AAPAM AWARD FOR INNOVATIVE MANAGEMENT COMPETITION

1 Name of organisation/entrant  
Department of Civil Aviation, Mauritius

2 Postal address  
SSR International Airport, Plaine Magnien, Mauritius

3 Name of project being entered  
Area Control Centre Project

4 Name of Contact Person  
Mr Anand GUNGAH – Director of Civil Aviation

5 Phone  
+(230) 603 2000 (available 24hrs)

6 Fax  
+(230) 637 3164

7 Email  
civil-aviation@mail.gov.mu

8 Number of employees  
325

EXECUTIVE SUMMARY

The Area Control Centre Project implemented in 2002, consisted of the installation of modern facilities for the provision of high standard Air Navigation Service. Innovative solutions including the Extended-Range VHF air/ground coverage over oceanic airspace and state-of-the-art equipment for the visualisation of air traffic by Air Traffic Controllers were implemented.
INTRODUCTION

The Department of Civil Aviation has the vision of being recognised as the best regulator of civil aviation and the best provider of air navigation services in the region.

The project we are submitting was named the ‘Area Control Centre (ACC) Project’, and initiated by the DCA, Mauritius in 1999. It consisted of the construction of a new building and the installation of equipment for Air Traffic Control Purpose.

Prior to the setting up of the Area Control Centre,

- DCA was providing Flight Information Service (FIS) in its Flight Information Region.
- DCA could not provide a positive Air Traffic Control service due to lack of adequate equipment and facilities. The equipment used for communication were very old and obsolete equipment, some of which were installed by the British Admiralty, when they were occupying Mauritius, in the 1950’s. The quality of long range communication, using High Frequency (HF), needed to be improved.
- DCA was not equipped with radar-type equipment and no surveillance facilities were provided.
- DCA was not able to implement all the components of the CNS/ATM facilities, as required by the International Civil Aviation Organisation (ICAO), due to inadequate equipment and facilities.

With growing Trans-Indian-Ocean traffic and fast development of the tourism industry, DCA had an urgent need to upgrade the quality of its Air Navigation Services and implement all the components of Communications, Navigation, Surveillance/Air Traffic Management System prescribed by the ICAO.

DCA fully committed itself to provide the best service that is technologically possible and to achieve the objective of being the best in the region.

The project started in 1999 and was completed in 2002. The Area Control Centre became fully operational in March 2003 i.e it has been in operation for more than 4 years.

The aims of the project was mainly to

- Improve the quality of service, more specifically the air/ground communication systems
- Replacement of the equipment and systems by the latest technology equipment;
- Automation of the Air Traffic Management System and installation of state-of-the air equipment for air-traffic control purpose
- Implement a surveillance system over the vast oceanic span of air space falling under the jurisdiction of DCA.
One of the major breakthroughs of this innovative project was the improvement of air/ground communications systems over the oceanic airspace. The range of Very High Frequency (VHF) communication, which is usually limited to line-of-sight coverage (approx. 200Nm) over land, has been extended over the ocean with a coverage of more than 600 Nm in the north of Mauritius.

We have made use of satellite technology such as the Very Small Aperture Terminal (VSAT) and solar power on remote islands.

The Flight Data Processing System (FDPS) is fully computerised and automatic. It allows controller to have a visual display for surveillance of traffic situations in the whole FIR and it communicates automatically with our neighbouring FIR such as Australia in order to update information regarding flight departure and estimates.

**Highlights and Achievements of the Project**

The main highlight of the project is that it has allowed the Department of Civil Aviation to upgrade the service it provides to users of its upper airspace from the provision of a *Flight Information Service* to a full-fledged *Air Traffic Control Service*.

Further this improvement in service delivery was accomplished by the introduction of a fully automated system that puts the human element at the heart of its preoccupations by designing highly efficient, ergonomically designed tools aimed at assisting the Air Traffic Controller in delivering the highest possible performance.

The system also makes use of cutting-edge satellite technologies to offer other facilities to our customers such as:

(i) **Highly advanced Extended Range Very High Frequency radio.**

   This communication system which uses Very Small Aperture Terminal (VSAT) technology, has increased our VHF range from 200 to approximately 600 Nautical Miles, covering a surface area of approximately 1.3 million square kilometres. This is a great achievement for an island surrounded by the ocean.

