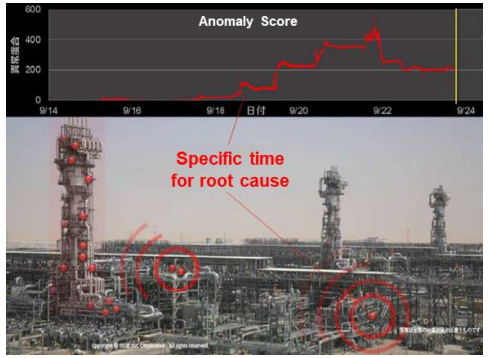
Quickly detect abnormalities and analyze causes to prevent any unforeseen events and trouble

Prediction of age-related deterioration.

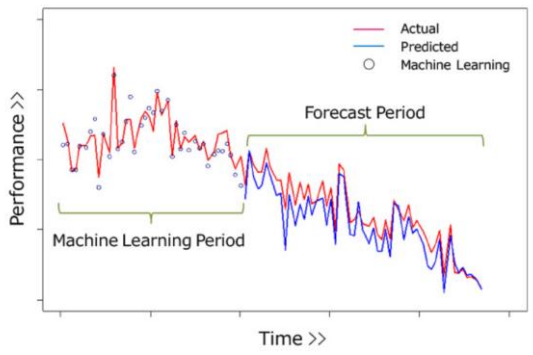
Predicts age-related deterioration of catalysts, solvents, etc., and suggests optimal replacement times.

Productivity Improvement

Incorporating external factor such as climate data into operational data analysis to improve productivity



Trace the process determine the cause



Time-dependent catalyst deterioration

Our Approach

Workshop

Proposal

Contract

Mobilize Team and Engineer

Discussions between client and JGC data analysis engineers (1.5-2 hours/workshop x 1 or more times as required).

- Identification of customer recognized and potential issues
- Planning of problem-solving measures
- Confirmation of quantity and quality of data required for data analysis

Offer the best methods such as:

- Report on cause investigation, etc.
- AI software (GUI of customer's choice)
- Automation system
- Image identification equipment
- Consultant for customer's AI construction and use

AI Digital Solution

Case Study: Analysis equipment clogging factors in Chemical plant

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(1) Issue

☹ **Equipment clogging occurs frequently**

☹ To clean the clogging, the plant had to be shutdown and resulting in a **significant loss of production.**

☹ Difficult to analyze **the large number of operating conditions** under which clogging occurs.

(2) Our Solution

Step-1 To develop AI model based on algorithms for LightGBM Classifier model to investigate operating conditions during clogging for the past 10 years

Step-2 The model calculates clogging in real time during operation and extracts operational factors (e.g., sensor values) related to blockages sequentially.

Step-3 Approximately 20 factors representing operating conditions that contribute to blockage were found. The top three factors were visualized as a three-dimensional plot. **(Fig. 1)**

Step-4 The result allows engineers to properly analyze the elements causing the clogging and develop an efficient solution.

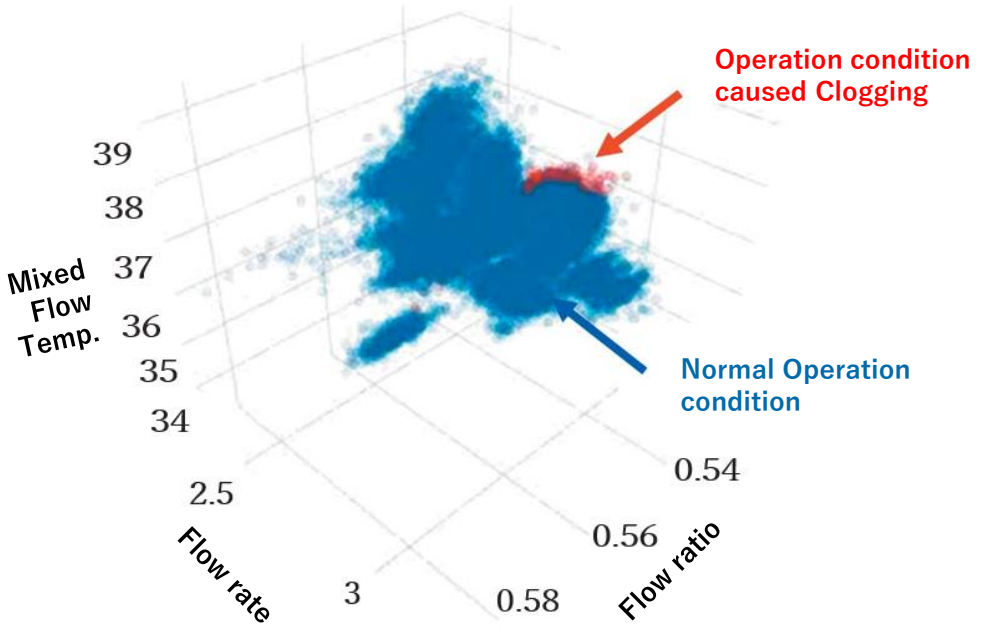

Fig.1 3D visualization of elements causing clogging

(3) Client's Benefit

Improved productivity was achieved by operating to prevent clogging