Nairobi | September 2019

Aeronautical Information Requirements

An Airline Perspective

معاً إلى كل مكان
Going places together

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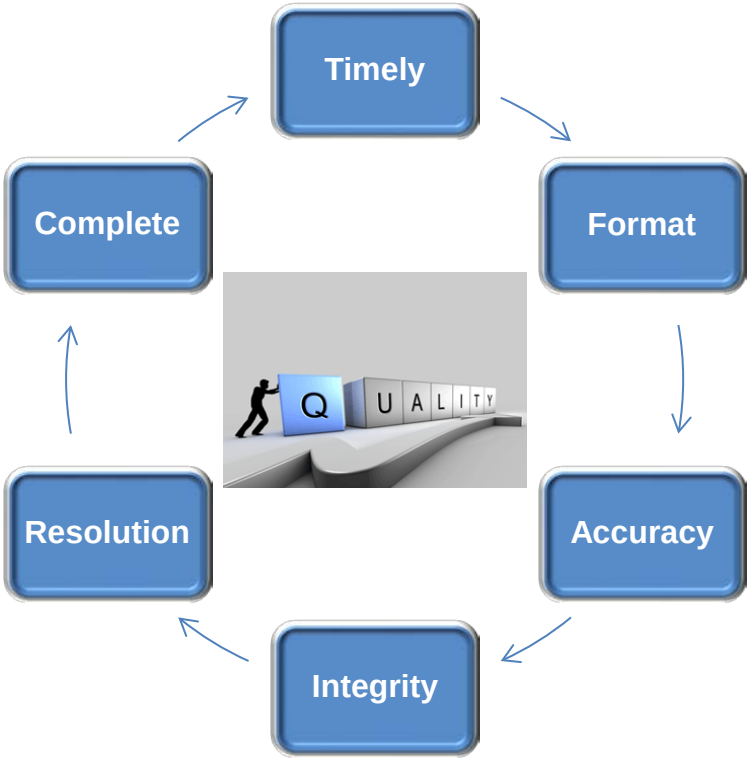
QATAR AIRWAYS القطرية

Outline

- Aeronautical Data Requirements and Process - Users
  - Data Quality Specifications Required by Airlines
  - How Airlines Utilize Aeronautical Information
  - Aeronautical Information - Airline Challenges
- Aeronautical Information flow Obstacles
  - Observation of Originator - AIS/AIM - Users
- Aeronautical Information Flow Obstacles - Case Studies
- Conclusion

AERONAUTICAL DATA REQUIREMENTS AND PROCESS - USERS

DATA QUALITY SPECIFICATIONS REQUIRED BY AIRLINES



Timely:
- On time distribution
- Complies with ICAO SARPs e.g. AIRAC system
- Electronic distribution

Format:
- Standardized format
- AIP, NOTAM Format - Correct use of QCODES

Accuracy:
- Close to reality , Error free

Integrity and Resolution:
- Assurance that information has not been corrupted
- Meets required precision standards

Complete:
- Adequate content in publications

HOW AIRLINE UTILIZE AERONAUTICAL INFORMATION

- AIPs subscriptions 224, additionally data received direct from airports
- 2210 NOTAM received daily into our NOTAM Manager application (based on specific criteria)
- Airport studies , Pilot airport briefing , Airline Operational manuals
- In-house databases used by operational staff
- Assessment of the impact brought by Aeronautical Information changes
- Data published is used in Flight planning system , Navigation Charts , FMS Navigation Databases , Take-off performance calculation , Pilot Briefing Packages (NOTAMs / MET, COMPANY Info)
- Decision Making – Airport selection, Airspace utilized and avoided, Airways / FLs flown , company policies

AERONAUTICAL INFORMATION - AIRLINE CHALLENGES

Data Element	Common missing Info from publications	Importance to Airlines
❑ Airport	❑ ICAO Airport reference code ❑ Low Visibility Procedures (LVP) – Availability and approval process ❑ Service available during scheduled operational hours	❑ Assessment of Airport adequacy ❑ Impacts operating minima (take-off & Landing) ❑ Determine availability of aerodrome
❑ Runways	❑ RWY Shoulders	❑ Impact operational procedures for A380 / B748
❑ Parking stands and Aprons	❑ PCN values ❑ Aircraft Parking Stand limitations (using codes) not just listing examples of the aircraft types ❑ Guidance systems availability (VGDS) and operation	❑ Assessment of Airport adequacy A380, B748, B773
❑ Taxiways	❑ PCN values, Width ❑ Aircraft restrictions-if applicable’	❑ Assessment of Airport adequacy for A380, B748, B773
❑ Approach Procedures	❑ Wording such as “Trial / Experimental procedures, explanation of the actual constraint(s) expected in their use.	❑ Constraints of such procedures are known and risk assessment done

