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4MW

Emergency power

Norway

4 MW of emergency power for Norway's Ålesund Hospital

HIMOINSA generator sets, supplied through Østerbø Maskin AS, the company's distributor in Norway, will be used to guarantee emergency power in the event of a grid outage at the hospital.



Power Solutions

Norway's healthcare system is one of the most advanced and least congested in Europe. Ålesund hospital, which provides healthcare coverage for a population of some 50,000 people, has installed three HIMOINSA HTW 1530 T5 generator sets to cover its emergency power requirements and to ensure a supply of critical power in the event of a grid outage.

PROJECT SUMMARY

HIMOINSA Installed equipment:

- 3 x HTW1530 T5 690V
- Low-speed and low-noise cooling fans
- 3 CC19 ATS panels with 2 AGC-150 pr panel
- 1 pcs AS40 centralized panel for genset controllers and MHI
- Fibre-optic communication system



LOCATION AND OBJECTIVE



This hospital is located in the city of Ålesund, on Norway's west coast. As the city is built on a number of islands and subject to adverse weather conditions, the project's design and development have had to take these environmental requirements into consideration.

Ålesund hospital, at location Åsehaugen, was first opened in 1971 and already had a number of emergency generator sets, hence the objective was to replace them with new HIMOINSA models housed in a soundproofed room in order to reduce sound levels to the maximum.

SOLUTION

Taking all these requirements into account, three HIMOINSA generators have been installed, **guaranteeing a total of 4MW** of power in what is a **mission critical project** designed to ensure operational continuity in all areas of the hospital in the event of a grid outage. One of the project's major challenges was to undertake the installation of the generator sets with the new 400V and 230V distribution systems in phases, ensuring that the hospital was fully operational at all times.

Safety | Redundant Power System

The project has entailed the construction of a new external building, next to the hospital, in which the generator sets and the emergency switchboard have been installed.

In order to increase the **safety** and **efficiency** of the equipment, certain essential requirements were met, such as ensuring that the installation was a **redundant system** and that the **generators worked in parallel**, i.e., a **N + 1 design**, thereby guaranteeing that should one of them fail to start up, another generator will always be able to do so and to supply power to the healthcare complex.

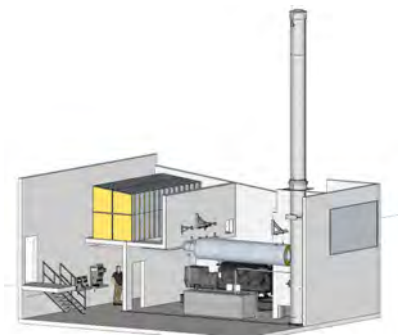
The new emergency genset building runs on a 690V system supplying the 400/230 transformers. A special system of transfer and control panels required by the client has been delivered. Along with the three generator sets' control unit, the main switchboard control system features a touch screen which is connected to the three transfer switches that feed six different connections of the hospital's installation, located in three different places.



Everything has been installed within a **redundant fibre-optic ring** for communicating and responding to the installation's different demands. "Redundant fibre communication between the control modules located in separate buildings was a project requirement **to ensure a reliable power supply under any circumstances**. We chose DEIF control units for the ATS, and HIMOINSA generator sets." says Ivar Areklett, Sales Engineer and Project Manager at Osterbo Maskin

Ensuring low noise emissions

Given the need to comply with strict regulations in terms of noise levels and due to the fact that this facility is **very close to a residential area**, one of the requirements was that the **sound level should not exceed 69dB@ 1m** on the outside of the building. To achieve this level of sound attenuation, specific measures have been taken such as the installation of sound attenuation panels, based on the engine specifications, as well as three 14-metre-long chimneys, each of which is connected to a powerful silencer.



The sound attenuation solution was designed by Østerbø and has been verified by an external acoustician who has ensured that the proposed system **not only meets the requirements of the emissions regulations, but also** in terms of pressure loss, thus **ensuring that sufficient cooling capacity is available**.

The chimneys have been installed in one single piece and have been raised more than 30 metres above the ground, in order to make sure they were installed correctly before the construction of the roof of this new building was completed.



"Østerbø Maskin won this contract in strong competition with main suppliers of emergency power solutions in Norway. In a project of this size and with this level of complexity it is **absolutely crucial to have a strong and flexible supplier as HIMOINSA** backing us throughout the project. Looking at the final result, we have delivered a solution we are proud of. But most important is the **good feedback from our customer** that have received a plant built within the frames of their specifications. We are confident that the close coordination between everyone involved, even in these days of COVID-19 and in spite of all the constraints that this entails, has been invaluable in ensuring that we all pulled in the same direction to find the best possible solution." explains Ivar Areklett.



2.4 MW

University Hospital Institute

France



2X1550 kVA | 2.4 MW

UNIVERSITY HOSPITAL INSTITUTE, STRASBOURG (FRANCE)

How HIMOINSA guarantees a redundant emergency power supply for one of the world's most advanced surgical centres

Summary:

Location:

Strasbourg (France)

Installed power:

2 x 1550 kVA = 2.4MW

Generator sets:

2 HTW-1550 T5 units
5,086 x 2,796 x 2,330 mm (L x W x H)

Special configuration:

Redundant emergency power supply with synchronised start-up system capable of supplying 100% of the load in 10 seconds. Two redundant control units per generator set and a double silencer system.

Installer:

SOVEC

The complexity of the project required HIMOINSA to conduct a thorough analysis, both of the design and manufacture, and of the installation of the equipment. In addition to the sensitivity involved in working with a hospital, in France there is a host of environmental and power supply safety legislation, which made development complicated in terms of engineering, adapting each part of the process to technical and legal requirements.

The University Hospital Institute (UHI) is the new part of Strasbourg Civil Hospital for the treatment of gastrointestinal disorders, a leading centre in image-guided and minimally invasive surgery. The new building that houses the Institute, which is equipped with cutting-edge surgical technology, is connected to two separate power grids. The power supply is distributed with separate loads that are combined in a common busbar. Under French standard NF61940-37312, hospital facilities of this kind are required to:

- have a redundant emergency power supply;
- ensure continuous power supply during transformer maintenance.

HIMOINSA therefore supplied two generator sets supplying 1,550 kVA in stand-by, synchronised with each of the grids and programmed with a parallel start-up system. Both generator sets start up synchronously and accept 100% of the load in 10 seconds, but only one of the units continues to function in an emergency, once the power supply is secured.



OBJECTIVE

The project required emergency generator sets that are capable of synchronising with two separate power grids and that, in the event of an outage on either grid, can supply 1,550 kVA of power in 10 seconds. The installation must comply with French legislation on noise emissions and environmental legislation, and ensure a secure power supply during transformer maintenance on the main grids.

SOLUTION

HIMOINSA guaranteed continuous power supply with a synchronised start-up system. Up to 2.4 MW of power can be supplied, double the current needs of this new part of the hospital. By installing load demand-based management or wattmetric management, the control units detect existing demand. If this exceeds a set threshold, both generator sets work in parallel to supply up to 3,100 kVA of power at specific times to cover demand peaks.

Technical Specifications:



Two HTW1550 T5 generator sets with Mitsubishi engines were supplied. They are **emissions-compliant models** that comply with French law No 2910, which requires engines, between 2 and 20 thermal MW, to meet NOx and HCH emissions limits.

The **control systems** are redundant with two control units in each generator set, so that the generator sets can continue to function if either of them breaks down. In addition, the installation includes a **programmable logic controller**, or PLC, which regulates the complex operating system. All electrical parameters, both of the installation and of the generator sets, can be viewed from a remote screen. Another challenge of the project was to secure the hospital's power supply during the annual **maintenance** required by French law for transformers on major grids. HIMOINSA planned a complex system that involves controlling a large number of low-voltage inputs and outputs to ensure the safety both of the machinery and of those working at the facility during this maintenance.



Double silencer system:



A **double exhaust silencer system** was incorporated, which maintains the backpressure of the equipment and ensures minimal noise. To minimise noise pollution, the sealed room in which the generator sets are located was completely soundproofed, including motorised grilles in the air vents to cool the room, and bushings, which absorb vibrations from the generator sets and the structure supporting the silencers.



Thierry Blond,
SECTOR MANAGER AT
SOVEC ENTREPRISES

As part of the construction of the UHI Strasbourg, from the award of the project SOVEC Entreprises sought a partner company for the implementation of two generator sets supplying

1,550 kVA in stand-by. The final choice was HIMOINSA, who has managed to demonstrate, during the various technical and commercial negotiations, its expertise in the ability

to carry out such a project. The design phase, the factory reception, execution and implementation have confirmed that we had chosen the right partner.





50 MW

Emergency power

Turkey

50 MW TURKEY



HIMOINSA supplies emergency power to Ikitelli City Hospital, the largest earthquake-proof building in the world and one of the largest hospitals in Europe.

LOCATION:
Istanbul, Turkey

INSTALLED POWER:
25 x 2,500 kVA= 62.5 MVA

GENERATOR SETS:
25 units HTW-2295 T5 (Open skid)

SPECIAL CONFIGURATION:
Emergency generator sets to guarantee the power supply of the hospital

complex's facilities and buildings, working in parallel with the grid to ensure the flow of power in the event of a grid outage.

DEALER:
Yanmar Turkey

CLIENT:
Rönesans Holding and the Turkish Ministry of Health

50 MW of emergency power to Ikitelli City Hospital, Istanbul

Istanbul, with more than 15 million inhabitants, is the most populated city in Turkey and has the greatest number of inhabitants living in the same urban area in Europe. Such concentration poses a real challenge to public health services in delivering quality health services to the population. With this in mind, the Turkish Ministry of Health has developed the new Ikitelli City Integrated Health Campus, which will provide health services to this large metropolitan area of the city.

It is the third largest Public Private Partnership (PPP) Healthcare project implemented on Turkish territory to date. A healthcare city made up of a healthcare campus and eight buildings dedicated to specialist hospitals

located next to the campus, a building for management and logistics, another for technical service, three heli-ports and a tri-generation plant (a project still in progress that also incorporates HIMOINSA gensets). The total construction area is more than one million m². Its facilities are expected to accommodate up to 60,000 visitors per day, and it incorporates more than 9,500 direct employees.

Due to the site's seismic activity, more than 2,000 seismic isolators have been incorporated to protect the facilities from possible seismic movement, making it the **largest building in the world protected by seismic isolators**.

HIMOINSA, together with **Yanmar Turkey**, has provided 25 HTW-2295 T5 diesel generator sets to provide 50 MW of standby power, in order to guarantee the continuous operation of the facilities in the event of a grid outage.

OBJECTIVE

Install an emergency power plant on the hospital grounds to guarantee 50 MW of power. Generator sets with a rapid response capacity to any grid outage, that can operate independently or in parallel for as long as necessary, providing 100% of the load. The site is fed by two connections to the public grid; the moment the first one fails, the second starts working, and in event the second one fails, the generator sets will start working to guarantee the entirety of the supply.



SOLUTION

Open skid generator sets with high mechanical resistance engines and a resized radiator, connected to an independent transformer and a fuel inlet with external tanks, providing greater autonomy for long periods of use. These gensets are distributed among rooms; two or three generators per room.



Efecan Ülkü, Energy Systems Manager of Yanmar in Turkey, assures that »HIMOINSA generator sets are the safest technology to deal with mission-critical applications, where an outage can have a tremendous impact on patient safety«, and adds that »the project has been subject to an exhaustive study by both companies to offer the optimum solution required by the client«.

Technical Specifications

The 25 HTW-2295 T5 gensets are equipped with a Mitsubishi engine and a tropicalised radiator resized for 50°, as well as vertical air outlets. These gensets are capable of starting up in a short period of time and can offer 100% of the load, preventing an outage from affecting what may be happening in surgeries, test benches, laboratories or hospital wards.

To ensure the highest level of soundproofing, the generators have been installed in soundproofed rooms, equipped with specially prepared air inlet and outlet points with vertical exhaust nozzles.

In order to enable them to be activated synchronized with the grid, the generators incorporate a Woodward 3500XT parallel control panel installed in the synchronization panel, and a ComAp AMF25 emergency control panel installed in the generator for an easy maintenance. This way, the amount of power required can be selected, as well as the number of units needed for use at any given time.

HTW-2295 T5
25 x 2.500 kVA





24 MW

Hospital

Turkey

24MW emergency power for the Gaziantep Hospital in Turkey

HIMOINSA has designed and implemented a comprehensive power supply solution to guarantee continuous operation at Gaziantep Hospital, even under extreme conditions. The project also includes the installation of pipelines and advanced soundproofing measures ensuring maximum reliability and safety of the power supply at all times.

CASE STUDY

24MW emergency power for the Gaziantep Hospital in Turkey



PROJECT SUMMARY

Location: The hospital is located in the Şahinbey district of Gaziantep the province is one of the most important regional healthcare projects in Turkey. **Installed Equipment:**

1- TSB - the Hospital's Technical Service Centre.

Genset model installed: **12 HTW 2295.**

2 - ISM -the Provincial Health Coordination Centre.

Genset model installed: **2 HTW 1030.**

Sector: The project is in the **health sector**. It is worth mentioning that the Gaziantep City Hospital treats around 45,000 people every day and has a workforce of 6,000 employees.

Details: The health centre, which serves Gaziantep and the surrounding region, has a capacity of 1,875 patient beds. Its total built area is 638,088 square metres on a site of 330,090 square metres. While the hospital was under construction, the region suffered one of the worst earthquakes in its history. The 7.7 magnitude quake affected the city of Gaziantep (the epicentre of the catastrophe was approximately 170 km far away). The earthquake delayed the opening of the hospital by about six months.



SITUATION & OBJECTIVE

The primary objective of HIMOINSA's project for Gaziantep Hospital was to ensure a reliable and uninterrupted power supply for this mission-critical facility, where continuity of operations is vital for patient care and medical services. Meeting this goal required a highly customized solution that addressed the unique technical and operational challenges of the hospital's energy needs.

The project aimed to provide a robust backup power system capable of activating instantly during a main grid failure, ensuring seamless transitions and uninterrupted functionality.

The design required rapid-response generators that could fully energize the system within 10 seconds and supply 100% of the load 20 seconds later, guaranteeing a swift and efficient recovery of all essential hospital services.

Another critical objective was to ensure system redundancy and operational reliability. To achieve this, the generators were configured to operate in parallel, allowing automatic switching and reducing the risk of disruptions even in the event of individual generator failure. The solution was also meticulously tailored to meet the hospital's high power demands, particularly for medical equipment requiring a stable and continuous power supply.

In addition to reliability, the project aimed to optimize the system's design to suit the local conditions of Gaziantep. The generators were installed within the hospital buildings, eliminating the need for external cabins or containers and simplifying maintenance.

SPECIAL CONFIGURATION

The synchronisation control system for the 12xHTW2295 package controls the synchronisation of the generator sets at 0,4kV / 34,5kV (medium voltage) downstream of the transformer.

This system, which uses **PLC and HMI technology** to manage the generator sets and the MT cells, not only controls synchronisation, but also alerts operators to any alarms occurring in the gensets and manages fuel automation.

This synchronisation system communicates with the hospital's **Scada system via the Modbus TCP-IP protocol**.

It controls all the generator sets and auxiliaries based on information received from the hospital's Scada system indicating the need to load, disconnect or reverse synchronise (synchronise with the grid).

The two HTW1030 generator sets have their own separate synchronisation control system, which is housed elsewhere and also controls the synchronisation at low voltage (400V), with a similar structure and functions



SOLUTION

For this mission-critical project, HIMOINSA developed a **comprehensive power supply solution** specifically designed to ensure the uninterrupted operation of the Gaziantep Hospital. The solution includes special 50 °C+ radiators, synchronisation panels, a fuel system consisting of four main 40 m³ underground tanks and fifteen 1 m³ tanks for everyday use, along with the installation of pipelines and soundproofing.

It also incorporates critical mufflers, soundproofing cassettes for the air inlet and outlet windows, seismic isolators and mechanical installations to ensure maximum reliability and safety of the power supply at all times.

“ Thanks to this solution, we can rely on HIMOINSA as one of our main suppliers for complex and energy-critical applications, not only in the healthcare sector, but in any field and location where high reliability is required”.

Technical solution:

- 50 °C radiators.
- Synchronisation panels.
- Fuel system.
- 4 main 40 m³ underground fuel tanks (for the 12xHTW2295).
- 1 x 11 m³ elevated main fuel tank (for the 2xHTW1030).
- 15 x 1 m³ fuel tanks for everyday use.
- Fuel pipelines and isolation.
- Critical mufflers.
- Attenuation buffers (for the air inlet and outlet windows).
- Seismic isolators.
- Mechanical installations



INSTALLATION CHALLENGES | HIGH SEISMIC RISK

Although the February 2023 earthquake delayed the opening of the Gaziantep Hospital by a few months, it also highlighted the need for high-capacity healthcare facilities. Despite the complicated conditions on the ground, the project team showed determination and commitment to complete the installation and commissioning work as quickly as possible. Thanks to the efforts of the technical teams deployed by Himoinisa, Yanmar and the sub-contractors, the project was successfully completed in record time.

