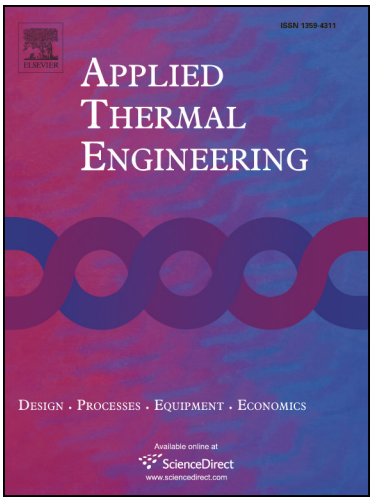

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Field test on ventilation performance for high level water collecting wet cooling tower under crosswind conditions

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Abstract: Field test was performed on the high level water collecting wet cooling towers (HWCTs) of a 1000MW unit to investigate ventilation performance under crosswind conditions, the circumferential inflow air distribution rules and ventilation rate were analyzed in this paper. The test results manifest that crosswind destroys the uniformity of circumferential inflow air, increases the wind velocity in the windward side, and reduces wind velocity in the lateral and leeward side. Moreover, the uniformity coefficient of circumferential inflow air and ventilation rate continuously decrease with the increasing of crosswind velocity. In this study, θ represents the angle between cross walls and crosswind direction. When crosswind velocity reaches to 3.74m/s, the uniformity coefficient decreases to 0.61 and 0.49 under θ_1=5° and θ_2=35°. Compared with 0.28m/s condition, the ventilation rate reduces by 30.13% under θ_1=5° and 34.36% under θ_2=35°. Additionally, at the same crosswind velocity, the smaller the θ is, the better the ventilation performance becomes. Compared with θ_2=35°, the uniformity of circumferential inlet air is better and the ventilation rate is larger than that under θ_1=5° condition.

Keywords: high level water collecting wet cooling tower, field test, inlet air uniformity, ventilation performance, crosswind

Nomenclature

V_c	Ambient crosswind velocity (m/s)
V_r	Effective radial wind velocity (m/s)