



International Civil Aviation Organization

**The Combined Meeting of the South Asia Indian Ocean Co-ordination Group
SAIOACG/4 and the South East Asia Co-ordination Group SEACG/21**

Hong Kong, China 24-28 February 2014

Agenda Item 4: Implementation of CNS/ATM Systems

IMPLEMENTATION OF LORADS III –NEW SINGAPORE ATM SYSTEM

(Presented by Singapore)

SUMMARY

This paper presents information on the implementation of Singapore's new ATM system- (LORADS III) to enhance safety and efficiency with technological advancement and to cope with the future growth of air traffic in this region.

1. INTRODUCTION

1.1 Singapore has implemented a next generation ATM system, Long Range Radar and Display System III (LORADS III). It is highly customized to suit the operational requirements of Singapore and commenced operations on 16 October 2013.

2. DISCUSSION

NEW CAPABILITIES

2.1 LORADS III represents Singapore next leap in capability to deliver high quality air navigation services using one of most advanced ATM system in the world today. LORADS III helps our air traffic controllers work more effectively, exploiting the technological advancement of the system, advances in aircraft navigational accuracy and functionality to achieve greater efficiency in our flight information region.

2.2 With new generation surveillance trackers, LORADS III is capable of harnessing multiple surveillance sources including ADS-B. Our controllers are now able to see ADS-B equipped aircraft up to almost 500 nm and communicate directly using VHF relay stations, well beyond the normal range of 250 nm for radars and radio, in ADS-B designated airspace through the sharing of ADS-B data with Indonesia and Viet Nam. Besides permitting reduction in the spacing and greater fuel efficiency, safety has also greatly increased due to the availability of surveillance.

LORADS III KEY FEATURES

2.3 LORADS III introduces a new Java-based HMI, which is designed with our inputs to help controllers work easier and more efficiently with smart menus and highly configurable displays. The system redundancy is unprecedented with multiple modes and physical redundancy. This and the improved and new safety nets (such as multiple hypothesis short term conflict alerts) coupled with decision making tools (e.g. integrated AMAN) which give our controllers the confidence to push the envelope to achieve higher efficiency in air traffic operations.

2.4 Controller peripheral tools such as navigational aids indicators (e.g. for ILS and navigational equipment) and meteorological displays are digitized into a single panel. Traditional charts are now housed in overhead digital displays which allows for instant update of latest information for controller's reference. All these are housed within a console.

LORADS III ECO-SYSTEM

2.5 Our new controllers are trained at Singapore Aviation Academy which houses the LORADS III ATC simulator. The simulator has advanced functionalities and emulates the human-machine of the actual ATC system. This helps the trainees to seamlessly transit from the training environment to the real-life operational environment with ease. Currently we have 300 controllers operating various ATC positions in various locations. Supporting our ATM operations are 65 Air Traffic Control Support Officers, with technical team of 70 engineers and technical officers from our Aeronautical and Telecommunications Engineering division.

LESSONS LEARNT IN IMPLEMENTATION

2.6 There are lessons learnt in the implementation of this key and major project in various areas. A strong project management team is essential to ensure tight control of schedule as projects of this scale will almost inevitably suffer slippage. For controller training, it is essential the controller's workflow be finalised before the commencement of training in order to maximise the training values. More efficient training will be achieved if it is based on workflow rather than functions since we have customised the system. Besides computer-based training, we found it extremely beneficial to have controlled live sessions which allowed us to stress-test the system during the peak hours and enable key sectors to be exercised in a controlled environment. This greatly boosted controller confidence and help iron out some teething issues which could not have been detected during shadowing. Controller buy-in and managing controller expectations are also key factors to ensure a successful cut-over.

LORADS III FUTURE DEVELOPMENTS

2.7 LORADS III is scalable and there are plans to increase the ATC positions in both Area and Approach centres in the next phase of development, which will also see the introduction of more advanced features such as Medium Term Conflict Alerts (MTCD) and additional functionalities.

2.8 The state-of-the-art system will enable Singapore to meet the challenges of handling the increasing air traffic safely and efficiently for years to come.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information provided on the implementation of new ATM System in Singapore.

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