# Operation

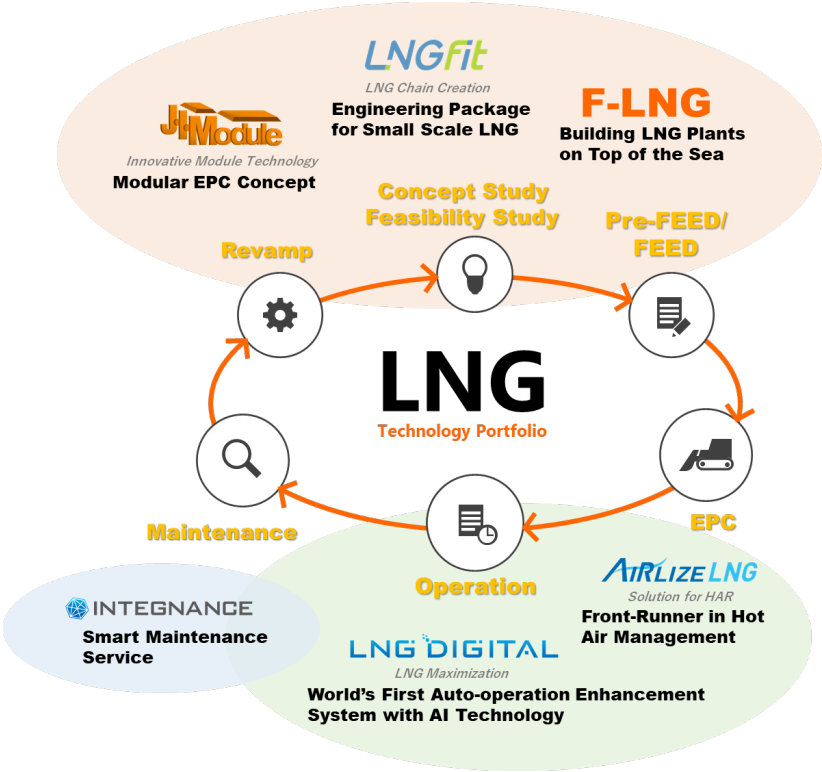
Service Menu

Return to OE Service menu

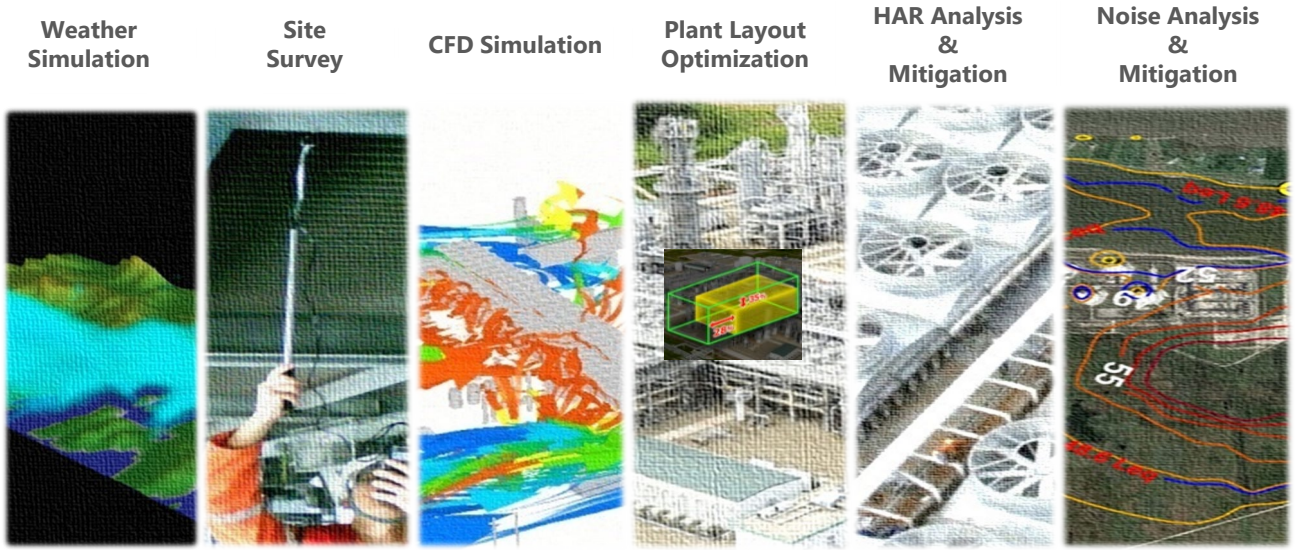
Our engineers have a wealth of experience, knowledge and enthusiasm for all aspects of plant engineering, and channel their expertise through cutting-edge engineering tools to provide Profitability Improvement service of the highest quality without major CAPEX.

