The plasma MHD electrical power plant has potential to provide a thermal efficiency higher than 60%, because it has no rotating parts and as a result, an operating temperature of working gas is increased up to 2000 K. If this attractive power plant is realized, the emission of CO$_2$ and the consumption of natural resources are reduced by 20%. In the past, experimental studies were carried out using facilities with short duration time from 3 msec to 60 sec. But, experimental efforts in the present study are focused on an investigation on performances of the plasma MHD generator under longer operation time than previous ones.

The newly constructed closed loop facility is used for this purpose and it consists of the argon heater, the disk MHD generator, the regenerative heat exchanger, the argon cooler and the compressor. The main objectives of the present study are; 1) to establish the advanced technology for the continuous circulation of high temperature gas inside the closed loop, 2) to know both the performances of the disk MHD generator and the durability of material under long operation time, and 3) to obtain knowledge of the thermal and fluid-dynamical interaction between electrical load and each component. Through these researches, the most advanced energy and environment technology will be developed.

References


Term of Project

Fiscal years 2003-2007 . 5 years

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