

**EXPERIMENTAL STUDY OF EFFECT
COMPARISON OF TURBINE INLET PRESSURE
VARIATIONS AND VARIATION CHARACTERISTICS
OF TURBINE ON LOADING ORGANIC RANKINE
CYCLE**

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ABSTRACT

Power generation system has been innovating at this time to keep going to the availability of electricity to meet the needs of one of them with Organic Rankine Cycle (ORC). This system consists of four major components, namely evaporator, turbine, condenser, and pump. The working fluid is pumped into the evaporator and then used to generate steam turbine. Condensed steam turbine expansion results and drained by the pump back to the evaporator. The system is able to utilize the energy source that has temperature and low pressure organic fluid to generate steam. This study was conducted to evaluate the performance of the turbine at the ORC system by varying the turbine inlet pressure and load by using R123 as the working fluid.

Data collection was performed by varying the turbine inlet pressure on every variation of loading generator. Observation performed only on the turbine to determine the characteristics of turbines in use today. Data collection was performed with R-123 as the working fluid. Temperature obtained from experiments in and out of the turbine, the turbine rotation speed in rpm, and enthalpy can be known. Used to calculate the

enthalpy of work produced turbines, turbine efficiency and the efficiency of the turbine blade.

At 8 bar inlet pressure turbine and a 1000 Watt load the data with the best value is obtained. The results of calculations of data obtained work produced the biggest turbine is 5,437 KW. Another result that can be seen is the highest turbine efficiency of 88%. Highest turbine blade efficiency is 42.9% counted.

Key words: *R123, working turbine, turbine efficiency, the efficiency of the turbine blade pressure variations, loading variations.*