1. What is the equation for isentropic efficiency of a turbine? How about for a compressor?

2. Water vapor at 1000 deg F, 140 lbf/in.² enters a turbine operating at steady state and expands to 2 lbf/in.², 150 deg F. Stray heat transfer and kinetic and potential energy effects are negligible. Determine the actual work and the maximum theoretical work that could be developed for a turbine with the same inlet state and exit pressure, each in Btu per lb of water vapor flowing. What is the isentropic efficiency? (Problem 6.142)
3. Air enters the compressor of a gas turbine power plant operating at steady state at 290 K, 100 kPa and exits at 330 kPa. Stray heat transfer and kinetic and potential energy effects are negligible. The isentropic compressor efficiency is 90.3%. Using the ideal gas model for air, determine the work input, in kJ per kg of air flowing. (Problem 6.145)
4. Air at 290 K, 100 kPa enters a compressor operating at steady state and is compressed adiabatically to an exit state of 420 K, 330 kPa. The air is modeled as an ideal gas, and kinetic and potential energy effects are negligible. For the compressor, (a) determine the rate of entropy production, in kJ/K per kg of air flowing, and (b) the isentropic compressor efficiency (Problem 6.147)