AERONAUTICAL INFORMATION - AIRLINE CHALLENGES

Data Element	Common missing Info from Publications	Importance to Airlines
❑ Temporary Displaced Threshold	❑ Affected Instrument Approach Proc. e.g. ILS ❑ Alternative Landing AIDs e.g. Temporary PAPI, DTHR markings ❑ Additional restrictions-if any	❑ Prepare for alternate approach procedures ❑ Recommended altitude descent calculations.
❑ Unserviceable NAV AIDS	❑ Affected IAPs ❑ Alternate Approach procedures ❑ Alternate missed approach procedures ❑ The NAV AID's ident and frequency	❑ Prepare for alternate approach procedures
❑ OCA(H) Changes	❑ Revised Aerodrome Operating Minima – if published by the state.	❑ Approach minima determination
❑ Work In Progress (WIP)	❑ Lack of published Information on works ❑ Lack of regular updates on the progress of works through NOTAM with relevant caution to crew ❑ Use of official AIS publications (AIP SUP) instead of safety bulletins published on websites.	❑ Avoid crew confusion when new infrastructure is visible

AERONAUTICAL INFORMATION FLOW OBSTACLES

OBSERVATION OF ORIGINATOR - AIS/AIM - USERS

AERONAUTICAL INFORMATION FLOW OBSTACLES – OBSERVATION

Website

States to publish Aeronautical Information on their respective website.

Benefits

- **Timely** distribution
- **Centralized** location for reference
- Effective **Communication and Notification**
- **Analysis** and impact of changes

Bilingual with English

Airline Operators face challenges related to publications not issued in English.

- Translation of AIP Publications published in Non English Language pose a challenge to end users, especially the meaning of technical instructions which may get “Lost In Translation” when doing direct translation.

AERONAUTICAL INFORMATION FLOW OBSTACLES – OBSERVATION

Contact details

- AIS office must ensure **accuracy and correctness of contact details** as published in AIP GEN Section.

Observations

- Published Phone numbers - either incorrect or nobody answers
- Email - Non-company email addresses being used office contacts , not published in AIP or NOTAMs
- Lack of response to queries raised requiring follow up
- Contact being sought through Industry engagement, i.e. AIS AGORA, Jeppesen, Lufthansa Systems, IATA
- Lack of Notification/Distribution of New Publications

AERONAUTICAL INFORMATION FLOW OBSTACLES – OBSERVATION

- Originators providing Aeronautical data should have awareness , guidance and training to perform tasks
- Stakeholder(s) consultation (QR had to assist an agency in writing a NOTAM for DISPL THR)
- Aeronautical data not shared with appropriate agencies (cross border co-ordination, i.e. WPTs)
- Not recognizing which Aeronautical data and in what timeframe must be communicated to appropriate agencies
- Originator(s) need to understand importance of providing Aeronautical data to AIS/AIM
- Lack of understanding on how Aeronautical data impacts airline operation
- Feedback on when Aeronautical data is being badly managed?
- Lack of information for all agencies can lead to safety occurrence

AERONAUTICAL INFORMATION FLOW OBSTACLES - CASE STUDIES

Case study No.1 – Construction Works notification & progress update

- MAY2019, Flight Crew reported : TWYs under construction , poor marking and lighting to indicate closure
- No AIS publications available on construction of New TWYs. Potential risk of aircraft entering a construction area during ground maneuvering.
- Aerodrome Operator contacted, confirmed two (2) new TWYs were under construction
- Regular NOTAMs issued advising of RWY closures (TWY linking works to RWY?).

  A0123/19 NOTAMN
  B) **1905030800** C) 1905031500
  E) RWY 07L/25R BTN TWY 'A' AND 'B' CLSD.

- Once these NOTAM expired, no details on TWY construction. Airline had to take responsibility to inform flight crew on new TWYs through a Company NOTAM
- No NOTAM or AIP SUP detailing TWY Specifications
  - **Location, Length, Width, PCN, Speed Restrictions, Lighting, HST status**
- If AIP SUP had been issued with relevant details and drawing, Navigation charting data houses could have updated charts used by flight crew showing TWY construction location(s).

