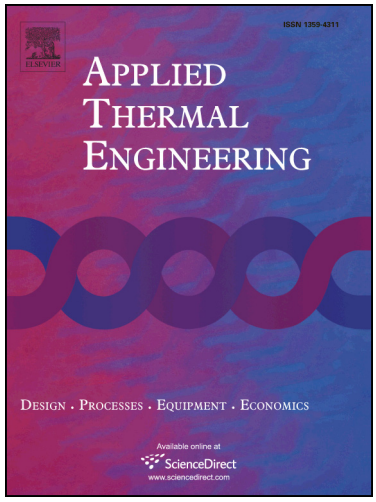

Research Paper

Exergy Analysis of Intercooled Reheat Combined Cycle with Ammonia Water mixture based bottoming cycle

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Exergy Analysis of Intercooled Reheat Combined Cycle with Ammonia Water mixture based bottoming cycle

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Abstract:

The present paper deals with exergy analysis of a combined cycle with ammonia water mixture as the working fluid in the bottoming cycle. The effect of varying ammonia mass fraction on the thermodynamic performance of various elements of the considered combined cycle configuration is studied. The analysis reveals that as the ammonia mass fraction increases, the availability increases in low pressure gas turbine of the topping cycle, reheater, heat recovery vapor generator (HRVG), low pressure turbine, and decreases in economizer, refrigerant heat exchanger and absorber. Results obtained are useful as the exergy estimation indicates that amongst all thermodynamic elements in the considered combined cycle, the maximum availability is destroyed in HRVG followed by low pressure gas turbine which is good input for designers to improve HRVG.

Keyword:

Combined Cycle, Exergy, Heat Recovery Vapor Generator, Ammonia Mass Fraction, Gibbs free energy.