Critical mufflers

A critical aspect of this project was the need to reduce noise levels to ensure they met the strict technical specifications. Mufflers were included in the comprehensive noise reduction solution, along with attenuation buffers on the system's air inlet and outlet windows. This configuration made it possible to reduce the noise generated by the units to such an extent that the sound is barely audible from outside the genset room, thereby ensuring that the quiet and safe environment of the hospital is not disturbed.



Seismic isolators

Installing generator sets in a city such as Gaziantep, located as it is in an area of Turkey prone to considerable seismic activity, presented a major challenge in terms of safety and uninterrupted power supply. Our generator sets are fitted with seismic isolators and are designed to absorb vibrations caused by ground motion and to remain in an upright position. This capability allows the units to continue to operate stably and reliably, even during an earthquake, ensuring an uninterrupted power supply in a critical environment such as a hospital. The disastrous earthquake once again painfully demonstrated the urgent need for these seismic measures.

50°C radiators

Instead of the 40 °C+ radiators that are standard in these HTW packages, 50 °C+ radiators were chosen for this project, due to the technical specifications and the ambient temperature requirements of the Gaziantep area. Due to their large size, the radiators had to be transported separately and connected to the engine and chassis at the site.



POWER PLANT

- 01** 5 MW of stand-by power plant to back up electricity supply in Faroe Islands, Denmark
- 02** 10 MW to cover surges in power demand and as emergency power in The Philippines
- 03** 9 X 1930 kW | 18 MW in West Midlands, United Kingdom
- 04** 10X2000 kW | 20 MW in Capacity Market, Midlands, United Kingdom
- 05** 25 MW | Power Generation Plant in Cassaque, Angola
- 06** 8.5 MW of power to a production plant in Sierra Leone
- 07** 5x975 kW Gas generator power plant in the Ecuadorian Amazon
- 08** 24 MW of power in Kouriah, Guinea



5MW

Stand-by power

Faroe Islands

The Faroe Islands provided with a HIMOINSA 5MW Stand-by power plant to back up electricity supply

HIMOINSA supplied two medium voltage generator sets HMW 3030 kVA T5 6.6 kV to one of the heavy fuel oil plants managed by SEV, the main producer and distributor of energy on the islands.

CASE STUDY | 2X2664 kW | 5 MW | Medium Voltage Project | Faroe Islands



Location: Faroe Islands

Installed Power: 2X2664 kW = 5MW stand-by power

Generator sets: 2 HMW-3030 T5 units

Special configuration: The medium voltage alternator incorporates current and voltage transformers for direct reading from the control unit. Medium voltage switchgear for protection and measurement. Special cooling system.

Distributor: KJ-HYDRAULIK

HIMOINSA has developed a Medium Voltage project to generate standby power for one of the heavy fuel oil plants that produce electricity for the residential and business area of the Faroe Islands.

Located in the North Atlantic Ocean, the Faroe Islands are composed of 18 islands with a total of 50,000 inhabitants. The average energy consumption on the islands is 240,000 MWh, with the available power generated reaching 260,000 MWh, according to the U.S. Energy Information Administration – Independent Statistics & Analysis.

To ensure a constant, failure-proof power supply, SEV, the Faroe Islands electric utility company, has installed at its Sund plant two HIMOINSA medium voltage generator sets, model HMW-3030 T5 6.6kV. The sets have been supplied through HIMOINSA's distributor on the Faroe Islands, KJ-HYDRAULIK.

The Sund Plant has five engines fuelled by heavy fuel oil which generate energy to supply power an area of the industrial and residential activity on the islands.

“The function of the HIMOINSA generator sets is to guarantee energy supply in the event of a network failure”, said Francisco Inglés, Sales Regional Manager at the company.

How does the equipment work?

The generator sets, which are connected in parallel with the grid, deliver an output of 3000 kVA at 6.6 kV of voltage. They are equipped with an engine, which performs at the rated conditions within 12 seconds after a power failure occurs. This quick response, provides emergency power assistance to prevent any outages in the residential area of the islands, but also ensures power continuity to the fish processing industry, one of the main industrial activities of the Faroes Islands.

The system is designed to cover sudden load increase –**peak shaving** - at those times when demand exceeds the power provided by the heavy fuel oil plant which is the primary resource of the generating station. This is where the function of the generator sets assumes an important role, being able to offer an additional 5MW.

Another mode of operation is that of exportation. From the SCADA control unit, connected to the gensets via a MODBUS protocol, it is possible to select the power to be exported to the network, which can increase the available power in the grid, regardless of the operation mode set by default. The generator sets have a DEIF AS5 AGC4 control unit and a medium voltage alternator provided with the current and voltage transformers for direct reading from the control unit. The equipment includes medium voltage switchgear for protection and measurement to obtain the reference voltage and current from the common power busbar for synchronisation with the mains.

12'

the gensets are ready twelve seconds after the power failure



Seawater cooling system

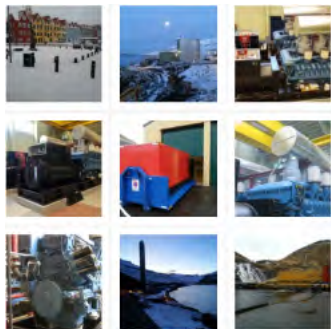
One of the peculiarities of the project has been to design a seawater cooling system. Due to the proximity to the sea, the gensets do not require a radiator, since it is therefore possible to harness sea water for cooling the generator sets. "The Sund Plant already had a seawater pipe system nearby, so that connection has been reused to supply the cooling system for the two generator sets installed", said Agustín Rodrigo, Network Development Manager at HIMOINSA. This has been one of the adaptations that the HIMOINSA distributor, KJ-HYDRAULIK, has taken into account in the project development process.

Technical specifications

Alternator: The medium voltage alternator incorporates current and voltage transformers for direct reading from the control unit.

Medium Voltage Switchgear: Medium voltage switchgear for protection and measurement to obtain the reference voltage and current of the common busbar for synchronisation with the mains.

Special cooling system: The cooling system uses water from the sea so that the generator sets do not require a radiator.





10MW

5x22030 kVA

Philippines

5x2230 kVA | 10 MW | Mindanao, Philippines

HIMOINSA supplies on the Philippine island of Mindanao 10 MW to cover surges in power demand and as emergency power in the event of any power outage.

CASE STUDY | 5x2230 kVA | 10 MW | Mindanao, Philippines



Summary:

Location: Barangay Bit-os, Butuan City (Philippines)

Installed Power: 5x2230 kVA | 10MW PRP

Generator sets: 5 HMW-2230 T6 units

Owner-End user: ANECO: Agusan del Norte Electric Cooperative, Inc.

EPC Contractor: Global Power Systems GmbH

Special Configuration: Generator sets can run in island mode to supply critical customers, or in parallel with the grid, operating in output mode to supply power for up to 6 hours per day for peaking requirement or 24-hour in emergency situation. The control system of all the generators is managed from a SCADA that communicates with the electrical substation and determines the optimal and most profitable mode of operation at any given time and can be monitored in ANECO headquarter 7-kms away from the power plant.

10MW to cover surges in power demand on the Philippine island of Mindanao

This generation plant has also been designed to generate emergency power in the event of any power outage of the Villa Kananga electrical substation in Butuan, north of the island of Mindanao

The Mindanao region of the Philippines has seen a significant increase in demand for electricity in recent years. This, coupled with its heavy dependence of over 50% on hydroelectric power, has led to frequent power cuts, especially during the driest and warmest months. To prevent power cuts, the Department of Energy has set up a modular programme of generator sets to supply power to the network during peak demand times.

HIMOINSA has a strong presence in the Philippines through its subsidiary in Asia-Pacific, HIMONSA Asia-Pacific. Via its main distributors in the country, Prime Power Systems, Energetix and MaxPower, the company has executed numerous projects with renowned local developers such as Megaworld, Vista, Ayala or SM.



On this occasion, HIMOINSA, through Global Power Systems GmbH, has supplied five generator sets in 40-foot containers. Two operation modes are possible for the owner and operator:

- In parallel with the grid for 6 hours per day, supplying up to 10MW of power during peak periods, and
- In island mode as emergency power supply for the area supplied by Villa Kananga electrical substation.



Bruno Reul | Project Management & Development at Global Power Systems

The decision to work with HIMOINSA was motivated by a good reactivity of the engineering team in order to customize the solution for our client. We received a full support from HIMOINSA engineering team during engineering and commissioning. Their team in China was really helpful during commissioning of this plant in The Philippines.



OBJECTIVE SOLUTION

To guarantee the supply of 10 MW of PRP power to the Mindanao electricity grid for up to 6 hours per day. In addition, the plant must be ready to function on a stand-alone basis, as an emergency power supply for the area in case of a mains failure.

Five **HMW-2230 T6** generator sets, which can work in parallel with the grid, supplying up to 100% power. All the Comap IntelliGen generator controllers are connected to the SCADA allowing a remote monitoring of the power plant.

Technical Specifications:

To allow the generator sets to run in parallel, they have been fitted with Comap IntelliGen controllers. All the controllers are managed via a SCADA, which optimises operation of the plant depending on the substation's power demand.



Medium voltage switchgear

The generator sets were connected to step-up transformers so they could adapt to the grid voltage. The **medium voltage switchgear** was installed in a 40 feet-container for simpler logistics. As a result, all the plant's power is concentrated at a single point that is responsible for supplying it to the grid.

Stand-Alone Operation. If the substation experiences a malfunction or breakdown, the power plant can switch from parallel to stand-alone operation to supply up to 3MW of emergency power to the hospital, while any damage to the substation is repaired.



Comap IntelliGen Control panel



SCADA with IntelliTouch touchscreen



Transformer



18MW

Power Plant

UK

9 X 1930 kW | 18 MW



- **Location:**

West Midlands (United Kingdom).

- **Power installed:**

9 x 1,930 kW.

- **Generator sets:**

9 HGM-2370 T5 NG units in a container.

- **Special configuration:**

Gas generator sets connected in parallel to the public grid that provide energy at a constant load for 2,500 hours a year.

- **HIMOINSA Distributor:**

Ocktcom Limited.



EFFICIENCY. The cooling system is controlled via a frequency converter, reducing the genset consumption and maximizing the electrical efficiency.



ENVIRONMENTAL SUSTAINABILITY. Gas generators - friendly fuel that reduces carbon emissions, NOx, CO₂ and particles.



REDUCED ACOUSTIC EMISSION
Special Soundproofing.



INTELLIGENCE
Gensets Remote Management.



RELIABLE POWER
Generators in parallel to the grid, providing the 100% of the installed power in a few minutes.

18 MW power plant with gas generator sets

Located in the central-western part of the British Isles, the West Midlands region of the United Kingdom is known for its high population density, close to three million people, and for being one of the most important commercial, healthcare and financial areas of the UK.

Considered a major development area, it has been subjected to a growing energy demand in recent years. In this context, power plants that support the public grid become the best solution to assume the constant increases in electricity demand. These plants have been adapted to a more sustainable productive model using environmentally friendly fuel that reduces carbon emissions, NOx, CO₂ and particles.

In order to contribute to sustainable development, HIMOINSA and its local distributor Ocktcom Limited, have designed a power plant composed of nine gas generator sets connected in parallel to the grid. These gensets supply the electrical grid with a total of 18 MW of power at constant load for 2,500 hours per year.

OBJECTIVE

The objective of the project was to release into the public grid, a continuous flow of power to cover the growth of demand for electricity and/or natural fluctuations in generation from renewable sources. The project required the gas generator sets to be activated immediately, and they had to be able to start up in a short period of time and to **provide the grid with 100% of the installed power in a few minutes.**

The generation plant has been built in an area close to a residential district, and because of that, special solutions have been implemented in terms of **soundproofing** able to avoid any acoustic impact.



SOLUTION

The main priority of HIMOINSA and of its distributor Ocktcom was to choose the most sustainable and safe technology, ensuring the lowest possible acoustic and environmental emissions. The answer: **generator sets with high power gas engines connected in parallel to generate stable power.** These generators ensure an effective response to fluctuations in the power supply, generating **18 MW of power at constant load with a maximum use of 2,500 hours per year.**

These generator sets have been installed in containers with special ultra-soundproofed insulation that even go above and beyond the legal requirements dictated by the MCPD (Medium Combustion Plant Directive) in the field of acoustic emissions. "The results obtained even improve the limits set by the regulatory directive and thanks to the work we have carried out in collaboration with Ocktcom we have obtained record sound levels. I'd say it is most unlikely that they have ever been matched before in a plant with these characteristics," says Manuel Aguilera, Gas Product Manager at HIMOINSA.



TECHNICAL SPECIFICATIONS

Specially sized and soundproofed containers were used, that ensures a sound level of 65dBA at a distance of 1 meter. In addition, a special double silencer **exhaust system** was added to ensure the sound level without affecting the operation of the engine.

The generator sets feature **natural gas engines** capable of providing 1,930 kW of power, **with high mechanical resistance** and low emission levels of particles, CO₂, SO_x and NO_x: 250mg/Nm³ of the latter at 100% of the load. These emission levels are perfectly in line with current regulations and represent an improvement in terms of environmental sustainability compared to their diesel-powered counterparts.

We decided to use control units with integrated PLC that were adapted by HIMOINSA to guarantee a safe and efficient parallel connection between the groups and the grid, as well as their remote management by the plant user. This system makes it possible to coordinate the transfer of power into the grid to ensure a continuous supply.

The **cooling system** is controlled via a **frequency converter**, which maximizes the electrical efficiency of the generator set by reducing its consumption to the minimum necessary at all times.

To guarantee the highest possible **safety levels**, the generator sets feature a host of safety sensors (smoke, gas...) and they also have **ATEX emergency ventilation** in the container, thereby guaranteeing safe ventilation of the cabin.



20 MW

Capacity Market

UK



10X2000 kW | 20 MW

CAPACITY MARKET, MIDLANDS (UNITED KINGDOM)

20 MW to
cover surges in
power demand
in the Midlands

Summary:

Location:
Midlands (United Kingdom)

Installed power:
10 x 2000 kW= 20MW

Generator sets:
10 HMW-2200 T5 units in a 40-foot container
12192 x 2438 x 2896 mm (L x W x H)

Special configuration:
Generator sets to reduce current surges, operating in parallel to the public grid to which they deliver a steady power load 1 or 2 hours a day, up to a maximum 400 hours per year.

HIMOINSA distributor:
Ocktcom Limited

In the United Kingdom, various areas register well above normal levels of electricity consumption at certain peak times during the day. The demand varies depending on the time of year, the day of the week and the time of day. In order to balance out power supply and demand, the UK National Grid requires access to power generation plants that avoid overloads in the grid and ensure a reliable response. Through its distributor Ocktcom Limited, HIMOINSA has supplied 10 parallel-connected generator sets in 40 foot containers that deliver a constant 20MW of power into its grid, 1 or 2 hours a day, up to a maximum 400 hours per year.

Due to the major increases in consumption that are affecting the electricity grid, the Capacity Market (CM) project has become one of the solutions that the National Grid has at its disposal in order to satisfy electricity requirements during these peaks of power demand.

OBJETIVE

The objective of the project was to install a power generation plant that would ensure the supply of 20 MW of power to reduce current surges using generator sets that are able to deliver 100% of the available power in less than 30 seconds. This is in a zone close to the urban area. As a result, the units must be housed in a weather proof containers that are heavily soundproofed with a noise level of 79dBA at a distance of 1 metre in free field conditions, in order to guarantee minimum acoustic emissions.

SOLUTION

One of the main priorities for HIMOINSA and Ocktcom was to select the best possible technology: low-emission engines designed specifically for CM applications; engine models that can be adapted for a natural gas supply if so required by the project and legislation in the years to come. Clive Dix, Managing Director at HIMOINSA Power Solutions, UK, says "we offer the cleanest solution possible that is within our control and suggest other manufactures should also consider their responsibilities for the environment."

The MTU engines that were chosen (16V4000G63 model) exceed the requirements that were laid down.



Technical Specifications:

Energy generation plants in projects of this nature tend to be located in zones close to the urban area. In this case, HIMOINSA's engineering team has managed to reduce the level of noise from the containers to **78dBA at a distance of 1 metre**, which actually went beyond the project's acoustic emissions requirements.

In order to do so, they chose a **horizontal cooling package** which, as opposed to vertical packages, makes it possible to reduce noise without having to increase the total dimensions of the generator set. This system also includes a frequency changer that reduces the noise of the fans and the power they consume.

In order to guarantee these high levels of **soundproofing**, the design contemplated 40 ft containers with 100 mm thick, high-density (145 kg/m³) volcanic rockwool. The floor was soundproofed with polyurethane foam.

At the same time, it was decided to incorporate a **ventilation system in the engine housing** that uses two electric fans to ensure that the air is renewed correctly. There is also a **fuel cooler** that makes it possible to increase the engine's efficiency.

To allow the generator sets to run in parallel, **Comap IntelliGen control units** were used. Furthermore, given the humid conditions and the abundant rainfall throughout the year, a **C5-M paint system** was applied in order to protect the structure of the container against corrosion, thereby guaranteeing the high durability of the units.

Fast Frequency Response (FFR):

The engine's electronic control unit is prepared to accept the load quickly and spread over time, a key quality in the capacity market application.



James Beck,
MANAGING DIRECTOR
AT OCKTCOM LTD.

The decision to work with HIMOINSA on this project and future Capacity Market projects was clear, HIMOINSA is the preferred supplier to Ocktcom because as a manufacturer they listen and is able to meet the Ocktcom design criteria offering low emission and low noise solutions specifically for the STOR market.