Case study No.1 – CONT'D

First NOTAM to advise of TWY construction since query raised in MAY2019

B) **1907040600 C)** 1908041500
E) THE FOLLOWING NEW TWYS ARE UNDER CONSTRUCTION:-
1) BTN TWY 'B' AND TWY 'A'.
2) FROM TWY 'A' TO CARGO TERMINAL.
3) BTN TWY 'D' AND TWY 'E'.
4) BTN TWY 'H' AND THE BEGINNING OF RWY 25R.
CAUTION ADVISED DUE TO VEHICLE MOVEMENT
AND FOLLOW STRICTLY ATC INSTRUCTION.

NOTAM published advising TWY M operational

B) **1907161500 C)** PERM
E) NEW TWY 'M' BTN TWY 'B' AND 'A' IS INSTALLED AND OPERATIONAL.

NOTAM advising of daily RWY closure (due TWY construction?). No NOTAM to indicate TWY existence.

B) **1909150800** C) 1909211300
D) DLY 0800-1300
E) RWY 25L/07R CLSD FOR LANDING AND TAKEOFF
PILOTS ARE ADVISED TO FOLLOW ATC INSTRUCTION

Case study No.2 – New apron , Parking stand

For New/Upgraded Apron and Parking Stands the following information is a must

- **Apron - Location, PCN, Strength, Taxi Lane Restrictions if any.**
- **Parking Stands – Coordinates, PCN, VGDS, A/C Type or Length & Width it can accommodate.**

Preference to have AIP SUP issued to include relevant textual details and layout charts

Example of NOTAM with required details

NOTAM ref new APRON

E) ADDITIONAL AD DATA AS FLW:
NEW APRON
SURFACE : CONCRETE
STRENGTH : PCN 54 R/C/W/T
DIMENSION : 130 X 291M

NOTAM ref new Parking stands

E) NEW PARKING STANDS: PARKING ORIENTATION POWER-IN/POWER-OUT. ALL ACFT WILL BE PARKED FACING NORTH.
LOCATION: EASTERN PART OF THE APRON
SURFACE: CEMENT CONCRETE
STREGNTH: PCN 32 R/B/W/T
DIMENSIONS: TOTAL APRON 151.6M X 75M
SHOULDERS: 7.5M ALL AROUND EXCEPTION TOWARDS WESTERN SIDE AS APRON IS CONTINUOUS ON WESTERN SIDE.
MARKINGS: TAXI-LANE GUIDELINES, APRON EDGE, AIRCRAFT STAND GUIDELINES, APRON SAFETY LINES, STOP BAR, STAND IDENTIFICATION NUMBER.
LIGHTING: APRON EDGE LGTS, APRON FLOOD LGTS
CONNECTING TWY: N1
STAND NO.10: WING SPAN-27.05M LENGTH-27.15M TYPE POWER-IN/POWER-OUT SUITABLE FOR ATR-72-500

Case study No.3 – Temporary Displaced Threshold

For DTHR, operators require the following to be included

- Declared Distance
- NAVAIDs Availability
- Instrument Approach Procedures (Impact)
- Altitude Ribbons recalculated
- Visual Landing Aids (Temporary PAPI)
- Lighting availability
- Surface markings
- Special Procedure/Restriction as applicable
- Obstacles located in construction area for performance calculations

NOTAM lack details and no other NOTAMs issued

E) RWY 18/36 LEN DECREASED TO 11129FT (3392M).
DTHR ABM TWY D.
RWY DESIGNATION TODA TORA ASDA LDA
18 3392 3392 3392 3188
36 3392 3392 3392 3392.

NOTAM containing relevant details

E) THR RWY 32 DISPLACED
1430M MARKED BY 5 GREEN LIGHTS EACH SIDE HN DUE WIP
RWY 14/32 1330M EAST END NOT AVBL
OBST 13FT AGL ON RWY 1170M FM START OF TORA RWY 14
DECLARED DISTANCE AND GRADIENT CHANGES
RWY TORA TODA ASDA LDA
14 1010 1070(4) 1010 1010
32 1070 1130(1.2)1070 1010
SUPPLEMENTARY TKOF DISTANCE
RWY14- 920(1.6) 960(1.9) 989(2.2) 1010(2.5) 1049(3.3)
RWY 32 TKOF TO COMMENCE AT RED LIGHTS
RWY 32 PAPI NOT AVBL
RWY 14 INT DIST MARKERS READ INCORRECTLY WHEN RWY 32 DISPLACED

Case study No.4 – NAVAID Unserviceability

- NOTAM advising NAVAID unserviceability should have complete information including **RWY, IDENT, FREQ.**

- Where NAVAID (VOR / DME / NDB) is used in a procedure , clear guidance should be given on actions to follow i.e. ILS missed approach procedure utilizing a VOR that's declared unserviceable.

