



ATNS Experiences and developments

Presented by Raoul Bester

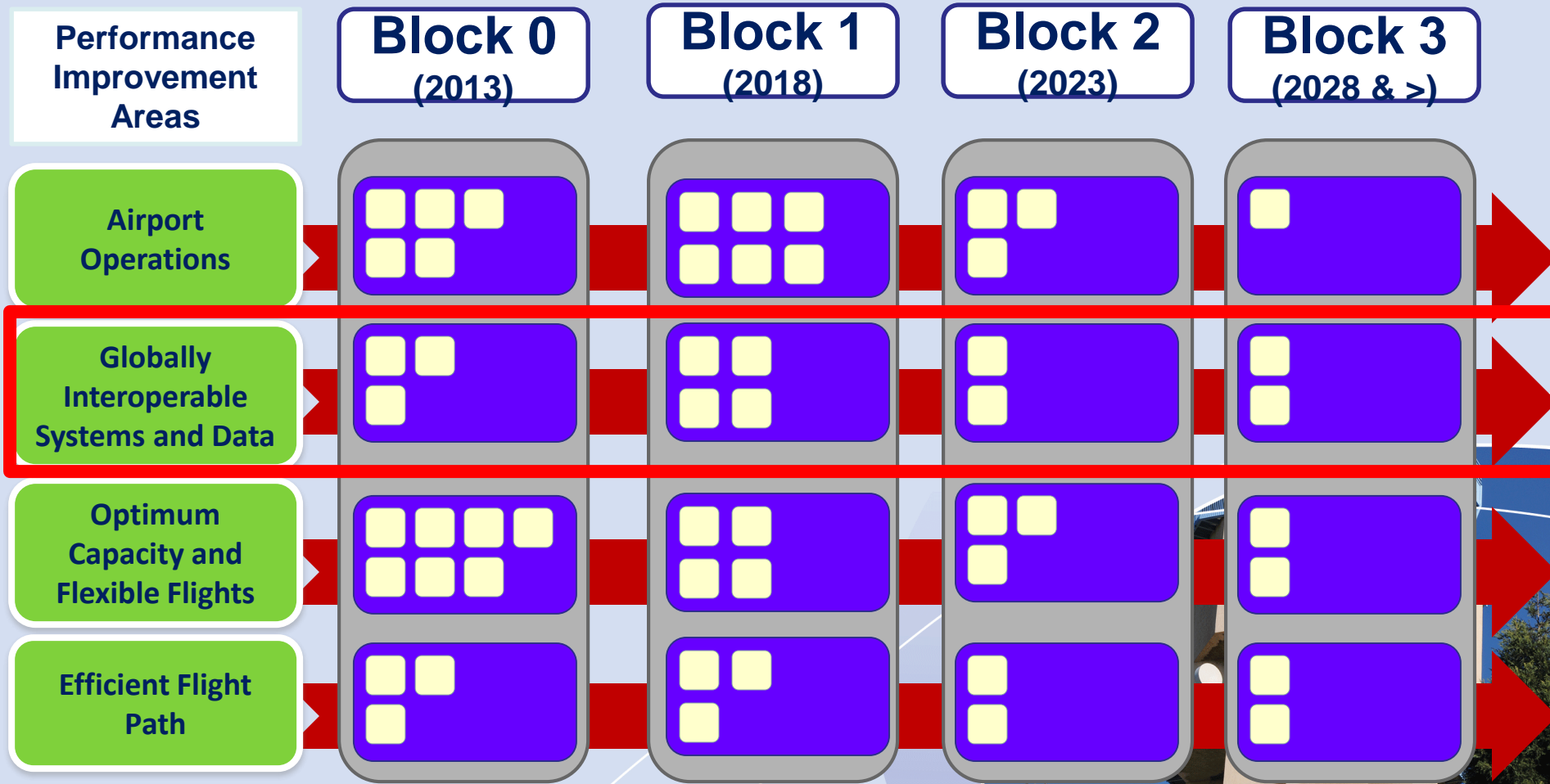


The Need for Change

- Various ATNS Internal Systems
- National AIS to AIM Roadmap, endorsed by DOT, SACAA and ATNS.
- ASBU Requirements
 - Global Interoperable Systems/Data
- Solution - Single National/Regional aeronautical database, with Global interconnectivity
- Endorsed by ICAO
 - African Regional Databases

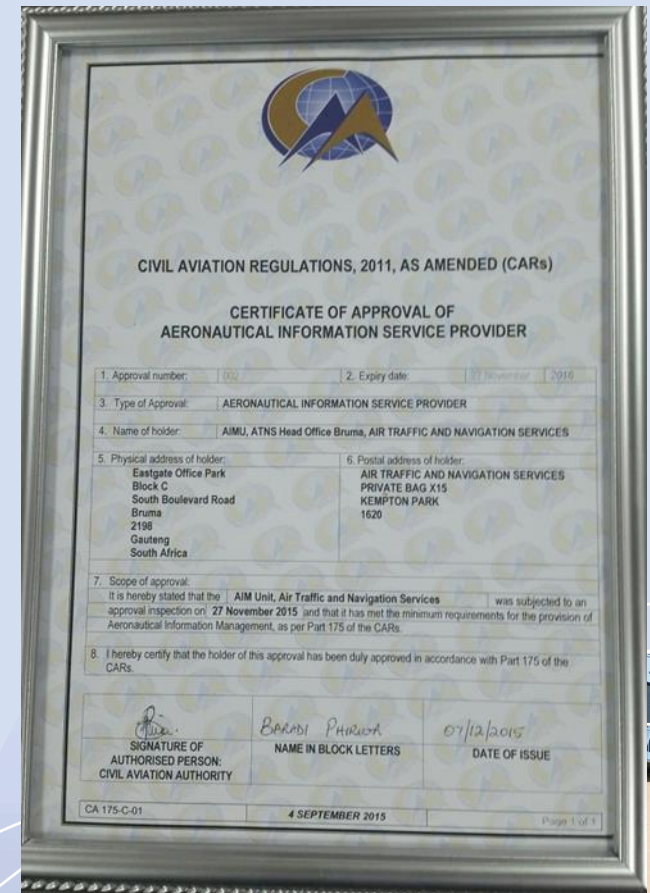


Aviation System Block Upgrades (ASBU)