Both Ocktcom & HIMOINSA are very focused on sustainability, together we are offering best emission technology not only for future compliance but to show we are responsible organisations. Ocktcom can also offer HIMOINSA natural gas generators for STOR application and plan to convert

some current STOR sites to run on dual fuel to reduce emissions, we can advise authorities of the benefits using emission optimised diesel and gas generating sets, STOR generating sites can be cleaner if designed responsibly and without the risk of an installation being de-commissioned because it will not meet future requirements.



25 MW

Power Generation Plant

Angola

25MW | Power Generation Plant in Angola

The Angolan Ministry of Energy and Water (MINEA) awarded the internationally-recognized generator set manufacturer, HIMOINSA, the construction of 25MW energy plant to supply the Cassaque pumping station in the town of Zango IV on the Kwanza river



Summary:

Location: Cassaque (Angola)

Installed power: 25MW

Generator sets: 9 HMW-1785 T5 units and 9 HMW-2200 T5 units in a 40-foot container
12192 x 2438 x 2896 mm (L x W x H)

Special configuration: Two containers have been installed to group together the transformers' 18 medium voltage outflows, protect the plant, make measurements and act as the synchronization point with the load or with the grid in the future.

Client: Angolan Ministry of Energy and Water

HIMOINSA's engineering team has developed a 'Plug & Play' system which gives the Ministry flexibility to increase the plant's generation capacity, dismantle it as necessary and install power production modules in any part of the country.

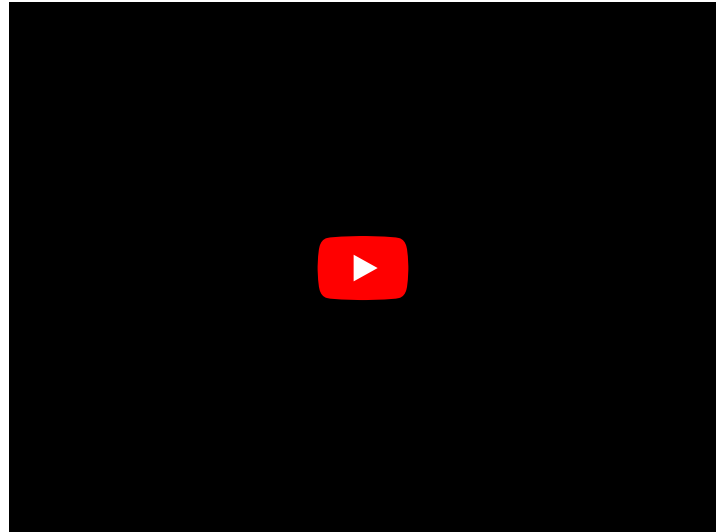
The project was equipped with the most up-to-date technology and a highly-qualified technical team was onboard from the outset. HIMOINSA also organised a training programme for local personnel on the use of the technical tools required for plant maintenance to ensure quality and professionalism in the technical control of the substation.

OBJECTIVE SOLUTION

The main objective of the project is the construction and start up of a substation to supply power to the Cassaque pumping station. This will provide a supply of good quality water to the town of Zango IV. The project is designed to generate 25MW PRP and deliver 20MW of continuous power to the grid, with 15,000 volts at 50 Hz.

The Cassaque plant has installed capacity of 40MW, however, guaranteed capacity stands at 25MW. The generation plant contains 18 HIMOINSA gensets (nine model HMW-1785-T5 units and nine model HMW-2200-T5 units).

The Cassaque project will improve living conditions for the people of Luanda, ensuring a more regular supply of clean water. Water supplied by the Cassaque pumping station accounts for 60% of treated water for public consumption in Luanda.



Technical Specifications:

Step-up transformers. Transformers with biodegradable coolant have been installed. Each transformer contains a temperature and pressure detection system. In total, nine 1600kVA and nine 2000kVA transformers were installed, with a transformation ratio of 15/0.4 kV/ 50 Hz.

Medium voltage (MV) switching centre. The switching centre channels all the transformers' MV power outflows, acting as a common busbar. Two containers have been installed to group together the transformers' 18 medium voltage outflows, protect the plant, make measurements and act as the synchronization point with the load or with the grid in the future.

Substation ancillary services. These comprise a 400KVA transformer with a transformation ratio of 15/0.4kV/50 Hz. A 400KVA genset was also installed to provide service when the generation plant is not operative. An ATS switchboard was installed inside the control container, enabling automatic switching in the event of a breakdown in the power supply.

Control room. This houses all IT and control equipment for the 20MW thermal plant. From here, gensets, cells, fuel management, power exports and ancillary services are all controlled.

Fuel storage system. This is made up of 11 double-walled 50m³ deposits for outside use. Nine of these 11 deposits are used to receive fuel and two are used to supply fuel (one for each branch of nine gensets).

Administration and social unit. The administration of the thermal plant and all employee services are carried out in this unit, located at a strategic point within the plant.

Lighting. This comprises lighting for the perimeter of the plant, with 10 single lighting towers, and interior lighting, with 10 double lamp lighting towers, all constructed of metal and providing sufficient illumination for the whole plant.





8.5 MW

Production Plant

Sierra Leone

HIMOINSA supplies 8.5 MW of power to a production plant in Sierra Leone

In addition to supplying the factory, the project challenges include the ability to feed surplus power into the local electricity grid, which will help stabilise the power supply in the Freetown port area.



In addition to supplying the factory, the project challenges include the ability to feed surplus power into the local electricity grid, which will help stabilise the power supply in the Freetown port area.

HIMOINSA has developed a project to supply power to a production plant in the Port of Freetown, in the West African region, an area of great strategic importance due to its commercial logistics. As the port is a key component in the distribution of Four and other products throughout its area of influence, an uninterrupted power supply is essential for the continuous operation of the production plant.

The project is focused on the Four production sector, where a continuous supply of power is required to

run the plant. In addition, the surplus power produced by the generator sets will be fed into the port's electricity grid to help stabilise the supply.

The customer requires a power solution that can meet the demand for 8.5 MW of power to supply the Four production plant. In addition, the ability to transfer surplus power to the local electricity grid is required to help stabilise the power supply in the Freetown port area, which has historically experienced frequent power outages. In this way, the customer's expectations were to secure the power supply to the factory, minimising outages in the local grid and maximising revenue by feeding the surplus back into the grid.

Customised planning

The port of Freetown has very specific space constraints, which posed a challenge for the installation of the equipment. In order to guarantee the required fuel autonomy without compromising the available space, special tanks had to be designed for the project.

In this regard, HIMOINSA's teams worked in coordination with local teams and operators, whose careful planning and execution ensured that the systems were correctly connected to the existing power grid and that everything worked without interruption.



The HIMOINSA solution | Operational Efficiency

HIMOINSA has designed and installed an 8.5 MW power plant consisting of a series of high-efficiency diesel generator sets designed to power both the production plant and the grid simultaneously. The solution includes:

HTW-1260 T5 generator sets

With advanced synchronisation technology to ensure stable power distribution.

Soundproofed generators

Installed in 20-foot containers with volcanic wool insulation to reduce sound emissions, ensuring quiet operation in a seaside environment.

Optimised configuration

To operate at high temperatures and with different fuel types, adapting to local conditions.

In addition, 0.4/11 kV outdoor transformers have been included in the project to allow for proper voltage conversion and connection to the grid. Also included were DEIF control panels for parallel operation of the generators and their synchronisation with the grid, ensuring the stability and efficient distribution of the power supply.



The benefits of the proposed solution include greater operational efficiency to reduce costs and improve profitability, as well as contributing to the stability of the electricity supply, with the capacity to feed both the plant and the grid, resulting in the generation of additional revenue by feeding surplus power back into the grid.



Adaptation to climatic conditions

The project has been carried out in a marine environment with a high salt concentration, so it was essential to ensure that the generator sets and equipment were sufficiently resistant to corrosion and the extreme conditions of the region's tropical climate. To achieve this, special protection systems have been incorporated to ensure optimal operation of the equipment despite its proximity to the sea.

Energy Efficiency | Sustainability

Customised planning

The solution implemented by HIMOINSA to supply 8.5 MW of power to the aforementioned production plant in Sierra Leone has not only improved the power efficiency of the Four plant, but has also provided added value to the customer by allowing surplus power to be fed back into the local electricity grid.

This project has not only stabilised the power supply in the port of Freetown, but has also opened the door to economic opportunities through the sale of power. The power solution installed and designed by HIMOINSA has had a positive impact both at the operational level of the factory and in the local community, contributing to sustainability and energy efficiency in Sierra Leone.





5x975 kW

Generator Power Plant

Ecuador

5x975 kW ORELLANA, ECUADOR



HIMOINSA supplies 5 MW of continuous power with generator sets powered by wellhead gas to meet the energy needs of Ecuador's most important oil field.

- **Location:**
Orellana Province (Ecuador)
- **Installed power:**
5 x 975kW | 5 MW (COP)
- **Generator Sets:**
5 HGS 975 T5 WG units in a special container
- **Client:**
Energy Solutions.

- **Special Configuration:**
Generator sets powered by associated gas in a tropicalised container with special ventilation and protection against extreme weather conditions. These generator sets have been designed to work in parallel with other diesel generator sets.

Gas generator power plant in the Ecuadorian Amazon

Flanked by the Napo River (a tributary of the Amazon River), the Block 43 oil extraction zone is a large oil field located in Ecuadorian Amazon, in the eastern part of the province of Orellana, to the west of Ecuador. Its certified oil reserves amount to 1,672 million barrels, equivalent to approximately 41% of the country's crude oil reserves; this means that this extractive region has been declared an area of National Interest by Ecuador's National Assembly.

Implemented by Petroamazonas EP, it is estimated that the Block 43 project will reach its maximum production level in six years' time, with an approximate extraction level of 330,000 barrels of oil per day. This project has been developed using the most advanced technology and environmental measures, minimising the environmental impact on the Amazon ecosystem; this includes directional and horizontal drilling, which make it possible to use a smaller drilling surface by placing several wells on the same platform.

With the aim of contributing to sustainable development, HIMOINSA, through Energy Solutions, has designed a power plant powered by wellhead gas, with 5MW (COP), integrated with the other diesel power plants.



INNOVATION

Gas-powered generator sets that use the associated gas generated by the crude oil extraction process itself as a source of energy, thus converting waste that is harmful to the environment into energy.

individually or in parallel with other diesel plants, depending on the power requirements of the complex.



ENVIRONMENTAL SUSTAINABILITY

Generator sets that reduce carbon, CO2 and NOx emissions.



DURABILITY & SAFETY

A tropicalised container, IP34 protection (antiparticles and water ingress), as well as fire, ATEX gas leakage and vibration sensors.



PARALLEL CONNECTION

Using a Woodward Easygen control panel, the gensets are controlled by the oil plant and can operate



REDUCED ACOUSTIC EMISSION

Canopy soundproofed with high-density rock wool to mitigate sound emissions.



Manuel Aguilera,
GAS PRODUCT
MANAGER AT
HIMOINSA.

This project has posed a great challenge for two reasons: A very low quality gas supply and adverse environmental conditions.

We managed to solve both problems satisfactorily, helping to reduce considerably emissions from the oil-associated

gas flaring, thus helping to preserve the environment of the Amazon rainforest.

OBJECTIVE

The project objective has been twofold: On the one hand, to provide continuous power to meet the growing power needs of the extraction plant, in parallel with other existing diesel generators; on the other hand, to reduce the flaring released by the crude extraction process itself, preserving the natural environment of the site.

From the beginning of the project, generator sets were required that were designed to withstand the extreme conditions of heat and humidity typical of the Amazon jungle, in addition to adhering to the compliancy requirements of the extraction plant itself.



SOLUTION

In this project, the key objective for HIMOINSA has been to offer an innovative solution that offers the perfect balance between performance, power, safety and environmental sustainability; generator sets with high power engines, driven by associated gas, connected in parallel to generate 5 MW of constant power to the plant.

These generators have been installed inside bespoke containers that are insulated against heat and humidity, as well as incorporating multiple safety sensors and a watertight container specially designed to avoid any expulsion of fluids to the outside.

TECHNICAL SPECIFICATIONS:

Engine. Gas engines with high mechanical resistance have been used, capable of generating 975kW of continuous power, fuelled by a gas with very low compressibility and reduced levels of particle, NO_x, SO_x and CO₂ emissions.

Control panel. The plant is managed by Woodward Easygen control panels which allow it to operate independently or in parallel with the rest of the diesel plants installed in the oil field.

Container. IP34 external protection that ensures correct insulation against solids with diameters greater than 2.5 mm and 360° protection against water spray. It is also prepared to withstand temperatures of over 40 °C and a relative humidity greater than 70%.

Safety. The container is equipped with different sensors that prevent gas leakages, fire vibrations, as well as a watertight compartment with a special seal to ensure that, in the event of any type of spillage, the fluid does not leak out of the container. The container features a ventilation system for explosive ATEX atmospheres and a silent spark extinguisher, thereby guaranteeing the safe operation of the equipment and the correct ventilation and cooling of all components.





24 MW

Kouriah

Guinea

HIMOINSA supplies 24 MW of power in Kouriah, Guinea

One of the challenges faced during the project was to ensure the supply of electricity during power cuts in the area. HIMOINSA has implemented a comprehensive solution, taking into account the specific characteristics of the Kouriah area and includes 12 HTW 2030 T5 generator sets capable of meeting the energy needs of an industrial site belonging to the metallurgical industry.



One of the challenges faced during the project was to ensure the supply of electricity during power cuts in the area. HIMOINSA has implemented a comprehensive solution, taking into account the specific characteristics of the Kouriah area and includes 12 HTW 2030 T5 generator sets capable of meeting the energy needs of an industrial site belonging to the metallurgical industry.

HIMOINSA supplies more than 24 MW of power to an industrial facility in a key area for the Guinean economy, located close to the capital, Conakry. The solution will mitigate the effects of the power cuts that have historically been common in this area, causing major complications for the inhabitants and the industrial areas affected.

HIMOINSA has provided the critical power required by this industrial plant which is located on the main freight traffic and warehouse artery in Guinea. The generator sets had to operate in an environment of high energy demand, ensuring a stable supply in the event of grid outage.

The client had a number of key requirements for this power solution, which had to be able to guarantee the supply of electricity to a large industrial plant dedicated to metallurgy, without forgetting process efficiency and optimum fuel consumption. The proposed solution had to ensure stability during peak loads, remain operational without prolonged downtime, and be an alternative that could be easily integrated with other existing electric systems in the production plant.

Yanmar Turkey has played a key role in the success of the project, working with HIMOINSA at every stage of the project. From the supply of medium voltage material to the commissioning of the installation, their experience and technical support have been essential to the correct integration and operation of the system.



Integrated Turnkey Solution

HIMOINSA has designed a project adapted to the conditions required by the client, taking into account the specific characteristics of the environment. The team has been responsible for overseeing both commissioning and testing, ensuring that the entire system operated optimally from the moment it was installed. HIMOINSA has provided a comprehensive solution that includes:

- **12 containerised**, high capacity HTW 2030 T5 diesel generator sets to meet the energy demands of the industrial facility.
- **8 cylindrical** 47.5 m³ main fuel tanks, to ensure continuous fuel supply and reduce the risk of production stoppages.
- **20 kV medium-voltage switchgear**, for safe medium-voltage electricity management.
- **0.4 / 20 kV step-up transformers**, to enable efficient conversion of electrical power.
- **Low-voltage (LV) distribution boards**, for safe distribution of electricity throughout the plant.
- **UPS and rectifier systems**, to ensure continuity of supply and stability of the power system.
- **2 electrical system containers** to optimise space by facilitating the management of the power system.
- **A synchronisation system** to facilitate the integration and coordination of all the generator sets in operation.
- **A SCADA system** for real-time monitoring and remote control of the power systems.
- **A fuel automation system** for functional fuel management and reduction of operational risks.



Challenges | Limited Infrastructure

The system has been designed to operate with parallel synchronisation between the 12 HTW 2030 T5 diesel generator sets. These gensets are particularly suitable for high volume industrial applications due to their efficiency and ease of maintenance, which has allowed a balanced load and an effective response to peak demand. The 0.4/20 kV step-up transformers and medium-voltage switchgear are configured to ensure safe and efficient electricity distribution. Fuel automation is key to optimising the use of resources and ensuring that the system operates continuously without interruption.



- **Accessibility and logistics**

The project presented logistical challenges due to the limited infrastructure and the location of the plant in the city of Conakry, which hampered the delivery and assembly of the heavy and bulky equipment.

- **Operating condition**

The installation was carried out in an environment with high temperatures and high humidity, especially during the rainy season. Such conditions required equipment capable of working in extreme conditions.

- **Coordination of multiple systems**

The complex integration of the automation, control and power systems involved the synchronisation of generators, transformers and SCADA systems and required close collaboration between the engineering and technical teams.

Success and Customer Satisfaction

The power solution implemented by HIMOINSA has enabled the industrial plant to operate continuously with optimised fuel consumption, thanks to the automation and remote monitoring system. The SCADA system allows the operators to efficiently monitor and control the performance of the generator sets from any location and has improved their ability to respond to any eventuality. In addition, HIMOINSA's ability to offer local technical support has been a key factor in the success of the project.



