Experimental Study about Micro Gas Turbine Performance

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Long Abstract

Introduction

In every summer and winter season, pick load power generation has been issued to run air conditioning system. The micro gas turbine is one of the suitable device to be applied for the distributed power generation. Because, capacity of electric power, system volume, maintenance and operation, etc. are suitable to be installed at local area than that of the conventional gas turbine. In Korea, several research programs have been progressed to make industry-owns micro gas turbine model. Numerous problems were presented, and the most of the key technology were not easily open to literature. For many years, KIMM (Korea Institute of Machinery & Material) has been requested to solve the industry's problems which were related to the micro gas turbine. To support industry's request and build up the key technology about the micro gas turbine, KIMM made the micro gas turbine and the performance test facility. This paper introduces a prepared micro gas turbine test facility briefly, and one of way to stabilize the secondary flow distribution. Also, it presents a part load performance analysis result.

1. Methods

For the stable operation, the characteristics of the secondary flow was analyzed. To identify the distribution of the secondary flow, pressure, temperature and displacement sensors were carefully installed. By conducting experiment data analysis, the improper secondary flow distribution was detected in inside of the developed micro gas turbine. Thermal-structural analysis was performed to

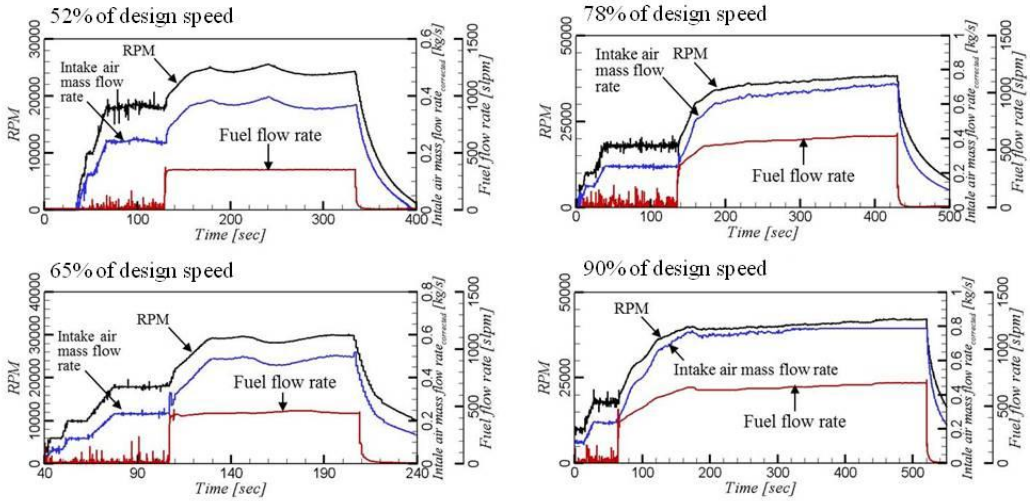

Figure 1. Self-sustain operations for different speeds

find out the reason of the improper secondary flow distribution. To stabilize it, a device was designed and installed in micro gas turbine, and a proper secondafy flow distribution could be acquired. With a resistance load bank, self-sustain operation was performed about different speed as shown in Fig.1. Part load test was conducted at 93% of design speed and performance was analyzed.

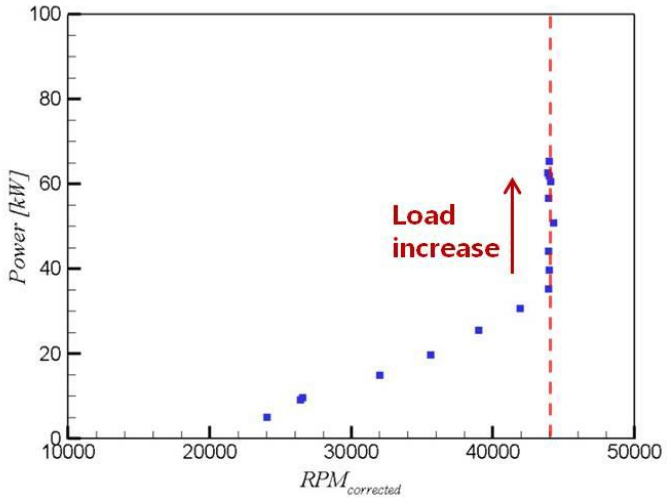

Figure 2. Part load test result

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