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QPTC 4.1 is a commercial code, so all of the analysis methods covered in the course are based on the commercial standards. This is different than the ASME PTCs, in that the commercial codes are premade and do not need to be modified and customised to the specific processes of a specific plant. Also, the commercial codes are treated as precision codes, while the ASME Codes are assumptions based codes. The commercial codes have strict tolerances, but the assumptions based codes also have the possibility to have tolerances. Tolerances are used to allow for an uncertainty in the measurements and therefore, allow for different readings. Development of the new code began in the 1970s. Many individuals and organizations participated in the development of the new code. Updating the requirements needed to be done with the knowledge that the current code had been in use for almost 40 years. The updated requirements needed to give comfort to the industry that ASME was supporting updated designs. In addition, ASME wanted to assure the industry that ASME would continue to support the industry during the test and certification of all equipment and systems. Two different proposals for calculation of the bagasse boiler efficiency are analyzed. The methodology of calculation, for both proposals, uses the heat loss method. The results, obtained through the two proposal's, presented important differences; the boiler efficiency determined through the proposal of code ASME PTC 4.1, based on HHV, highlights the effect of bagasse moisture content upon boiler efficiency. This effect, in the Beatn and Lora proposal, is hidden, because the energy required to evaporate the bagasse moisture content and the water vapour from hydrogen contained in the fuel are discounted in the LHV calculation. Three types of boilers, with different capacity and leaving steam properties were analyzed. Considering the boiler constituted by a sequential arrangement of a steam generator, an air heater and an economizer, a simulation was made determining the influence of the variation of the air heater exit gases temperature upon theirs performances. The performance analysis was based on the second law of thermodynamics.

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