MHPS Gas Turbine

H-25

MITSUBISHI HITACHI POWER SYSTEMS, LTD.

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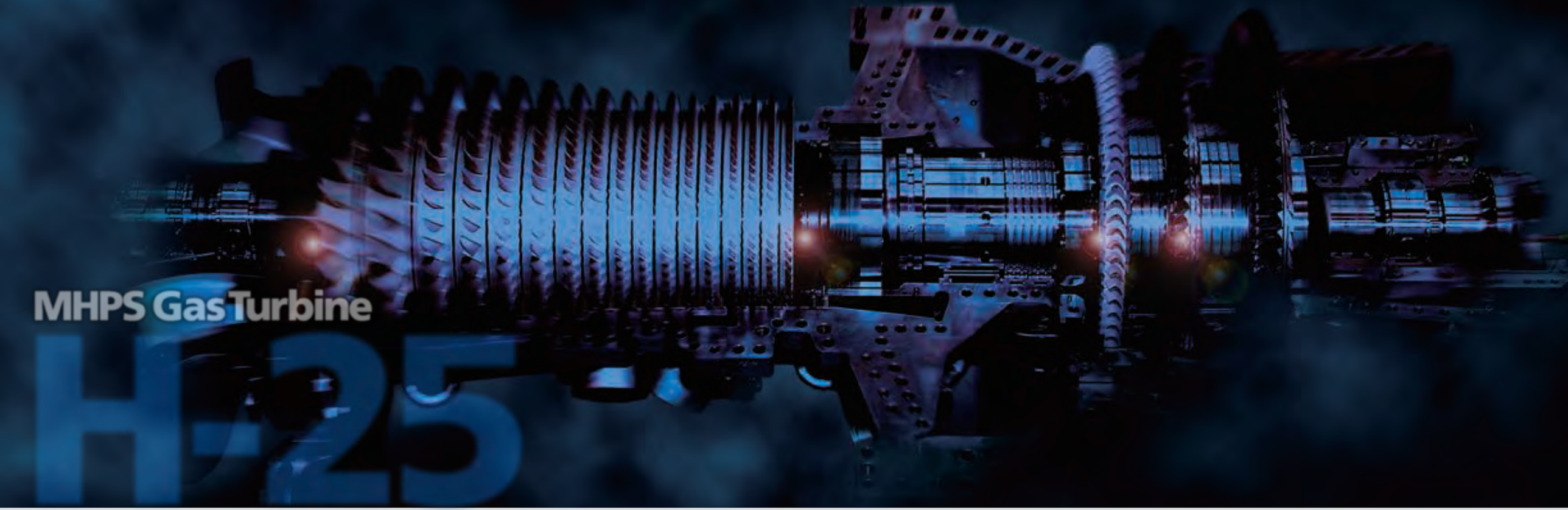


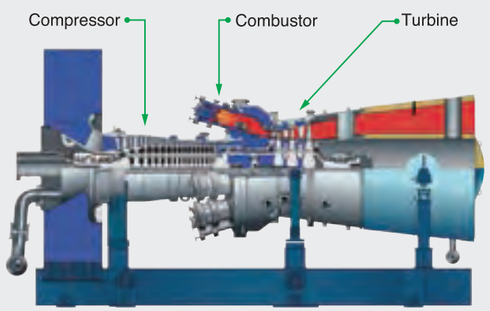
MHPS GasTurbine H-25

Introduction

MHPS H-25's fuel savings will repay your investment within a few years while allowing you a range of fuels from distillate to natural gas. And with cogeneration or combined cycle power plants, even higher efficiency will be achieved.
Plus an excellent automation system will add ease and precision to your operations after a fast installation.
Excellent engineering, superior quality control, and reliable service has earned gas turbines a reputation for excellence and efficiency.
With an output of 40MW class and, coupled with the latest in gas turbine technology, the H-25 becomes a superior value.