MINING

- 01** | 8 MW of Prime Power for LNG and Helium Plant in South Africa
- 02** | 12 MW Diesel Generator Spinning Reserve power for Delta Gold Zimbabwe's Eureka Mine



8MW

Prime Power

South Africa

8 MW of Prime Power for LNG and helium plant in South Africa

HIMOINSA Southern Africa provide an 8MW Prime Rental Solution for LNG and Helium Plant in South Africa



PROJECT SUMMARY

Location: Virginia, Free State, South Africa

Installed equipment:

- 4 x HRYW1275, Yanmar engine
- 4x HRMW1270, MTU engine
- 1 x HRFW200, Iveco engine
- 2 x 33,000ltrs Fuel Tank
- 2 x TRANSFORMERS 400V/11kv 11kV
- Neutral Earth Transformer
- Control Room
- LV & HV cabling
- Onsite HIMOINSA O&M Technical Team



SITUATION AND OBJECTIVE

Regergen's wholly owned subsidiary, Tetra4, is the holder of South Africa's first onshore petroleum production right. Tetra4's Virginia Gas Project is situated in the Free State of South Africa.

The project will produce LNG (liquefied natural gas) and liquid helium. The Plant is Sub Saharan Africa's first helium facility, making South Africa one of only 8 countries globally to produce and export liquid helium and South Africa's first onshore LNG operation.

Helium is required worldwide to manufacture **semi-conductors, fibre optic cabling** and provides **deep cryogenic cooling for the superconducting magnets** that are **critical components in magnetic resonance imaging (MRI)** devices.

It also serves as the only propellant for rocket fuel which enables space travel. There is a global shortage and demand internationally is high.

LNG is produced by purifying natural gas and cooling it down to -162°C until it liquefies. LNG is a versatile liquid fuel and can be used in the following applications while providing CO2 emission reductions when compared to traditional fossil fuels to aid decarbonisation strategies:

- Industrial heating for burners or boilers
- Transport as a substitute to diesel and petrol
- Power generation to compliment renewable wind and solar by providing stable base load or peaking power.

A natural gas liquefaction plant requires an immense amount of power to run. **Extraction, cooling and liquifying on site is an energy-intensive process.** During the construction process, no electrical connection was available, necessitating Regergen to proceed with a self-build electrical connection to the Eskom grid infrastructure and, in the interim, ensure they had a temporary, prime power solution to ensure timely commissioning of the Phase 1 Virginia gas Project.

SOLUTION

HIMOINSA Southern Africa won the tender for an eight month 8MW rental contract. They successfully provided, in rapid timelines, a competitive, flexible, turnkey power solution.

Rapid Deployment

Local utility Eskom would not be able to provide the dedicated power supply required to the site for a minimum eight months. The **HIMOINSA team installed and commissioned a fully functioning power plant within three weeks of the site being ready.** Due to maintaining a well-stocked fleet of rental units locally, HIMOINSA Southern Africa were able to offer flexibility with contract timelines. The units were installed and provisioned on site early to ensure there were no production delays due to lack of power. Extensions to the original contract term were also accommodated when utility power was delayed ensuring there was no disruption to the commissioning timelines Regergen had committed to their customers.

Technical Solution

Eight, fully synchronised generator sets, neutral earth transformers, fuel tanks and a **control room,** were installed to run the site at 8MW Prime capability, compliant with all health and safety requirements. A 200kVA unit was also provided for temporary use during the construction phase. As the massive compressors used for the manufacturing process have large step-loads, it was vital to ensure these did not cause power tripping which would interrupt production capability. **The 8MW, 11kv voltage solution ensured sufficient power redundancy.**

Turnkey Solution

HIMOINSA provided a fully bespoke service, fuel tanks and fuel piping in the construction phase to 24/7 data monitoring during production, as per the HIMOINSA preventive maintenance protocol. In strict adherence to health & safety protocols, three HIMOINSA technicians lived on site operating on 8hr rotational shifts.



HYW 1275-T5 Generator



Fuel Tank



Regergen Site

Cost Competitive

To best meet Regergen's operational and fiscal requirements HIMOINSA Southern Africa devised a two tier bespoke tariff.

1. Fixed capacity charge for the sunken costs on site
2. Variable running charge for every kWh that the plant generated

This meant that Regergen were able to have generators on site and commissioned in advance of the plant becoming operational, at a low fixed monthly charge. However, Regergen were not forced to pay a fixed electricity charge during this time but had the benefit to **pay only for energy that they required and was generated.**

The biggest cost of the early energy solution for Regergen was the diesel consumption used during power generation. **HIMOINSA generators with Yanmar and MTU Engines have best in class fuel efficiency rating,** a claim HIMOINSA Southern Africa were happy to back-up with financial performance liabilities if they did not successfully achieve the fuel efficiency rates committed to. By incorporating penalties if fuel efficiency levels were not met, paying only for energy that was needed and fixing the capacity charge provided Regergen with the comfort that the plant could be run at a pre-determined cost.

The plant ran efficiently on a fully turnkey solution, including the necessary manpower and operational planning requirements for the contract term, and beyond, until the utility connection was successfully installed, and the temporary power plant decommissioned.

COMMENTS



“

The HIMOINSA Southern Africa team have provided world-class service and support from the very first engagement until the very end of the project. They are extremely customer focused and have been very attentive to our rapidly changing needs ensuring the Virginia Gas Project was always prioritised.

Nick Mitchell | Chief Operating Officer | Regergen

“

It was an honour for HIMOINSA Southern Africa to be selected by Regergen for the Tetra4 processing facility and a delight to see Stefano and Nick take this project from inception to operation. This is a great success story for South Africa that we are delighted to have been involved in supporting the project to fruition with an interim, cost effective, quality power solution. We wish the Regergen team all the best in the future with this fantastic project.



Matthew Bell | Director of Business Development - HIMOINSA Southern Africa



They were there when we needed them, and were instrumental in giving us the power when we needed it. Matt, Martin and the HIMOINSA Southern Africa are great to work with and are very solution driven.

Stefano Marani | CEO & Managing Director | Renergen

Watch HIMOINSA and Renergen Directors discuss the 8 MW rental power solution for Renergen's LNG and helium plant in South Africa

- **Martin Foster** – Managing Director HIMOINSA Southern Africa
- **Matthew Bell** – Director of Business Development, HIMOINSA Southern Africa
- **Guillermo Elum** – HIMOINSA EMEA Regional Head
- **Nick Mitchell** - Renergen CEO





12 MW

Mining

Zimbabwe

12 MW | ZIMBABWE

HIMOINSA Southern Africa provides 12MW Diesel Generator Spinning Reserve power for Delta Gold Zimbabwe's Eureka Mine

CASE STUDY | 12 MW OF POWER AT ONE OF ZIMBABWE'S LARGEST MINES



PROJECT SUMMARY

Location: Guruve District, Zimbabwe

Installed equipment: 12 x HYW 1275 T5 Gensets with YANMAR engines in 20FT containers.

2 x 8MVA / 400-33kV Transformers.

1 x 33kV Switchgear Station housed in a 40FT container .

SCADA/DSE8660 and Control Room

Auxiliaries: 570m³ Fuel farm, Fuel Consumption Management System, LV & HV cabling.

Special Configuration: Advanced diesel "spinning reserve" solution that offers a greater level of reliability of supply to maintain the necessary power levels at the mine, without disruption.

Client: Dallaglio Investments.

SITUATION & OBJECTIVE

Delta Gold Zimbabwe is one of the largest mine in Zimbabwe. Although the mine is connected to ZESA through the grid network, Delta required additional power security.

Due to the uncertainty in Zimbabwe as to how reliably the grid will operate, supplementary energy from diesel generator sets, **1MW HIMOINSA generator with Yanmar engine HRYW 1275 D5/6**, were required to ensure power continuity in the event of grid outage. A minor outage of only a few minutes can cause the mine hours of production process delays resulting in significant production and financial losses. With Health and Safety of critical importance to the mine the solution had to be fully compliant with all protocols.



SOLUTION

HIMOINSA Southern Africa were selected as the turnkey supplier to provide power to the mine after submitting a thorough technical response to a complex technical solution which guaranteed reliable power security.

The scope includes the integration of the utility supply as well as back-up power diesel generators and on-site operational services. In conjunction with Delta, HIMOINSA Southern Africa developed an advanced diesel "spinning reserve" solution. In the event of multiple and consecutive grid outages, the diesel spinning reserve solution offers a greater level of reliability of supply to maintain the necessary power levels at the mine, without disruption. A SCADA system was installed and integrated to communicate with the grid and the HIMOINSA diesel generators. To avoid any downtime during periods of grid unreliability, the generators run continually at a low load factor, in conjunction with the grid power.

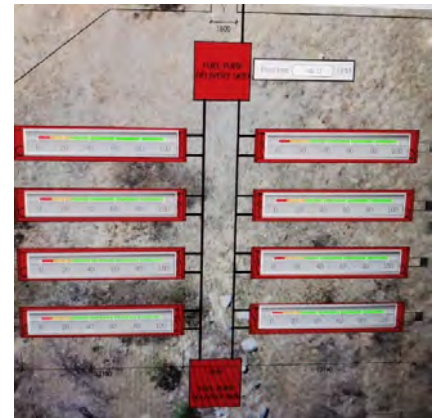


Should the grid fail, the SCADA system shuts down the power supply to all non-critical parts of mine and the diesel generators pick up the full load of the mines critical process power requirements. Sufficient spinning reserve power is always available to provide the mine's critical power requirements instantaneously.

If there is a prolonged outage, more generators will automatically start so that all the mine's operational power is generated and the HIMOINSA units seamlessly power the mine's full production capabilities. In total HIMOINSA Southern Africa provide **12MW power** to the mine to ensure **N+1 redundancy**.

It is important that the gensets run at their optimum fuel efficiency level and have sufficient spare capacity for peak demand and step-load spikes.

When the utility restarts again, the gensets automatically return to running at the low load spinning reserve. Spinning reserve diesel generation in conjunction with the grid is quite unique. As Health and Safety is a critical value for HIMOINSA Southern Africa and Delta, the HIMOINSA solution encompasses aspects that are not typical for standard applications. For example, when generating power in parallel with the grid it is imperative that there is no chance of back-feed down the line. The SCADA system, plus additional protections, are in place to protect individuals, the mine and the utility from any injury or damage to equipment. A 33kV switchgear has been also provided to integrating the utility supply, the mines transformers and **HRYW 1275 D5/6** HIMOINSA generators. Due to the size and potential scope of the mine's operations, HIMOINSA Southern Africa have made sure to futureproof the project by allowing sufficient spare incomers on the switchgear. As the mines power demand grows there is built-in spare capacity which will enable HIMOINSA Southern Africa to easily install additional power supply.



SUPPORT | TURNKEY PROJECT

HIMOINSA will train and educate local Zimbabweans to operate the power plant. Then, at the end of the project term, the day-to-day operations and maintenance can then be passed over wholly, or in conjunction with HIMOINSA Technical Service, to local employees.



«From the shortlisting of the tender process HIMOINSA have worked closely and innovatively to provide Delta Gold with our optimal power security solution as well as accommodating our stringent timelines leading up to plant commissioning. Operating in an environment where grid power can be unreliable, Delta Gold now has peace of mind that our plant's production is safeguarded from power availability issues».

James Beare
Managing Director | Delta Gold Zimbabwe

«HIMOINSA is honoured to partner with Delta Gold in Zimbabwe and supporting the mine's long-term goals with a reliable and cost-effective power solution. Working in collaboration with the Delta and fully appreciating the mine's development objectives, we have worked together to develop a phased installation approach and the most fuel-efficient solution for the mine's operations».



Matthew Bell
Director of Business Development | HIMOINSA Southern Africa

AIRPORT

- 01** | 6.3 MW of emergency power to Algeria's International Airport
- 02** | 17 MW of emergency power for the Malatya airport in Turkey



6.3MW

Emergency power

Algeria

6.3 MW ALGERIA



HIMOINSA supplies emergency power to Algeria's International Airport.

- **Location:**
International Airport of Alger (Algeria)
- **Installed power:**
7,875 kVA on stand-by
- **Generator Sets:**
1 HTW-2030 T5 unit, 4 HTW-1030 T5 units, 1 HTW-1030 T5 unit with a built-in load bank and 1 HTW-670 T5 unit
- **HIMOINSA Distributor:**
SARL Globale Réalisation.
- **Special Configuration:**
Stand-by generator sets with a redundant control system for the generation of emergency power in critical infrastructures, a built-in load bank inside the container of one of the gensets and tanks with a fuel capacity of 3,000 litres.

6.3 MW of emergency power in Algiers Airport

Opened in 1924, the Houari Boumediene Airport is the largest and most central airport to Algeria's capital, Algiers. It offers connections to the world's most important airports, and its privileged location on the edge of the Mediterranean Sea, makes it one of the gateways to the African continent. More than 7.5 million passengers pass through its facilities each year, and more than a hundred flights operated daily. As a result, they require a constant and reliable power supply that allows them to keep everything running smoothly without any grid outage.

HIMOINSA generator sets supply emergency power to more than 400,000 m² macro-complex consisting of three terminals: Hall 1, which is dedicated to international traffic; Hall 2, which is used for local traffic, and the Château d'Eau, which specialises in charter flights.

OBJECTIVE

Goal to supply emergency power to the facilities that serve as the two terminals at Algiers Airport. Also, to a third additional facility called Château d'Eau, to avoid any interruption in the airport's operation. Installations, that are Running 24/7 and that require solutions adapted to each space in order to guarantee the continuity of all services in the event of a power outage.

SOLUTION

The HIMOINSA engineering team has designed a solution to adapt the company's generator sets to the specific technical configurations of each terminal. The generator sets are configured to work in parallel, capable to operate individually or in parallel between them or other generators, offering the power the system requires in each space in the event of peak demand times.

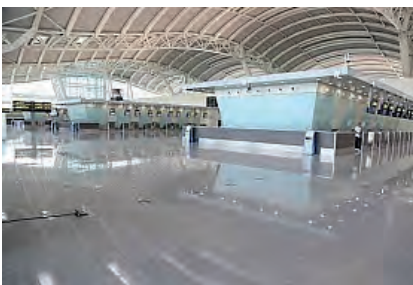


To cope with that peak moments, the system has a special configuration that allows it to continue operating autonomously even if the unit's main control system fails, thereby ensuring the continuous operation of the system.

TECHNICAL SPECIFICATIONS

In accordance with the project requirements in terms of sound emissions, and given that the units are installed outdoors, the gensets are housed in soundproofed containers with a special coating, designed to reduce sound emissions.

In order meet an international airport quality and power requirements, the generator sets have different configurations depending on which space they are supplying:



INTERNATIONAL TERMINAL:

The largest of the three complexes, 3 x synchronised 3 HTW-1030 T5 generator sets supply a total of 3,090 kVA. The control panels, housed in special cabinets, are synchronised to coordinate the start-up and power requirement of each genset according to the need detected in the grid.



DOMESTIC TERMINAL:

Given the more reduced space, we have worked on a different configuration to the first one, and we have included an HTW-2030 T5 genset and two HTW-1030 T5 gensets (one of them with a built-in load bank).



CHATEAU DE L'EAU:

An HTW-670 T5 genset that guarantees the emergency supply of 670 kVA in the event of a grid outage.



All the generator set models used in this project are powered by Mitsubishi engines and work at 400V/50Hz.

In addition, the generator sets feature a 3,000-litre tank that gives them greater running time.

The control panels that synchronise the units are configured to detect fluctuations in the power supplied by the grid. If the grid power supply drops below optimum levels, the system will automatically manage the units output to compensate for the fluctuation, thereby guaranteeing a stable supply.

The load bank serves to protect the unit it is housed in when it is working at low load mode. If the genset were to be running at below 30% of recommended power, the load bank activates, thereby guaranteeing this minimum level of power for optimal operation.

High Temperatures:

Given the climatic conditions at Algiers airport, the gensets are designed to work at temperatures above 50 °C. The special coating of the containers is prepared to endure the most extreme climatic conditions of heat and dust, ensuring that the units keep running at optimum efficiency.





17 MW

Malatya Airport

Turkey

17 MW of emergency power for Malatya airport in Turkey

Malatya airport, a medium-sized airport located 34 kilometres from the city of Malatya in south-eastern Turkey, was opened in 1941.



HIMOINSA has been involved in a large-scale power generation project at Malatya Airport. This project allows HIMOINSA and Yanmar Turkey to provide **versatile and reliable power solutions**, taking advantage of this infrastructure. The project for the supply of generator sets takes into account aspects such as **redundancy, reliability and the capacity to meet the high standards and demanding requirements** typical of **mission-critical projects** such as those in the airport sector.

Tailor-made power solutions | Project specifications

Location: Malatya Erhaç Airport is a small civilian airport and airbase, located 34 km from Malatya, Turkey.

Power needs: Supply of 5 main 2500 kVA generator sets with 6.3 kV medium voltage alternators plus 23 low voltage (400V) generator sets to supply the distributed systems.

The 5 2500 kVA generator sets are the main source of emergency power for all the systems in the extension; the other 23 smaller capacity gensets power the systems separately as additional (redundant) emergency systems in different locations.

