

IM270-IHI-FLECS

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1. Introduction

IHI has been supplying 4~6MW class flexible heat and power cogeneration system IM400-IHI-FLECS, which can meet the change of steam demand flexibly. In addition to that, IHI has newly developed 2.5 MW class flexible heat and power cogeneration system IM270-IHI-FLECS which is a improvement type of 2MW class cogeneration system IM270(Refer Fig.1).



FIG.1 IM270 GAS TURBINE

2.CHARACTERISTICS

2.1Flexible Heat and Power

Excessive steam could be injected to gas turbine combustor and convert that into electrical power when steam demand is low. Injecting 2.5t/h of steam into the combustor at maximum, electrical output increases from 2MW to 2.5MW. The technology about steam flow control and steam quality control is based on the experience of IM400-IHI-FLECS.

2.2High Performance

Original IM270, base engine, achieves excellent thermal efficiency as a simple cycle gas turbine in this class. IM270-IHI-FLECS achieves higher thermal efficiency by steam injection. Table 1 shows the specification of IM270-IHI-FLECS.

2.3Simple system

The schematic system flow is shown in Figure 2.

Tab. 1 Design Specification

ITEM	UNIT	BASE ENGINE IM270	IM270 -IHI-FLECS
OUTPUT (@ISOCondition)	kW	2000	2500
Steam Injection (MAX)	kg/h	0	2500
Electrical Efficiency	%	25.5	28.5
Over-All Efficiency	%	78.3	58
Steam Generation	kg/h	5900	6200
Process Steam Flow	kg/h	5900	3700
Fuel	—	Natural Gas LPG Kerosene	Natural Gas LPG Kerosene

By injecting whole steam into the mainstream air without the secondary air, it is possible to inject saturate steam without superheating. Therefore the simple system without superheating could be realized.

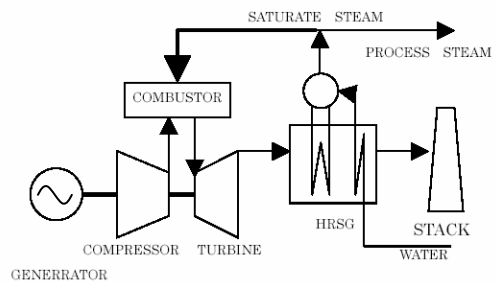


FIG.2 SYSTEM FLOW

2.4Low NOx emission

Original IM270 has applied Dry Low Emission combustor. The emission of IM270-IHI-FLECS is still lower level by steam injection. NOx emission level is lower than 10 ppm@16%O2 at maximum power.

3.Actual Achievements

The 1st plant of IM270-IHI-FLECS has been in service successfully since March 2002 at IHI Kure plant. The 2nd plant, which is the first commercial plant, started operation in September of this year.