FIFA World Cup ATFM T/F

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FPL SYS Capability

ATM Airline Coordination



Flight Planning System Capabilities

An Enabler for Regional AT(F)M

26 September 2022



Flight Planning System – An Enabler for AT(F)M

- An Introduction to Airline Flight Planning for ANSPs
- How the modern Flight Planning System can ensure adherence to State ATM Network Restrictions
- Capability to Manage Traffic Flow Restrictions and optimization and adherence through Flight Planning Systems Capabilities
- State ATM Network Restrictions and Aeronautical Information needs to be
 - Dynamic Application yet predictable and complete
 - Machine Readable, Accessible Publications
 - Timely, accurate publication without ambiguity
- Awareness of
 - Flight Planning / Dispatch Ecosystem
 - Airline Company Restrictions
 - State of registration restrictions on airlines
 - Dissemination of FPL (responsibilities operator/tower/who to file FPL)

The following 'Flight Planning' slides are courtesy of Lufthansa Systems and its customers to demonstrate Lido 4D Flight Planning capabilities







Lido/Flight 4D - for your flight planning into the future

Flight Planning – The Solutions

- □ ANSPs are responsible for effective Demand-Capacity balancing:
 - ANSPs have direct access to both Airspace Capacity data and Traffic Demand data. <u>Airspace</u> users do not have access to this information.
 - For this reason, ANSPs are in the position of rule-maker.
- Airspace Users are obliged to comply with published ATFM rules.
 - Airspace Users are using Flight Planning Systems with incorporated flight optimizing algorithms.
 - All Flight Planning Systems work on a similar principal, searching for the optimal route taking into account published restrictions often generating identical or very similar routes.
 - If the ATFM rules are ineffective or ambiguous, traffic may be planned in a completely different way than ANSPs intended or expected.



Data to Briefing Pack

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Life of a Flight Plan / The Dispatch Ecosystem







Lido Flight 4D

Key benefits:

- Fuel, emissions and cost savings
- 24/7 helpdesk support
- High-quality aeronautical data with worldwide coverage



Lido/Flight 4D - for your flight planning into the future



Key features:

- Interactive flight planning
- Dynamic route optimisation
- Aerodrome suitability checks
- Traffic Flow Restriction (TFR) compliance
- Flight planning process automation
- Systemised Flight Crew Briefing
- In-Flight Monitoring



Flight Planning Life Cycle





Plan | Data & Configuration

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Plan | Required Data

Airline Company Data

- Company Restrictions – Safety & Security
- Company Preferred Routes
- Aerodrome Approvals
- FuelCosts
- Aircraft Costs
- Cost of Time
- Aircraft Performance
 - By Type | Tail

Aeronautic al Data

- AIS
 - NOTAMS
 - Traffic Schemes
 - Flexible Airspace Use
 - Airspace Structure
 - Route Structures
- Metrological Data
- Overflight Charges & Permits
- Terrain



Plan | Traffic Flow Restrictions

The ability to **consider restrictions** such as the so-called 'Route Availability Document' (RAD) Aeronautical Publications (AIP) restrictions, Traffic Orientation Schemes (TOS) or any other published restrictions for **flight planning purposes automatically**.

| and Flow Restriction | | | 2. DE | e tollowing standard | routings apply for traffic departing in Muscal Piec | Route/Exit point |
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| S OO ALL ALL DEP OOMS | Subpart Restr ID | | OOMS | | VOTR, VOTV | PARAR, TOTOX |
| i per cons v | TA ITRAX | Effective from Effective till Notes | | | VAPO, VOMM | RASKI |
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| Restriction Type Flow Element | | | | | Northwestbound (1,2) | 1508 - DAPOK - 1509 - PASOV - 8540 - KUP |
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| | | Flight Level new | | | OMDB | T508 - DAPOK - T507 - TAPRA - M762 - VAX |
| | | FLET - | | | OMDW, OMDM | T508 - DAPOK - T507/T509 |
| | | Denting . | | | Northern UAE alirports | P513-BUBAS |
| | | Special Expression | 1000 | | OOKB | DOSA - DAXAM - P316 - MCT (DVOR/DME) |
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| 4 | | 1 | OOTH | | OMDB, OMPK, OMSJ | R401 - MUSAP |
| Conditions | | | 005H | | Southbound and Eastbound | BOTAM - Y855 - LAKLU then planned route |
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| AND - Phi - there is a support (a. | 0) | Appent | | | Southern UAE aliports | ITRAX |
| AND Waypoint: ITRAX (00 | | E Lie For Select | I | | OOSA | OOSH - BOTAM - Y855 - LAKLU - R402 - HAI (DVOR/DME) - B400 - ASTUN |
| AND | R NORTHERN UAE AIRPORTS) | 1 | | 1007 - ATC may to- | route traffic to PASOV (8540) to facilitate the efficient | t flow or traffic into northern UAE aliports. |
| AND AND NOTDest. Airspace (00-TFI sl Mandatory Action Route AWY Q978 From T | R NORTHERN UAE AIRPORTS) | Append The Select | Note 3: | 1509 - ATC may re- Flights overtrying OI | route traffic to TAPRA (M/R62) to facilitate the efficien IX FIR exit via SOLUD. | now or transc into northern UAE air |





Plan | Unpublished Restrictions

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Through close relationships with ANSPs, we often become aware of Flight Level allocation schemes or flight level restrictions that are not published in the AIP. This often includes the contents of Letters of Agreements where certain Flight Levels must be achieved.

