DESIGN OF BLADE AXIAL FLOW COMPRESSOR IN GAS TURBINE TYPE T-4702 (CENTAUR) CASE STUDY IN ECHO FLOW STATION BP INDONESIA

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ABSTRACT
Gas turbine type T-4702 (Centaur) at bp Indonesia is used to drive a centrifugal compressor which is producing gas for lifting oil from the well. The decreasing specific gravity of gas properties at the centrifugal compressor inlet which is most likely to causes overspeed condition. To overcome that, it is needed to reduce the rotation speed of gas turbine but that condition will gave occasion to lower the efficiency at gas turbine. The Impeller of centrifugal compressor and rotor blade of gas turbine have been redesign according the decrease of specific gravity at actual condition. As a consequence, the work of axial flow compressor at gas turbine is not going to reach the maximum condition.

The design of blade axial flow compressor at gas turbine type T-4702 is started with finding out how the changing work operation of centrifugal compressor would effecton gas turbine’s work. Then, determine the axial flow compressor design parameter. Afterwards, continue with designing blade axial flow compressor at each stage to get the maximum work at wanted rotation.

This design result shown that the blade is used NACA 65019 base profile. This base profile is selected because it is effective in subsonic flow and approximation value of lift coefficient is 1. The other design result are dimention of blade which is 0.1183 m in span for rotor and 0.0961 m in span for stator for the first stage. Then the root radius of rotor is 0.0788 m and the tip radius of stator is 0.0843 m. This radii are only for the
first stage of compressor. With this dimension, the compressor has maximum efficiency in 14871 rotation per minute.

**Key words:** axial flow compressor, gas turbine, blade, stage