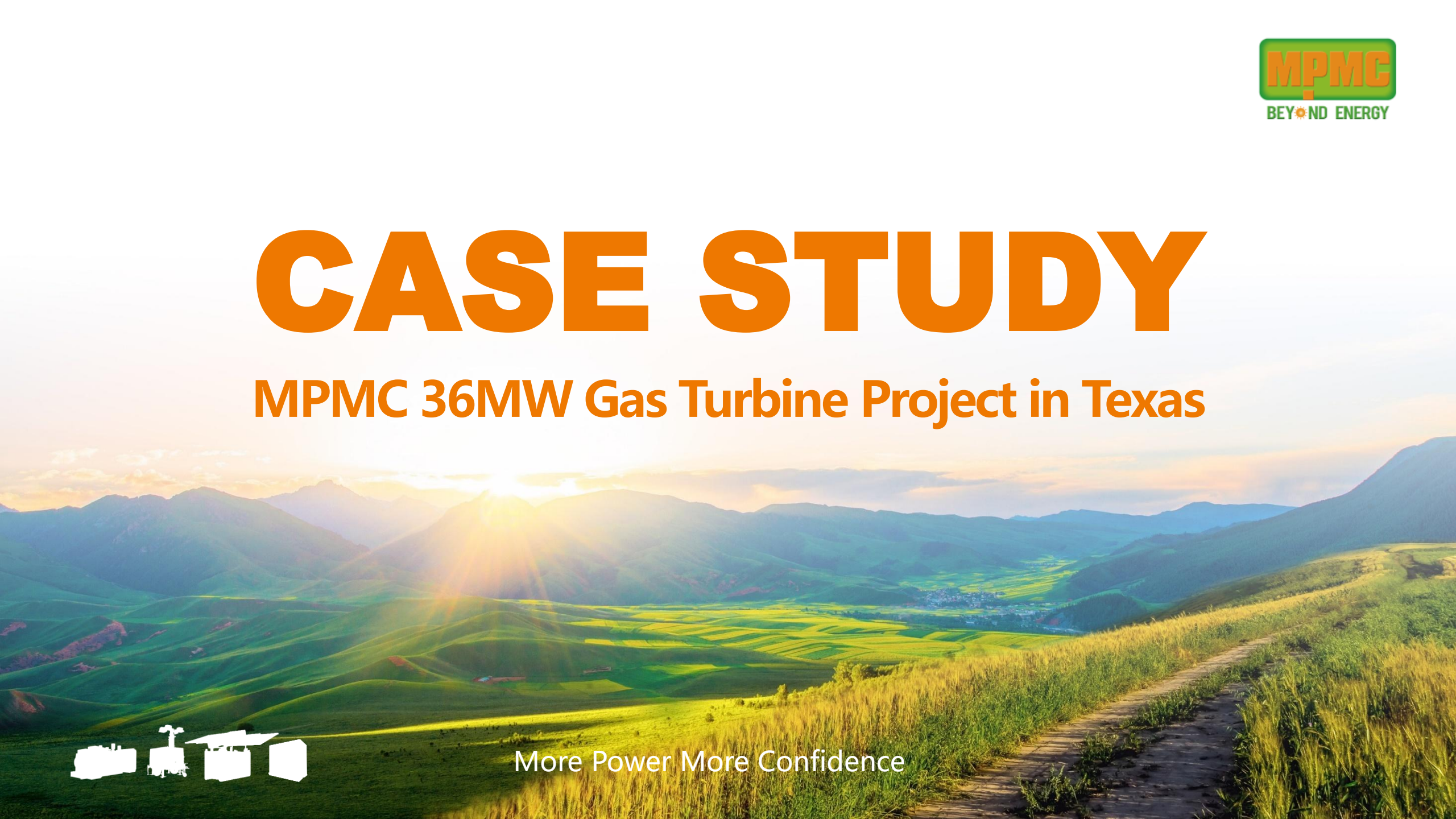
MPMC
BEYOND ENERGY

CASE STUDY

MPMC 36MW Gas Turbine Project in Texas

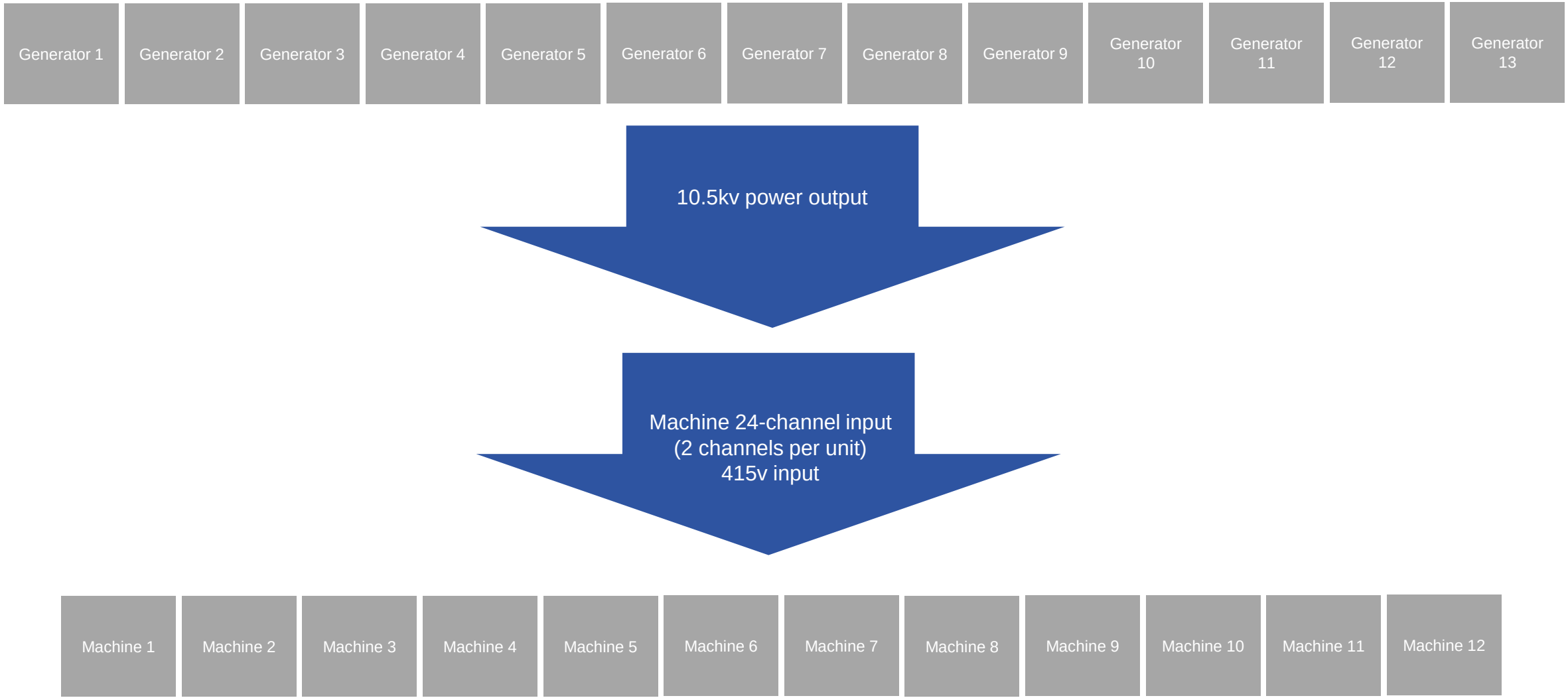


More Power More Confidence

Project Overview

1. This project site uses **six Weichai Baudouin 16M33 and 54 6M33 gas generator sets** as the main power supply for 24-hour uninterrupted operation.
2. To improve the reliability and stability of long-term operation of the project, **low-voltage 3 parallel machines** are used to supply 1MW of power.
3. All equipment must meet the customer's requirement for **7x24-hour long-term operation.**