Features

- Reliable heavy duty design
- High efficiency
- Replacement of old gas turbine
- On-site maintenance
- Quick delivery
- Suitable system for cogeneration and combined cycle power plant
- Environmentally friendly combustion system with flexible fuel applications



Specification

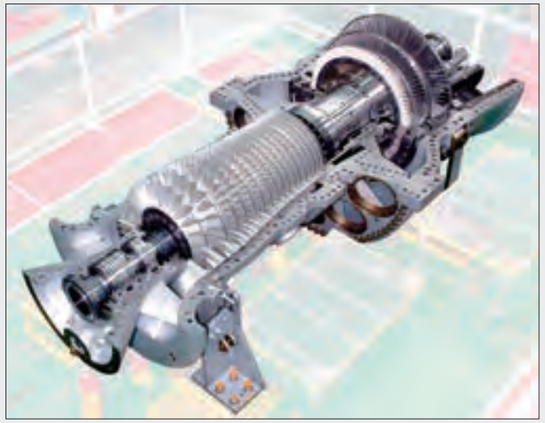
Item		Specification
Gas Turbine	Type	Heavy duty design, single shaft
		Horizontal split casing, stacking rotor
	Rotating Speed	7,280 min^{-1}
Compressor	Type	17 stages axial type
Turbine	Type	3 stages impulse type
	Cooling	Air cooled 1st & 2nd stage nozzles and buckets
Combustor	Type	Reverse flow type
		Conventional type or low NOx type
		10 cans

Performance – Simple Cycle

The H-25 heavy duty single shaft gas turbine provide a high efficiency and reliable power plant.

Item	H-25 50Hz/60Hz
Output, MW	41.0
Efficiency, %(LHV)	36.2
Heat Rate, kJ/kWh	9,949
Heat Rate, Btu/kWh	9,432
Exhaust Flow, kg/s	114
Exhaust Temperature, deg.C	569
NO_X Emission, ppm@15%O_2	≤15-25

・All ratings are defined at ISO standard reference conditions:101.3 kPa, 15 deg.C and 60%RH
・All ratings are at the generator terminals and based on the natural gas fuel



H-25 Gas Turbine Project (Venezuela)

Modular Package Design

Package Design

Package design offers the following benefits:

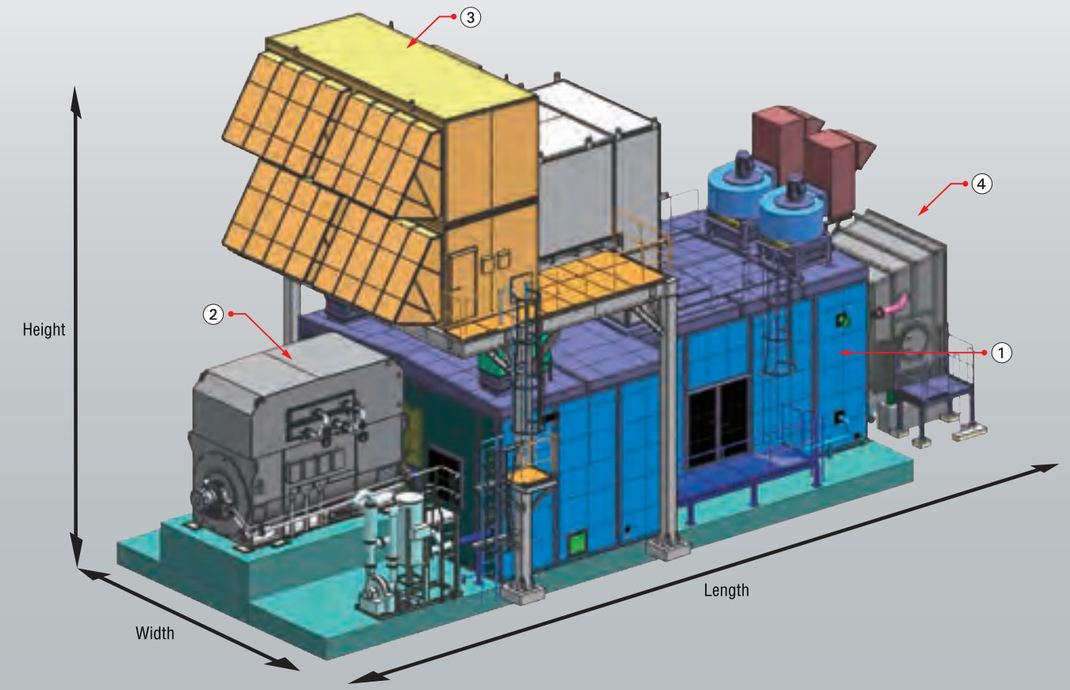
- Minimized site installation work and period
- Flexible site layout
- Economical and delivery-time benefit to customer