## ◆ Profitability Improvement Program

- LNG Cube (Engineering Consultation Service)
- HAR (Hot Air Recirculation) Digital
- AIRLIZE LNG




LNG Cube Technical Service Menu




Airlize LNG Coverage Services

# Operational Excellence Services

## Operation

### LNG Cube

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

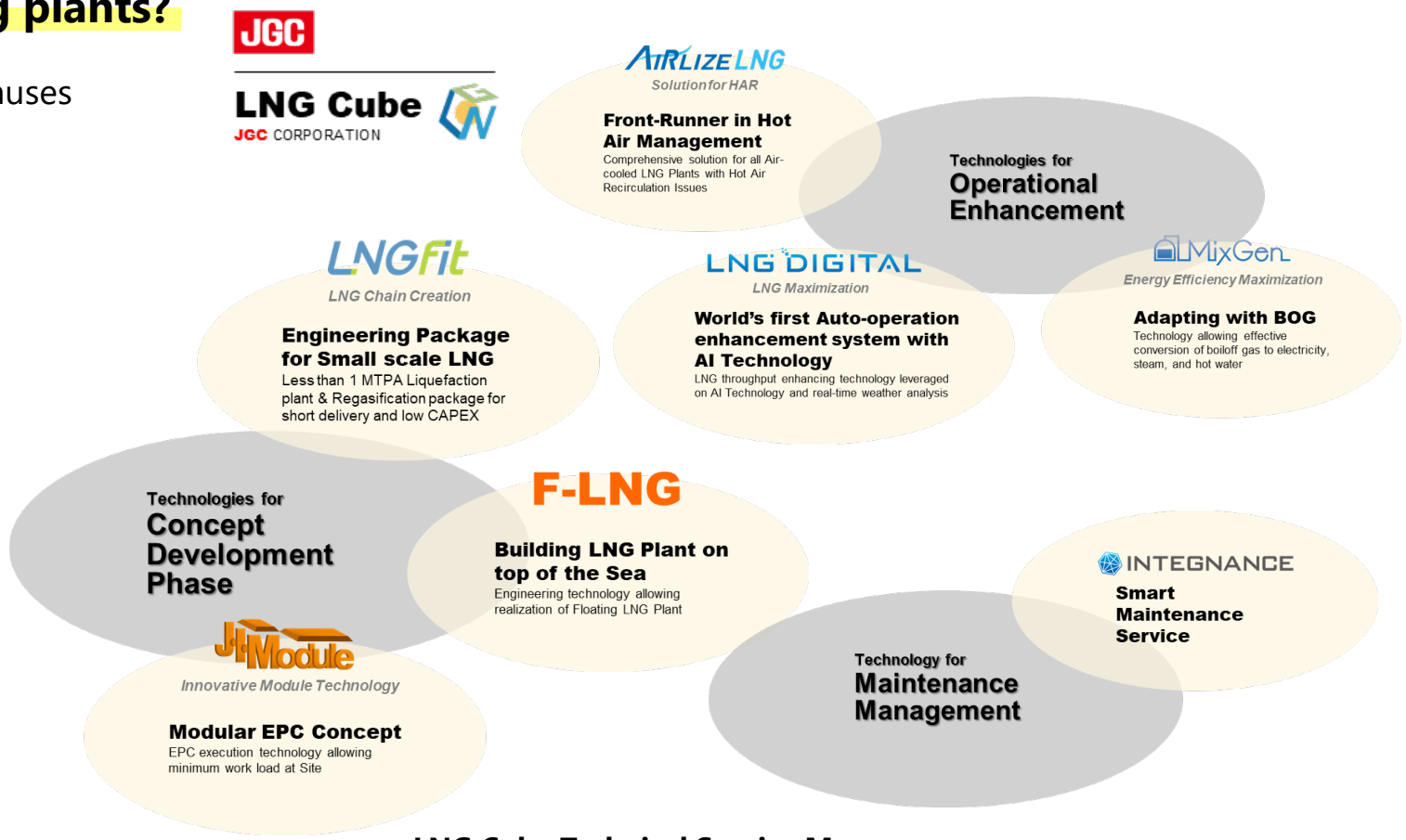
# LNG³ (Engineering Consultation Service)

