SIMULATION OF VARIATION ON AIRCRAFT COMPOSITION TO OBTAIN MAXIMUM CAPACITY OF TWO PARALLEL RUNWAY

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ABSTRACT

The number of aircraft movement in airport increases due to increasing demand on aircraft passengers. However, a runway has a limited capacity to accommodate the aircraft movement. If the number of aircraft movements is greater than the runway capacity, the aircraft have to queue and delay the takeoff or landing process. One of the solution is providing an additional parallel runway.

This final project attempted to design a simulation program to obtain the possible maximum parallel runway capacity. The development of simulation program considered a distribution pattern of arrival and departure aircraft, aircraft mix composition, and arrival-departure separation rule. The simulation program was running until the maximum capacity was achieved by changing the percentage of each category of aircrafts operated in Juanda. The simulation program is expected to be a model for the airports which are intended to have a new parallel runway.

The results of this simulation program obtained based on the designed parallel runway with the separation distance of 4300 ft. The maximum capacity was achieved for three different operation types, which were arrival only for 78 operation per hour, departure only for 102 operation per hour and mix operation for 88 operation per hour. These capacity was provided
for aircraft composition as follows: category B: 10%, category C: 70%, and category D: 20%