

Numerical Investigation into the Effect of Axial Fan Blade Angle on the Fan Performance

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Abstract : The performance of cooling system affects on efficiency of turbo generators and temperature of winding. Fan blade is one of the most important components of cooling system which plays a significant role in ventilation of generators. Fan performance curve depends on the blade geometry and boundary condition. This paper calculates numerically the performance curve of axial flow fan mounted on turbo generator with 160 MW output power. The numerical calculation was implemented by Ansys-workbench software. The geometrical model of blade was created by bladegen, grid generation and configuration was made by turbogrid and finally, the simulation was implemented by CFX. For the first step, the performance curves consist of pressure rise and efficiency flow rate were calculated in the original angle of blade. Then, by changing the attack angle of blade, the related performance curves were calculated. CFD results for performance curve of each angle show a good agreement with experimental results. Additionally, the field velocity and pressure gradient of flow near the blade were investigated and simulated numerically with varying of angle.

Keywords : turbo generator, axial fan, Ansys, performance

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