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Integration of Meteorological Data in the ATM System

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Air Traffic and Navigation Services

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Presentation Overview

- ATM Operational Concept & Community
- Phases of Airspace Management
- Central Airspace Management Unit
- South African Weather Services
- ACSA Airport Management Centre
- Pre-Tactical Phase Integration
- Tactical Phase Integration

ATM Operational Concept

- The ATM operational concept is a vision that describes how an integrated global ATM system should operate.
- The concept provides States and industry with clearer objectives for the design and implementation of ATM and supporting CNS systems.
- The global ATM operational concept addresses what is needed to increase user flexibility and maximise operating efficiencies in order to increase system capacity and improve safety levels in the future ATM system.

The ATM Community

The ATM community is made up of the following members:

- Aerodrome Community;
- Airspace Providers;
- Airspace Users;
- ATM Service Providers;
- ATM Support Industry;
- Regulatory Authorities;
- States and
- ICAO

Phases of Airspace Management

- There are 3 phases of Airspace Management
- Strategic phase
- Pre-tactical phase
- Tactical phase

Central Airspace Management Unit

- Officially open in March 2001
- Responsible for:
 - ATF and capacity management
 - Flexible use of Airspace
 - Slot allocation program
 - Re-routing of traffic

South African Weather Services

- Public entity on 15th July 2001
- Member of WMO
- Provides weather services to:
 - Aviation industry
 - Marine industry
 - Government obligations

ACSA Airport Management Centre

- Officially opened in 2009
- 3 AMCs – FAOR, FACT and FALE
- Introduced to manage:
 - Passenger processes
 - Baggage handling
 - Aircraft processes
 - Recovery after weather phenomena

DAILY AIRSPACE FORECASTS AND PLANS

- Daily Airspace Forecasts (DAFs) and Daily Airspace Plans (DAPs) are distributed by CAMU to affected ATM community members, primarily Aerodrome and Air Operators, informing them of capacity and demand, particularly at the three coordinated airports (FAOR, FALE & FACT)
- The DAP and DAF also informs the industry of constraints that are being experienced at these airports, as well as possible weather phenomenon that could be expected for the duration of the day.
- The reliability of the DAP and DAF allows the aviation industry to effectively plan and mitigate any constraints that are being experienced or that are foreseen to occur, in the air or on the ground. The major benefit to the aviation industry is that delays can often be put into effect while the aircraft is on the ground instead of being airborne and burning extra fuel due to possible holding and/or diversions.