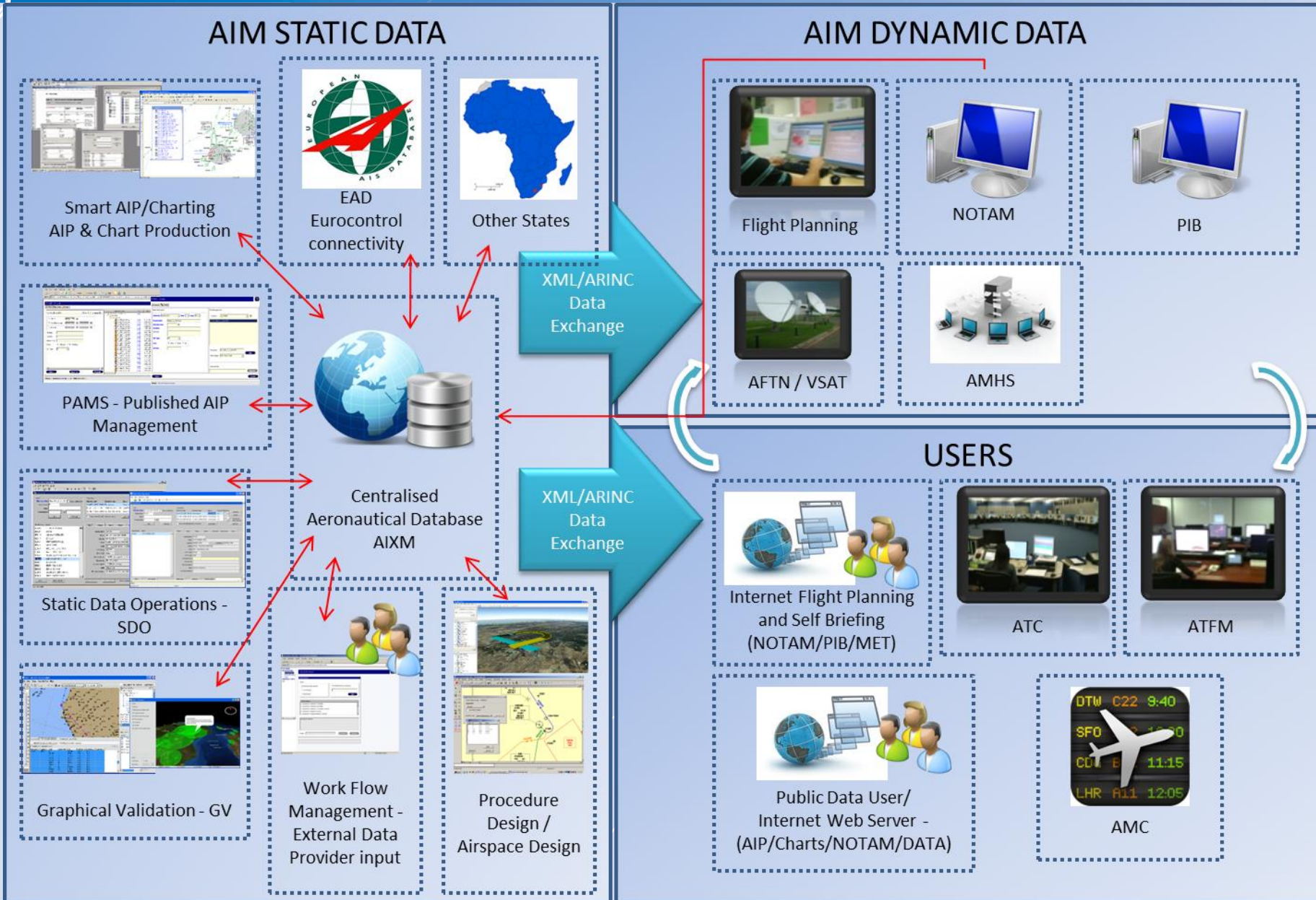


CAD Implementation

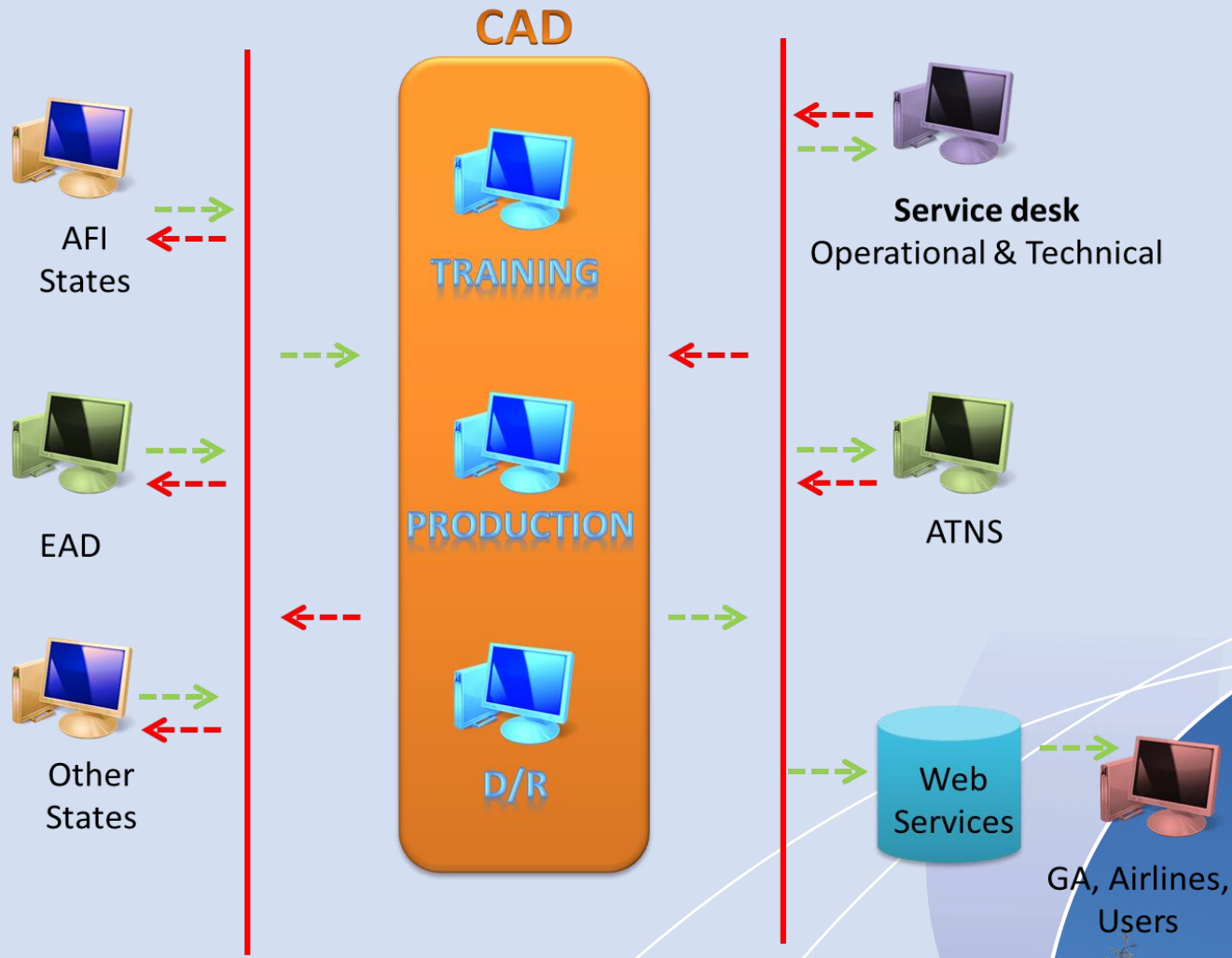
- Started 2011
- SDO SAT passed 2011
- AIP/Charting SAT Passed 2013
- AIP Services Transferred from SACAA to ATNS in 2014
- ATNS Certified in terms of Part 175
- Current project – Charting Services Transfer from SACAA to ATNS