## Do you have any needs in your operating plants?

- Sudden shutdown of the plant with unknown root-causes
- Frequent malfunction of equipment
- Unachieved production corrective planning
- Flare minimizing
- Smooth startup operation and flawless maintenance

## What is LNG³ ?

- LNG Cube is a comprehensive technical service package related to LNG plants
- LNG Cube starts from Workshop and Consulting by the world's leading LNG specialists
- Analysis and Consulting leveraged on lessons learnt and operational database from past engineering, construction and operational experiences
- LNG Cube technical services are not limited to existing plants but can be applicable to grassroots plants




**LNG Cube Technical Service Menu**

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# LNG3 (Engineering Consultation Service)

Return to Operation menu

## Workflow & Results

1. Send Survey Form
2. Send Operational Data and Register for LNG Cube Analysis

Client

3. LNG Cube Analysis
4. Develop Improvement Plan or General Concept (2~3 weeks)
5. LNG Cube Workshop with Client
6. Share Improvement Ideas, Execute Consultation
7. Implementation of the Plan, Seamless Execution of EPC

JGC

## Our Strengths

- Abundant experience in commissioning and startup
- Speedy solutions leveraged on millions of Lessons Learned from past commissioning and startup experience
- Consulting by Project Manager and Study Manager with extensive site experience and EPC execution experience

## Our Experiences

| Client | Year | Region | Activity |
|---|---|---|---|
| **A Company** | 2017 - 2019 | **South East Asia** | - LNG Cube Workshop (Development of New Digital Solutions)<br>- Feasibility Study for the implementation of the Digital Solution<br>- Implementation of the Digital Solution |
| **B Company** | 2018 - 2019 | **South East Asia** | - LNG Cube Workshop (Development of Efficiency Improvement Ideas)<br>- Proposal for Advanced Control System Installation<br>- Feasibility Study of the Advanced Control System Installation (Planned) |
| **C Company** | 2018 - 2019 | **South East Asia** | - LNG Cube Workshop (Development of Production Enhancement Ideas)<br>- Business Case Study for LNG Production Enhancement |
| **D Company** | 2018 - 2019 | **Europe** | - LNG Cube Pre-Workshop (Development of New LNG Technology)<br>- LNG Cube Workshop |

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# Operational Excellence Services

## Operation

### Hot Air Recirculation (HAR) Digital

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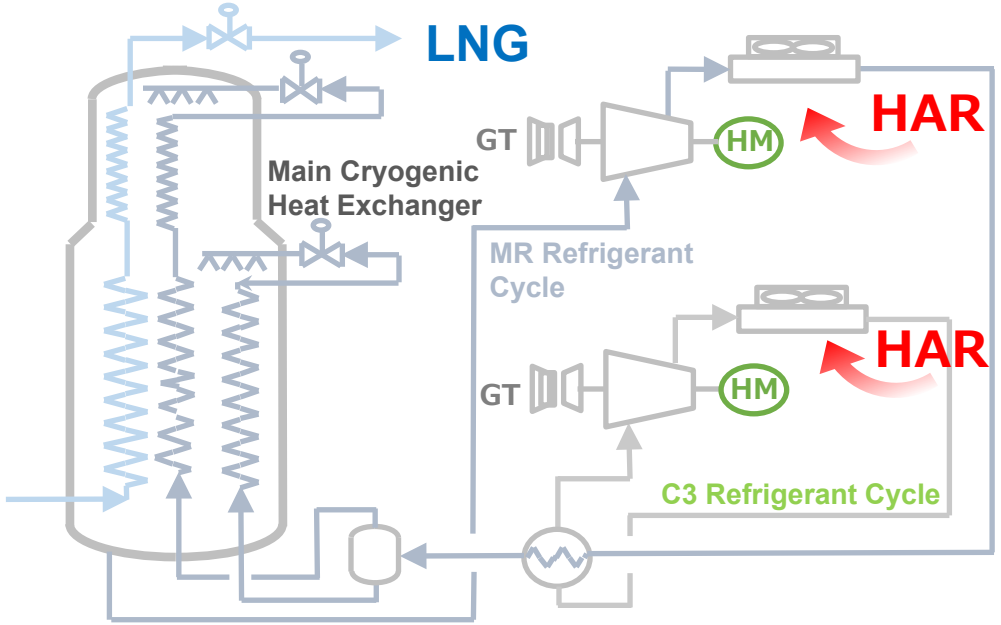
# Hot Air Recirculation (HAR) Digital