Dimensions

Package	H-25
Width	9.9 m
Length	18.1 m
Height	13.7 m

Mass

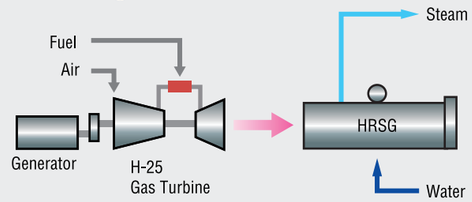
No.	Package	H-25
1	Gas turbine + base	47 t
	Lube oil tank, reduction gear and auxiliaries	82 t
2	Generator	85 t
3	Air intake system	51 t
4	Exhaust system	7 t



Cogeneration Power Plant

Cogeneration power plant with the H-25 provides large capacity of steam production as well as high thermal efficiency of the heat and power generation.
Applicable to various cogeneration systems, MHPS provides system engineering to meet various heat and power requirements to optimize the design.

System Configuration



HRSG : Heat Recovery Steam Generator

Performance

Item	H-25
	50Hz/60Hz
Power Output, MW	39.6
Heat Output, t/h (6 MPa/300 deg.C)	79
Overall Efficiency, %(LHV)	More than 80

- All ratings are defined at ISO standard reference conditions: 101.3 kPa, 15 deg.C and 60%RH
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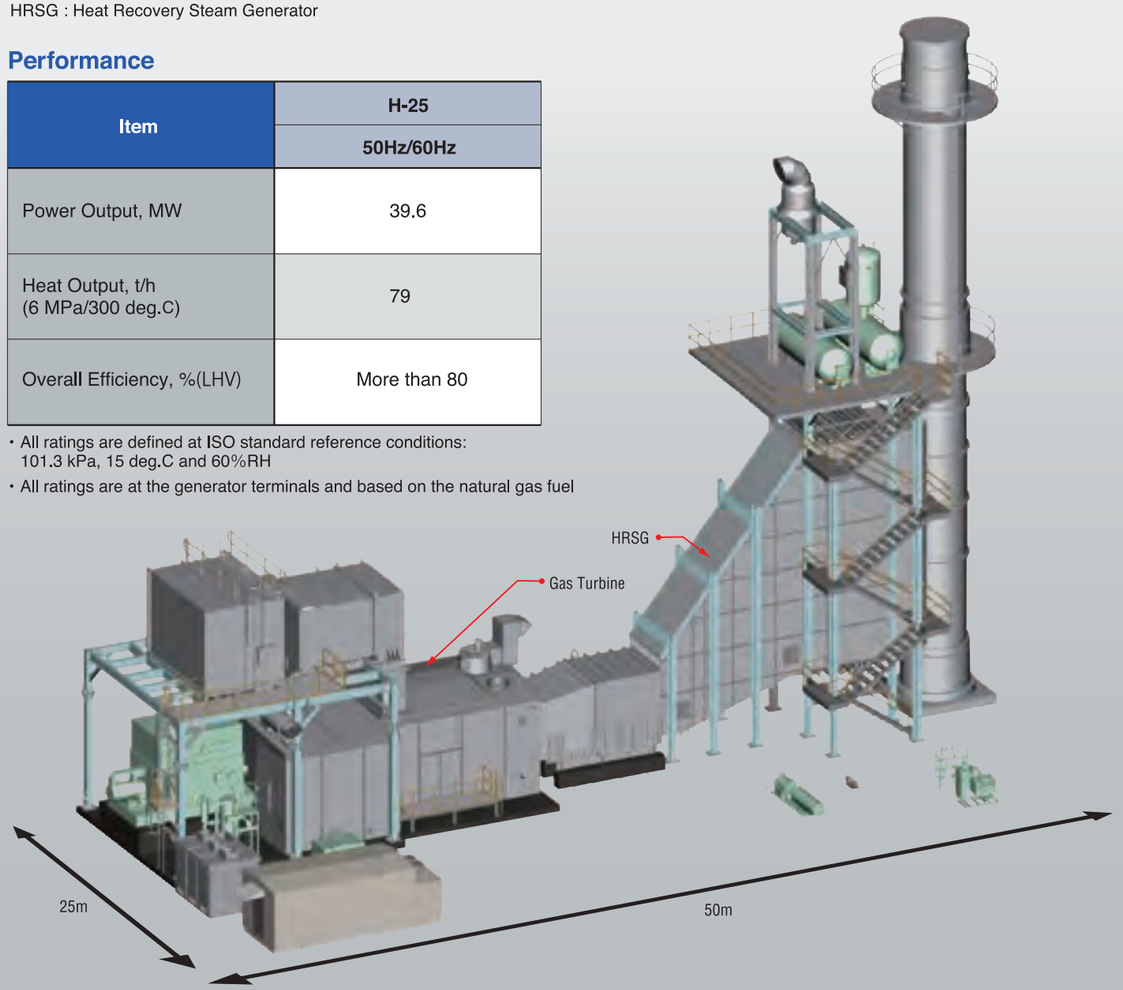
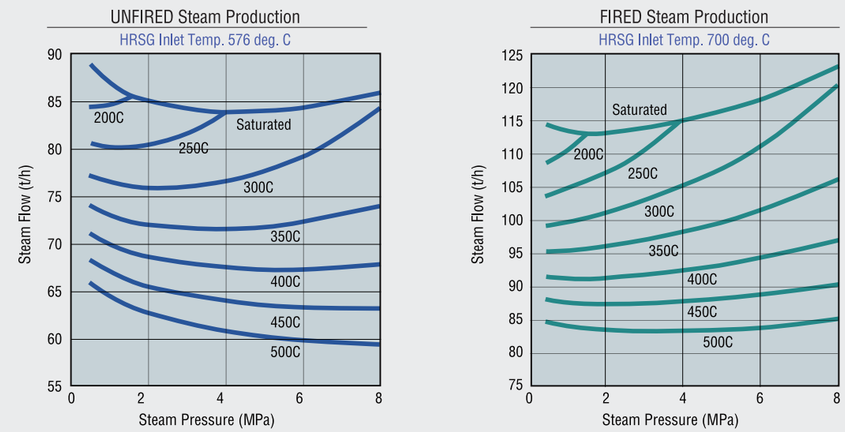
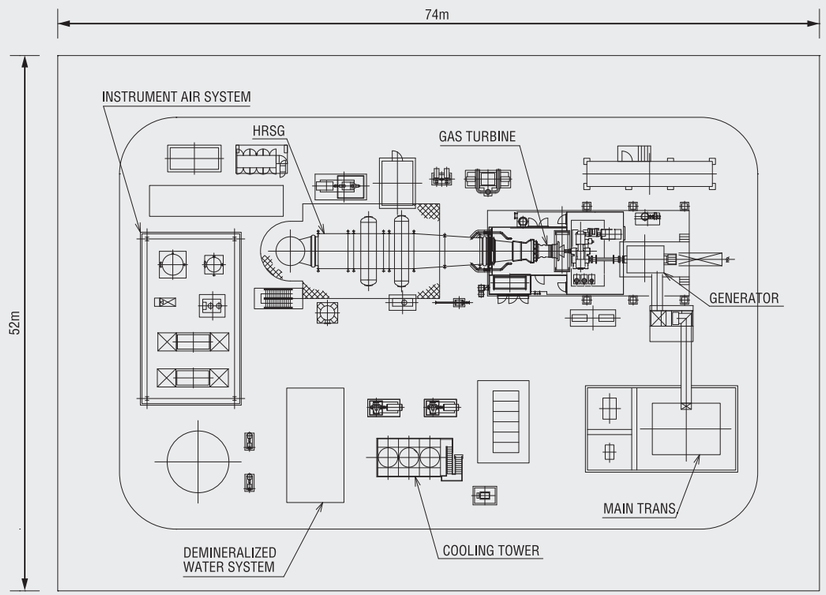