CAD Implementation



CAD Connectivity



SDO - IFP

Static Data Operation

File Edit Window Help

Instrument approach procedure

Find

Effective date: 21-SEP-2018 00:00 Show withdrawn

Designator:

ADHP: FAGG, GEORGE Find ...

RWY direction: Find ...

Find Clear all

Version(s)

Effective date	Expiration date	Status	Version	Withdrawn
27-APR-2017 00:00	Permanent	Pending	4.5	<input type="checkbox"/>

Show cancelled/aborted version(s) Last edited Compare Reset Affected by active NOTAM NOTAM...

Aerodrome	Designator	Aircraft category	Transitio
FAGG	RNAV01	ABCD	
FAGG	RNAV011	ABCD	

Page 1 Page 2 OCA OCH Procedure leg 1 Procedure leg 2 Procedure leg 3 Trace

Type [path and terminator] Fix Turn direction Fly-by

IF	WPT	IMPEG	→	Y - Yes
TF	WPT	ETLAG	→	Y - Yes
TF	WPT	GG2F1	→	Y - Yes
TF	WPT	GG2MP	→	N - No
TF	WPT	GG2M1	→	Y - Yes

Gradient:

Vertical distance interpretation: LA - at or above the lower altitude

Lower limit: 6500 FT Unit of measurement

Lower limit Reference: ALT

Upper limit: Unit of measurement

Upper limit Reference:

New... New based ... Edit/Update... Withdraw... Related entities:

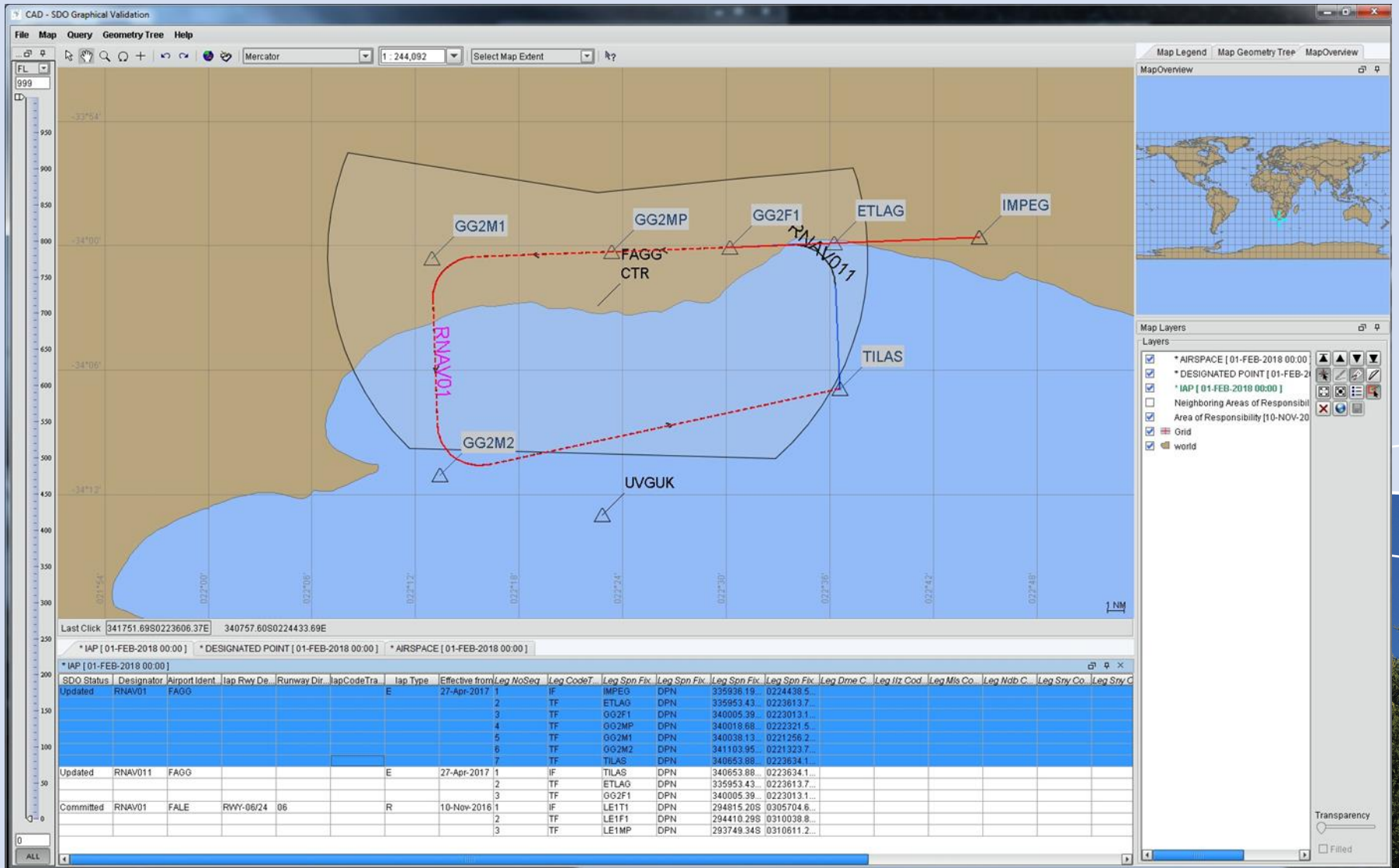
At first record.

