

Abstract Submitted
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Analysis of Binary Cycle Efficiency Using Redlich-Kwong Equation of State DEBORAH SAUNDERSON, ARIEF BUDIMAN, University of Calgary — Coal, natural gas and nuclear power plants operate using various forms of Rankine cycle. We present an efficiency maximization strategy of binary cycle, which has two Rankine cycles in tandem, using Redlich-Kwong equation of state for wide ranging working fluids: alkali metals, mercury, water, and ammonia. Binary cycle efficiency can approach the Carnot efficiency at a cost. The mercury/ammonia working fluid combination yields the highest efficiency for typical binary cycle conditions. We discuss practical implications given that mercury and ammonia create safety concerns, especially on finding other fluids having similar efficiency based on our simulations.

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