## HAR causes loss of LNG Production

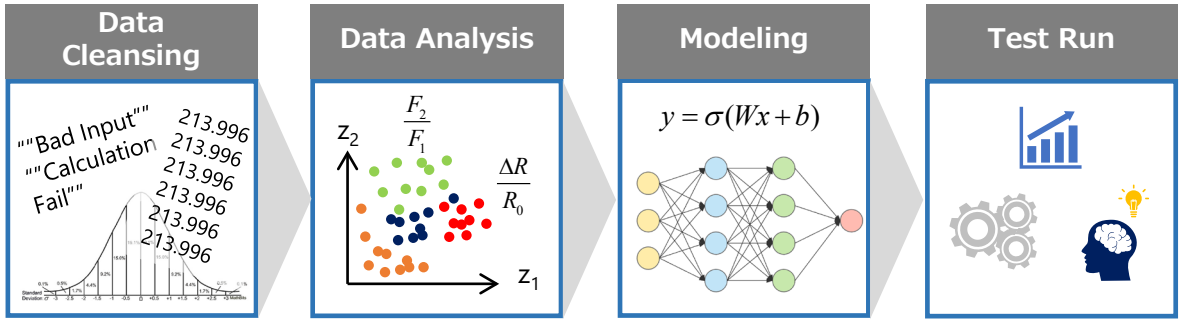
Sudden HAR to the air-cooled heat exchangers could cause an under-speed trip of the gas turbines when the power usage of the Helper Motor (HM) exceeds its limit. Many operators, therefore, set the software limit to the HM power well below its designed capacity to cope with any unexpected HAR. This prevents the plant from realizing the full benefit of the motor power for maximum production.




**HAR on C3 Condenser**

## What is HAR Digital ?

- HAR Digital is an auto control system powered by Artificial Intelligence (AI) to mitigate HAR.
- The feed-forward process control powered by the HAR Predictive Model allows you to realize the full benefit of the motor power which will enhance your LNG throughput by at least 2~3% without any major modification to your facility.

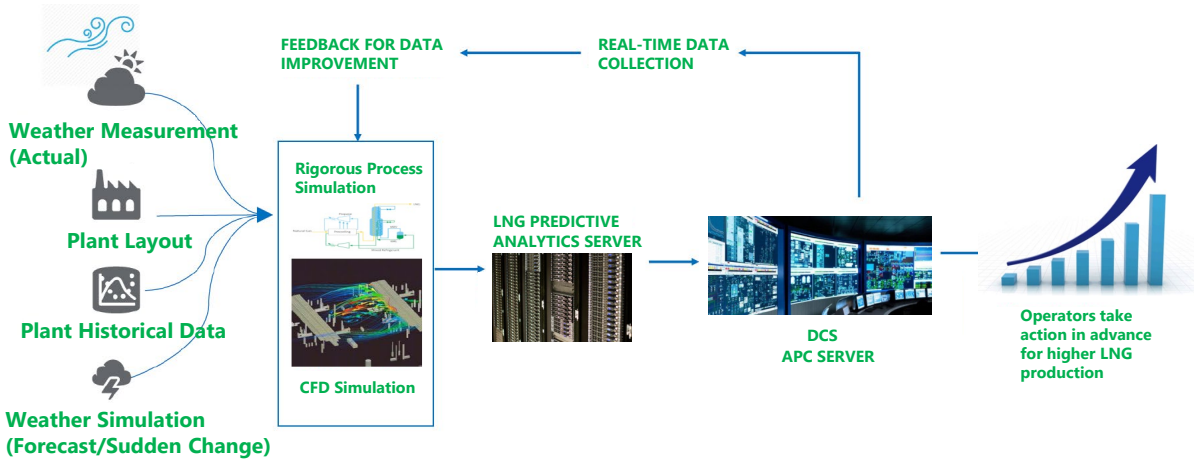



**AI Modeling**

# Hot Air Recirculation (HAR) Digital

Return to Operation menu

## Workflow & Results




- Plant Data correction (Weather Data, Operating Data)
- Data Analysis by Data Scientist
- AI Modeling
- System Deployment