Details: Synchronised unit management: The 5 generator sets operate in synchronised mode to ensure stability and continuity of power supply. Quality supervision: Detailed and customised FAT (Factory Acceptance Test) test procedures.

Turnkey scope: Comprehensive coverage such as Balance of Plant (BoP) and other components in addition to the generator sets, as part of a complete management solution.

HIMOINSA's integrated solution | Power supply and stability

HIMOINSA's integrated fuel system solution is designed to ensure both the supply of power and operational stability. This design meets the quality and reliability standards required for a critical infrastructure such as an airport, maximising efficiency and minimising operational risks. The solution provides the ability to run continuously for 20 days at 100% capacity, 28 days at 75% average load and 41 days at 50% average power. This is a very high capacity compared to similar general standby applications. Optional special measures are also included for the chemical protection of this high-capacity fuel during long storage periods.



Fuel system

Description: The fuel system consists of a set of main and day tanks and a polishing system to ensure the quality of the fuel supplied to the generators.

Main tanks

Capacity: 10 fuel tanks, each with a capacity of 125 m³, providing a total storage capacity of 1,250 m³. These tanks are designed to ensure long-term on-site fuel supply. They can also store large quantities of fuel, enabling supply even in situations of high demand.

Day tanks

Capacity: 5 tanks, each with a capacity of 5 m³, for a total capacity of 25 m³. These tanks act as intermediaries between the main tanks and the generator sets, ensuring a continuous and controlled fuel supply, allowing a constant flow and avoiding possible interruptions.



LV and MV synchronisation systems

Low and medium voltage synchronisation systems enable the generators to work together in a coordinated manner. Our synchronisation system also includes very high quality engineering and design. Our integrated management system is not only capable of synchronising 5 MV generator sets at medium voltage level and feeding all systems, but can also provide control and coordination with local LV generators according to different emergency scenarios.



Low voltage (LV) synchronisation

This system is responsible for synchronising generator sets operating at low voltage to ensure that the frequency and voltage remain constant and within the appropriate parameters. Key components include synchronising units and switching modules that allow LV generators to be switched on and off as required. These devices communicate with the central control system. The system also allows parallel start-up of the generator sets, thereby optimising load sharing and operational efficiency, as well as the flexibility to disconnect individual units for maintenance without affecting the continuity of supply.



Medium voltage (MV) synchronisation

The system ensures that the medium voltage generator sets, which are configured at 6.3 kV, operate together in a stable manner to meet the site's higher capacity power requirements. Key components include control logic developed using our application expertise, digital synchronisation panel monitors, a reverse grid synchronisation function, switches and protection transformers to safely manage the transfer of power between generators and to the site's medium-voltage grid. Additional functions include voltage regulation and protection against overloads, imbalances and other grid problems, thus maintaining the stability of the medium-voltage systems and protecting the units from possible failures or fluctuations.



Mechanical site installations

Mechanical site installations include all the ancillary infrastructure required for the safe installation, operation and maintenance of the generation and fuel systems. For this solution, HIMOINSA has designed and installed ventilation components and thermal insulation for the exhaust pipes, manufactured and installed hoods, completed fuel pipelines and power and signal cables, and supplied and installed components and spring-loaded seismic anti-vibration devices for earthquake-prone areas.

Adaptation to climatic conditions

As temperatures in the region can be very high, a **high-capacity 50°C radiator**, also known as a tropical radiator, has been included in the solution to reduce the risk of the generator set losing power during such periods.

Reliability | Generator sets

The proposed solution for Malatya airport consists of a series of HIMOINSA generator sets to cover different levels of demand. The system includes **five HTW-2555 T5 medium voltage (6.3 kV) units, designed for high-capacity critical loads** to ensure the stability of the main supply. **One HFW100 T5 unit, three HFW160 T5 units and fifteen HFW200 T5 low-voltage** units have been integrated into the system to provide scalability and redundancy for lower demand operations.

In addition, **four HTW765 T5** units complement the **low-voltage** system, providing additional power and increasing the overall reliability of the installation. This complete configuration ensures a robust and adaptable power supply to meet the airport's needs.



In a highly competitive market where generator sets have achieved a considerable degree of standardisation in terms of diesel engine quality, HIMOINSA's main advantage lies in its ability to **offer customised solutions** adapted to each customer's individual needs.

By positioning ourselves as an integrated supplier of turnkey solutions, we can differentiate our offering by combining expertise and design flexibility to provide added value beyond simply choosing an engine. This approach also allows us to strengthen our relationship with our customers by offering them a comprehensive service tailored to their specific requirements.

CONSTRUCTION

- 01** | Supplying power to build the largest suspension bridge ever built over the river Danube



15 Generators Sets Supplying Power

Danube

Supplying power to build the largest suspension bridge ever built over the river Danube

HIMOINSA generator sets form part of the machinery used to build this new structure connecting the regions of Romania. The project has entailed substantial investment in the technologically innovative solutions required to overcome such natural hurdles as the enormous volume of water carried by the Danube as it flows through the different cities where this infrastructure has been developed



HIMOINSA has supplied no less than **15 generator sets** through its distributor, All Generating, capable of supplying **more than 8 MW of power** for the construction of a major road linking the counties of Braila and Tulcea County and forming part of the Buzau - Constanta highway, which is scheduled for final construction in 2030 and will connect northern Muntenia and southern Moldova.



The construction work began in 2018. A project that has made it possible to build what is undoubtedly the largest suspension bridge ever erected over the Danube. The bridge, which spans the river as it passes by the towns of Braila and Smardan and represents an important step forward in the communications between the two regions of the country. With a length of **2 km**, this infrastructure is considered in improving the quality of life of its inhabitants, who previously depended on a ferry that meant long hours of waiting even in harsh winter conditions.

HIMOINSA generator sets have supplied **power both for the extraction pumps** used to lay the bridge's pillars and anchorages and for the **welding machinery** used to secure all the metal parts of the bridge's framework.



This new infrastructure has two 7-meter legs, four traffic lanes, two pavements and two additional lanes for bicycles, pedestrians and maintenance work. A dehumidification system is in operation on the bridge to ensure an anti-corrosive environment).



15 generator sets has supplied **more than 8 MW**

Technical specifications Reducing the environmental impact

In order to guarantee a sustainable power supply in such a natural environment, in addition to its generator sets, HIMOINSA has included a **high-capacity tank** designed to increase the units' running time and **reduce the need for refuelling, thereby minimising the risk of contamination in the area.**



During the first phase of the project, HIMOINSA supplied more than 4 MW of power to **operate the water extraction pumps** located both on the anchorages and on the central pillars of the bridge, one of which has been erected on an artificial island in the Danube. In order to extract water from the first anchorage, a 1 MW containerised generator set was installed; in the second

anchorage, three generator sets providing a total power supply of 1.5 MW were deployed. Both anchorages measure 40 m in diameter and are 23 metres deep, which is why the efficiency and reliability of the HIMOINSA generator sets was key to generating power during the water flow extraction process.

During the second phase, model HFW 600 T5 generator sets were supplied, coupled on slow-speed, 4-axle trailers, generating almost 4 MW of power and running at least 20 hours per day for a minimum of 3 months.



One of the requirements of this project was that the controller could **monitor the generators** via GSM for **geolocation purposes and for parallel synchronization**, if necessary. Attached to the generator sets is a switchboard that connects the numerous welding equipment used during the construction of this infrastructure.



“



Our end customer has been very positive about the compact size of our generator sets with high-capacity tank we installed to increase the running time of the equipment and reduce the need for refuelling, thus reducing the risk of contaminating the river. Another positive factor was the chassis which we designed to retain any possible spillage of liquids inside the canopy itself. The performance and responsiveness of the equipment, HIMOINSA and ALL Generating's know-how, as well as the quality of the generator sets are the reasons why our equipment was chosen for this project.

Catalin Stanculescu, General Manager at ALL Generating, Romania

DATA CENTER

- 01** | 12x2000 KW | 24 MW of power for Data Center Alibaba Group, China
- 02** | Supplying 5MW of power for one of Finland's largest Data Centers



24MW

Alibaba Group

China



12x2000 KW | 24 MW

DATA CENTER ALIBABA GROUP, CHINA

24 MW of HIMOINSA power for the data center of the largest online sales group in Asia-Pacific

Summary

Location:

GDS Shanghai Waigaoqia
Alibaba Group Data Centre (Phase II)

Power required:

11X2000kw=22MW

Power installed:

12X2000kw=24MW

Generator Sets:

12 HMW-2555 T5 generator sets
6420 x 2175 x 3657 mm (L x W x H)

Special Configuration:

Remote cooling system: intercooler, remote radiator and anti-condensation alternator

HIMOINSA Dealer:

Shanghai EPG Machinery & Electricity Co., Ltd

The data center of Alibaba Group, regarded as the largest online sales group in Asia-Pacific, required a 22 MW standby power supply in the second phase of the project. The aim: to prevent any loss of data and/or functionality of the databases that power the group's online sales portals.

After analysing the project requirements, HIMOINSA chose to supply 24 MW of power by installing 12 HMW-2555 T5 generator sets (MTU engine), 11 of which run on standby in the event of power failure, with the remaining generator acting as a backup for the other 11. Each generator set supplies 2785 kVA of standby power.



PURPOSE

The challenge was to ensure that the generators were properly cooled. The room in which they were to be installed is unventilated, so in order to cool the generator sets it was decided to install a remote cooling system with vertical radiators on the roof of the building.

SOLUTION

Two circuits were installed to overcome the cooling problem. The first circuit has an engine with an integrated heat exchanger to increase the distance between the engine and the radiator. A secondary circuit cools the engine water from the heat exchanger and channels it to the remote radiator, located on the building's roof, far away from the room housing the generator sets on the first floor of the building.



Technical Specifications:

The 12 HIMOINSA generator sets installed in this project have a heat exchanger, remote radiator, anti-condensation alternator and fuel cooler. The fuel cooler keeps the fuel at room temperature to ensure optimal engine performance.

The generators are fitted with a -35 dB (A) steel silencer, which provides a high degree of sound insulation to control noise in the residential area in which the generators are installed.



Control Unit

A HIMOINSA CEA7 control unit monitors and controls the generators and the mains. The control unit controls switching, thus acting as an automatic backup system.



Why HIMOINSA generator sets?

Alick Wan, General Manager at Shanghai EPG Machinery & Electricity Co. Ltd, one of HIMOINSA's distributors in China, says that "our end client was very impressed by the performance and compact structure of the generators. They believe that HIMOINSA product design is the best match for this project."

Alick Wan - Shanghai EPG Machinery & Electricity Co. Ltd.: "We always choose HIMOINSA generator sets with total confidence for our data center projects."





5 MW

Data Centers

Finland

Supplying 5MW of power for one of Finland's largest Data Centers

Occupying an area of more than 8500 m² and with a built capacity of more than 10 MW, Ficolo offers cloud and data center connectivity services, SDN-based cloud networking and a centralised multi-cloud management solution to make sure that a power outage does not disrupt its services.



HIMOINSA, through its distributor KW-set Oy, has supplied **5.4 MW** of emergency power to ensure uninterrupted service to the customers and users of Ficolo's data center facilities in Finland. After 10 years of supplying non-stop power to its data centers, our distributor KW-set has been certified by Ficolo as a key partner.

This major European data center provides data storage and cloud services. To guarantee service with built-in security, a reliable power supply and the constant availability of its services, Ficolo has installed three model **HTW 2030 T5**, HIMOINSA generator sets, capable of providing 6750 kVA in emergency power, together with an independent UPS system.



**3 X HTW
2030 T5,
provide 6750
kVA critical
power**

Ficolo has 3 data centers, The Rock in Pori, The Deck in Tampere and The Air in Helsinki which uses a cell-based technology that combines power and cooling, which means that each cell has its own generator set to guarantee a continuous supply.



PLAY VIDEO

Technical Specifications



HIMOINSA offers reliable equipment for **critical power** operations such as hospitals, data centers, airports, etc., where nothing can go wrong. This project has called for generator sets with pre-heating resistances with a pump, whose thermostat has been set at between 38-54 C°, thus keeping the water in the engine at a minimum temperature of 40 C°, which allows the generator sets to **start up within 10 seconds** of any failure.

 **10s**

This ensures an immediate response and a continuous supply. In addition, to ensure comprehensive control of the system, the generators are monitored via a controller that supervises the pre-heating resistances with a pump.

Immediate **Response** | Continuous **Supply**



Do you want to know more about how HIMOINSA generator sets are designed for Data Centres?

“



Our end customer has placed great value on the performance and responsiveness of the equipment. HIMOINSA and kW-set Oy's know-how in Data Center projects, as well as the quality of the generator sets explain why our equipment has been chosen for this project.

Jimi Nurmi, General Manager at kW-set Oy, our distributor in Finland

EVENT

- 01** 8.5 MW in the Dakar Rally 2018 (Peru, Argentina and Bolivia)
- 02** 3 MW of power at the "Aire 25" Festival in San Javier, Murcia, Spain
- 03** EHR, HIMOINSA's battery-powered clean energy system, present at the largest Rally Championship in Japan
- 04** HIMOINSA has supplied power at the 'Fan Futura Fest' sustainable festival
- 05** HIMOINSA and La Vuelta join forces to supply sustainable power to Spain's flagship cycling competition



8.5 MW

Dakar Rally 2018

Peru, Argentina, Bolivia

8.5 MW | Dakar Rally 2018

HIMOINSA supplies energy to
the Dakar Rally 2018



Summary:

Location: Peru, Argentina and Bolivia

Power Available: 6 x 503/524 kVA in PRP

Generator sets: 6 units HPCW-500 D5-6 (dual-frequency)

Special configuration: Redundant power supply to serve the 10 camps set up by the ASO along the 9,000-kilometre race, with dual-frequency generator sets prepared to withstand the course's adverse temperature, rain and sand conditions without diminishing performance.

HIMOINSA, the official energy provider of Dakar 2018, provided a total of 8.5 MW of energy to supply the 10 camps set up along the 9,000-kilometre race.

Six Power Cube dual-frequency generator sets (two per camp) guaranteed the proper functioning of all services to accommodate the 2,800 people of the organisation, as well as the services of the camp hospital, the sport television retransmissions and the geolocation systems of the drivers during the races.



The HIMOINSA Engineering team designed a mobile energy supply with three independent technical units composed of two Power Cubes and a technical team of 5 people in each of these units who worked in the installation, commissioning and transportation of the groups. In total, some fifteen people (engineers and technicians) provided services throughout the entire rally.

The generators supplied up to 503 kVA (50Hz) or 524 kVA (60Hz) of PRP power. From the moment the race started, both units worked in parallel to ensure an uninterrupted supply to the television retransmissions and the monitoring system for the vital signs of the drivers, which allowed, via satellite, any emergency to be identified throughout the entire route. For the rest of the time, the second group acted in case of an emergency, prepared to operate in the event that the energy demand of the camp increased.

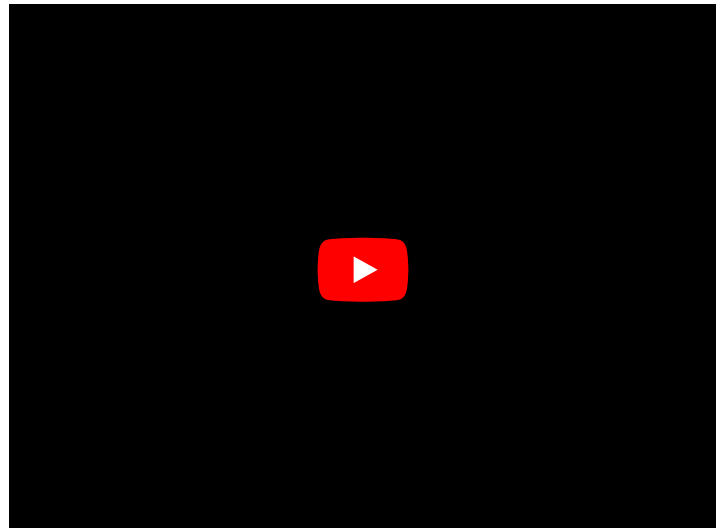
OBJECTIVE SOLUTION

Provide continuous power to each of the camps set up by the Dakar organiser during the race. The route crossed countries with electric network frequencies of both 50 Hz and 60 Hz and diverse weather conditions, going from desert to mountainous areas.

Six Power Cube model HPCW-500 D5-6 dual-frequency generator sets, with an FPT engine and Cramaco alternator, capable of supplying power of up to 1 MVA when working in parallel. All Power Cubes had an internal fuel tank with a capacity of 875 litres and an **automatic oil replenishment system**. In addition, they included 2,000-litre external tanks to guarantee the power supply in any eventuality.

HIMOINSA also made two reserve generator sets available, with the aim of offering maximum guarantees at all times.

"Being away from the power grid, the generator set had to guarantee a reliable and safe energy supply throughout the route", explains Mario Dovo, Head of Operations HIMOINSA Argentina & Cono Sur. "This modular supply allowed the technical team to always work with two camps in advance, resolving any eventuality beforehand, maintaining the frenetic pace of the race".



