

Imposing Speed Constraints on Arrival Flights: Case Study for Changi Airport

Authors : S. Aneeka, S.M. Phyo, R. Guo, Z.W. Zhong

Abstract : Arrival flights tend to spend long waiting times at holding stacks if the arrival airport is congested. However, the waiting time spent in the air in the vicinity of the arrival airport may be reduced if the delays are distributed to the cruising phase of the arrival flights by means of speed control. Here, a case study was conducted for the flights arriving at Changi Airport. The flights that were assigned holdings were simulated to fly at a reduced speed during the cruising phase. As the study involves a single airport and is limited to imposing speed constraints to arrivals within 200 NM from its location, the simulation setup in this study could be considered as an application of the Extended Arrival Management (E-AMAN) technique, which is proven to result in considerable fuel savings and more efficient management of delays. The objective of this experiment was to quantify the benefits of imposing cruise speed constraints to arrivals at Changi Airport and to assess the effects on controllers' workload. The simulation results indicated considerable fuel savings, reduced aircraft emissions and reduced controller workload.

Keywords : aircraft emissions, air traffic flow management, controller workload, fuel consumption

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020