Record: 1/7 ... <OSC>

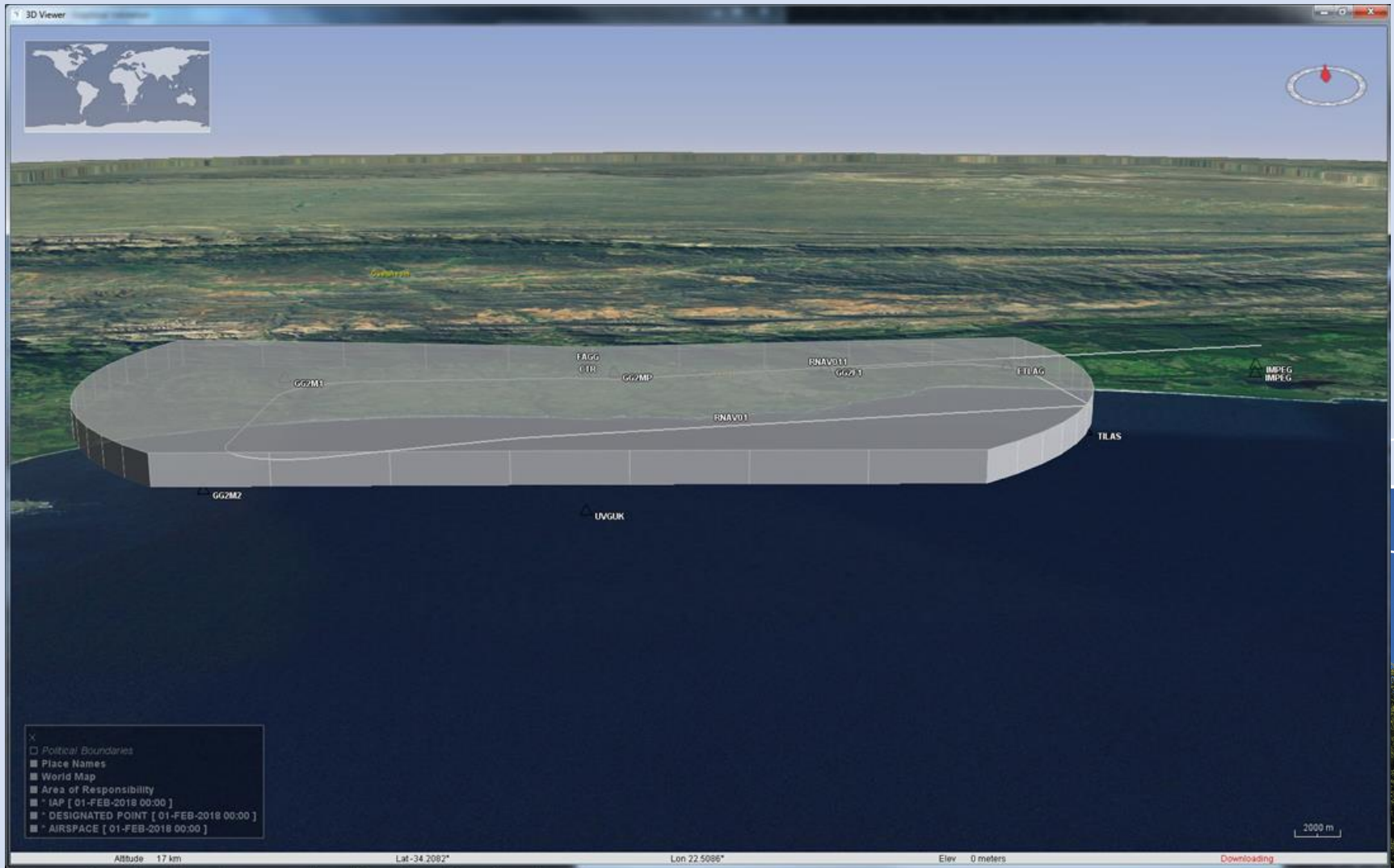


ORACLE FUSION MIDDLEWARE

SDO - IFP



SDO - IFP



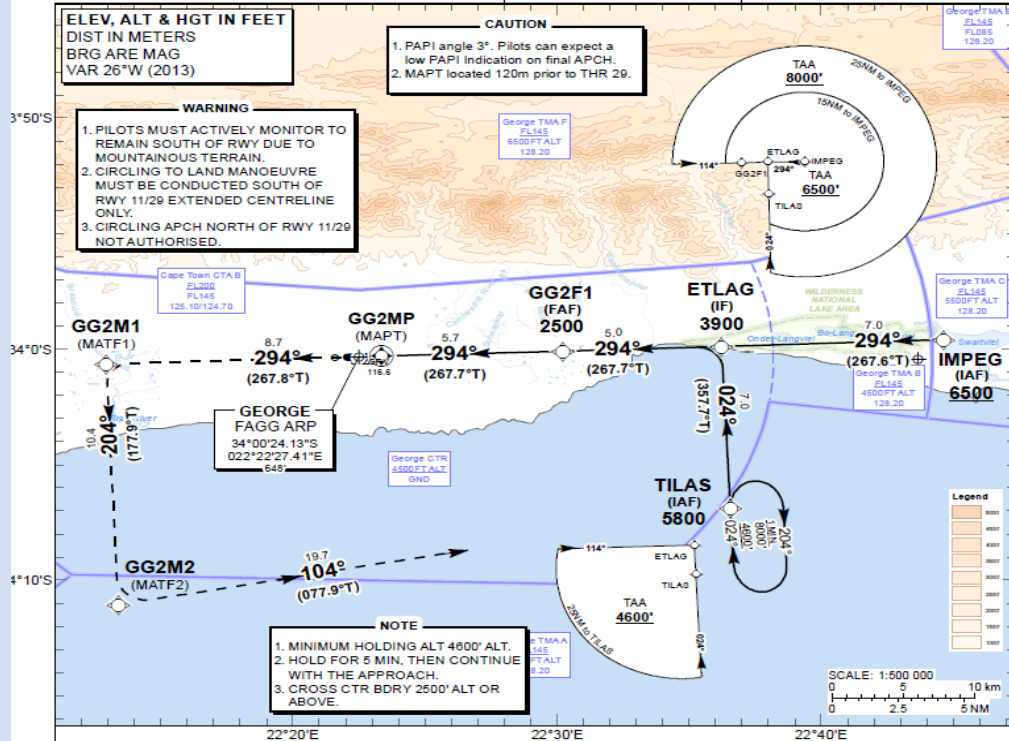
SDO - IFP

INSTRUMENT APPROACH CHART - ICAO

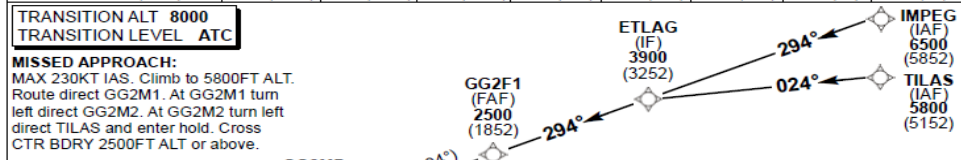
AERODROME ELEV 648'
 HEIGHTS RELATED TO THR RWY 29 - ELEV 648'

GEORGE APP: 128.20
 TWR: 118.90
 ALPHA OSCAR (APN) 122.65
 ATIS: 126.225

GEORGE RNAV (GNSS) RWY 29
 CAT A - D



DIST (NM) to THR 29	5.8	5	4	3	2	1	0.06	0
DIST (NM) to Next WPT	5.7 (FAF)	4.94	3.94	2.94	1.94	0.94	GG2MP	THR 29
ADVISORY ALT (HGT)	2500 (1852)	2260 (1612)	1950 (1302)	1640 (992)	1330 (682)	1020 (372)	720 (72)	700 (52)



THR ELEV 648

NM to/from THR RWY 29	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
MIN TEMP: 0°C		A	B	C	D	GS	KT	80	100	120	140	160									
LNVA	2.5%	1260 (612)	1260 (612)	1260 (612)	1260 (612)	FAF to MAPT	M:S	4:16	3:25	2:51	2:26	2:08									
LNVA/VNVA	2.5%	1030(382)	1030(382)	1030(382)	1030(382)	Rate of descent	FPM	416	520	625	729	833									

Notam Revisions



AIXM

foxe - [BD_2016-09-15_800000102779640.xml C:\Users\raoulb.ATNS\Desktop\Dakar\AIM\3 - 5 Oct\Presentation\slides\Downloads*]

File Edit View Tools Window Help

AIXM-Snapshot

- version = 4.5
- effective = 2016-09-15T00:00:00
