

**Analisis Tingkat Kavitasi Pada Turbin Francis Poros Horizontal 4 MW:
Studi Kasus Unit 1 PLTA Timo**

*Analysis of Cavitation Level on a 4 MW Horizontal Shaft Francis Turbine:
A Case Study of Unit 1 at PLTA Timo*
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ABSTRACT

Hydropower Plants are power plants that convert the potential energy of water into electricity using turbines. During the operation, turbines face several challenges, such as decrease in generated power and cavitation. During the annual inspection conducted on the Francis turbine of Unit 1 PLTA Timo, several factors leading to decrease in power output and occurrence of cavitation on the turbine blades surface were indentified. This study aims to analyze the generated power, the level of cavitation, and the impact of cavitation on the Francis turbine of Unit 1 PLTA Timo. The research method employed in quantitative experimental, utilizing primary and secondary data while adjusting the load from 1MW to 4MW. The primary data used includes active power, effective water head, water discharge, and turbine spesification. The research findings indicate that the active power generated by PLTA Timo at 1MW, 3MW, and 4 MW loads did not meet the operational targets. However, at a load of 2MW, the generated power fulfilled the target at 2,04MW. The highest level of cavitation occurred at a 1 MW load with cavitation coefficient of 0,05677189 and a spesific speed 6,8129 rad/s. The cavitation coefficient affects the power generated where when the Thoma number rises, the power produced is greater, but inversely proportional to the level of cavitation that occurs.

Keywords: *Power, Cavitation, PLTA Timo, Francis Turbine*