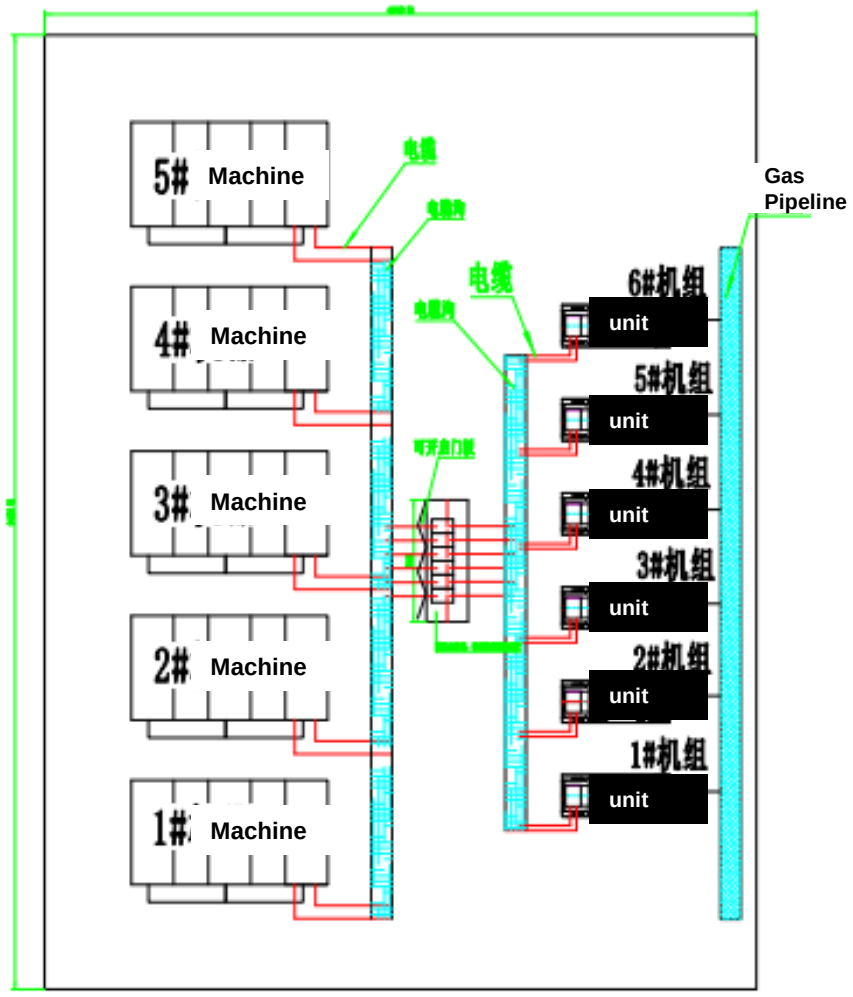
Initial plan



Drawbacks of the initial plan

1. High-voltage generators place high demands on the technical and safety standards of on-site maintenance personnel.
2. Step-down transformers increase on-site construction costs and subsequent maintenance costs.
3. The original plan was not conducive to line maintenance and had a long construction period.

Final plan



The following suggestions are provided:

1.Each unit should be arranged separately, with a spatial distance of 3 meters. Six units form a group, operating on a "five active, one standby" basis. The above arrangement is the most cable-efficient and ensures that the control distance from the controller to the units does not exceed 40 meters (actual wire length).

2.In this plan, each unit corresponds to one outgoing cabinet, equipped with one frame circuit breaker. The closing and opening of the frame circuit breaker can be controlled automatically by the controller or manually.

3.The total load current is relatively large, approximately 8000A. Since a single circuit breaker cannot handle such a high current, and the unit controller monitors the generated current and power of each unit, independent protection (e.g., against over-power, under-voltage, or overload) can be implemented without affecting other normal circuits. The standby unit requires manual activation.

4.A total of six outgoing cabinets are needed, with the busbar rated current reaching 8000A. Due to the high external ambient temperature and large current, refrigeration air conditioning should be installed inside the low-voltage distribution cabinet container.

5.The load alarm should be directly wired from the busbar to the two incoming cabinets of the load, connected via cables.

6.According to the diagram, the plan can be divided into two groups, each operating on a "five active, one standby" basis. The main challenge lies in the long-term operational capability of the units and the stability of gas supply.

7.For cable construction, cables should be laid overhead or buried (due to high ambient temperatures, the cable covering should be increased).

8.This plan involves fewer cable specifications. Since the actual current is not excessively high, it is recommended to connect the power directly.

