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Xiaoxiao Li, Hal Gurgenci, Zhiqiang Guan, Yubiao Sun

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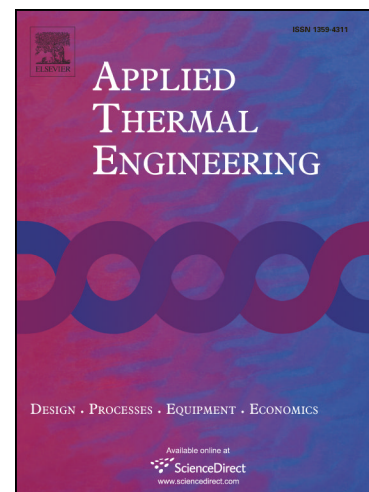
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# Experimental Study of Cold Inflow Effect on a Small Natural Draft Dry Cooling Tower

Xiaoxiao Li\*, Hal Gurgenci, Zhiqiang Guan, Yubiao Sun

*School of Mechanical and Mining Engineering, The University of Queensland, Brisbane, Australia*

## Highlights

- Detailed experimental data of cold inflow behaviours are presented.
- The mechanism of cold flow and its effect on cooling tower performance is discussed.
- A solution is proposed to deal with the problem.

**ABSTRACT:** The heat rejection rate of natural draft dry cooling tower, as well as the operating performance of a power plant, can be affected by numerous ambient factors. The cold inflow is an unfavourable air turbulence at the top of the cooling tower and has a significant negative effect on the performance of natural draft cooling towers. In the present research, results are given for a 20 m high natural draft dry cooling tower experimental system tested at different ambient conditions. Several events of cold air incursion into the top of the cooling tower are identified and the detailed experimental data are presented. The experimental data show that this effect could seriously impair the thermal performance of the cooling tower. The water outlet temperature of the cooling tower has increased by as much as to 3°C in these tests because of the cold inflow effect. The mechanism and the solution are discussed based on the experimental data. The findings in this paper can lay an important foundation for future small natural draft cooling tower design and operation.

**Keywords:** Cold inflow, Natural draft dry cooling tower, Experimental study

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\* Corresponding author.

E-mail address: [x.li3@uq.edu.au](mailto:x.li3@uq.edu.au) (X. Li) [dr.xiaoxiao.li@foxmail.com](mailto:dr.xiaoxiao.li@foxmail.com)

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