Technical specifications:



Distribution Boxes:

The Dakar camps are travelling operations centres from which accommodation and services are provided to all race organisation staff, the sports teams of the participants and international media, as well as the health services necessary for an event of this nature. For the supply of each camp, with an average expanse of 1,000 square metres, HIMOINSA supplied eight distribution boxes made of aluminium, which significantly reduces their weight, and mounted on a two-wheeled transport device. This way, we used mobile distribution boxes which were easy to handle to transport the energy from the Power Cubes to the camps' different points of demand. Each board has 16 power points for industrial use. Additionally, one of the eight boards supplied to the camp was configured exclusively for television use.



Efficiency in the operation:

The generators incorporate an FPT C13TE7 engine. Their electric radiator was fitted with a frequency changer that adapts its speed depending on cooling needs. This not only reduces the level of noise emissions, but optimises fuel consumption, thus leading to the generator set running more efficiently.



Adverse weather conditions:

The HIMOINSA generator sets were designed to withstand the adverse environmental conditions presented by the rally route. According to César Rodríguez, Project Manager at HIMOINSA, "the data obtained during the testing of the equipment before leaving the factory were optimal and the experience in the field has corroborated it: the performance of the sets was not diminished at any time, even though they had to endure conditions from the high temperatures of the Peruvian dunes to the persistent rain of the Bolivian Plateau". In this sense, the six Power Cubes were equipped with a non-metallic, compact air filter, which offers high filtering capacity and is ideal for equipment operating in medium to heavy dust environments.



Logistics:

To achieve better space optimisation, the cooling system of the HIMOINSA Power Cubes were installed on the upper part of the canopy. Its compact dimensions, in 10-foot containers, greatly facilitated transport and logistics during the days of the race, making it a particularly suitable generator for this type of event.

The Dakar logistics director, Thomas Cerf-Mayer, greatly appreciated the work done by the HIMOINSA technicians as well as the performance of the generator sets during the almost 15-day race. HIMOINSA was chosen as one of the leading generation brands in the market, and the result obtained has corroborated the reliability of its equipment and the rigour and experience of its technicians.





3MW

Power supply

Spain

HIMOINSA becomes "Official Power Supplier" at the "Aire 25" Festival

The event, which will take place on 14 and 15 June, commemorates the 40th anniversary of the creation of the Patrulla Águila, aerobatic team. HIMOINSA's generator sets and battery storage systems will be responsible for supplying 3MW of power to various areas of the festival, from sound and lighting equipment to control units for television broadcasting, the hospitality area and flight simulators.



HIMOINSA, global leader designer and manufacturer in power technology solutions belonging to the Yanmar group, has become the official power supplier for the **"Aire 25" Festival**, one of the world's largest air shows and the main aeronautical event to be held in Spain this year, organised by the Air and Space Force. This unique event commemorates the 40th anniversary of the creation of the Patrulla Águila aerobatic team, whose first flight took place on 4 July 1985 at the San Javier Air Base.

'Aire 25' will take place on 14 and 15 June at San Javier Air Base (Murcia) and the beaches of the Mar Menor, and is expected to attract more than 400,000 visitors who will enjoy aerial demonstrations by world-class patrols and squadrons such as the French Air Force's aerobatic demonstration team 'Patrouille de France'; the Italian Air Force's aerobatic squadron 'Frecce Tricolori'; and the Swiss Air Force's flight demonstration group 'Patrouille Suisse', among others.



A unique **international event** that requires a temporary power supply and will feature HIMOINSA as the **official supplier**, providing generators and battery storage systems to cover the nearly **3MW of power required** in various areas of the festival.

LATEST TECHNOLOGY AND SUSTAINABILITY FOR A UNIQUE EVENT.

The aim of this partnership is to supply **temporary power with reliable and sustainable equipment**, incorporating the latest technology.

The HIMOINSA S5 generators are capable of reducing harmful gas emissions (Nox, HCO, PM, CO) by up to 90%. For this event, dozens of diesel and gas generators as well as battery storage systems will be combined. The LPG generators incorporate a three-way catalyst to further reduce pollutant emissions. And the EHR - Battery Generators - guarantee zero emissions when they run as the single source of energy.

HIMOINSA, integrated in Yanmar Energy System (YES), the energy division of the Yanmar Group, plays an important role in the constant development of power generation solutions, implementing innovative technologies and coordinating with the rest of the YES teams new developments to offer complete solutions to the market; generation, cogeneration, trigeneration, hybridisation, battery systems and hydrogen-based power generation.

'It is an honour to be present at this unique aeronautical exhibition in the world, becoming the Official Power Supplier' explains **Cristina Avilés, Global Marketing and Communication Head at Himoinsa**, who adds that *'HIMOINSA is committed to supporting this type of social and cultural festivals, in line with our CSR policies and contributing with the most appropriate power solution in the most reliable, safe and sustainable way'*.

This is not the first time that HIMOINSA has become a **power supplier at major international sporting and music events**, such as the extreme competition of the Dakar Rally or the Vuelta a España, the Football World Cup in Qatar, among many others.



For its part, the Patrulla Águila has consolidated its position among the best military air patrols in the world. All its components - pilots and mechanics - are characterised by their excellent preparation, safety and discipline in flight, showing very precise movements. The spectacular nature of its aerial manoeuvres has been exhibited all over the world.





32kW

Power storage

Japan

EHR, HIMOINSA's battery-powered clean energy system, present at the largest Rally Championship in Japan

The EHR | Battery Power Generator was present at the largest Rally in Japan, where the final round of the Rally Championship series took place at the Toyota Stadium. The solution proposed, which integrates cutting-edge technology, was based on a Yanmar hydrogen fuel cell, responsible for supplying clean, high-performance energy at this world-class event.



HIMOINSA, was present at one of the largest **Rally Championships in Japan**, with its **EHR | Battery Power Generator**. Through this battery power storage and distribution technology, the solution was based on a **32kW** Yanmar hydrogen fuel cell connected to a 45 kVA EHR battery power generator to meet the energy needs of the Toyota team's garages.

The system has achieved the highest efficiency, **optimising emissions** and **noise**: two fundamental premises in events such as the Japan Rally, held in the urban area of the city of Toyota, which hosted the event from 21 to 24 November.

Following its commitment to sustainability, Toyota, has chosen to organise an **event with a zero carbon footprint**. This approach has demonstrated the potential of HIMOINSA's EHR system, based on clean energy and zero emissions, as a key solution for events such as this. Looking ahead, Toyota's goal is to replicate this model in Europe, with the aim of organising an all-electric rally using the advanced energy generation and storage technology offered by the EHR system.

Rally Japan 2024 embraces a sustainability-focused environmental policy for the Rally Championship, with a highly committed executive committee, implementing environmentally friendly initiatives and integrating these practices into the planning and execution of the event.





“For HIMOINSA it has been a pleasure to be present with our EHR systems at such an important event as the final of the Rally Championship in Japan. Achieving the demanding environmental requirements set by the organisers has been a pleasure. Our EHR technology, which enables the generation of energy from batteries in a sustainable way and with zero emissions, is ideal for urban environments where the environmental and acoustic impact must be kept to a minimum. This event is an important step for the company in our consolidation in the mobile power market in Japan and highlights the value of the alliance between HIMOINSA and Yanmar, offering a complete integrated solution”

Christopher Autey, Head of Battery Energy Solutions at HIMOINSA

YANMAR GREEN CHALLENGE 2050

Under the motto Yanmar Green Challenge 2050, the Yanmar Group is promoting **sustainable solutions, such as renewable energies and hydrogen**, to decarbonise its operations and offer zero-emission solutions to its customers. For this purpose, Yanmar has a Clean Power facility in Okayama, where it tests and develops technologies such as hydrogen power generation and storage batteries, optimising their integration with existing equipment.

HIMOINSA and Yanmar are working together to develop advanced technologies to promote a cleaner and more efficient society. This alliance highlights the balance and synergy between the two companies, adding value to their products. A clear example is the **integration of HIMOINSA's EHR battery generator with Yanmar's hydrogen fuel cell**, a sustainable solution that reinforces the commitment to decarbonisation to move towards a more sustainable future.

As part of its electrification strategy, HIMOINSA continues to make progress in the development of new battery energy accumulation and distribution systems, reaching capacities of **up to 2MW**. During this time it has offered its systems worldwide, with high demand in Europe, North America and Australia. In 2025, HIMOINSA will continue its roadmap by launching new models to meet the growing demands of the market.



Power supply

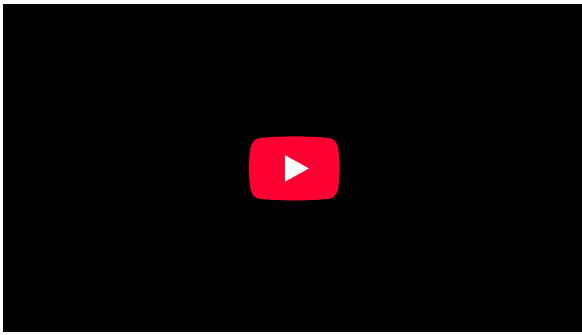
Spain

HIMOINSA has supplied power at the 'Fan Futura Fest' sustainable festival.

The Fan Futura Fest has been certified and audited as a sustainable festival thanks to its concerted efforts to reduce emissions, hence its decision to use HIMOINSA's S5 generator sets (Stage V engines) and battery power storage and distribution systems (EHR) to supply the festival with power.



HIMOINSA, the leading designer and manufacturer of power generation systems, has become the **official supplier of sustainable power for the Fan Futura Fest festival**, held in Murcia (Spain) on the 28th and 29th of July and in which some **40,000 people** have enjoyed its music. This music event has been audited and accredited as a **sustainable festival** thanks to its determined support for the Sustainable Development Goals (SDGs) and its strategy which is based on three areas of work: sustainable production, parallel activities related to sustainability and a positive legacy for the environment.



This context explains why the Festival has chosen **HIMOINSA's S5 generator sets** (Stage V engine) and battery power storage and distribution systems (**EHR | Battery Power Generator**) to supply power for the festival - these generator sets are capable of reducing emissions of gases harmful to health (Nox, HCO, PM, CO), by up to 90% compared to previous technologies (S3A). In addition, the areas of the festival that are powered by the Battery Power Generator system guarantee a significant reduction of the carbon footprint given that they produce **zero emissions and zero noise** when they are the sole source of power.



"Being involved in the Fan Futura Fest project fulfills one of our main objectives, that of contributing to sustainability and respect for the environment at large events", explains **Juan Ignacio Perona**, Commercial Director of HIMOINSA Spain.

Fan Futura Fest is **committed to taking all the necessary measures to offset its environmental impact, reduce its carbon footprint and maximize its positive impact on the environment.** And this year it has gone one step further in its commitment to sustainability by choosing HIMOINSA as its official sustainable power supplier. *"Being able to rely on HIMOINSA equipment to help us achieve our mission to be a sustainable festival is extremely important and we are sure that this will mark the beginning of a fruitful collaboration going forward",* declared **José Manuel Jiménez**, Fan Futura Fest's Sustainability Director.

This is not the first time that HIMOINSA has provided its different power solutions to sporting and musical events. Its power generation units have been seen at major football championships around the world, extreme competitions such as the Dakar Rally and high-profile international concerts.



LA VUELTA

SUSTAINABLE POWER SOLUTION

HIMOINSA
A YANMAR COMPANY

Power Supply

Spain

HIMOINSA and La Vuelta join forces to supply sustainable power to Spain's flagship cycling competition

The organizers of La Vuelta have chosen HIMOINSA as their official supplier of sustainable power solutions, that will have a significant presence along the more than 3,500 kilometres of the race, especially at key points such as the finish lines of each of the 21 stages.



HIMOINSA, international benchmark company in the design and manufacture of power technology solutions, and La Vuelta are joining forces to provide more **sustainable power for Spain's premier cycling competition**. Events such as La Vuelta require the deployment of a vast array of resources and as the new official supplier, HIMOINSA's power generation equipment will play a key role by supplying power along the entire route.

Some twenty **generator sets and battery power storage and distribution systems will provide the race with more sustainable power**, promoting energy transformation through the use of hybrid generation systems - diesel (Stage V) and batteries. They will do so throughout the entire race through Spain, which will take place from 26 August to 17 September, in what is one of the world's leading cycling competitions, alongside the Tour de France and the Giro d'Italia.

To do so, they will use **generator sets that utilize Stage V technology**, which allows them to reduce harmful gas emissions by up to 90% compared to previous technologies. They will also use **battery power storage and distribution systems** - Battery Power Generator - which guarantee a significant reduction in the carbon footprint, even reaching zero emissions and zero noise when used as the sole source of power.

The 2023 Vuelta, which has more than **295 accredited international media**, will visit more than **390 municipalities** on the peninsula and will employ a team of more than **2,500 people** managed directly by Unipublic.



At the heart of this major logistical operation, which also includes more than **74 hours of live television coverage**, HIMOINSA's power generation systems will be on hand throughout the competition and at such key points as the start and finish lines, supplying power for television broadcasts, giant screens, catering, VIP and sponsorship areas, where sponsors will carry out brand activations during the different stages.

HIMOINSA will be supported by AMS, a company that specialises in rental and management solutions for power generation systems at events, with a wealth of experience in La Vuelta and other similar projects. An experienced technical team will manage the logistics and operation of the power systems throughout the competition.

“

*Society is undergoing a major energy transition process and **HIMOINSA is committed to designing increasingly sustainable generator sets**. We have also started to electrify our equipment, with hybrid and 100% battery systems. Therefore, becoming the **official supplier of such a prestigious sporting event** as La Vuelta is a clear reflection of our **commitment to sustainability**. We are associating our brand and values with musical and sporting events that are committed to reducing emissions.*

Cristina Avilés | Global Marketing & Communication Head at HIMOINSA

“

*Having HIMOINSA as an official supplier and working hand in hand with AMS gives us a **great sense of security when it comes to meeting all the needs of such a logistically complex** event as La Vuelta, thanks to the extensive experience both companies have in events of this magnitude. It is also of paramount importance to the race that our suppliers provide sustainable solutions and thanks to these **generator sets with Stage V technology and battery systems**, we are taking another step towards the **decarbonization of the event**.*

Pedro Lezaun | Production Director for La Vuelta



OTHERS

- 01** Energy for the largest port in the Black Sea | Port of Constanța, Rumania
- 02** 5X1745 kVA | 8.7 MVA in the Doha Festival City Mall, Qatar
- 03** 5.5MW of Emergency Power for Thailand's New Parliament Building
- 04** 3.5 MW of emergency power for the Göztepe Gürsel Aksel football stadium in Turkey
- 05** HGY Series | HIMOINSA emergency power for salmon facility farms in Norway



2x458 kVA

Largest port in the Black Sea

Romania

Energy for the largest port in the Black Sea | Port of Constanța (Romania)

HIMOINSA supplies generator sets for the cranes that load and unload the containers

CASE STUDY | Transtainer cranes, Port of Constanța (ROMANIA)



SUMMARY:

Location: Port of Constanța (Romania)

Installed power: 2X458 kVA in PRP

Generator sets: 2 HVW-400 T6 units

Special configuration: Gensets specially configured for port applications, synchronized with the on-board systems of the cranes and able to withstand major load variations and sub-zero temperatures.

Client: PACECO España

Covering an area of almost 40km², the Port of Constanța, in Romania, is the largest port in the Black Sea. It is able to handle 100 million tons of cargo per year. In addition to its privileged location, the Port is also connected to two pan-European transportation corridors that link Europe to Central Asia. Each day, some 200 containers are transported from the Port of Constanța through the Danube to countries in Central and Eastern Europe such as Bulgaria, Serbia, Hungary, Austria or Germany.

HIMOINSA generator sets supply power to two Rubber Tyred Transtainer® (RTG) cranes of PACECO España, a company that designs, manufactures and develops container handling equipment. The cranes have been designed with state-of-the-art technology to optimize container handling in the port's terminals, to ensure operational safety at all times and to enable all operations to be automated in the future.

OBJECTIVE SOLUTION

To supply continuous power to the Transtainer® RTG cranes that load and unload containers in the port, machines designed to work 24 hours a day, 365 days a year, with very brief stops for maintenance and continuous container loading and unloading cycles. The generator sets must be perfectly synchronized with the cranes' on-board systems.

The HIMOINSA Engineering team, together with PACECO, has designed the gensets to tailor them to the specific needs of RTG applications. Both generators are ready to work very hard, with very large peaks in demand for power. To cope with these abrupt load variations and to minimize running costs, the design incorporates engine speed control and cooling optimization solutions, intended to reduce fuel consumption, resulting in an improvement of approximately 20%.



Technical specifications:

To meet the needs of a seaport market that is increasingly demanding as far as noise is concerned, the gensets are housed in a **soundproofed canopy** and its brackets and anchor points to the main crane chassis have been designed to withstand the force exerted on all three axes as a result of motion during the transportation of the crane and when it is loading or unloading containers.

As they are installed in moving vehicles, the **fuel tanks**, with sufficient capacity for a full day's work, incorporate air chambers that prevent the fuel from swaying to and fro, which might otherwise cause errors when reading the sensors not to mention the premature mechanical fatigue of the tank itself and its components.



On the other hand, their design has been adapted to make it possible to carry out **maintenance** work on the generator set on the actual crane itself. Coolant changes are carried out from the side of the generator set by means of an electric pump, thereby removing the need to access the interior. Lighting has been added to the control panel and in the interior of the genset to facilitate supervision and control tasks.

