Abstract

This paper compares Utility Heat Exchanger Network (UEN) design between two Total Site Heat Integration (TSHI) methods, the Conventional Total Site Targeting method (CTST) and the recently developed Unified Total Site Targeting (UTST) method. A large Kraft Pulp Mill plant has been chosen as a case study. Total Site targets have been calculated using an Excel\textsuperscript{TM} targeting spreadsheet and networks have been designed with the help of Supertaget\textsuperscript{TM} for both the CTST and UTST methods. To achieve heat recovery and utility targets, both series and parallel utility heat exchanger matches for non-isothermal utilities are allowed in the CTST method, while series matches are allowed in the UTST method if the heat exchangers in series are from the same process. Series matches based on CTST method may create a dependency on two or more separate processes, which operational and control issues may occur, higher piping costs may be imposed, and utility target temperatures may not be achieved in the consecutive processes if one or more processes were to be out of service. Relaxation of the network can resolve these issues for the CTST method; however, if the relaxation occurs on the side of the utility loop that constrains heat recovery, the net heat recovery targets may not be achieved within the Total Site. The UTST method with its modified targeting procedure may offer slightly lower heat recovery targets but with simpler UEN design compared to CTST method are more realistic and achievable. Finally, after UEN design, non-isothermal utility loops need to be balanced in terms of mass and energy for both methods.