All requirements MUST be published in the AIP to ensure it is considered in the Flight Planning process



Plan | NOTAMS

State published, international NOTAMs, are automatically processed and considered in every FPL calculated.

- Currently over 240000 NOTAMS to consider
- Tailored based upon the relevance of the NOTAM





Plan | Flight Planning Optimisation

History of Flight Planning – Then & Now



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Plan | Airport Suitability

All airports used in a Flight Plan must be validated. This is known as the Airport Suitability Check.

- Departure Airfield (Is a Take-Off Alternate Required?)
- Arrival Airfield
- Alternate Airfield
- En-route Alternate
- ETOPS Alternate

These will be checked against NOTAMs, MET forecasts and operating minima to ensure the airfield is available at the time it is required in the flight.





Plan | Dynamic & Automated Route Optimisation



- Wind & Temperature Atmospheric Conditions
- NOTAMS
- Traffic Flow Restrictions

- Vertical and Horizontal Trajectory
- Fuel Requirement
- Aircraft Defects & Performance



Plan | NOTAM Consideration





Plan | Route & Level Restrictions





Plan | Company Preferences

- Minimum Cost (Time, Fuel & ATC), Fuel, Time or Distance
- Airport Availability & Authorisation
- ETOPS





- Flight Planning & Commercial Policies
- Overflight Security Restrictions
- Operational Constraints
- Aircraft Performance / Defect Constraints



FLY | Crew Briefing & Monitoring

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Fly | NOTAMs & Crew Briefing Pack

Whilst all NOTAMs are considered in the planning process, it is a regulatory requirement to brief crew on all applicable NOTAMs, which in addition to the Operational Flight Plan, FPL, MET & Charts, makes up the Briefing Pack.

| OMDW Arrival Alternate OBBI Arrival Alternate | | 1A1931/22 2130-2225 RWY 12L/3 1A1798/22 | • 07 Sep 2022 OR <u>CLSD</u> . - 01 Sep 2022 | , 21:30 - 29 Se , 11:00 - 29 Se | p 2022, 22:25 SEP 07 p 2022, 14:00 | 08 16 20-22 28 29 | P. |
|---|---|---|---|--|---|---|----|
| OKBK Arrival Alternate OERK | | SEP 01 1100 1100-1400 RWY 12L/3 1A1794/22 |)-1400, 06-08 OR <u>CLSD</u> - 24 Aug 2021 | 2, 20:00 - PERN | s 1100-1400, 20-22 2/ A | 29 | p |
| • OERK Arrival Alternate | > | 1A1794/22 RVR LCA AM RVR1 (ID 29271) 1 (ID 29270) 1 RVR2 (ID 29272) 1 | - 24 Aug 2022 MD AS FOLLOW 111.06 M (N) 08 111.05 M (N) 01 106.19 M (N) 0 | ; 20:00 - PERN /S F RWY CL AND F RWY CL AND F RWY CL AND | 352.22 M FM LDG DTH 383.49 M FM LDG DTH 1289.09 M FM LDG DT | IR RWY 30R- HR RWY 30R THR RWY 30R- | 14 |
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Crew have a limited amount of time to brief themselves on the conditions and restrictions of a flight.

The average long haul briefing pack is in excess of 100 pages.

NOTAMs must be clear, concise and unambiguous to aid crew briefing and systemized flight planning.



Fly | Flight Monitoring

- Continuous monitoring of all flights
- Change of situation
 - New NOTAMs
 - En-route Conditions
 - Geo-Political Issues
 - Destination Monitoring
 - Unexpected Diversion
- Flight Dispatcher alerting
- Crews eyes and ears on the ground







Fly | A Pilots View – Briefing Pack







Summary & Questions

- Airlines are continuing to leverage the capabilities of more advance flight planning systems
- Less use of fixed company routes built in advance, and instead more dynamic flight planning based upon the airspace situation on the day taking advantage of tactical changes
- Large data sets and rules are considered by the FPS when calculating a flight.
- Some flights will be planned, filed and dispatched fully by the FPS without human intervention
- Our plans are based on the published AIP, NOTAM, TOS etc. Clear, unambiguous and correct aeronautical information is essential. Informal agreements are not understood by the system



