

热能工程

压缩和吸收式制冷复合循环电站空冷系统性能评价

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摘要: 针对电站传统空冷技术的种种缺陷, 曾提出蒸汽动力循环耦合以氨为制冷剂的正、逆制冷循环的电站空冷系统(以下简称复合循环空冷系统)。复合循环的正制冷循环可根据机组负荷特性和安装地的气象条件选用氨蒸气压缩制冷循环或氨水吸收式制冷循环。为便于设计选型, 简要介绍复合循环空冷系统的两制冷循环的构成及工作原理, 建立复合循环空冷系统性能评价指标; 并根据模拟计算机组安装地的典型年-气温分布进行2种方案的性能评价指标的计算分析及2种方案能级和能耗的对比分析。算例表明: 氨水吸收式制冷复合循环空冷系统的性能评价指标和能级和能耗均明显优于氨蒸气压缩式制冷复合循环空冷系统, 前者还有望用于高温时段长的南方地区。

关键词: 电站空冷系统 复合制冷循环空冷系统 氨蒸气压缩式制冷循环 氨水吸收式制冷循环 性能评价

Performance Evaluation of Combined Power and Refrigerating Cycle for Power Plant Air Cooling System

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Abstract:

A new air cooling system by steam power cycle coupled with the positive and negative sequence refrigerating cycle (hereinafter called 'combined cycle air cooling system' or CCACS) was presented in order to handle the shortcoming of the actual air cooling system. The designers could make a choice between the ammonia compression refrigerating cycle (ACRC) and ammoniacal-liquor absorption refrigerating cycle (ALARC) according to the load bearing characteristic of turboset and climatic condition of unit installed sit. Moreover the components and process flow diagram of ACRC and ALARC of combined cycle air cooling system was briefly illustrated in order to facilitate type selection. The performance evaluation criteria of CCACS was established and contrastive analysis between the performance evaluation of ACRC and ALARC was done. An analog computation example show that the ALARC has many advantages, such as, all the performance evaluations, the energy consumption, energy level and so on, the ALARC is suitable to be installed in higher temperature area.

Keywords: power plant air cooling system combined refrigerating cycle air cooling system ammonia compression refrigerating cycle ammonia absorption refrigerating cycle performance evaluation

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