

IAF SPACE PROPULSION SYMPOSIUM (C4)
Virtual Presentations - IAF SPACE PROPULSION SYMPOSIUM (VP)

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EFFECT OF BLADE CONFIGURATION ON PERFORMANCE OF A HIGH SPEED AXIAL FLOW
PUMP INDUCER

Abstract

The paper evaluates the effect of number of blades on the non-cavitation and cavitation performance of an inducer used in high speed axial flow pump. The study is carried out by changing the number of blades of an inducer with varying hub diameter and constant tip diameter. The three configurations used for the study are two full bladed inducer, two bladed inducer with additional splitter blades and a three bladed inducer. The high solidity splitter bladed inducer with lower blade spacing and the three bladed inducer are realised through 3D printing route using Titanium alloy while the two bladed inducer is realised through machining route. The test methodology for the inducers consists of non-cavitation and cavitation tests carried out at high speed pump test facility with electric motor as the drive source. The non-cavitation performance is compared based on head rise and efficiency while the cavitation performance is assessed based on the required net positive suction head (NPSH). The test data analysis showed that the splitter bladed inducer is providing a substantial increase in head rise and lowest NPSH requirement compared to full bladed inducers. The study showed that splitter bladed inducer is a good substitute for obtaining high head rise with lower NPSH requirement for aerospace and industrial applications.