As the application requires the equipment to cope with very abrupt load variations, an oversized **alternator** was included in the genset with a non-standard voltage controller, which provides the dynamic response that PACECO España was looking for.

The gensets' **control unit** communicates with the crane's PLC while the units have been fully integrated with each crane's SCADA and on-board systems. This ensures a smooth operation and makes it possible to foresee how the genset will be used and to schedule maintenance. According to Fernando Monje, Engineering Director at PACECO España, "as equipment designers and manufacturers, PACECO looks for the best possible integration between systems and on-board subsystems. Close collaboration between the engineering teams of both companies has made it possible to achieve the desired level of integration, both in mechanical and electric and electronic terms."



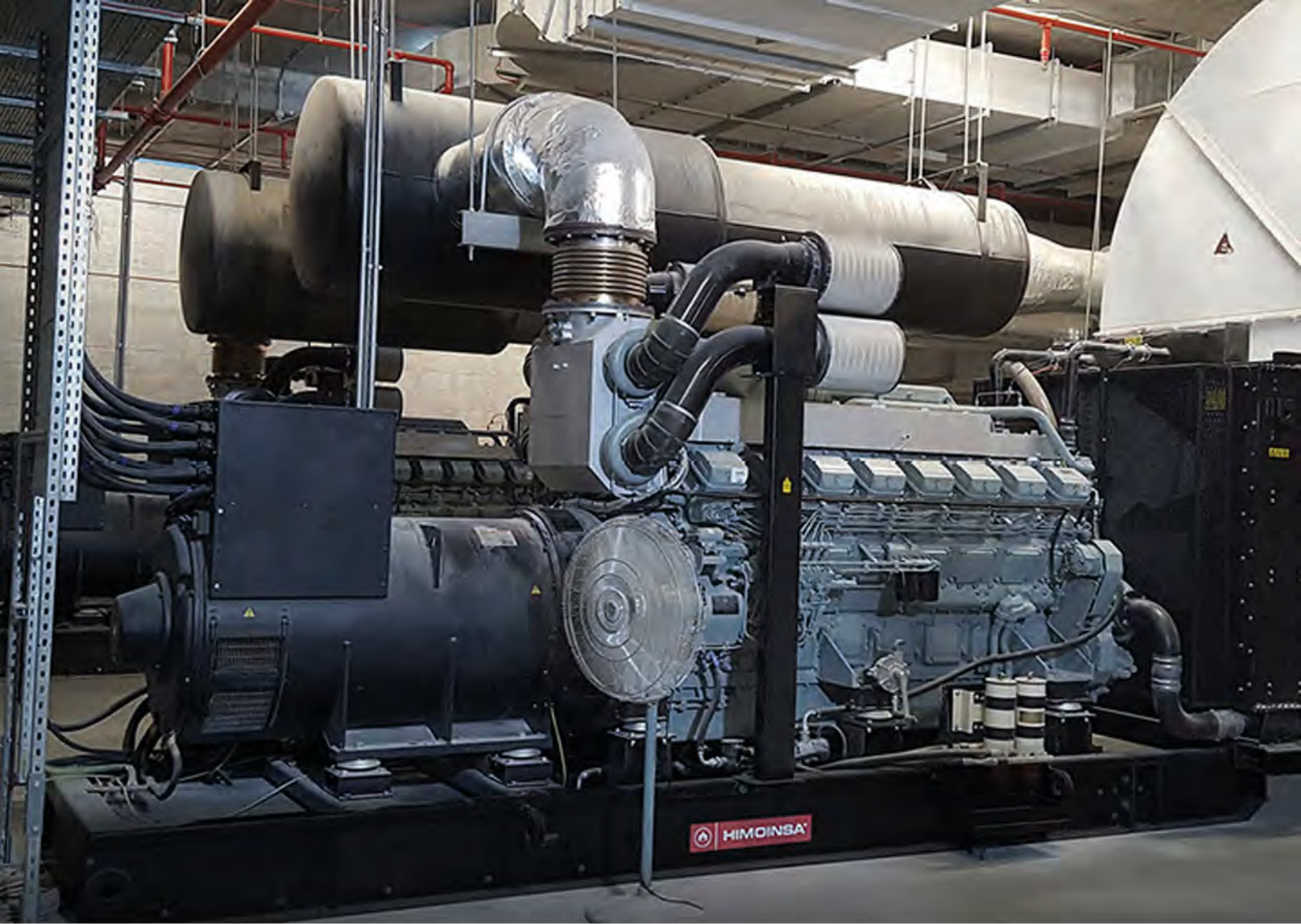
Sub-zero temperatures:

Given the climatic conditions of the Port of Constanța, the genset is prepared to work at temperatures as low as **20 degrees below zero**. To make this possible, a heater has been included for the fuel tank, lubricant and coolant, and a system has been installed to prevent condensation in the alternator and the ice formation.



Fernando Monje, Engineering Director, PACECO España.

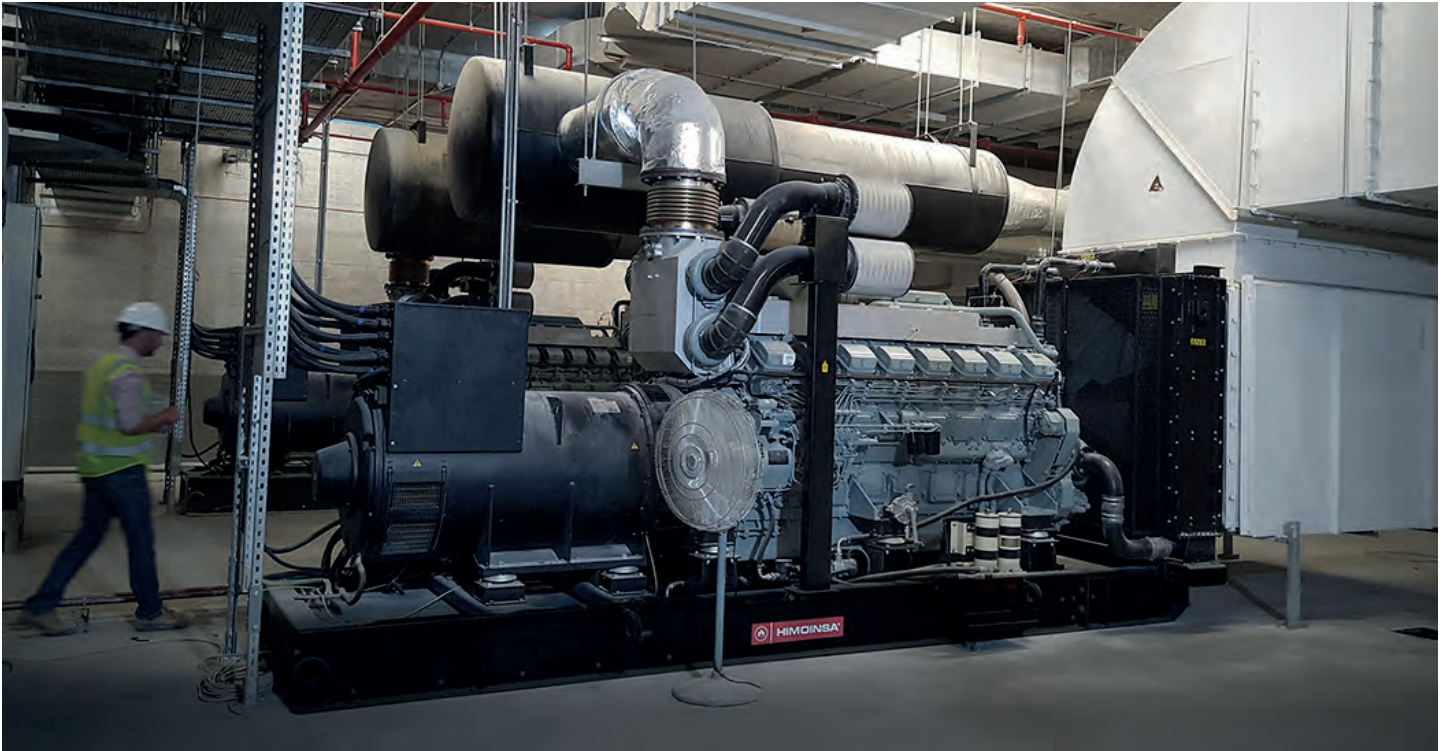
"HIMOINSA has designed a solution in line with the requirements of PACECO España. We worked in close collaboration to introduce a series of improvements in this new generation of generator sets for our RTGs, making them truly cutting-edge".



8.7 MVA

Doha Festival City

Qatar



5X1745 kVA | 8.7 MVA

DOHA FESTIVAL CITY, QATAR

HIMOINSA emergency power in just 7 seconds for the Doha Festival City

Summary:

Location:

Doha (Qatar)

Installed power:

5X1736 kVA= 8.7MVA stand-by power

Generator sets:

5 HTW-1745 T5 units
5,238 x 2,043 x 2,600 mm (L x W x H)

Special configuration:

Redundant emergency power supply with a 7-second start-up synchronised to a Dead Bus. Assumes 100% of the load in one single step. Redundant control panels.

HIMOINSA distributor:

FAMCO

Doha Festival City, a world-class destination in Qatar celebrating the best in entertainment, retail and hospitality, has ensured the continuity of its power supply by installing generator sets that start up in record time in the event of a failure in the electricity grid.

Occupying 670,000 square metres in the very heart of the Middle East, Doha Festival City will be home to more than 500 stores, including over 100 restaurants, and a world-class entertainment complex, with both indoor and outdoor attractions unique to Qatar. This comprehensive mix of entertainment– from Qatar’s first VOX 4D cinema complex with 18 digital screens, to four unique theme parks, including “Angry Birds World”, “Snow Dunes” - Qatar’s first indoor snow park, “Juniverse” – an edutainment park for children and “Virtuocity” which has been created exclusively for teens and adults.

With footfall expected to exceed 1.6 million people per month, safety and the proper operation all business units at Doha Festival City will heavily rely on a system capable of supplying power in the event of an emergency. Not only that, such a system must meet the requirements that the Qatar Civil Defence has envisaged for public spaces.

To feed such a huge complex and to respond quickly in the event of a power cut, HIMOINSA has supplied five generator sets, which each supply 1.736 kVA of stand-by energy. Thanks to a detailed programming study of its control units, and after having subjected the units to multiple highly demanding tests, HIMOINSA is able to guarantee a synchronised start-up in just seven seconds, which in fact exceeds the project’s technical specifications.

OBJETIVE

To guarantee an uninterrupted supply of electricity with generator sets capable of starting up in synchronicity with 100% of the load and in less than 10 seconds in the event of a failure in the supply of electric power.

SOLUTION

Five HTW-1745 T5 generator sets that supply a total of 8.7MVA of stand-by power and respond seven seconds after any power failure. The units feature Mitsubishi engines and Stamford alternators that have been oversized and fitted with sophisticated control systems that synchronise the gensets. The gensets are also prepared to work in a maximum ambient temperature of 55 degrees centigrade.

“The biggest challenge of this project,” states Terry McGuire, FAMCO Regional General Manager, “was to meet the stringent requirements of Qatar Civil Defence. We needed to prove that all the gensets would be able to run from a dead start, synchronise and produce power within ten seconds. We managed to show this by the factory witness test, where we achieved 7.8 seconds and we also proved the same results on site.”



Quality controls:

HIMOINSA's technical team subjected the five generator sets to a stringent test protocol, pushing the units to the limit of their operational capacity, to predict and guarantee a suitable response. Massimo Brotto, HIMOINSA Sales Engineering Manager, assures us that “we measured both the synchronisation times and the quality of the voltage and the current. We ran single-step load impact tests at 100%, guaranteeing a stable and rapid recuperation. We also simulated all the possible combinations of breakdowns to ensure that the system would respond in the event of a failure. And we did not endorse the tests until we had established that the units were reliable in all these situations”



Technical specifications:

The PI734E alternator has been oversized to 1900kVA and fitted with a programmable Digital Voltage Governor capable of providing an extremely quick response. Also, at the mechanical level, we guaranteed the temperature controls in the bearings and the winding so that they can operate safely and continuously, even for longer periods of time, were that to prove necessary.

The gensets feature Mitsubishi S16R PTA engines and Japanese technology, fitted with a Woodward speed control that guarantees a quick and reliable response.



All the engine's vital parameters such as the oil pressure, the temperature of the water or the oil or the exhaust fumes are measured continuously and they communicate with a monitoring system that controls the condition of the engine. To ensure a fast response in the event of a grid failure, a water pre-heating system was added, as was a battery charger that ensures maximum efficiency. HIMOINSA has used Deep Sea control units that allow the units to sync directly with a Dead Bus, thereby saving time manoeuvring the motorised circuit breakers in each generator set. The control systems are also connected to a PLC that handles the running of the generator sets and their interactions with the shopping complex's distribution system.



Terry McGuire,
REGIONAL GENERAL
MANAGER, FAMCO

To consider a complex project like this, we needed the full support of the HIMOINSA Engineering team, as the requirements are enormous and highly technical.



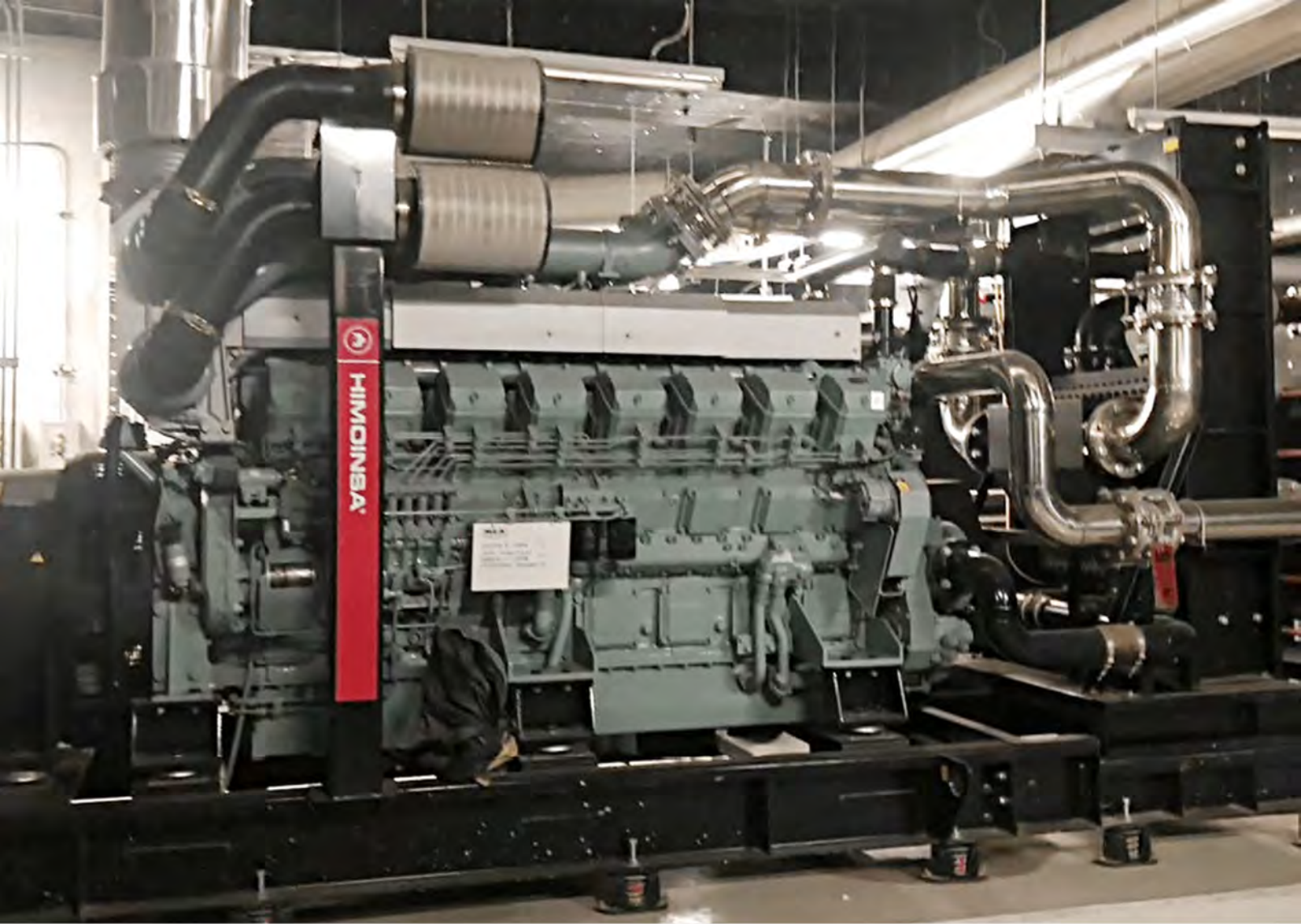
Tony Gumley,
SENIOR MEP
MANAGER- ALEC

What we look for is a large international supplier who can deliver when we need it and also work with us with all the complex issues that arise during the development.



Kareem M. Shamma,
CHIEF EXECUTIVE
OFFICER – BAWABAT
AL-SHAMAL REAL
ESTATE COMPANY W.L.L

We looked for reliability, the ability to deliver on their promises and an excellent customer service. When you have a large project like this that runs on a tight schedule, power supply is extremely important.