- origin = EAD-SDO
- created = 2016-09-02T06:00:00

```
</Timsh>
<txtRmkWorkHr>Pilots &amp; operators wanting to make use of Sishen Airport shall app
Liana.Blaauw@angloamerican.com copy to the airport Flight co-coordinator at Jacky.Ster
2.1. Date of intended movement;
2.2. Type of intended movement (AR or DEP);
2.3. Name and Contac details of the operator;
```

foxe - [BD_2016-07-21_800000099687146.xml C:\Users\raoulb.ATNS\Desktop\Dakar\AIM\3 - 5 Oct\Presentation\slides\Downloads*]

File Edit View Tool Window Help

AIXM-update

- xm:xmlns:xsi = http://www.w3.org/2001/XMLSchema-instance
- xsi:noNamespaceSchemaLocation = http://www.aixm.aero/schema/4.5/AIXM-
- version = 4.5
- effective = 2016-07-21T01:00:00
- origin = EAD-SDO
- created = 2016-07-19T12:50:21
- number = 8000000332781240023
- group
 - Name = CAD SUPPLEMENTS AND AIP UPDATES
 - SubName = AIP QUALITY CHECK FEB
 - Reason = RSA IAIP update
 - New
 - Changed
 - New
 - Rte
 - New
 - New
 - Changed
 - Changed
 - New
 - Rte
 - RteUid
 - mid = 800000099686214
 - txtDesig UT916
 - txtLocDesig FA-FB
 - Changed
 - Withdrawn
 - Changed
 - Changed
 - Changed
 - Changed
 - Changed
 - Changed
 - Changed
 - Withdrawn
 - New
 - Withdrawn
 - Changed
 - Changed
 - Changed
 - Changed

