ABSTRACT

Recently,most people spend their live indoor, therefore thermal comfort needs to be realized. But the thermal comfort in a room can only be analyzed after the room has been built. Objective of this study is to predict the thermal conditions in the room. The prediction is obtained by using a Computational Fluid Dynamics (CFD) simulation to a Computer Simulated Person (CSP). CSP is analogous to humans in a simulation room. The simulation results are compared with the results of experiments using physical manikin in a room. Compared parameters are air velocity (U) and temperature (T) taken at the three test points. The purpose behind the comparison is to validate the CSP model in predicting thermal conditions. Validation criteria are Normalized Mean Bias Error (NMBE), Coefficient of Variation of the Root Mean Square Error (CV RSME), and Coefficient of Determination (R^2). Value of NMBE U and T are 0.63% and 0.003%, value of CV RSME U and T are 2.34% and 0.016%, value of R^2 U and T are 0.99 and 0.981. The validated CSP is used to predict the thermal comfort of the Telkom University Building Physics Laboratory Room The prediction results show that thermal comfort is obtained at the CSP position in the section front and center of the room.

Key words: Computer Simulated Person, Computational Fluid Dynamics, Model Validation, Thermal Comfort