عنوان مقاله:

The Influence of Crosswind on Natural Draught Dry Cooling Towers (NDDCT) using CFD Approach

محل انتشار:

دومین کنفرانس نیروگاههای برق (سال: 1388)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Shidvash Vakilipour - *Sharif University of Technology*

S. Hossein Sajadi - *Iran Energy Efficiency Organization-SABA*

خلاصه مقاله:

The natural draught of Dry Cooling Towers (NDDCT) is strongly affected by crosswind which is an atmospheric disturbance. In some practical cases, the crosswinds decrease the cooling efficiency of NDDCT more than 30%. In this research, the wind effects on a NDDCT are predicted using computational fluiddynamics (CFD). The solution domain is considered as large as the outlet boundaries do not affect the natural draught flow inside the tower. Based on the numericalresults, it is obvious that the crosswind distorts the air flow pattern inside the tower from two regions. Firstly,the tower inlet includes 20 meters of tower bottom, where heat exchangers (deltas) are installed, and called the tower base. Secondly, the exited warm air from thetower is affected by the crosswind at the last 10 meters of tower, where called the tower tip. The velocity vectors and pressure contours on a plain located at 7.5meters from the ground show about 10% of the total effective delta area will be lost. Also, the same study ontower tip with temperature profile shows unfavorable wind effects on tower tip. Also, the numerical results demonstrate that about 20% of tower outlet area ischocked by crosswind and this causes pressure drop for outgoing warm air. These two phenomena .cause 14% of efficiency drop on heat exchanged by NDDCT in comparison with calm air condition

کلمات کلیدی:

Natural Draught Dry Cooling Tower, CFD, Crosswind effects, Heat exchanger