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</Rte>
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<Ndb>
<NdbUid mid="4909491">
```

DATA Elements

7	AERODROME	Aerodrome / Heliport (AHP)	Runway centre line point (RCP)	Stepway (SWY)	Runway protect area geometry (RPA)					
8			TLOF lighting system (TLS)	Protection area (PA)						
9			TLOF geometry (TLG)							
10			TLOF safety area (TSA)							
11			Touch down and lift off area (TLA)	TLOF safe area geometry (TSG)						
12				FATO centre line position (FCP)						
13				Final approach and take-off area (FAO)			Distance declared for FATO direction (FDD)			
14							Approach lighting system for FATO direction (FLA)			
15							FATO area lighting system (FLS)			
16							FATO protection area (FEA)			
17							FATO protect area geometry (FEG)			
18							Navaid - Distance indication (DIN)			
19							Navaid - Angular reference (AIN)			
20			Taxiway (TWY)	Position on the centre line of a TWY (TCE)			Taxiway holding position (THP)	Checkpoint (NSC)		
21			Ground service (AGS)	Taxiway lighting system (TLX)						
22			Fuel (FUL)	Ground service contact address (AGA)						
23			Oil (OIL)							
24			Passenger facility (PFY)							
25			Aerodrome / Heliport - Co-location (AHC)							
26			Apron (APH)	Parking position stand or gate (GSD)			Checkpoint (NSC)	Navaid - Distance indication (DIN)		
27				Apron geometry (APG)				Navaid - Angular reference (AIN)		
28				Apron lighting system (ALS)						
29										
30				Radio navigation aid at Aerodrome / Heliport (ANA)						
31				NITROGEN supplier (NTG)						
32				Oxygen supplier (OXG)						
33				Aerodrome / Heliport Usage (AHU)						
34			NAVAIDS	VHF omnidirectional radio beacon (VOB)			VDB limitation (VLN)			
35							Distance indication (DIN)			
36							Angular reference (AIN)			
37				Distance measuring equipment (DME)			DME - Limitation (DLN)			
38							Distance indication (DIN)			
39							Angular reference (AIN)			
40	Non-directional radio beacon (NDB)	NDB - Limitation (NLN)								
41		Distance indication (DIN)								
42		Angular reference (AIN)								
43	Tactical air navigation beacon (TACAN)	TACAN - Limitation (TLN)								
44		Distance indication (DIN)								
45		Angular reference (AIN)								
46	Marker (MKE)	Distance indication (DIN)								
47		Angular reference (AIN)								
48	Instrument landing system (ILS)									
49	Microwaves landing system (MLS)									
50	Special navigation system (SNS)	Special navigation system station (SNS)								
51	POINT	Designated point (DPN)	Distance indication (DIN)							
52			Angular reference (AIN)							
53		Aeronautical ground light (AGL)								
54	ROUTE	En-route route (ETE)	Route segment (BSG)	Route segment usage condition (BSU)						
55			Traffic flow restriction (TFR)							
56	PROCEDURE	Holding procedure (HPF)								
57		Instrument approach procedure (IAP)	IAP condition of usage (IUE)							
58		Standard instrument departure (SID)	SID usage (SUE)							
59		Standard instrument arrival (SIA)	Runway direction STAB (RDS)							
60			FATO direction STAB (FDS)							
61		Usage of particular STAB (SSE)								
62		MSA group (MGP)								
63	AIRSPACE		Airspace association (AAC)							
64		Airspace (ASE)	Airspace aggregation (AGG)							
65			Significant point in airspace (SPA)							
66		Airspace border (ABD)								
67		Physical or political border (PRB)	Authority responsible for airspace (DFA)							
68	ORGANISATION		Organization or authority - Association (OAS)							
