Homework #9

Web Problem #9 Nuclear Reactor Design and Analysis

1. Consider a helium Brayton Cycle with regeneration, pressure losses, and real machines. These are characterized by the following parameters:

> ζ = 0.92 β = 1.025 $η_t = η_c = 0.92$

The cycle operates at a pressure ratio of r_p = 2.2 between limiting temperatures of 303 K and 1083 K. For helium,

For this cycle, find the thermodynamic efficiency, $\eta_{\text{T.}}$

2. **TEAM PROBLEM:** Select a power conversion system (PCS) for your reactor. Using general integral balances, develop a preliminary design for your reactor PCS and report the calculated efficiency for this PCS using your reactor as a heat source.