9.The above is only a preliminary plan. Detailed design requires specific communication on each detail, as well as further overall design after the following steps.

Advantages of the plan

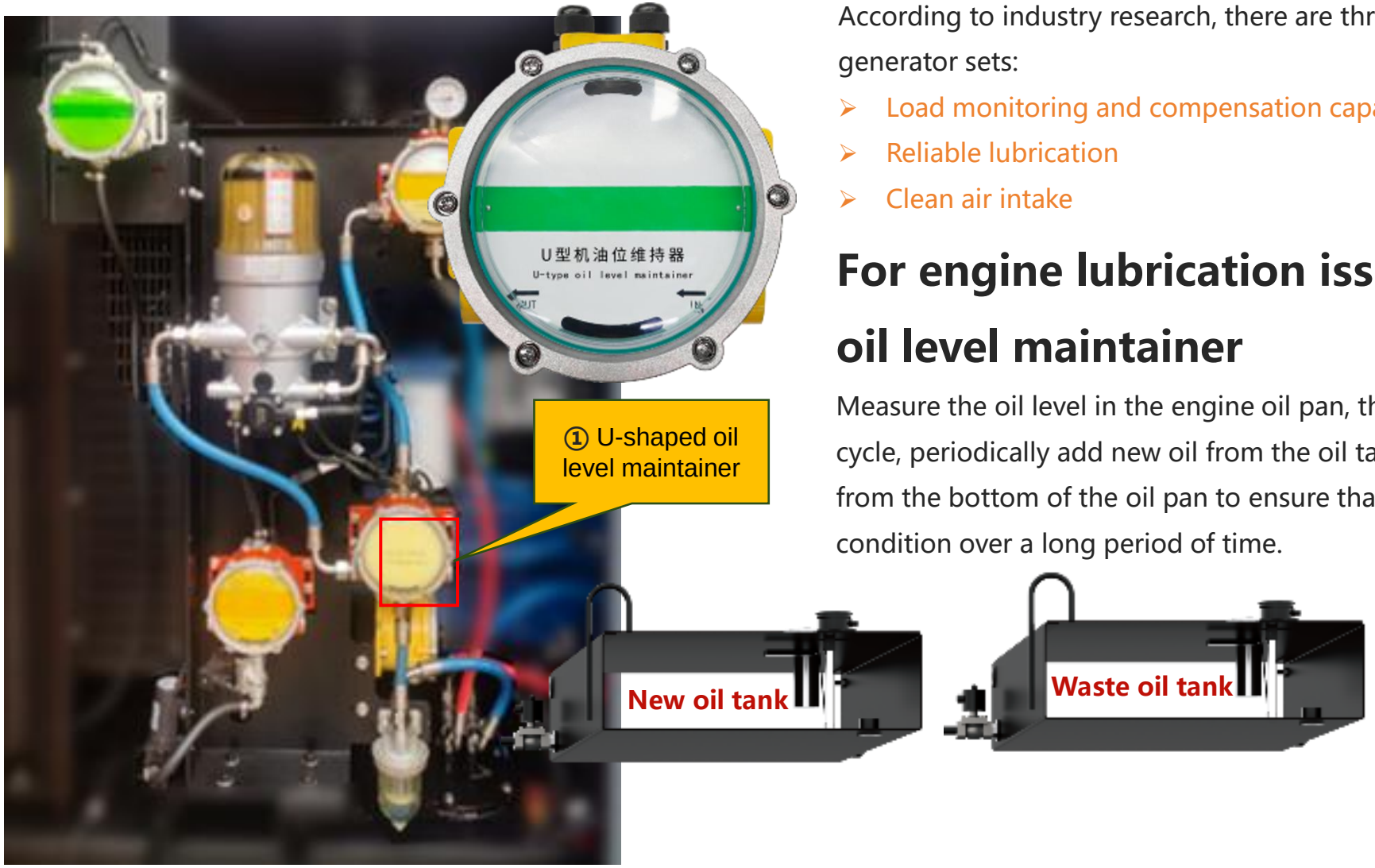
1. Divided into several independent power supply units to improve power supply reliability and stability.
2. More conducive to on-site construction, reducing construction difficulty and budget
3. Saved the customer approximately 98,000 USD in transformer procurement costs and approximately 50% in motor procurement costs.