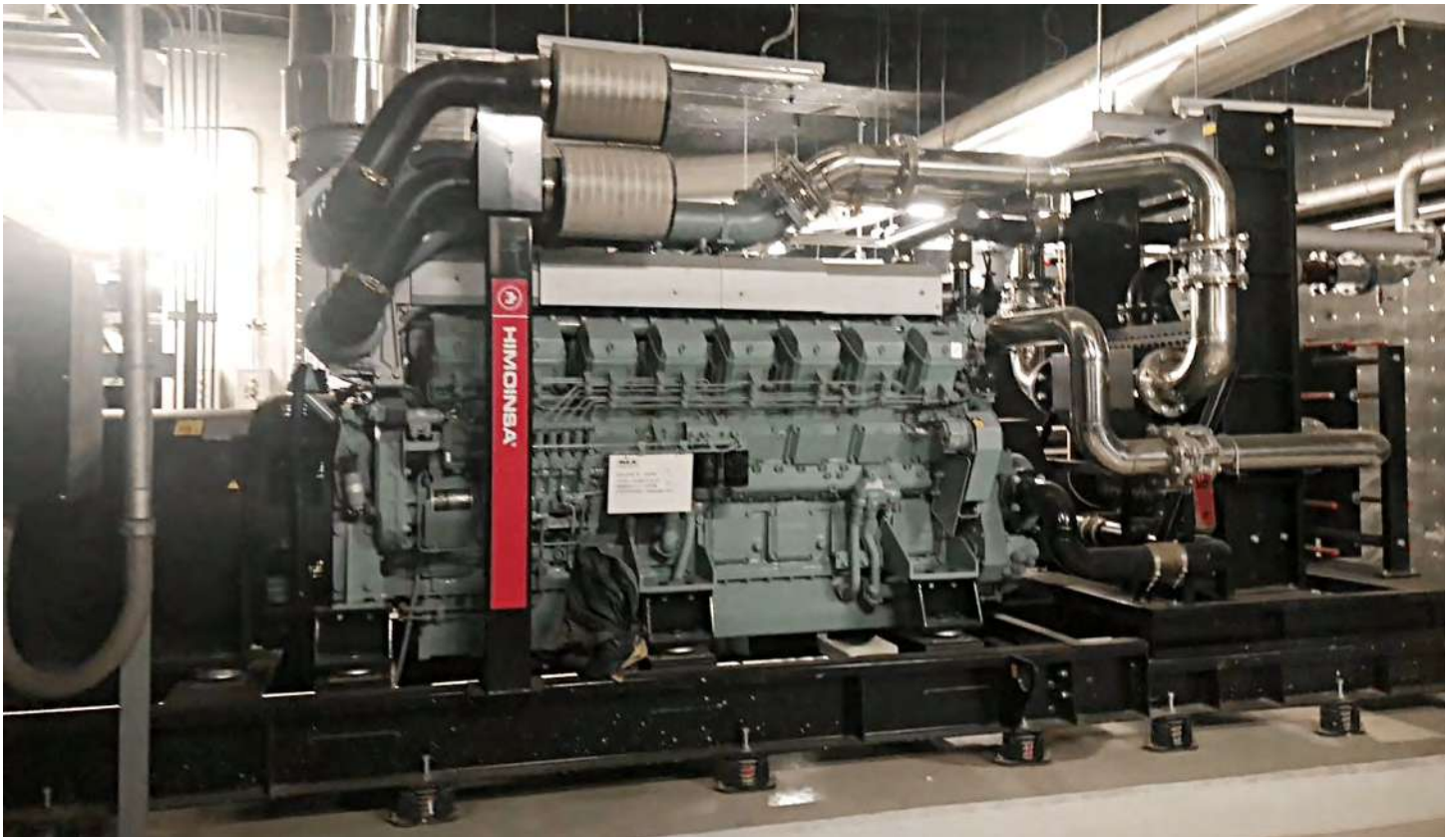
5.5 MW

Parliament Building

Thailand

5.5MW of Emergency Power for Thailand's New Parliament Building

Four units of HIMOINSA gensets, in total of 5.5MW power, have been supplied to Thailand's new parliament building, to provide reliable emergency backup power.



PROJECT SUMMARY

Location: The new parliament building in Bangkok Dusit District, Thailand

Special Configuration: Remote radiators with heat exchangers

Installed Equipment: Open skid industrial gensets @ 400V, 3-Phase, 50Hz, with CEA7 Controller

Sector: Government

- HTW-1260 T5 x 1
- HTW-1745 T5 x 1
- HTW-2030 T5 x 2

ABOUT THE PROJECT

Sappaya-Sapasathan, known as Thailand's new parliament building, serves as the meeting place for the Thailand National Assembly. It is located in the Dusit District in Bangkok, on the east bank of the Chao Phraya River, and spans approximately 424,000m², making it the world's largest parliament building.

The building houses two main chambers, one for the House of Representatives, and the other for the Senate. It also includes various facilities such as museums, seminar rooms, banquet halls and a convention centre. Hence, ensuring reliable power supply is extremely important considering its importance in the national legislative processes.



POWER SOLUTIONS

HIMOINSA generators powered by Mitsubishi engines, packed with Stamford alternator and CEA7 controller, in total of 5.5MW of HIMOINSA power, are installed in the new parliament building, to provide reliable and high-efficiency emergency back-up power supply.

With advanced technology that allows integration with domestic power grids, in case of grid failure, the gensets can operate automatically within seconds to guarantee a swift recovery of all essential services, provide sufficient and efficient power to support the daily operation of the parliament building.

SPECIAL CONFIGURATION

Remote radiators were installed, providing a more flexible and controlled way to manage heat generation of the gensets, and to achieve the following benefits:



Space Optimization

The heat source is diverted to the roof of the building, away from the genset room, allowing for better layout design and utilization of space.



Noise Reduction

By separating the heat source, noise generated by the cooling process can be minimized and directed away from occupied areas.



Improved Efficiency

Dedicated radiator design is optimized for cooling needs, leading to better heat dissipation and overall system efficiency.



Targeted Heat Control

Allows for focused heat management in specific areas where it is most needed.



Maintenance Accessibility

Easier access to the radiator for cleaning and maintenance due to its separate location.

To facilitate the remote radiator, **heat exchangers** are installed to transfer excess heat from the engine coolant to the water-cooling system. The process is crucial for managing the engine's temperature, which regulates the heat produced during the engine's operation, ensures safe and efficient operation, prevents overheating and maintains optimal performance.



TROPICAL CLIMATE

The weather in Bangkok can be extremely hot, especially during its dry season with daytime temperature reaching exceeding 38°C or so.

Also, due to the city's dense urban environment and limited green spaces, Bangkok is experiencing 'urban heat island' effect. The new parliament building is seated in the city center, where temperatures are even higher compared to surrounding rural areas. To prevent overheating issues that could lead to generator failure or shutdowns, the gensets are packed with high-powered fans and electronic control panels, allowing the gensets to perform optimally even at high temperatures.



"The new parliament building is an outstanding landmark in Bangkok, reflecting Thailand's cultural heritage and the importance of its legislative processes, we are proud that HIMOINSA gensets can be part of this significant project", said Panchanok Temiyasen, **Managing Director of Gateway Intertrade Co. Ltd.**, HIMOINSA's authorized distributor in Thailand since Y1999. *"During the past two decades, HIMOINSA generators have been successfully applied in hundreds of commercial, residential, government and industrial projects across the country. Customers trust us to provide one-stop power solutions from the installation to aftersales."*



3.5 MW

Football stadium

Turkey

3.5 MW of emergency power for the Göztepe Gürsel Aksel football stadium in Turkey



HIMOINSA has provided a power solution consisting of the **installation of four 1015 kVA generator sets to guarantee an uninterrupted power supply at the stadium of the Göztepe football team in the city of Izmir**, which plays in the Turkish first division. The aim is to avoid the interruptions during matches caused by grid outages that fans have had to endure during major sporting events in recent years.



A reliable power solution at critical moments during the Göztepe team's matches was one of the main needs expressed by the client for this project. The city of Izmir, in the Esmirna region of Turkey, has a football team that plays mainly in the country's premier league, the Süper Lig. The club's stadium in the Üçkuyular neighbourhood of the Konak district, the Göztepe Gürsel Aksel, has become a landmark in Izmir since its construction in 2020. It is notable for its mixed-use design, which at the same time meets the criteria of UEFA and the Turkish Football Federation. With a capacity of 20,000 people and a total built area of 95,000 square metres, the intention is for the stadium to be used in the future not only as a sports complex, but also as a leisure area with an exhibition arena, sports museum, catering facilities and car park.

Comprehensive Solution. Immediate Response

HIMOINSA has designed and developed a comprehensive power solution to ensure a reliable electricity supply during matches, a key requirement for events that attract large crowds. **The four HMW1015 generator sets installed by the company provide a total power of 3.5 MW**, guaranteeing an immediate response to any possible grid outages. This equipment is designed to operate in synchronisation and adapt to the demands of the stadium, ensuring a seamless transition in the event of a power failure.

Fuel system

In order to optimise the running time and efficiency of the system, a fuel storage and distribution infrastructure has been implemented, including:

- **Six 2 m³ main tanks** to ensure a continuous flow of fuel.
- **Four 1.5 m³ day tanks** for direct supply to the generator sets.
- **Pipelines, automation and filling control systems** that enable efficient fuel management, optimise consumption and reduce risk.



Synchronisation and control panels

The system features **advanced synchronisation panels, PLC controllers and motorised switches** that allow full integration of the generator sets, guaranteeing stability and precise control over the power supply.

Infrastructure adapted to the environment



Taking into account the location of the stadium and the safety requirements, HIMOINSA has implemented:

- **Exhaust extensions** of more than 25 metres on each generator set to ensure proper gas evacuation.
- **Seismic isolators** to reinforce the stability of the system against possible seismic activity in the Esmirna region where the stadium is located.
- **Mechanical installation adapted to the structural conditions of the stadium**, guaranteeing safe assembly.

Technical testing and validation

As part of the project, HIMOINSA also carried out tests such as the FAT (Factory Acceptance Test), to ensure the correct operation of the generator sets prior to their installation and the official authorisation of the project, in order to comply with the regulations and technical requirements imposed by the authorities. **HIMOINSA has been able to provide a solution adapted to accept 100% of the block load**, in accordance with the demanding requirements of the tender and the NFPA110 standard. This ensures a stable power supply, especially for the stadium lighting.



Noise Attenuation

The HIMOINSA solution includes **an exhaust system designed to guarantee a maximum sound level of 80 dB at a distance of 3 metres**, thus meeting the acoustic requirements of the project. The stainless-steel mufflers ensure high noise attenuation resistance and efficiency. In addition, the exhaust pipe has been extended by 28 metres per generator set from the generator room to the outside of the stadium, optimising gas evacuation and system performance.

Reliable Power System

Thanks to this solution, HIMOINSA has provided the Göztepe Gürsel Aksel Football Stadium with a robust and reliable power system in the event of possible interruptions to the electricity grid. Although the power cuts suffered by the stadium during major football matches in recent years will undoubtedly remain in the collective memory of the fans for years to come, **HIMOINSA's power proposal ensures that fans can now enjoy sporting competitions without interruption and that the facilities can maintain their activity at all times.**





HGY

Emergency power

Norway

HGY Series | HIMOINSA emergency power for salmon facility farms in Norway

The HGY Series provides backup power to 'Salmon Evolution', Norway's global leader in advanced land-based salmon farming projects. The facility is in Indre Harøy, a strategic area for the Nordic salmon industry, where water pumping and recirculation systems are critical to ensuring the living conditions of salmon at all stages of growth.



The emergency power core for 'Salmon Evolution' consists of HIMOINSA HGY Series generator sets, **models HGY-2350 D5 PRP**, a solution designed to operate in mission-critical applications such as this industrial salmon production facility. This is because a power outage would compromise oxygenation levels, temperature and water quality, and could lead to significant biological losses. At this salmon facility, continuity of power supply is not an added value, but a basic condition for viability. HIMOINSA's HGY solution provides nearly 2 MW of emergency power to the hydraulic heart of the plant.

In this context, M/S has supplied the D5 PRP, through its local distributor, meeting the requirements for continuous operation in emergency mode to ensure the main production system. The project ensures the continuous operation of the industrial salmon plant, reducing the likelihood of power failure, and guaranteeing an immediate response to any incident in the facility. M/S's HGY Series, specifically designed for mission-critical applications, guarantees high availability, immediate response and high reliability in continuous operation. Three M/S generator sets with capacity from 1,000 to 2,000 kW, are currently operating at the salmon facility, installed in the first phase of this large-scale project. M/S, together with other solutions, partner for years, have delivered the largest emergency Power Solutions for land-based salmon farming in Norway.

HGY Series | **Critical power** for industrial salmon farming infrastructure

The HGY Series provides advanced solutions for critical power supply, setting itself apart with **engine start-up in less than 8 seconds** and under ISO 8525-5 class G3 conditions. The HGY-2350 D5 PRP model supplied incorporates a Yanmar engine 12GY175L.DF5F with the most advanced technology and has been designed to work with demanding loads and maintain stability in scenarios of high continuous demand.

The unit is also equipped with a parallel operation system using a **DSE8610 control unit**, which allows for secure synchronization with other equipment, automatic transfer in the event of a mains failure and efficient load management. This control architecture ensures that the HGY Series not only provides available power, but also precise and coordinated control of the backup system, in line with the requirements of a high-risk biological environment such as the salmon industry in Norway.

A **landmark industrial project** in Indre Harøy, Norway

Three HIMOINSA generator sets are currently operating at the salmon facility, installed during the first phase of this large-scale project. One of the generators is dedicated to the fjord water pumping system, while the other two focus on the emergency supply of the entire tank system, buildings, and critical systems. This set of generators ensures the operational continuity of the production process from the outset.

With the addition of the HGY Series generator, the facility takes a qualitative leap forward in its power infrastructure. This new equipment reinforces the existing system and prepares the plant for the expected growth in production, ensuring that **power availability** keeps pace with the industrial expansion of the project in Indre Harøy.



This modular, phased deployment demonstrates HIMOINSA's ability to support expansion projects by **integrating scalable Power Solutions** that are compatible with each other and aligned with the customer's technical architecture.

Installation and commissioning of the HGY Series in an already operational infrastructure

The installation of the HGY Series, carried out by Østerbø, was performed in Salmon Evolution's already built and operational salmon facility, which presented both an engineering and logistical challenge. The generator set was introduced through a **narrow cavity**, requiring extremely precise loading and movement operations with very limited room for maneuver.

For a successful installation, specific solutions were implemented for integration with the existing infrastructure:

- **Upper cable outlet**, designed to connect to the main busbar of the emergency system without modifying the architecture of the room.
- **Exhaust system adapted to the structure**, with anchors calculated according to the original building design.
- **Internal tank with guaranteed minimum autonomy**, fed in turn by a common external tank that also supplies the other three generator sets already installed.

This approach allows for fully integrated operation and facilitates maintenance, ensuring continuity of water flow throughout the tank system.



Norwegian climate: Reliability in **adverse conditions**

Although the installation is located in a room in the building, the region's climate — cold, wet and unfavorable for much of the year — requires the equipment to offer safety even in low-temperature scenarios. The HGY Series responds to this with its **preheating system**, ensuring immediate start-up in emergencies and reducing motor wear. The configuration has been designed to respond without restrictions in environments where a power failure would have a direct impact on biological production.

More than 25 years of technical collaboration with Østerbø

The collaboration between HIMOINSA and Østerbø Solutions now exceeds 25 years, developing power supply **projects for industry, public infrastructure, aquaculture and mission-critical applications**, combining HIMOINSA's engineering with Østerbø's local expertise and capabilities as an EPCI contractor.



*"This relationship has been strengthened through flagship projects in the country. More than 50 MW of emergency power to land-based fish farms in the period 2023-2025. We can double this volume if we count emergency power to the whole aquaculture industry in this period. The shared vision remains intact: to **raise the standard of energy projects in Norway** and support customers in applications where availability and power supply are everything", says Magne Halland, Department Manager from Østerbø Solutions AS.*

Critical energy for a **strategic industry in Norway**

Norway is a world leader in salmon production and, according to the Norwegian Seafood Council, exported 1,255,654 tons of farmed salmon in 2024. In this context, 'Salmon Evolution' represents a new generation of production plants on land, where RAS systems require maximum power stability. The HIMOINSA installation guarantees the operational continuity of the process, **protecting millions of liters of circulating water**, and **maintaining the vital conditions of the stock**.



The choice of the HGY Series confirms 'Salmon Evolution's commitment to **high-performance solutions** with high load acceptability and extended reliability, designed to respond immediately to any power failure. The architecture of the HGY Series is designed precisely for advanced industrial environments, where available power, mechanical robustness and electrical system stability are critical to keeping the process running.

"Salmon Evolution considers these backup power units as critical systems to ensure water and oxygen supply to the fish tanks in the event of a power outage. We have experienced several power outages where the backup power units have started and delivered power as they should. We are satisfied with the dialogue and cooperation we have with Østerbø Solutions and HIMOINSA", says Hallgeir Øyen, Technical Manager Power and Automation from Salmon Evolution.

At this salmonid fish farm, where a second's reaction time can mean the difference between preserving or losing the entire production, HIMOINSA provides power and responsibility, ensuring that every stage of the production process remains under control even under the most demanding conditions.

