



TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 4: Optimum Capacity and Efficiency – through global collaborative ATM

4.3: Enhance operational decision-making through integrated meteorological information

AVIATION SYSTEM BLOCK UPGRADE MODULES RELATING TO METEOROLOGICAL INFORMATION - COLLABORATION AND COOPERATION IN SOUTH AFRICA

(Presented by South Africa)

SUMMARY

South Africa has designated the South African Weather Service (SAWS) as the Aviation Meteorological Authority to fulfil the international obligations of the Government under the Convention on International Civil Aviation, 1944. SAWS is committed to improve aviation operational efficiency in collaboration with different stakeholders such as the Air Traffic and Navigation Services Company (ATNS) and the Airport Company South Africa (ACSA).

This Information Paper discusses the status of collaboration and cooperation in South Africa between different stakeholders.

1. INTRODUCTION

1.1 In order to improve the operational efficiency and quality across the total value chain with multiple stakeholders ensuring a common focus, South Africa has integrated a number of key processes through the Airport Management Centre (AMC) with the objective to effectively manage the value chain across all role-players in real-time, to effect collaborative decision making around specific events by all role-players, to identify trends for corrective action and to predict events and initiate pro-active actions. Airports Company South Africa (ACSA) has the lead in managing airport operations through the AMC where decisions are taken in a collaborative manner. Data sharing among partners and customers provides the transparency needed for optimal decisions.

1.2 South Africa has also developed the Central Airspace Management Unit (CAMU) which is established at the Johannesburg Air Traffic Control (ATC) centre. The South African Weather Service (SAWS) and CAMU have a cooperative relationship in terms of common operations. CAMU uses the meteorological information on tactical planning. South Africa has installed the Aviation Weather Display System at some forecasting offices, at the Air Traffic and Navigation Services Company (ATNS) and at other users with the intention to have a live system running between SAWS, ATNS and the users.

1.3 SAWS has a strong relationship with the Aviation Industry in South Africa through participation in regular industry meetings. It also chairs the Advisory Committee for Aeronautical Meteorological Services (ACAMS). SAWS strives to be a world-class meteorological organisation and, as such, provides the best possible service to the aviation industry in South Africa. It regularly shares its

initiatives on improving the Aviation Meteorological Services with the Aviation Industry. Representatives from SAWS frequently attend industry meetings and give talks on weather and safety in flight.

2. COLLABORATION TO ENHANCE OPERATIONAL EFFICIENCY

2.1 Collaboration between SAWS and ACSA

2.1.1 The AMC operates in a single room, providing for a collaborative working environment where the airport's major stakeholders can come together to work pro-actively on a common agenda supported by a shared situational awareness of performance. SAWS and ACSA is in the final stage of installing a link through Aviation SITA between the Aviation Weather Centre (AWC) and the AMC. The meteorological information will be made available on the display system to all AMC stakeholders. The Aeronautical Meteorological Forecasters (AMF) will have a desk where he/she can brief the numerous role-players regarding the expected weather conditions or advise the AMC on warnings that will effect airport operations. ACSA has the lead in managing the airport operation, thus ACSA is moderating the processes. ACSA's systems have preference over individual optimization. Decisions are taken in a collaborative manner (CDM approach) and extensive data sharing among partners and customers provides the transparency needed for optimal decisions. The future communication channels need to be efficient with a common situational awareness and is characterised by a one-to-many relationship. A common situational awareness requires visibility to the same information through a common platform and transparency of all performance measures. It must be recognized that the numerous role-players have different requirements which necessitates a single version of the current key information that requires a single performance management system.

2.2 Collaboration between SAWS and ATNS

2.2.1 Air traffic flow and capacity management is a vital part of air traffic management in exploiting the full capacity of the air transport system without running the risk of infringing upon safety caused by overload situations. The responsibility for the management of air traffic flow and capacity management within the South African sovereign and delegated airspace resides with the CAMU which is established at the Johannesburg ATC Centre. The unit's responsibility includes, apart from managing the functions of the slot allocation program, the management of the flexible use of airspace (FUA), facilitating military exercises and operations, management of special and unusual events and any other activity which might require the use of airspace for a particular time period. The unit is also responsible for the re-routing of traffic affected by adverse weather and temporary restricted or special-use airspace in consultation with the aviation community in a collaborative decision-making (CDM) process. In addition they will balance demand against capacity using the air traffic flow management (ATFM) system after CDM with the appropriate aviation community members.

2.3 Air Traffic Flow Management System

2.3.1 When severe weather occurs within the South African airspace, the ATFM system is able to interface with SAWS for the reception and display of real-time and predicted thunderstorm data and imagery. Displaying convective weather radar and precipitation as well RADAR mosaic are superimposed directly onto the ATFM's ASD. Flow-constrained areas like thunderstorms are automatically tracked by the system and continually updated as the thunderstorm activity progresses. The system also allows controllers to manually control the system to create flow constrained areas, such as simulated thunderstorms or congestion. Controllers can then use this information to try multiple reroute scenarios to determine the safest, most economical or most environmentally friendly solution to avoid the conflict.

2.4 Aviation Weather Display System

2.4.1 The multidimensional display system (MDS) is known as the Aviation Weather Display System (AWDS) in South Africa. It is a deliverable of the Advanced Operational Aviation Weather System (AOAWS) Project. The AWDS meteorological products include the following types:

- a) **Real Time Data:** Meteosat satellite data, radar, airport surface observational data, aircraft reports, AMDAR, and lightning data.
- b) **Forecast Data:** Winds, temperature, freezing level, relative humidity, Clear Air Turbulence (CAT) and icing from a model for the South African domain and World Area Forecast System's (WAFS) model data for the globe. The AWDS also has the capability of overlaying data (such as terrain map, airport navigation sites/points, forecast winds and observational data over a selected product) which can be utilized to support decision-making analysis.

2.4.2 The AWDS uses graphics and text to display 3-dimensional and 4-dimensional weather products with the capability of showing 3D data by flight level. It can also display vertical cross sections for a selected flight route and also has a movie feature.

2.4.3 The AWDS in South Africa is installed at the National Forecasting Centre (NFC), the AWC, various weather offices, ATNS at O.R.Tambo International Airport, ATNS at Cape Town International Airport as well as at the South African Airways (SAA) Operation Centre. SAWS has a full data set available 24/7 at the NFC, AWC and various weather offices where the data can be exported from these sites behind a firewall.

3. CONCLUSION

3.1 The Conference is invited to take note of the level of collaboration and cooperation in South Africa between SAWS, ATNS and ACSA.

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