

ABSTRACT

Low power building is one of the more famous breakthroughs in an attempt to reduce energy usage. One of the most inefficient energy usage in a building is using air conditioners. Therefore, natural ventilated building was designed with the intention of replacing air conditioners to fulfil comfort in a room. One of the conveniences that has to be looked for is the thermal comfort. This research will quantify thermal comfort levels in a room using PMV (Predicted Mean Vote). PMV is used to indicate cool and warm sensation that felt by human. That identification is based on seven thermal scales, -3 (very cold), -2 (cold), -1 (cool), 0 (neutral), +1 (warm), +2 (hot), +3 (very hot) [3]. PMV scores will be generated from two simulations : energy simulation to get energy parameter using energyplus software and CFD (Computational Fluid Dynamics) simulation with OpenFoam software to get velocity profile in the room. There will be 4 scenarios, the first one is to compare PMV index score with the difference of room placement on the same floor, and that will generate the northernmost room as the most convenience. The second one is to compare rooms that have floor differences but still in the same column, and that generates a roughly the same PMV index. The third one is to examine hourly PMV index changes, and it generates the breaking point of PMV index on 16.00. The fourth one is to compare PMV score index on 13.00, and that generates room 16 on 2th floor as the most convenient room.

Keywords : *PMV, CFD, Thermal Comfort, Natural Ventilation*