Typical Steam Production Quantity for H-25 Cogeneration System

H-25



Typical Plant Layout



Combined Cycle Power Plant

The higher operating temperature of gas and steam cycles makes a H-25 combined cycle power plant achieve higher efficiency generation. By creating a packaged type combined cycle power plant, MHPS makes installation, operation, and maintenance an easy part of your power generation.

Combined Cycle Power Plant(1-1-1)

Performance

Item	H-25
	50Hz/60Hz
Total Plant Output, MW	60.1
Gas Turbine Output, MW	39.6
Steam Turbine Output, MW	20.5
Gross Efficiency, %(LHV)	54.0

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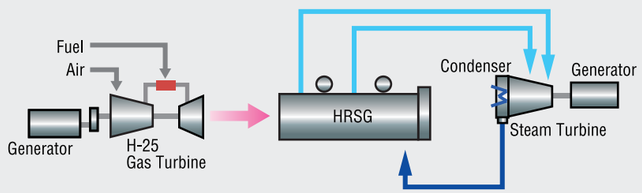
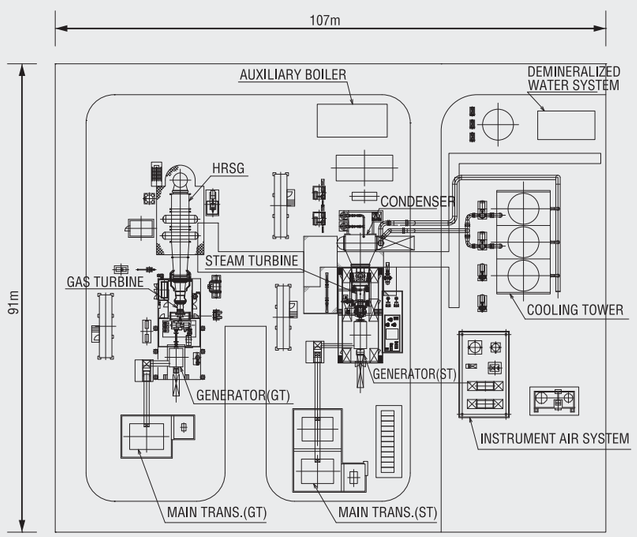
System Configuration



Typical Plant Layout



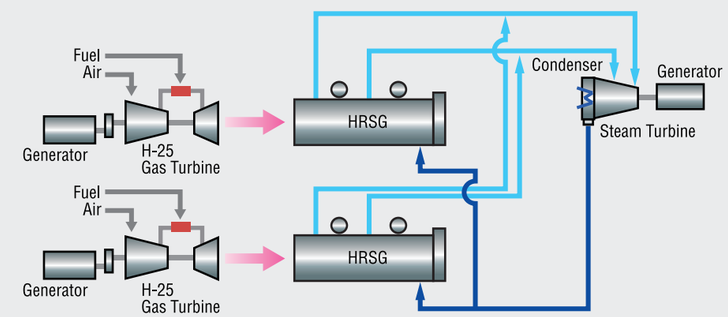
Combined Cycle Power Plant(2-2-1)