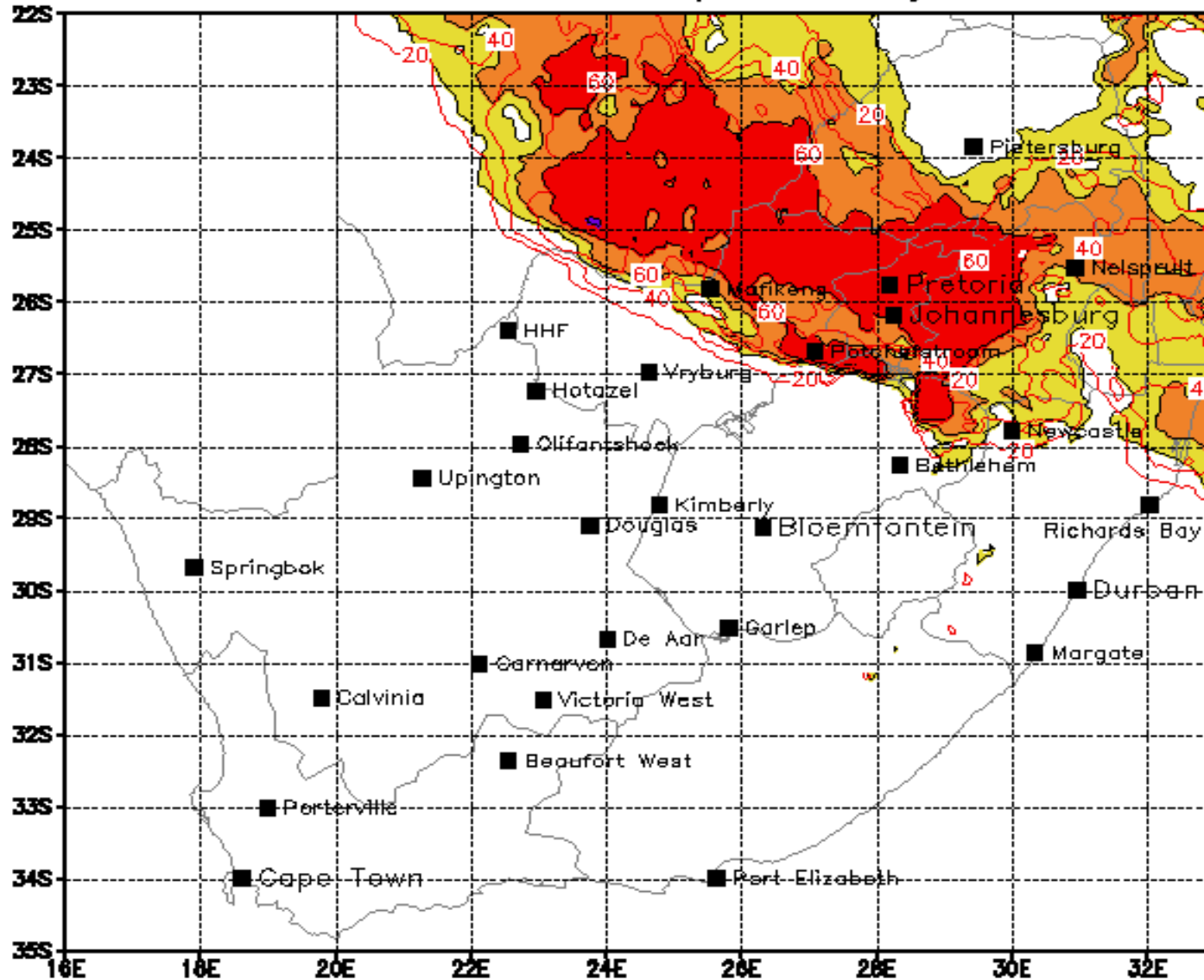
Pre-tactical Phase Integration

- The Daily Airspace Forecast (DAF) - distributed a day in advance
- Information provided:
 - CNS constraints
 - Airport demand Overview
 - Meteorological forecasts

Tactical Phase Integration

- The Daily Airspace Plan (DAP) – distributed on day of operation
- Information provided:
 - Thunderstorm Probability
 - Significant weather below F180
 - Significant weather above F180
 - Terminal Aerodrome Forecast
 - Advisories and warnings
 - A qualitative overview for the day

Thunderstorm probability



Thunderstorm distribution: 20%; 40%; 60%; >80%;

Shaded area=TS prob at 14:00 redlines show 17:00

Weather Overview

Primary Aerodromes

Location	Weather (note: IMC = cloud base below 1500ft/red viz of 5000m, LVO = Cloud base below 200ft and RVR of less than 600m)
FAOR	TEMPO 2712/2717 4000 TSRA BECMG 2718/2720 09016KT BKN015
FACT	CAVOK
FALE	TEMPO 2700/2706 2000 RA BKN003 OVC010 BECMG 2708/2710 19015G25KT PROB40 TEMPO 2712/2718 4000 SHRA BKN010
FALA	TEMPO 2711/2717 4000 TSRA
FAGG	PROB30 TEMPO 2700/2707 4500 -SHRA
FAPE	PROB40 TEMPO 2700/2705 3000 +SHRA BKN012
FAEL	TEMPO 2705/2708 5000 SHRA BKN012
FABL	CAVOK

Secondary Aerodromes

Location	Weather
FAKN	NOT AVAILABLE
FAPP	TEMPO 2705/2708 -TSRA BKN008 TEMPO 2713/2715 4000 TSRA BKN010
FAPM	NOT AVAILABLE

Warnings and advisories (Overview only. Refer to official products for updates and details)

Warning type	Details
SIGMET - High	Nil
SIGMET - Low	Nil
Wind Shear	Nil
Volcanic Ash	Nil
Tropical Cyclone	Nil

Weather Conditions – Qualitative Overview 27 Oct 2017

	Thunderstorms		Low Cloud/Visibility		Wind/Turbulence	
	AM	PM	AM	PM	AM	PM
FAOR		FM 12-TL 17		FM 12-TL 20		
FACT						
FALE			FM 00-TL 06	FM 12-TL 18	FM 08-TL 10	
FALA		FM 11-TL 17		FM 11-TL 17		
FAGG			FM 00-TL 07			
FAPE			FM 00-TL 05			
FAEL			FM 05-TL 08			
FABL						
FAKN						
FAPM						
FAPP	FM 05-TL 08	FM 13-TL 15	FM 05-TL 08	FM 13-TL 15		

Favourable

Minimal impact to operations expected

Marginal

Some potential for operations to be impacted on

Unfavourable

Impact on operations likely

Tactical Phase Integration

- What happens if there is a significant change in weather conditions at an aerodrome?
 - TAF
 - Traffic Management Initiative (TMI)
 - Resultant reduction in capacity

The arrivals into FAOR have been reduced to 25 arrivals from 1200-1800z due to forecasted thunderstorms with hail for this afternoon. Comply with revised CTOT's.

