

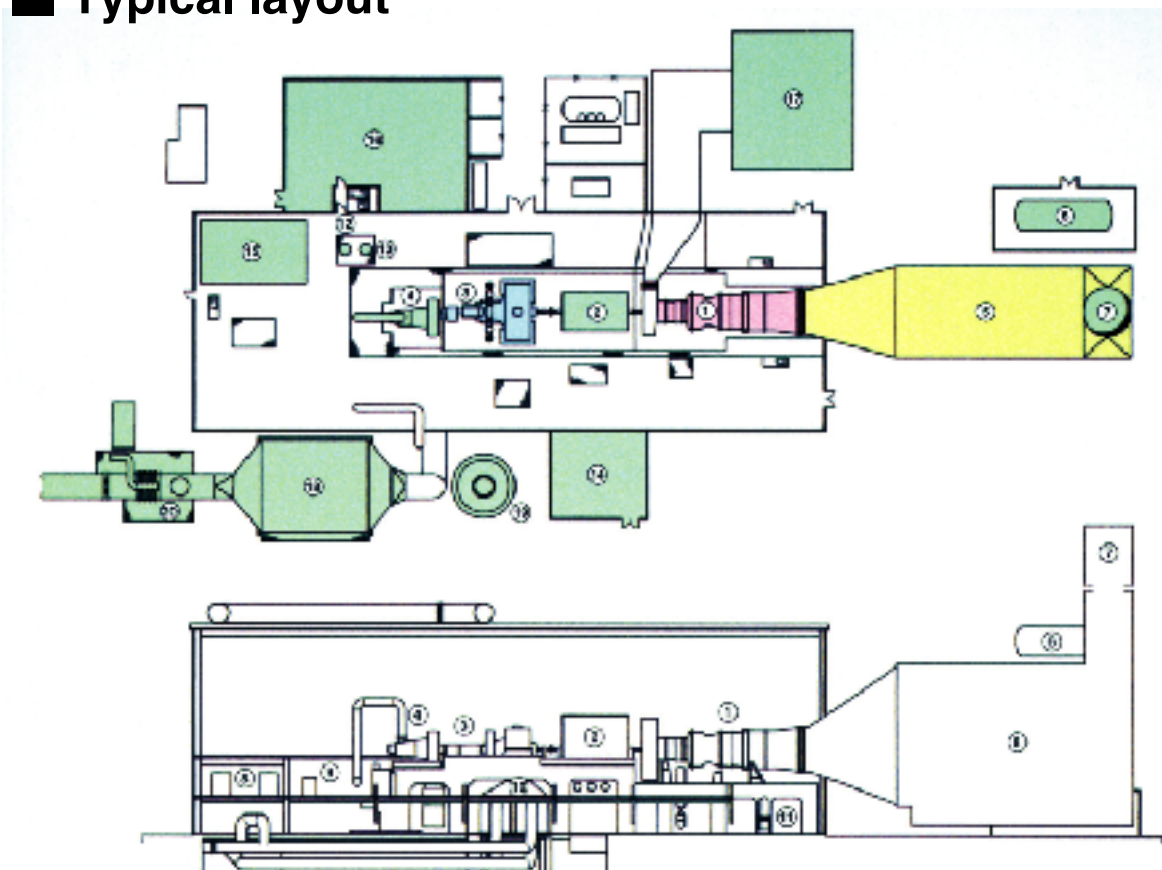


Low BTU Gas Firing Gas Turbines

■ Features

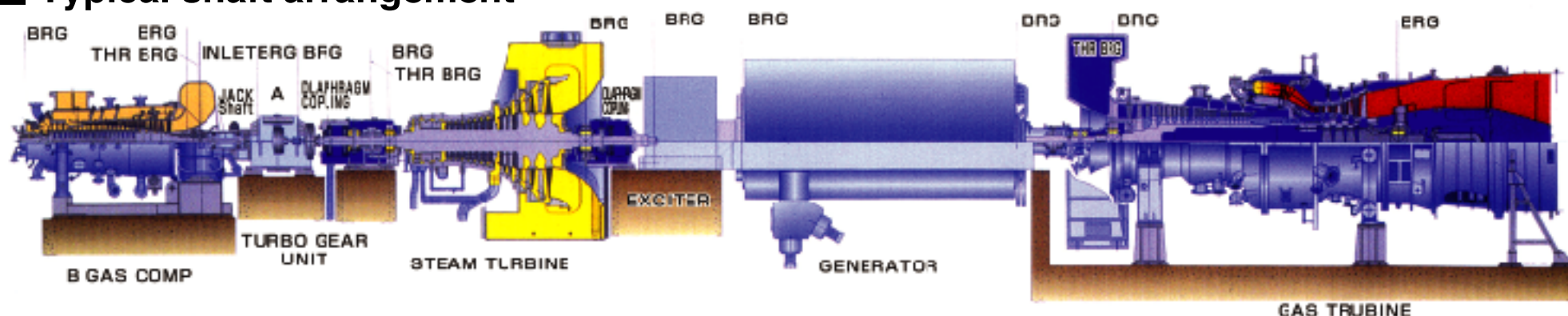
- Meet the stable combustion in wide range of Low BTU Gas (700~1,000kcal/Nm³) with low NOx emission.
- Electrostatic Precipitator to eliminate dust for the long term reliable operation.

■ Typical layout



- ① Gas turbine
- ② Generator
- ③ Steam turbine
- ④ Gas compressor
- ⑤ Heat recovery steam generator
- ⑥ Deaerator
- ⑦ Stack
- ⑧ Clean cooling water cooler
- ⑨ Gas cooler cooling water cooler
- ⑩ Condenser
- ⑪ Turbine cooling air cooler
- ⑫ Lube oil coolers
- ⑬ Main lube oil reservoir
- ⑭ Fuel gas by-pass valve area
- ⑮ Unloading bay
- ⑯ Control room
- ⑰ Inlet air filter
- ⑱ Electrostatic precipitator
- ⑲ Gas cooler
- ⑳ BFG/NG/COG mixer

■ Typical shaft arrangement



■ Mitsubishi Experience on Low BTU Gas firing gas turbines

Year	Customer	Plant Capacity kW	Model	Fuel	LHV kcal/Nm ³	Application
1958	Nippon Steel, Yawata	850	—	BFG	770	Power generation
1964	Nippon Steel, Yawata	4,000	—	BFG	770	Power generation
1965	Sumitomo Metal, Wakayama	15,000	M171	BFG	750	Cogeneration
