EFFECT OF STAGE LOADING AND TIP CLEARANCE ON TIP CLEARANCE FLOWS IN A CENTRIFUGAL COMPRESSOR

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Abstract

The present paper reports measurement of periodic static pressures on the casing over the impeller of a low speed centrifugal compressor at different stage loadings and tip clearances. The periodic pressure data is acquired employing the technique called PLEAT. Experiments are carried out in a low speed centrifugal compressor with unshrouded impeller. Twelve holes are provided on the casing in which adapters are attached. A fast response pressure transducer, Kulite XCS-062 5pisd is inserted in the adapters. The pressure transducer measures pressure in terms of voltage. The voltage output is very low. The output voltage is amplified and converted to digital values for further processing of data. Sample results are presented and interpreted. From the measured static pressure, tip clearance flows can be easily identified. Effect of tip clearance and stage loading on tip clearance flows is highlighted.

Keywords: Centrifugal Compressor, Tip Clearance, Stage Loading, Casing Static Pressure, Experimental Investigation