Example of NOTAM missing critical information:
E) ILS/DME U/S

Example of NOTAM with complete information.
E) ILS BVT 111.150MHZ RWY12 U/S DUE TO MAINTENANCE, DO NOT USE, POSSIBLE FALSE INDICATIONS.

Example of NOTAM where a NAVAID is unserviceable and impacting associated procedures
E) DVOR/DME 'BEL' FREQ 117.20 MHZ CHANNEL 119X. BOTH U/S

E) MISSED APPROACH PROCEDURE RWY 07/25 AND RWY 17/35 CHANGED, FLY STRAIGHT AHEAD TO 3000FT, THEN AS DIRECTED BY ATC, DUE BEL VOR OUT OF SERVICE.

Case study No.5 - Permanent changes made at Short Notice

Two (2) NOTAMs issued advising of IAP withdrawn

E) IAC VOR RWY26 WITHDRAWN.

E) IAC ILS Z OR LOC Z RWY 26 WITHDRAWN.

Operational impact

- Only RNAV procedures available to both RWY ends.
- Aerodrome Operating Minima - ILS 200’/550m vs RNAV 430’/1300m
- GPS outage consideration , Airline operational rules on conducting visual approaches

Airline requirements

- Advance Notification (Communications through AOC / Airline, Aeronautical Publications)
- AIRAC adherence

Case study No.6 - Runway Surface condition

Examples of NOTAM missing Location of slippery area.

E) END OF RWY 25L AND 07R IS SLIPPERY. PILOTS ARE ADVISED TO EXERCISE CAUTION DURING AND LANDING AND TAKEOFF

E) PARTS A AND B OF RWY 09/27 MAY BE SLIPPERY WHEN WET.

Examples of NOTAM with location of slippery surface area.

E) TDZ OF RWY 08 AND 26 IS SLIPPERY WHEN WET. PILOTS TO EXERCISE CAUTION

E) A PORTION OF RWY 04/22 MAY BE SLIPPERY WHEN WET **BTN 400M TO 800M** FM THR RWY 22 (WI TDZ RWY 22). PILOTS TO EXER CTN.

Note the writing styles applied to content, abbreviations versus full wording. This can impact automation used by airline and data-house operational systems.

Case study No.7 - Obstacle , OCA/H & minima

State which publish visibility values are encouraged to included revised visibilities values when changes OCA/H are NOTAMed.

For states that do not publish visibilities the airline operational staff recalculates the values and publishes as a company NOTAM for pilots.

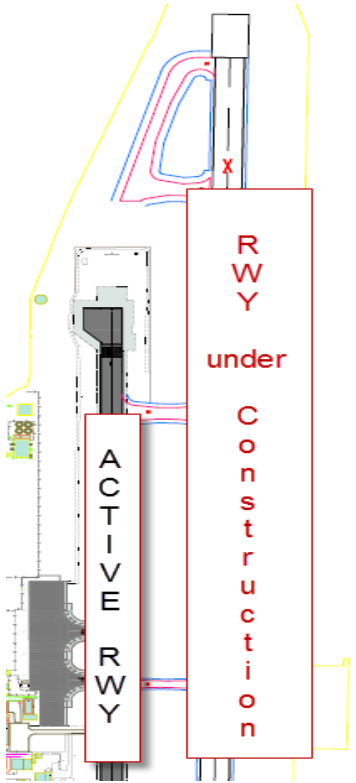
E) AERODROME OPERATING MINIMA FOR RWY 33 CHANGED AS FOLLOWS:
ILS RWY XX CAT I:
CAT A DA(H) - 244(217) FT
CAT B DA(H) - 256(229) FT
CAT C DA(H) - 264(237) FT
CAT D DA(H) - 293(266) FT
CAT E DA(H) - 336(309) FT
ILS RWY XX CAT II:
CAT A DA(H) - 199(172) FT
CAT B DA(H) - 217(190) FT
CAT C DA(H) - 228(201) FT
CAT D DA(H) - 243(216) FT
CAT E DA(H) - 269(242) FT
REF AIP SECTION OTBD AD 2.22 FLIGHT PROCEDURES, SUBSECTION 3.1 LANDING OPERATING MINIMA AND XXXX AD 2.24 CHARTS RELATED TO AN AD, IAC - ICAO RWY 33 ILS.