1970	Shikoku Electric, Sakaide	225,000	M301	COG	4,700	Combined cycle (Fully fired)
1970	Mitsubishi Coal Mining, Oyubari	9,000	M101	CMG	4,700	Cogeneration
1982	Nippon Steel, Kamaishi	16,000	M151	BGF	670	Combined cycle (Repowering)
1987	JFE Steel, Chiba	149,000	M701	BFG+COG	1,000	Combined cycle (Single-shaft)
1988	Mitsubishi Gas-Chemical, Mizushima	16,250	MF-111	BFG+COG	2,400	Cogeneration
1989	Nippon Steel, Hirohata	30,200	M251	LDG	1,815	Cogeneration
1989	Nisshin Steel, Kure	50,000	M251	BFG	700	Combined cycle
1991	Nakayama Steel, Funamachi	39,000	M151	BFG+LDG	1,000	Combined cycle (Single-shaft)
1994	Mizushima Joint Thermal Power	149,000	M501	BFG+M	955	Combined cycle (Single-shaft)
1994	Fukuyama Joint Thermal Power	149,000	M501	BFG+M	955	Combined cycle (Single-shaft)
1997	UNA, Netherland	145,000	M701	BFG+COG	1,000	Combined cycle (Single-shaft)
2001	Nippon Steel, Ohita	67,400	M251	BFG	700	Combined cycle
2003	Nippon Petroleum Refining Co.Ltd,Negishi	430,000	M701F	VRIGCC	1,390	Combined cycle (Single-shaft)
2004	Kimitsu Joint Thermal Power	300,000	M701F	BFG+COG	1,050	Combined cycle (Single-shaft)