Performance

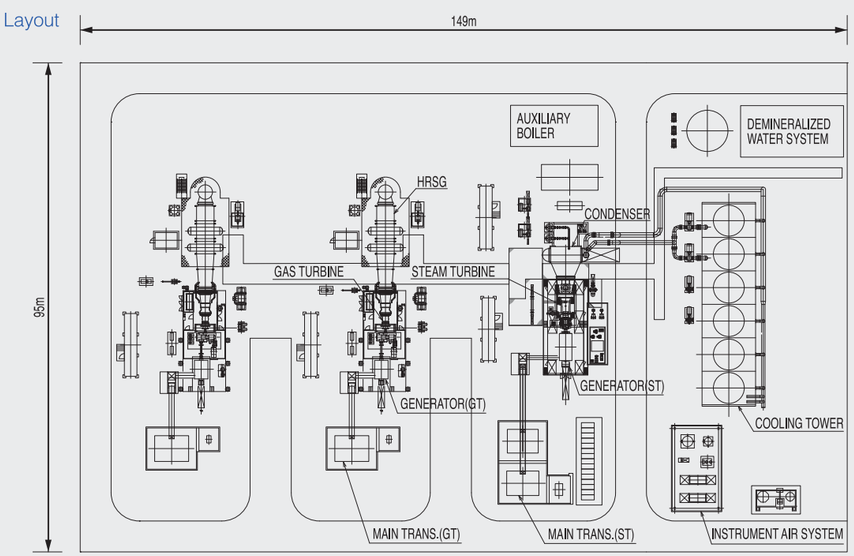
Item	H-25
	50Hz/60Hz
Total Plant Output, MW	121.4
Gas Turbine Output, MW	39.6×2
Steam Turbine Output, MW	42.2
Gross Efficiency, %(LHV)	54.5

- All ratings are defined at ISO standard reference conditions: 101.3 kPa, 15 deg.C and 60%RH
- All ratings are at the generator terminals and based on the natural gas fuel

System Configuration



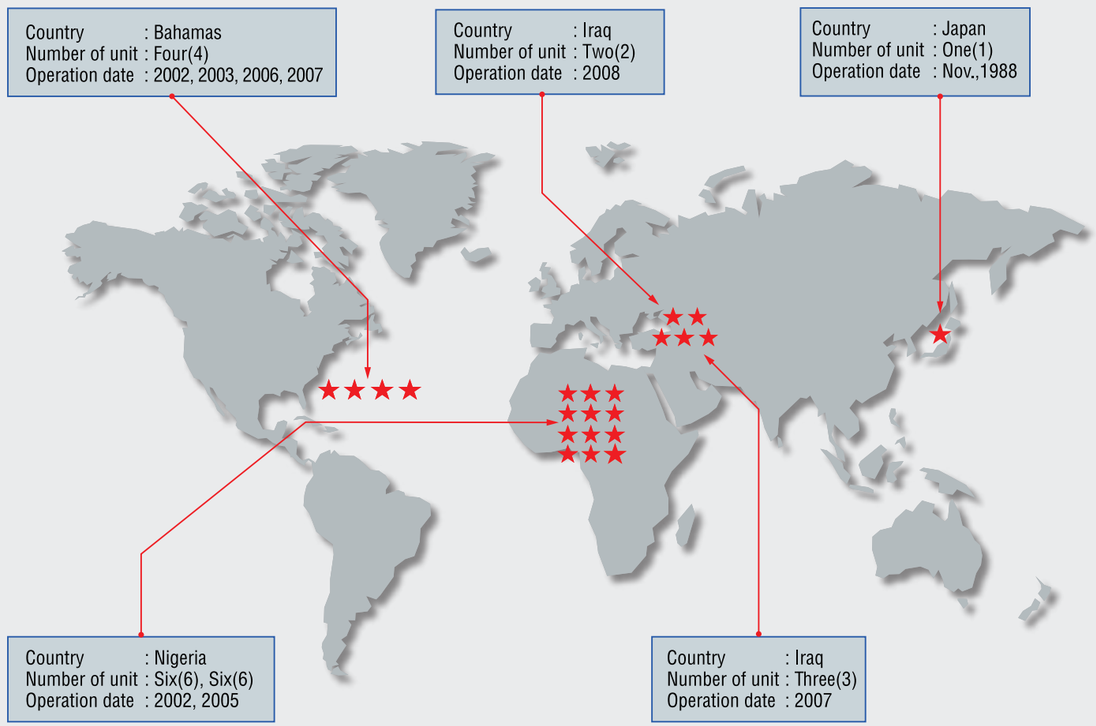
Typical Plant Layout



Various Applications

Replacement Experiences of Old Machine

The H-25 can be used, not only to create new, highly efficient power plants,
but also to replace the Old Machine, gaining an immediate 20 percent reduction in fuel consumption.
Transported separately, the combination with the re-utilized existing equipment is done at the installation site.
And when replacing an existing Old Machine with the H-25, the replacement can be performed in a short period,
because existing foundations, building works, and ancillary equipment are compatible.

