International Civil Aviation Organization

Third Meeting of the Asia/Pacific Air Traffic Management Automation System Task Force (APAC ATMAS TF/3)

Video Tele-Conference, 8– 10 June 2022

Agenda Item 4: ATM Automation System Implementation by States

4.1 ATMAS Implementation Status and Experience

INTRODUCTION TO FLIGHT INSPECTION OF AIR TRAFFIC MANAGEMENT AUTOMATION SYSTEM

(Presented by China)

SUMMARY

This paper shares the experience in Flight Inspection of Air Traffic Management Automation System (ATMAS) of the Civil Aviation Administration of China (CAAC).

1. INTRODUCTION

1.1. Flight Inspection of ATMAS is one of the key factors before the system is authorized to the commission.

1.2. Usually, Flight Inspection is compulsory for brand new, relocation, or updated ATMAS major modules. In 2011, CAAC promulgated the ATMAS Flight Inspection Technical Requirements, which puts forward the requirements of Flight Inspection subjects, procedures, data analysis, report, etc., to follow and implement.

2. DISCUSSION

PREPARATION

2.1. By the experience, some preparatory work is recommended to be taken before the Flight Inspection, which may include:

a) Draft the scheme of the Flight Inspection task, including time, area, route, altitude subjects, etc.
b) Discuss the scheme of Flight Inspection with the flight crew, controllers, and engineers to ensure the feasibility.
c) Complete setting and verifying the Flight Inspection parameters in ATMAS, such as warning area and arguments, radar parameters, indication maps, etc.

d) Obtain the wind direction of the airport and the meteorological conditions of the flight route on the day of flight inspection.

CONTENTS

2.2. There are 14 Flight Inspection subjects specified in the Flight Inspection Technical Requirements of ATMAS, as shown below：

a) Takeoff and Landing.
b) Special code warning.
c) Short Term Conflict Alert (STCA)
d) Reduced Vertical Separation Minimum (RVSM) function.
e) Minimum Safe Altitude Warning (MSAW) warning.
f) Danger Area Intrusion Warning (DAIW) warning.
g) Radar data processing accuracy.
h) Multi-radar processing.
i) Correlation of radar data and flight plan.
j) QNH data processing.
k) Cleared Level Adherence Monitoring (CLAM) warning.
l) Route Adherence Monitoring (RAM) warning.
m) Primary Surveillance Radar (PSR) signal processing.
n) Mode S、ADS-B data processing.

2.3. Usually, the Flight Inspection subjects are suggested to categorize into three types. The first type is the surveillance coverage and the processing precision in ATMAS. This type of subject mainly checks whether the target trajectory in the ATMAS properly generates and disappears, whether the track information displayed matches the actual flight information from the crew, and whether the system track is continuously smoothed without loss, and also validates multi-radar tracking and accuracy for maneuvering and circular flight.

2.4. The second type is the functional verification of ATMAS. regarding whether the key functions of the system are normal, mainly including the correct coupling to the flight plan, QNH altitude level changing display, DAPs data application, RVSM function, the customized function validation, etc.

2.5. The third type is the warning function inspection of ATMAS. This part mainly checks whether the system warning can be correctly produced and disappeared under various settings. Those may at least include STCA, MSAW, DAIW, CLAM, RAM, Emergency codes (such as 7700, 7600, 7500), etc.

IMPLEMENTATION

2.6. Flight Inspection time is recommended to choose in the low air traffic flow period for safety.

2.7. All participating parties, flight crew, air traffic controllers, and engineers familiar with the Flight Inspection scheme, carry out the work as assigned, and collaborate in teamwork. Usually, during Flight Inspection, engineers are responsible to record the ATMAS behaviors in the prepared record form, for all inspection types. This recording information will be used to analyze after the Flight Inspection.

ANALYSIS and SUMMARY

2.8. Generally, after completion of Flight Inspection, engineers in charge of obtaining airborne recorded location data, and work together with ATMAS manufacturer in carrying out data analysis as follows:

a) Complete the comparison and analysis of radar position accuracy, focusing on whether airborne equipment records location data and system track location data are consistent. Form a position accuracy analysis report based on system track data to ensure that the system meets the operating conditions.
b) Aggregate the recorded data in conjunction with the system playback to verify that the parameters of the system configuration match the relevant validation features, seeing to it that system functions achieve the prospective purpose.
c) Finish the Flight Inspection summary report according to the above data analysis.

2.9. It is recommended the Flight Inspection summary report of ATMAS include flight time, route, subjects, data records, conclusions, etc. The report matters whether the ATMAS is satisfied and authorized formal commission.

3. ACTION BY THE MEETING

3.1. The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate

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