69		Organization or authority (ORG)	Organization or authority - Contact address (OAA)							
70			Special Dates (SPD)							
71				Service provided in airspace (SAE)						
72				Service provided at an aerodrome/heliport (SAH)						
73				Service provided on holding procedure (SHP)						
74				Service on STAB (SSE)						
75			Service provided on SID (SSD)							
76			Service provided on IAP (SIP)							
77	Organization unit providing services (UNI)	Service (SFE)	Service provided on route segment (SES)							
78			Frequency (FRY)							
79			Unit association (UAC)							
80			Unit contact address (UAS)							
81	OBSTACLE		Obstacle at Aerodrome / Heliport (AHO)							
82		Obstacle (OBS)	Obstacle for a RWY direction (FDO)							
83			Obstacle for FATO direction (FDD)							
84										
85										



PAMS

The screenshot displays the PAMS application interface within a web browser. The browser address bar shows the URL: `http://vead03:8888/eadexplorer/startDPApp.jsp?newWindow=http://vead03:8888/PAMSEcitServer/servlet/com.ead.pams.ui.commonservices.dataProvider?UserName=PAMS_fa_RBester&Signature=P54m8bqLLTVz5bV7fOMqAxdOoyageIk5k80sBy1IDPltp1a4KfzQKL6hBeUFQdlsfneU9R67yhDA1s%2F8nZumfrqYqrW`. The application title is "PAMS - Search".

The search criteria on the left include:

- Authority: South Africa (FA)
- Responsible: [Empty field]
- Valid on: 15-Sep-2016 (highlighted with a red dashed circle)
- Start Effectiveness: 21-Sep-2016
- Modified: 21-Sep-2016
- Heading: [Empty field]
- Filename: [Empty field]
- Search Text: [Empty field]
- State: Published Pre-Published
- AIP Type: All

The search results on the right are displayed in a tree view under the heading "Original File Name". The results are:

- South Africa (FA) CIVIL EN (687)
- AIP (144)
- GEN (29)
- ENR (98)
- AD (77)
- AMDT (4)
- AIRAC (1)
- Non-AIRAC (3)
- SUP (68)
- AIRAC (68)
- Non-AIRAC (0)
- AIC (34)
- Charts (435)
- eAIS Package (2) (highlighted in blue)

At the bottom of the application, there are buttons for "Clear", "Show Cart", "Prepare CD", and "Refresh". A status bar at the very bottom indicates: "Status: Finished the search (Found 687 Document(s))".

SDO Reports

AERODROME CHART 26°14'31.12"S
028°09'04.88"E

ELEV 5483'

RADAR APP 134.40 (N)
123.70 (W)
124.50 (S & E)
TWR 118.70

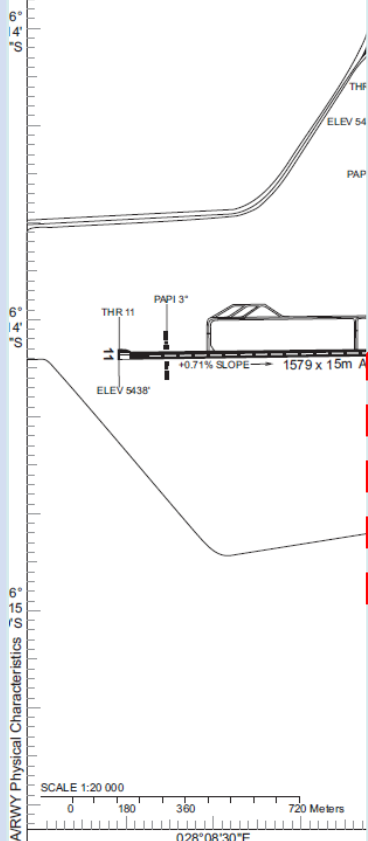
RAND
(JOHANNESBURG)
FAGM

ELEV, ALT & HGT IN FEET
DIST IN METERS
BRG ARE MAG
VAR 19°W (2009)

NOTE

Private Slot Checking Report

01-SEP-2015 06:24



Public Slot - Effective date: 04-FEB-2016 00:00

Check finished at:

Status: Unknown

Name: UPDATE - REGULAR AIRAC AMENDMENT

AIRAC: Y

Private Slot - Status: Inconsistent

Check finished at: 01-SEP-2015 06:20

Name: 17 SEP AIRC SUPPLEMENTS UPDATE

Owner: AIR TRAFFIC AND NAVIGATION SERVICES COMPANY LIMITED (ATNS)

Error-Type Error-Text

Error Declared distance TORA A for Direction 17 for RWY RWY-17/35 at Aerodrome FASZ: If Type is 'LDA', 'TORA' or 'DPLM', then Declared distance (considering the corresponding Unit of measurement) must be smaller than or equal to the Length of the related RWY.

Error Declared distance LDA A for Direction 35 for RWY RWY-17/35 at Aerodrome FASZ: If Type is 'LDA', 'TORA' or 'DPLM', then Declared distance (considering the corresponding Unit of measurement) must be smaller than or equal to the Length of the related RWY.

Error Declared distance TORA A for Direction 35 for RWY RWY-17/35 at Aerodrome FASZ: If Type is 'LDA', 'TORA' or 'DPLM', then Declared distance (considering the corresponding Unit of measurement) must be smaller than or equal to the Length of the related RWY.