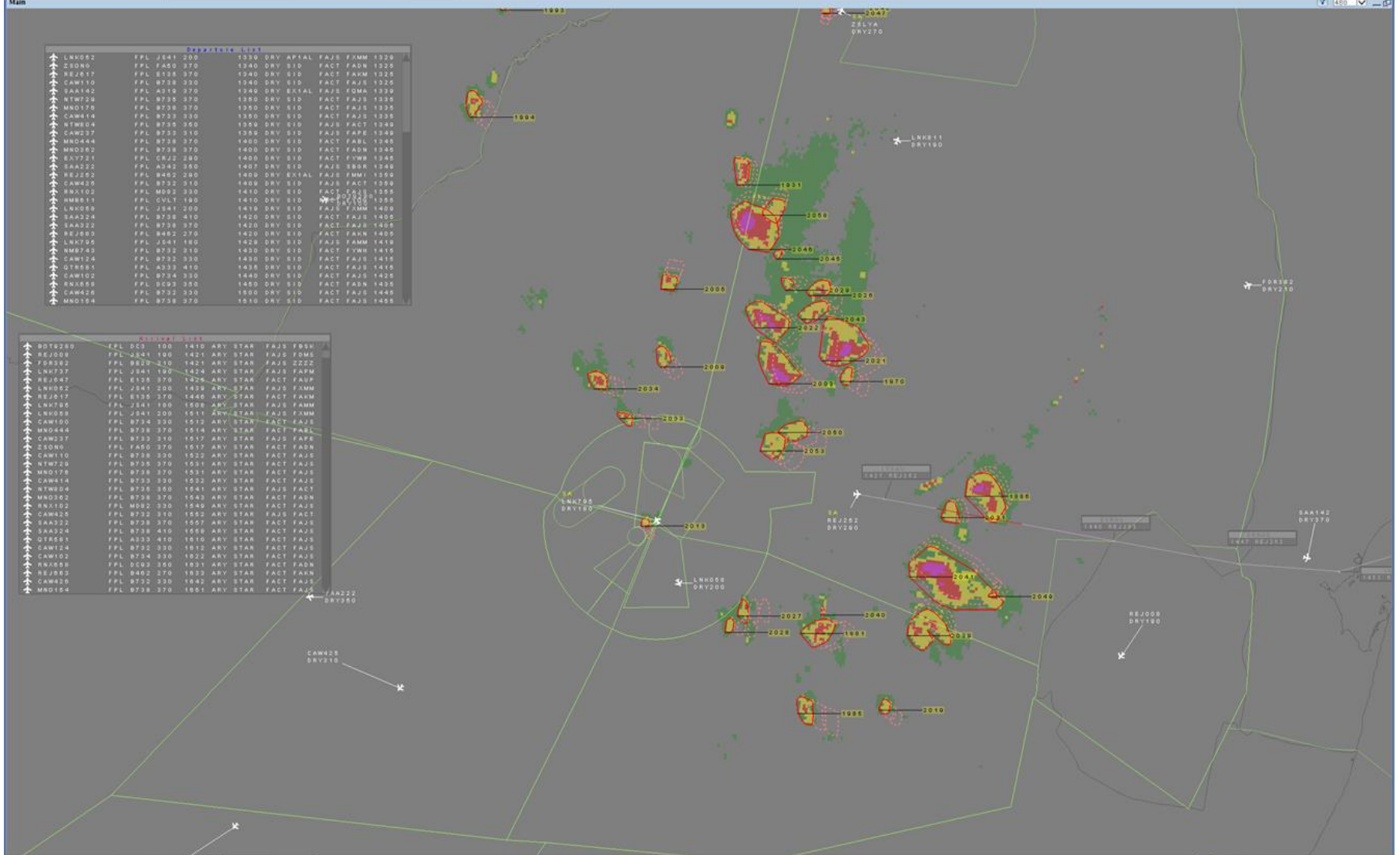
TAF - Terminal Aerodrome Forecast

Date: 2017-10-27 Time: 10:10:17

TAF FAOR 271200Z 2712/2812 29008KT 9999 SCT040 SCT040TCU
TEMPO 2712/2719 5000 TSRA FEW035CB
PROB40 TEMPO 2712/2715 3000 TSGSRA SCT035CB
FM271500 08017KT 9999 SCT045
BECMG 2718/2720 SCT015

Tactical Phase Integration

- How do we determine what TMI to implement?
 - Currently CAMU makes use of a system called TITAN for thunderstorm activity predictions. TITAN was designed to identify and track thunderstorms, as measured by digital weather radar. TITAN data is delivered to the AMT from the SAWS Meteorological Office. The thunderstorm predictions are then depicted on the Air Situation Display
 - The Air Traffic Flow Specialists (ATFS), who sits at CAMU, uses the data to determine what TMI needs to be implemented and also the duration of the TMI. The reliability of the data being provided and the predictions of the TITAN system allows the ATFS to implement a TMI that will ensure that demand and capacity are balanced



Conclusion

- CAMU and SAWS are ensuring that all weather predictions and actual events are accurately integrated into the pre, and tactical phases of the ATM System in a timely manner thereby ensuring that the aviation industry can effectively plan for their immediate and indeed, daily operations.
- Previously a silo environment existed where each and every support service provider individually made their information available. This came with its cost in time and energy. Today it is intended that the system wide information sharing and availability as and when required is provided into the ATM System and used by all needing community members. The name of the game is collaboration to ensure we can meet the expectations of the users



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Thank you

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