## Our Strengths

- Introduction of the Real-time Weather Monitoring System
- Process Big Data Analysis, CFD Simulation, and Rigorous Process Simulation
- JGC's extensive experience in LNG processes and Hot Air Recirculation Analysis

## Our Experiences

- HAR Digital is jointly developed with PETRONAS
- HAR Digital is deployed in Malaysia LNG and is in operation.
- This technology can be applied to various types of plants, not limited to LNG plants.

PETRONAS

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# Operational Excellence Services

## Operation

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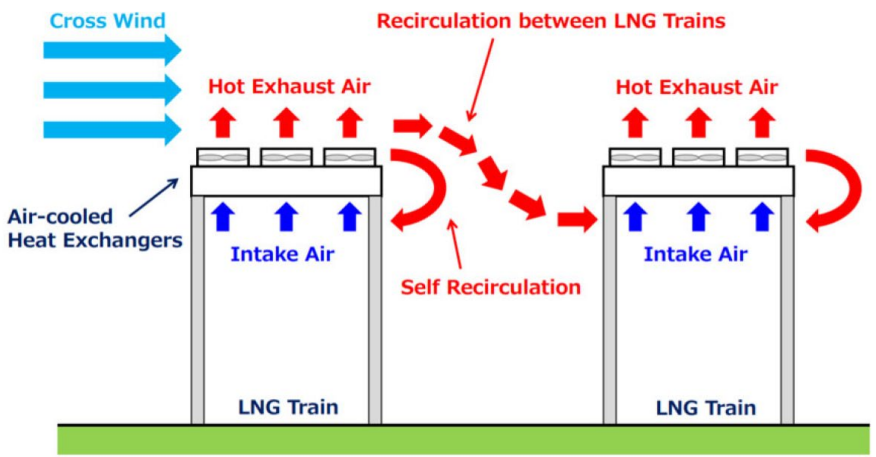
AIRLIZE LNG

## Do you have HAR (Hot Air Recirculation) issues?

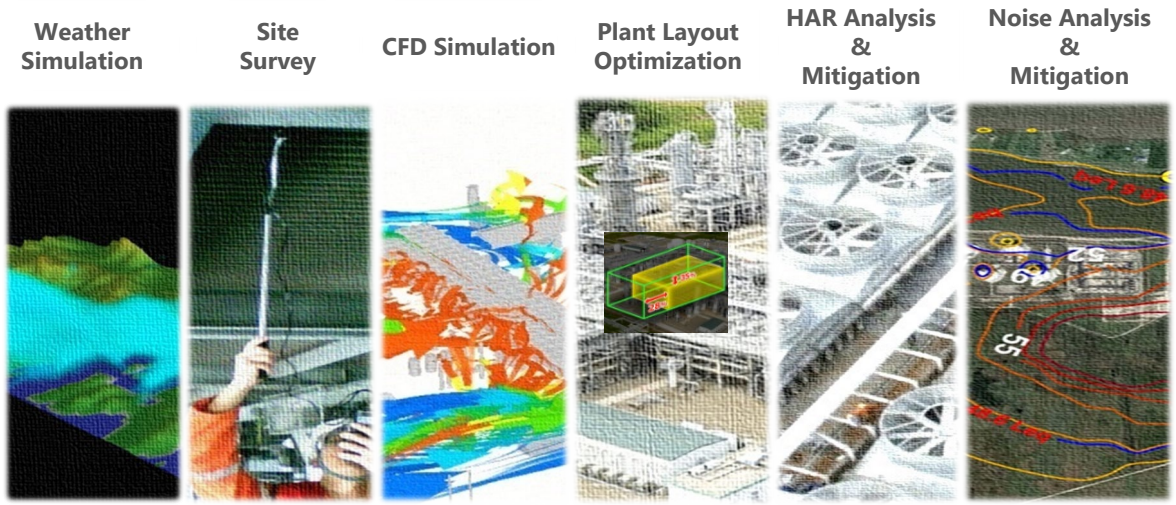
- ☹ **Process performance degradation due to HAR**
- ☹ **HAR visualization and identification**
- ☹ **HAR mitigation plan**