Warning (Error) Airspace with Coded Identifier FAR76 and type R must be the child in at least one Airspace Association having Type = 'BOM' (Bill Of Material), because lower, upper, minimum and maximum limit are not specified.

[Message based on committed data and the content of this private slot]

Warning Direction 17 for RWY RWY-17/35 at Aerodrome FASZ: True bearing (155 degrees) must match (or differ exactly by 180) the value calculated using the geographical co-ordinates of the associated Position on the centre line of a RWY, which is 335.6887 degrees.

[Message based on committed data and the content of this private slot]

Warning Direction 35 for RWY RWY-17/35 at Aerodrome FASZ: True bearing (335 degrees) must match (or differ

RWY	DIRECTION (T)	THR COORDINATES	THR ELEVATION	TORA (m)
11	089°	26°14'33.55"S 028°08'25.99"E	5438'	1579
29	269°	26°14'32.87"S 028°09'22.86"E	5475'	1714
17	157°	26°14'12.66"S 028°08'54.55"E	5437'	1374

ATNS Procedures



AP018

PUBLISHED AIP MANAGEMENT SYSTEM (PAMS) PROCEDURES

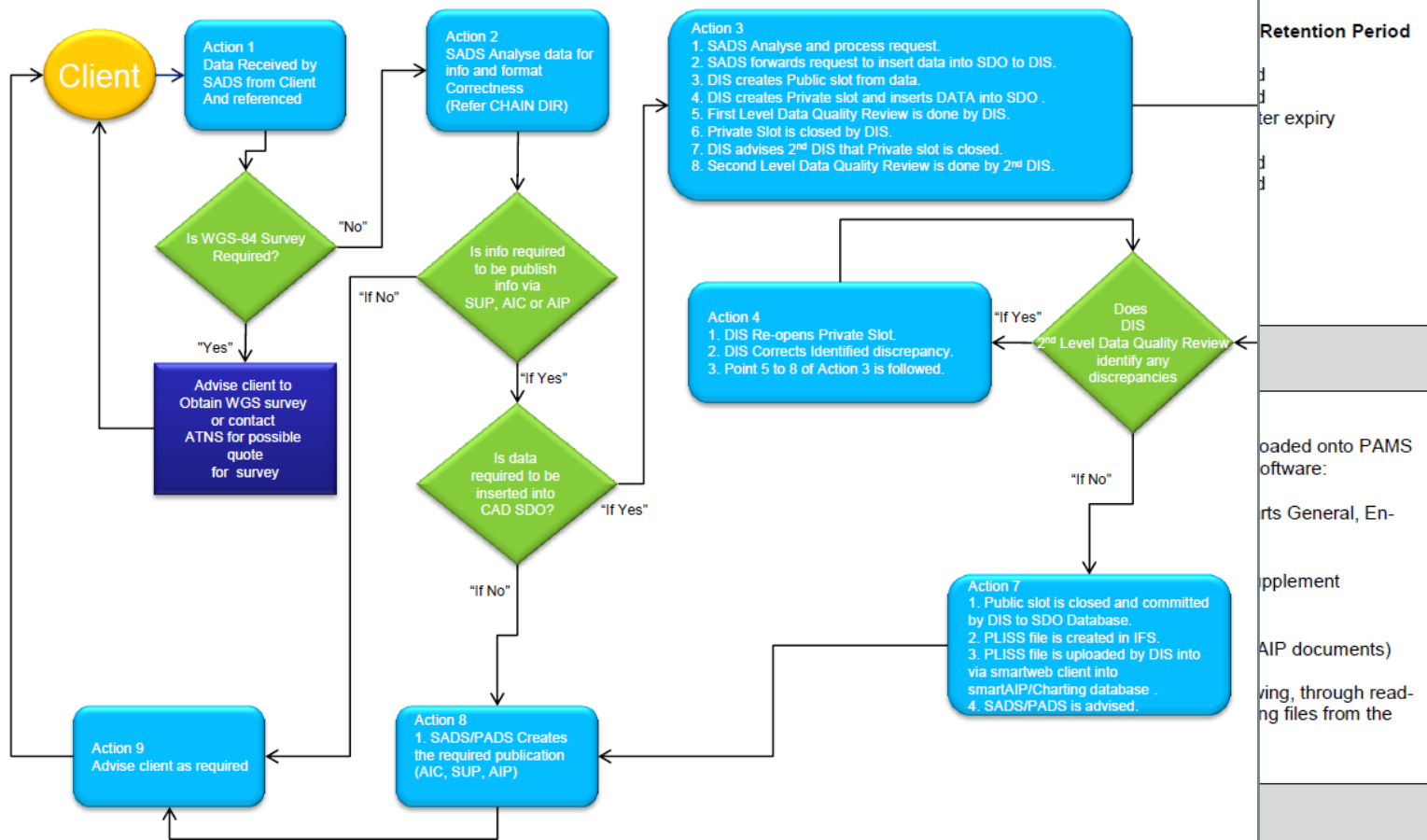
PURPOSE

ATNS ATM
PROMULG
EFFECTIVE
ENQUIRIES
APPLICABLE
CONTROL
PROCESS

Annex A 1

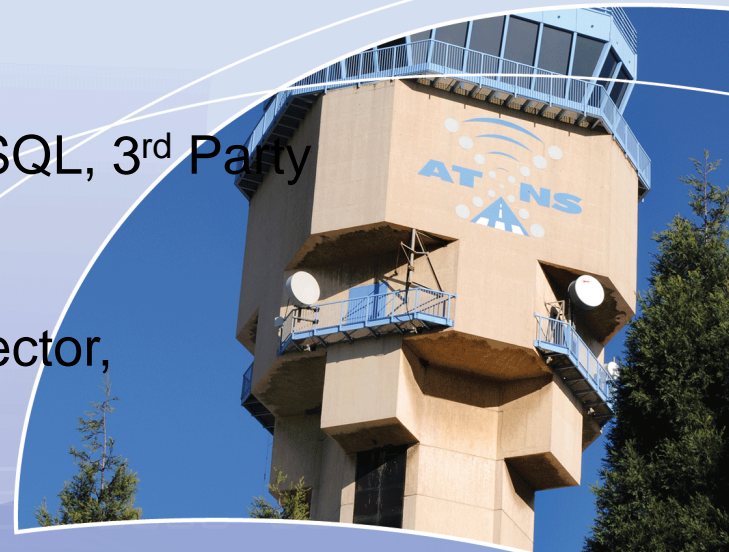
CAD Process flow

(South African Data)



Implementation Challenges

- Inadequate Regulatory Framework (National)
- Misinterpretation of ICAO SARP's (Annex 14 & Annex 15, etc)
- Reluctance to change (Regulator and Aviation Community)
- Legacy Data Issues (Obstacles, WGS-84, e-TOD, etc)
- Staff competency and training
- Interoperability between systems (Oracle, SQL, 3rd Party Software)
- Standardised exchange formats (Raster, Vector, Grid formats, .ort, .bil, etc)



Implementation Challenges

- Different System providers
 - Although the system languages are the same (AIXM) communication between systems is still not guaranteed.
- Connection setup
 - Network infrastructure and load can pose a challenge
- Data Originator Service Level Agreements
 - Data requirements need to be reviewed and amended
 - Data originators can be hesitant towards change



Conclusion

- Safety critical aeronautical solution; (Data is the same throughout all systems, All ATM systems are able to run off ARINC 424/AIXM data extracted from the CAD)
- Guaranteed ownership and control of aeronautical data; (Data remains the responsibility of the State) (Civilian and military visibility of the data)
- Un-breach able security; 3 levels of security, Firewalls (Network) and application level security and logical level security in terms of passwords.



Conclusion

- Total reliability, integrity and accuracy; (Data inserted into the CAD would follow a structured QMS process and would have traceability (meta-data) of the data. Reliability in the form of up-time/availability.
- Fast transition into digital global AIM community; (AIS to AIM Roadmap)
- Cost efficient compared to domestic data repositories; (cost of deploying own system)
- APIRG 17/18 & 12th Air Navigation Conference endorsed initiative;



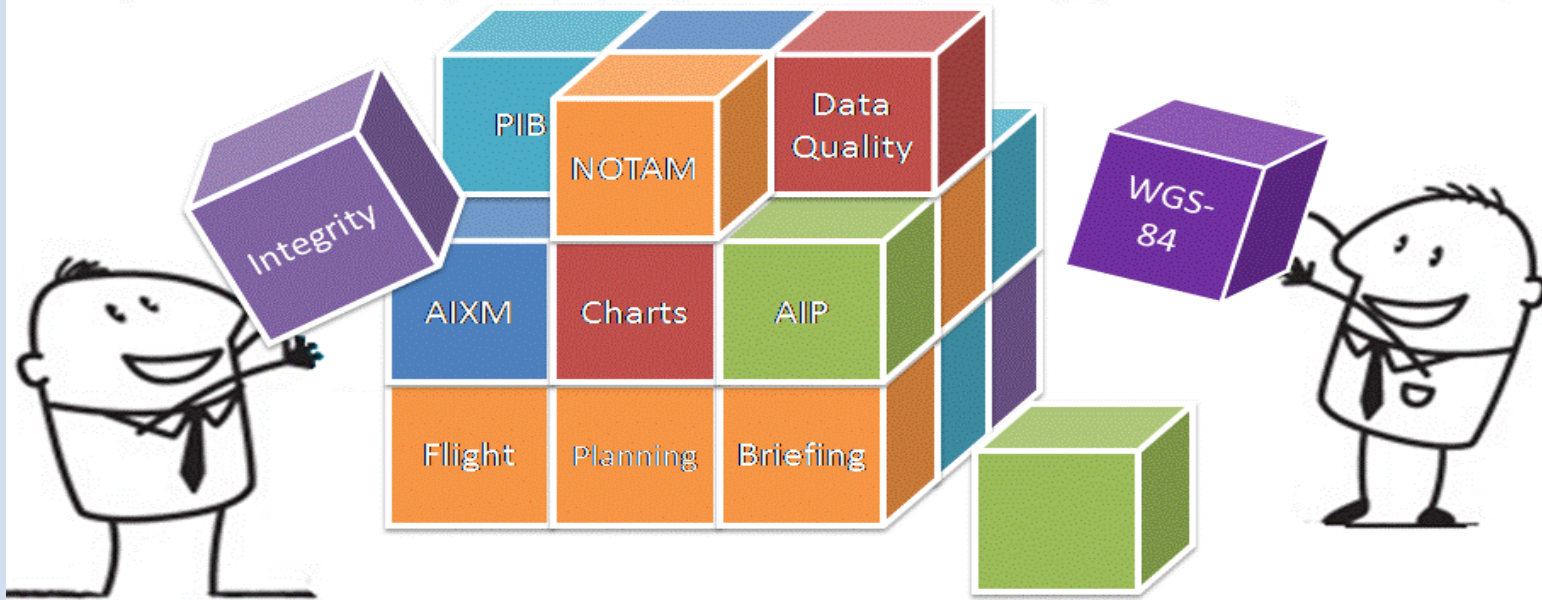
Conclusion

- Supports ICAO's AIS-to-AIM transition initiative, using AIXM (Aeronautical Information Exchange Model);
- Ability to evolve with future technological development; (PBN, E-TOD, etc)
- Guaranteed ongoing compliance with ICAO's standards and recommended procedures.



Thank You.

Aeronautical Information Management



The Building Blocks of the ATM Community



Contact us

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Thank you