

**ANALYSIS OF THE EFFECT OF TURBINE CASING
TEMPERATURE ON THE START-UP PROCESS IN TG-25 PG-3
PT. INDAH KIAT PULP & PAPER PERAWANG**

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ABSTRACT

Steam turbines are critical components in steam power plants that require proper start-up procedures to ensure operational reliability and safety. This study analyzes the effect of turbine casing temperature on the start-up process of Turbine Generator 25 (TG-25) at PG-3 PT. Indah Kiat Pulp & Paper Perawang. The focus of the study is on the differences in startup time based on casing temperature conditions, namely cold startup ($<150^{\circ}\text{C}$), warm ($150\text{--}300^{\circ}\text{C}$), hot ($300\text{--}400^{\circ}\text{C}$), and extra hot ($>400^{\circ}\text{C}$). The methods used include direct observation, interviews with operators, and analysis of historical turbine operation data. The research results indicate that turbine casing temperature significantly affects startup duration. Cold startup requires the longest time (7 hours) because it necessitates gradual heating to avoid thermal stress on turbine components. Meanwhile, extra-hot startup has the shortest time (3.33 hours) because the turbine casing is already close to operational temperature. Additionally, the temperature difference between the upper and lower casings must be maintained at $\leq 50^{\circ}\text{C}$ to minimize vibration and mechanical damage. In conclusion, the higher the casing temperature, the more efficient the turbine startup process. This study suggests implementing startup procedures based on casing temperature conditions to optimize operational time and extend turbine lifespan.

Keywords: *Steam turbine, startup, casing temperature, vibration.*