## What is Airlize ?

- Airlize LNG is JGC's Comprehensive Life Cycle Engineering Support Services for Air-Cooled LNG Plants
- Airlize LNG helps to identify root and cause of HAR by Weather Simulation, Site Survey, CFD Simulation
- Airlize LNG gives Plant Layout Optimization, HAR Mitigation Plan leading to minimization of loss of production




**HAR Mechanism**




**Airlize LNG Coverage Services**

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AIRLIZE LNG

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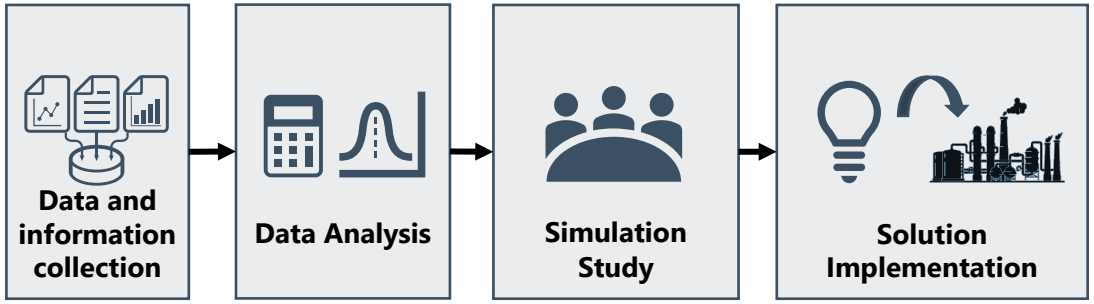
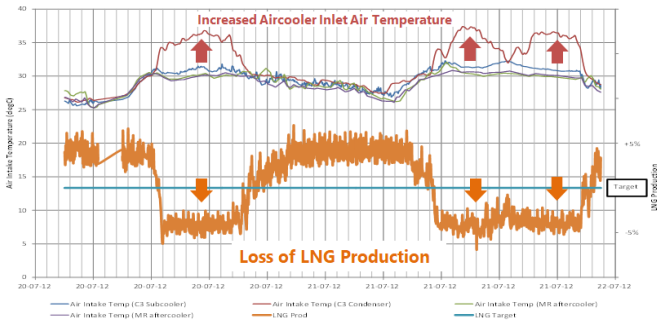
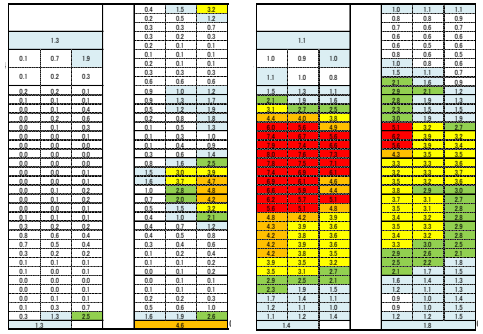
## Workflow & Result




- Plant Data correction (Weather Data, Operating Data)
- Site Survey
- Data Analysis by data scientists
- Weather Simulation, CFD Study
- Solution Recommendation and Implementation



**Airlize LNG Service Image**

## Our Strengths

- Professional Process Engineers, CFD Engineers & LNG Specialists
- Accumulated Know-How on HAR mechanism
- One Stop Service for Weather Simulation to CFD Simulation
- Utilization of big data that integrates customer plant operating data and JGC design data to identify best solution

## Our Experiences

**20+**

**Project**

Contributed to over 20 projects in various phases of Project/Plant Life Cycle (FS, Pre-FEED, FEED, EPC, Revamps)

TANGGUH LNG · PETRONAS LNG 9 · Ichthys PROJECT INPEX · MOZAMBIQUE LNG · DONGGI SENORO Liquefied Natural Gas · YAMAL LNG · GORGON AUSTRALIAN LNG · Kitimat LNG · Jordan Cove LNG · Golden Pass LNG · Cameron LNG · Lake Charles LNG