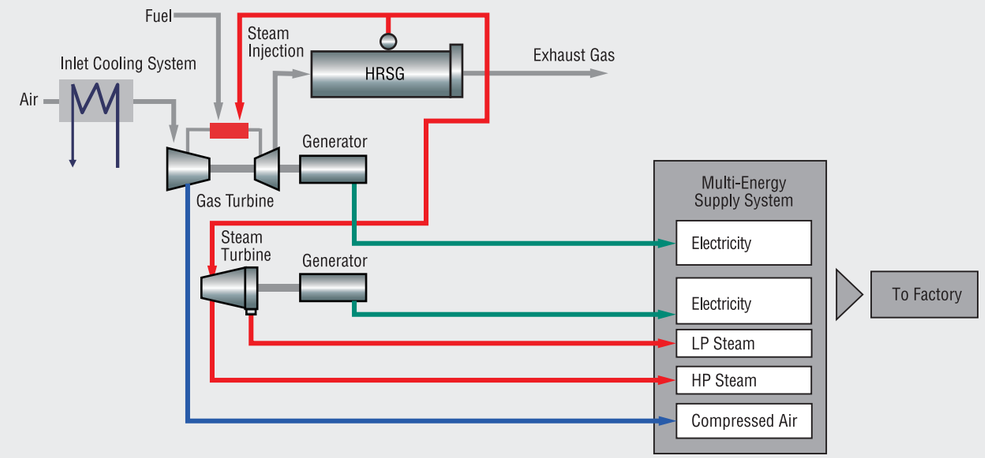


H-25 Gas Turbine Project (Bahamas)

Multi-Energy Supply

The H-25 can be used to supply electricity by generators,
high/low pressure steam extracted from steam turbine
and compressed air extracted from gas turbine compressor for factory.

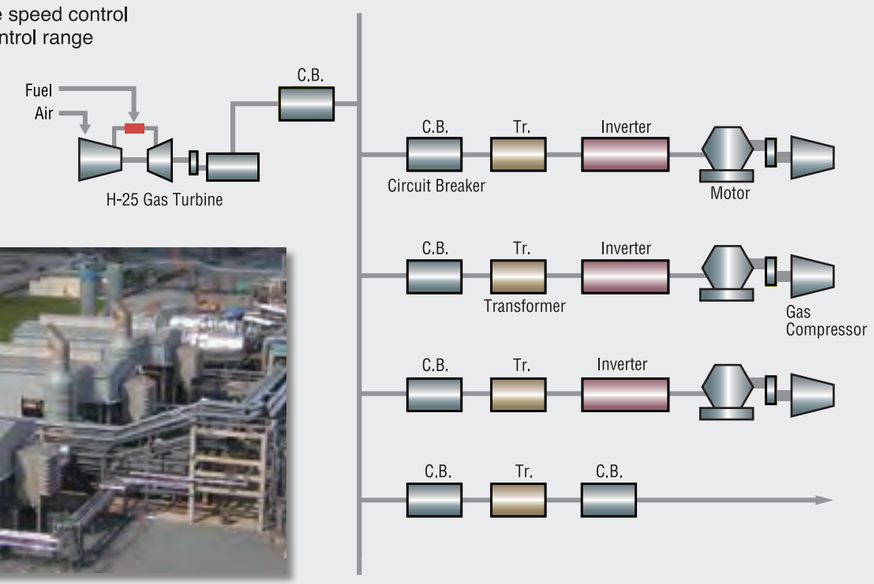
Example of Multi-Energy Supply System



Motor Driven Compressor Drive

The H-25 can be used with motor driven
compressor for gas plant.

- Higher response and wide speed control with 50 to 100 percent control range
- Flexible selection of gas compressor sizing
- Less maintenance



H-25 Gas Turbine Project (Indonesia)