Photos of the layout at the Texas site

MPMC design and manufacture a 10,000A current-carrying cabinet for a 16M33 gas engine unit.

Core Product 2：Emergency Generator Set，Intelligent Power Equipment

Special Project to Extend Equipment Lifespan—Engine Oil



According to industry research, there are three key points for improving the service life of generator sets:

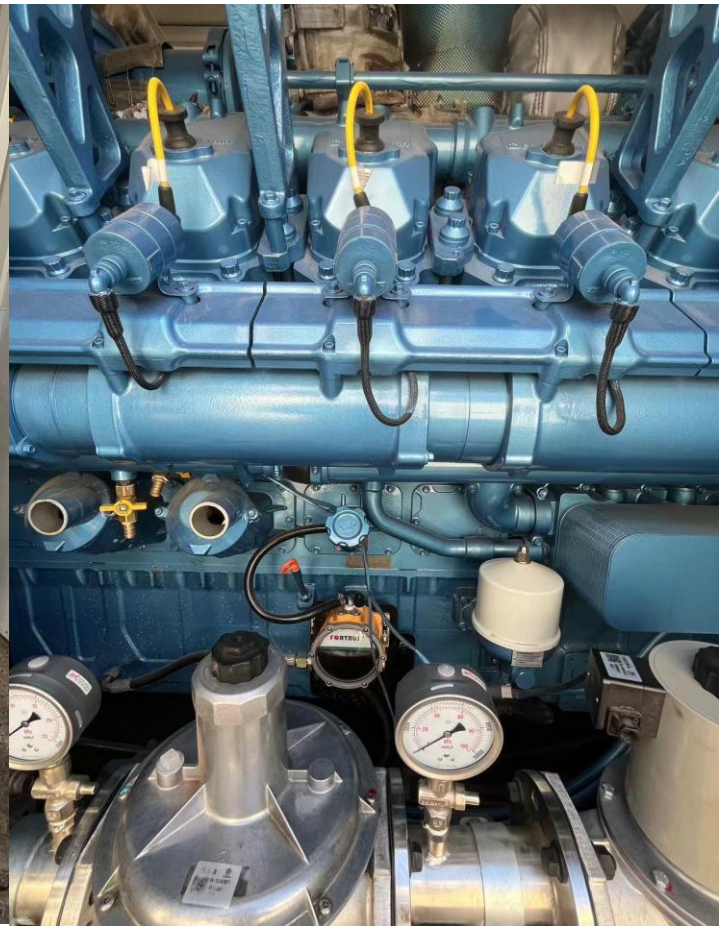
- Load monitoring and compensation capabilities
- Reliable lubrication
- Clean air intake

For engine lubrication issuesThrough ①U-shaped oil level maintainer

Measure the oil level in the engine oil pan, then, based on the engine maintenance cycle, periodically add new oil from the oil tank to the oil pan and drain the used oil from the bottom of the oil pan to ensure that the unit remains in good lubrication condition over a long period of time.

Smart Kit Retrofit for Gas Turbine Units

The engine automatically compensates for oil loss and automatically changes the oil.

