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**AGENDA ITEM 6: TECHNICAL AND REGIONAL
 COOPERATION**

**APPLICATION OF SIMULATION TECHNOLOGY TO
AIRPORT PLANNING AND DESIGN**

(Presented by People's Republic of China)

INFORMATION PAPER

SUMMARY

With regional economic and social development, aviation business has sustained a rapid growth, resulting in the expansion of airports and more system complexity. It is impossible to conduct quantitative evaluation of different programs, making their comparison and selection difficult by only traditional planning and design method and experience. To this end, computer simulation technology was applied to the research of the configuration program for Kunming Airport to develop the simulation model for different programs. Quantitative analysis and comparison can be made through simulation operation and data analytics to assist decision-making.

APPLICATION OF SIMULATION TECHNOLOGY TO AIRPORT PLANNING AND DESIGN

1. INTRODUCTION

1.1 Kunming Changshui Airport is strategically positioned as an international hub airport. It was predicted that Kunming Changshui Airport will see its annual passenger traffic reach 120 million and passenger aircraft movements exceed 800 000 in the year of 2030. It's necessary to optimize the airport planning program and accelerate infrastructure development to meet the strategic positioning and air transport demand.

1.2 Separate researches were carried out into the runway configuration and terminal development model based on domestic and international airport cases, resulting in 5 airport configuration programs. SIMMOD (Airport and Airspace Simulation Model) simulation software was used to conduct simulation comparison and research according to the principle of "efficiency first" for scientific evaluation of programs.

1.3 Considering that the characteristics of the simulated flight schedule would have a direct impact on simulation results, a research of the flight schedule at large-sized domestic and international airports has found that the flight schedule mainly falls into two categories, namely the departure-in-the-morning and arrival-in-the-night one, and the hub one, which shows no necessary connection with the host country. But to a greater extent, it is dependent on the operational characteristics, transport demand and capacity of the airport. Kunming Airport is predicted to basically maintain the current departure-in-the-morning and arrival-in-the-night characteristic through a comprehensive analysis of the airport's air traffic curves.

1.4 A benchmark model for the current two-runway operation was established after collecting basic data and studying the operational rules to analyze simulation results and determine the average taxiing time and delay, etc.

1.5 With regard to the simulation and research of the planning program, the runway use model, main taxiing curves and ATC separation covered by the program, etc. were discussed and determined with the operating entity.

1.6 Quantitative evaluation of different programs was conducted by comparing the average delay, peak-hour delay and average operational time, etc.; a comparison of the airport's future operations with the simulation result of the benchmark model was made to determine an expected capacity; a comprehensive consideration of the simulation and selection result and other factors was made to identify a program to be recommended and assist decision-making.

2. DISCUSSION

2.1 Key indicators for simulation evaluation of the airport planning and design program.

2.2 Importance of the collection of airport operations data and identification of operational rules.

2.3 Factors to be considered in the development of a simulated flight schedule.

2.4 Acceptable simulated delay in the flight zone in the airport planning and design.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to note the information contained in this paper.