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## The Effect of Varying the Nozzle Exit Angle on the Performance of a Radial Turbine

Masato ARUGA\*

The performance characteristics has been improved considerably in the past decade. However, the performance characteristics of a part of load is not so good so far as the fixed nozzle exit angles are employed. Therefore, it is required to improve the off-design performance varying the nozzle setting angle. Thus, the effect of varying the nozzle setting angle on the performance of the turbine was experimented. The nozzle setting angle was changed in five steps, i.e.  $23^{\circ}22'$ ,  $17^{\circ}29'$ ,  $11^{\circ}52'$ ,  $6^{\circ}29'$ ,  $1^{\circ}20'$ . Experiments were conducted to examine the effect of the change of nozzle exit angle for efficiency, degree of reaction and weight flow, etc.

From the experiment, it was found that the favorable range of operation was limited to a fixed nozzle exit angle and the efficiency lowered as it departed from the operating range. However, the operation range could be expanded by changing the nozzle exit angle and the good operation condition would be achieved. And by considering the velocity triangle at the maximum efficiency point, it was found that the efficiency was best when the direction of inflow at the inlet of the rotor was somewhat inclined opposite to the direction of rotation.

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