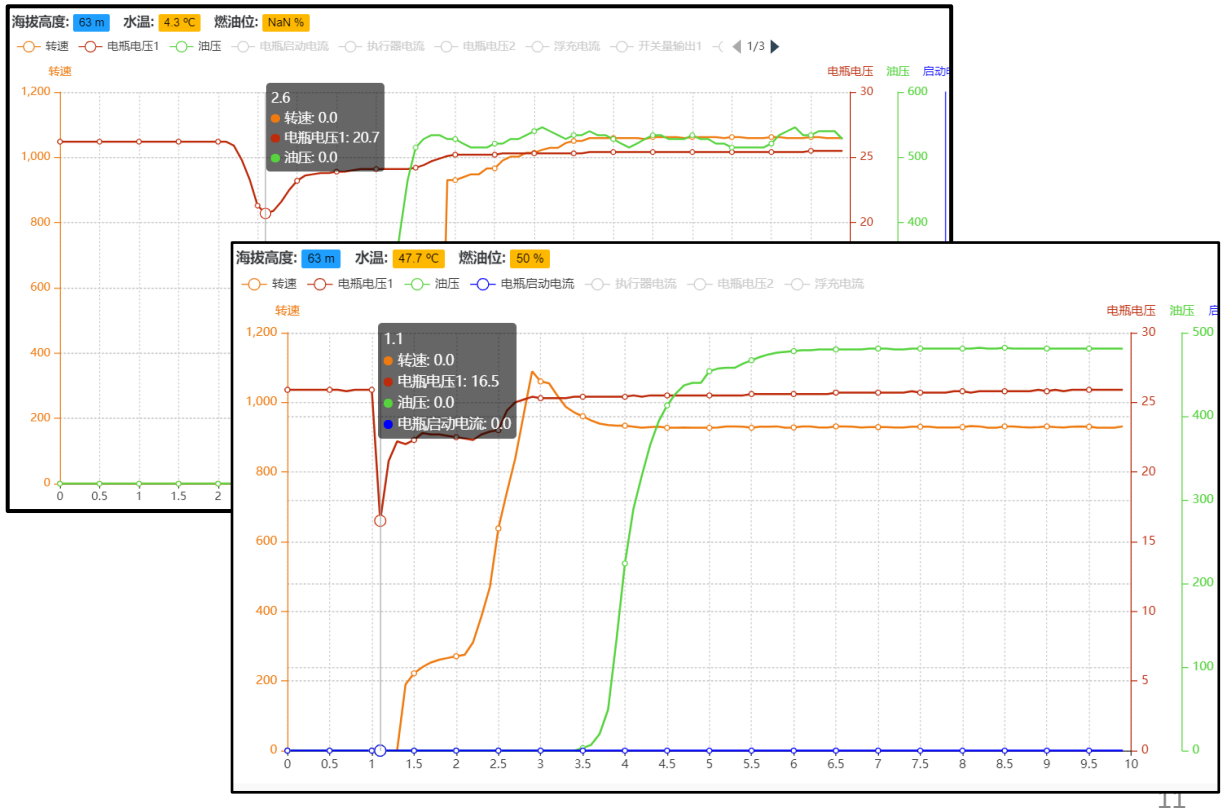


Core Product 2：Emergency Generator Set，Intelligent Power Equipment

Launching a special project on reliability—batteries

The reliable start-up of the unit is highly dependent on the battery being sufficiently charged, but:
Most current control systems only monitor the static voltage of the battery and do not pay attention to the voltage drop during battery startup. However, even if the battery voltage can be maintained after capacity degradation, reliable startup cannot be guaranteed.

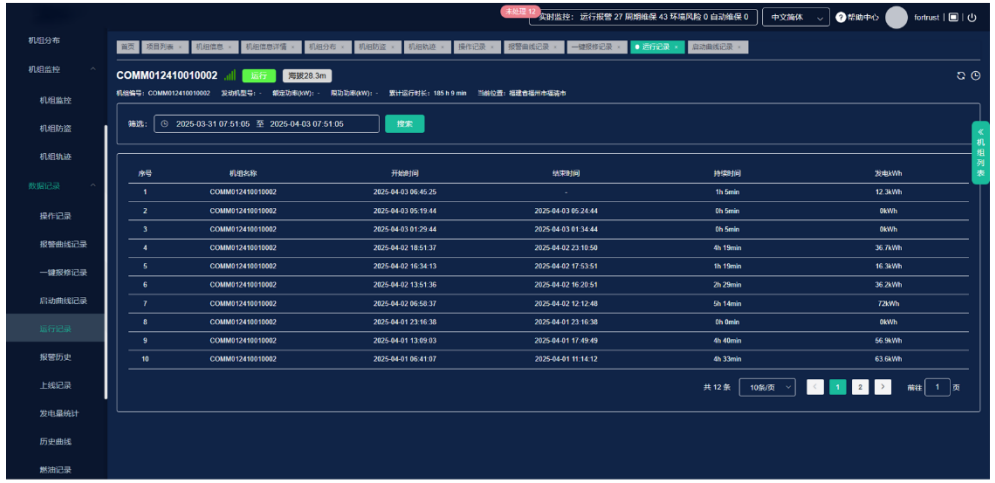
In response to the above issues
MPMC uses smart terminals and IoT technology (which can be converted into a wired local area network) to monitor each start-up process of the unit (fault recording, 0.1-second data), check the battery voltage drop, and allow customers to replace the battery pack based on the intuitive display of battery degradation to ensure reliable start-up.