(ii) **Controller-Pilot Data Link Communication (CPDLC)**

   This is also a cutting-edge technology which allows for the direct exchange of text-based messages between a controller and a pilot via a computer keyboard. This reduces the need for voice communication.

   CPDLC greatly improves communication capabilities in oceanic areas and apart from the direct link, CPDLC adds a number of other benefits to the ATS system, such as:

   - Allowing the flight crew to print messages.
   - Allowing the auto load of specific uplink messages into the Flight Management System (FMS). This will reduce crew-input errors.
- Allowing the crew to downlink a complex route clearance request, which the controller can re-send when approved without having to type a long string of coordinates.

- Specific uplink messages arm the FMS to automatically downlink a report when an event, such as crossing a waypoint, occurs. This automation assists with workload management for the flight crew and the controller.

- Specific downlink messages, and the response to some uplink messages will automatically update the Flight Data Record in some ground systems.

Automatic Dependence Surveillance (ADS) which allows the ground system to interact with the flight management system of aircraft in the air to display ADS Track position in real time (Radar like) on the controllers VDU.

Hence a quantum leap from an antiquated past to a satellite based technology future. With this state-of-the-art facility, Mauritius leads many countries in the African Region in the CNS ATM field as prescribed by the standards and recommended practices of the ICAO.

This project has indeed brought a considerable increase in the level of customer satisfaction in terms of improvement to Air Traffic Services within our FIR.

In a letter dated 16 February 2007, IATA has acknowledged this improvement and has mentioned that there has been a marked (60%) decrease in flight reports regarding communication problems.

**Sustainability and Replicability**

**Sustainability**

Throughout the conception and implementation of the Area Control Project, the sustainability issue has been a major concern. We realized very early that however innovative it may be, to be sustainable the project must first of all satisfy the needs and requirements of our customers and also be economically viable.

To ensure customer satisfaction we have given great attention to the Regional Plan developed by the International Civil Aviation for the Implementation of Air Traffic Management Systems in our region. Compliance with these plans, which have been developed by the ICAO in consultation with all major civil aviation stake holders including the International Air Transport Association (IATA), have ensured that we have implemented a system that not only satisfies the present and to some extent anticipates the future needs of our customers but also sets the scene for a harmonious regional development in cooperation with our neighbouring air navigation services provider in order to achieve a seamless air navigation system in our part of the world.

The other aspect that has ensured the sustainability of the Area Control Centre Project is its financial viability. Although the project required massive investments to the tune of approximately one billion rupees, we have ensured that we obtain value for money for every rupee invested as we were very much aware that the costs incurred would have to be passed on to users of our airspace who would expect any
increase in charges to be matched by a corresponding improvement in the level and quality of the service.

That this investment has indeed provided value for money is proven by the fact that we have since the first of February 2007 introduced a new system of charges which reflects the new services being provided and that these new charges have been accepted by the airspace user community.

**Replicability**

The Air Traffic Management system implemented at the Department of Civil Aviation is also fully transferable, especially in relation to regional air navigation service providers. Such replicability has been achieved as mentioned, by ensuring compliance with the relevant standards and recommendation of the International Civil Aviation Organisation and also by complying with the ICAO AFI regional plan, which is a conceptual framework developed by ICAO to ensure harmonious development of air navigation services in the region.

Here we should add that on a regional basis, we have been quite a precursor and have led the way for the development of similar systems in a number of neighbouring countries, e.g Republic of Madagascar.

The Department of Civil Aviation is the only provider of air navigation service in Mauritius. Nevertheless as much as possible, we share our experience and knowledge to other public sector organisations and other aviation stakeholders through meetings and seminars.

The public in general should also be made aware of the works that devolve in the delivery of air navigation services which is meant to ensure their safety as passengers. Thus whenever opportunities arise the public is informed accordingly. An “open day” visit has been organised in December 2007 to expose the air navigation system to the public and also to trigger interest for potential new recruits in order to prepare the next generation.