Software Features - Device Management

Unit Information Management

Anti-theft protection for the unit



Operating Record

Alarm History

Software Features - Warning/Alarm Audible and Visual Alerts

Warning/Alarm Audible and Visual Alerts:

Early warning and alarm strategies can be set for generator sets. When an early warning or alarm occurs, the system will automatically trigger an “audible and visual alarm” alert and display the current alarm-triggering generator set, alarm time, and alarm description on the system interface. This enables monitoring personnel to promptly identify generator set abnormalities, implement fault prevention or resolution measures, and minimize losses caused by equipment failures or power supply disruptions.

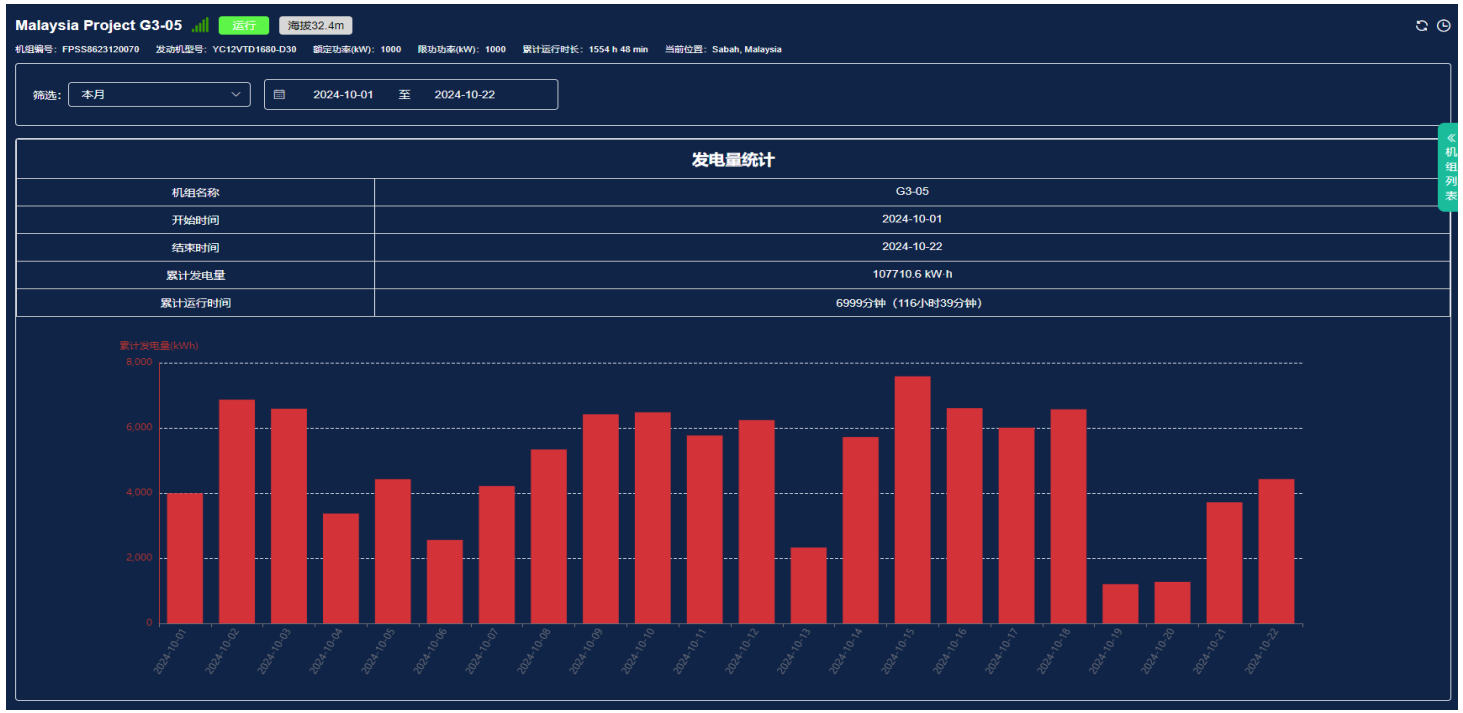
Software Features - Single-unit Monitoring

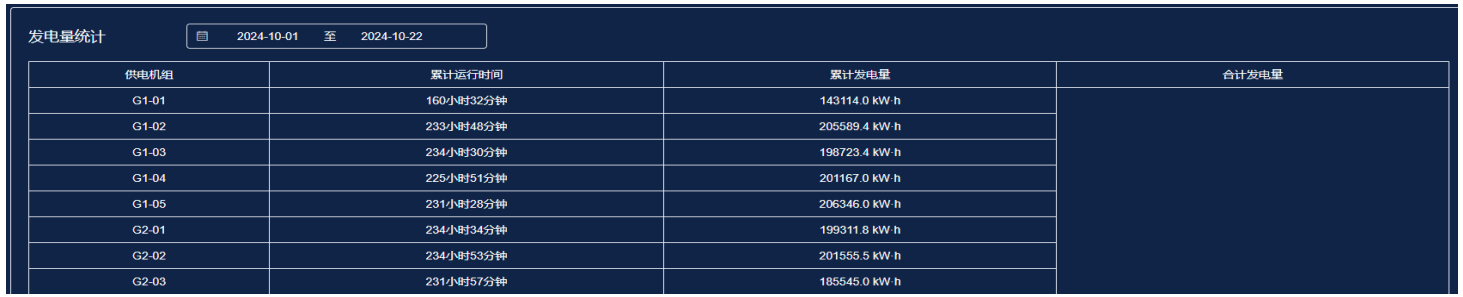
Single-unit monitoring:

1. Comprehensive monitoring of engine data, load data, generator data, busbar data, early warnings, and alarms for a single generator set;

2. Remote control and unattended operation of the generator set through functions such as start-up, shutdown, setting start-up mode, setting manual/automatic mode, and alarm reset, thereby reducing on-site equipment operation and management costs.

Software Function - Power Generation Statistics





供电机组	累计运行时间	累计发电量	合计发电量
G1-01	160小时32分钟	143114.0 kW·h	
G1-02	233小时48分钟	205589.4 kW·h	
G1-03	234小时30分钟	198723.4 kW·h	
G1-04	225小时51分钟	201167.0 kW·h	
G1-05	231小时28分钟	206346.0 kW·h	
G2-01	234小时34分钟	199311.8 kW·h	
G2-02	234小时53分钟	201555.5 kW·h	
G2-03	231小时57分钟	185545.0 kW·h	

Power Generation Statistics:

1. Statistics on power generation can be compiled for each power generation unit or power plant/project comprising multiple power generation units over different time periods to understand the power generation trends of the power generation units/power plant.

2. This facilitates managers in assessing power demand and power generation costs, providing a basis for decision-making in formulating scientific power generation plans, controlling power generation costs, improving power generation efficiency, predicting future power demand, and reasonably scheduling power generation units.

Customized Case Study - Automated Operation and Maintenance of Gas Generators

Gas Power Plant Operation Monitoring:

1. Remote monitoring and management of power plants established with gas/diesel generator sets (such as oil and gas extraction);

2. Unmanned/minimally manned operation through automated start-up and shutdown control strategies, reducing labor costs while improving generator set operating efficiency and power supply reliability, reducing energy waste, lowering carbon emissions, and improving management efficiency.

Note: The monitoring system visualization supports customization for different devices/application scenarios.

Online cloud operation and maintenance and operation and maintenance plan formulation

Online 24/7 real-time monitoring of power generation units

36MW gas turbine generator set successfully connected to the grid at project site

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THANKS

Power Generation
Diesel / Gas / Methanol / Biofuel Genset
Diesel Lighting Tower

Hybrid Solution
Hybrid Power Station
Hybrid Lighting Tower
Solar Lighting Tower
Micro Grid Solution

Battery Energy Storage System
HBD-E Series
HBD-A Series
HBD-R Series

Mobile BESS Charger
BCH-80-70
BCH-275-200
BCH-500-1000

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