Case study No.8 - New RWY under construction

- New parallel RWY under construction EAST of existing RWY
- AIC issued Jul 2017 to provide information and advise regarding works
- No work timeframe and no NOTAMs published during construction
- As outline of RWY progressed, crew reports received , Company NOTAM issued
- QR contacted responsible agencies (APR2018) asking for a NOTAM to be issued for flight crew awareness. NOTAM was issued on 6th JUN 2018.
- Regular updates of WIP via NOTAM help to heightened crew awareness to avoid RWY misidentification
- Navigation Charting providers unable to include new RWY construction on airport layout chart due missing timeframe details.

Example of a NOTAM advising of WIP progressing for a new RWY

- E) NEW SOUTH PARALLEL RWY CONSTUCTION WIP SOUTH OF EXISTING RWY. BLACK TOPPING IN PROGRESS. ALL PILOTS TO EXER CTN WHILE APPROACHING XXXXXXX RWY09/27



Case study No.9 - Runway closure and assoc. works

- Airport NOTAMS making reference to Method of Works (MOWP) or Safety Bulletin Pages as a means of communicating major works.

- NOTAM referenced “Safety Bulletin Page” detailing works including graphics. “Safety Bulletin Page” is not listed as an authorized Aeronautical Publication in respective AIP.

  – E) RWY 10L/28R CLSD TO LANDING/TAKE-OFF TRAFFIC. SEE: WWW.XXXXX.DHMI.GOV.XX 2018/6 SAFETY BULLETIN PAGE

- Separate NOTAMs issued advising RWY/TWY/Stand CLSD, ILS unserviceable etc. DOMESTIC and INT’L NOTAMs on same subjects were written differently , example

  – E) ILS IBDR RWY 10L U/S versus E) ILS RWY 10L OUT OF SERVICE

Operational Impact

- Initial RWY closure for 3 months (SEPT 2018) , RWY remains CLSD as of SEPT 2019
- Notification of RWY closure and detailed drawing contained only in Safety Bulletin Page , not an AIP SUP
- Navigation charting data-house was unable to publish a temporary aerodrome layout chart due no AIP SUP
- All information was made available to crew via NOTAM
- Airline needed to produce in-house document for pilot awareness

Case study No.10 - New Apron & Terminal

- AIP SUP issued indicating that 5 days later both new apron and terminal would be operational
- AIP SUP content provided required information to make analysis, i.e. apron layout, parking stand(s) ident. Lat/long, aircraft type applicable for each stand. Only VGDS availability was not stated.

Operational Impact

- Due to late publication, navigation chart displaying aerodrome layout could not be updated
- Non standard marking for stop lines , marking indicate numbers and not aircraft type
- Flight crews are not familiar with AIP chart formats, so confusion could arise due presentation
- Airline produced an in-house document to assist pilot guidance when using new apron and associated parking stands

Case study No.11 - Ambiguous NOTAM & AIP statements

E) ANNUAL WGS-84 SURVEY NOT COMPLETED. ALL AERODROME DATA NOT VALIDATED.

Aerodrome operator confirmed no impact to aircraft ops.

E) REF AIP XXXXXX VOL III AMDT 44 DATED 29 OCT 2015 PAGE XXXX, NEW AFTN ADDRESS AND APRON DATA AS FOLLOWS:
-**AFTN:** XXXXYOYW, XXXXZAZW, XXXXZTZW
-**APRON STRENGTH** : PCN 51/F/C/X/T

One NOTAM to contain One Subject

B) 1907210123 C) 1909202359
E) BIRD BATH CLSD

Annex 15 on when to issue a NOTAM

B) 1909021200 C) 1909201800
D) 02 1200-1800, 03-20 0600-1800
E) 50 PER CENT RWY 12 APPROACH LIGHTS SUBJECT TO INTERUPTION

Operational guidance only provides for impact to length of lighting and not % . Planning minima difficult to determine

RVR Assessment Systems	No effect
Approach lights	Minima as for Nil Facilities
Approach lights except the last 210 m	Minima as for Nil Facilities
Approach lights except the last 420 m	Minima as for Intermediate Facilities

Case study No.11 Cont’d

E)REF AIP XXXXXX AD2.24-9A(2015-6-15), AD2.24-10A(2016-10-15), AD2.24-10E(2015-6-15), IAF R245DEG 38.0FKG/1800M OR ABOVE CHANGE TO IAF R245DEG D38.0FKG/R274DEG URC/1800M OR ABOVE, OTHERS REMAIN.

E) BIRD CONCENTRATION IN VICINITY OF AD
TYPE OF BIRDS: PAINTED STORK, GREY HERON, BLACK-HEADED IBIS, PURPLE HERON, OPEN-BILL STORK, BRAHMINY KITE, BLACK-SHOULDERED KITE, CRESTED SERPENT-EAGLE, LESSER WHISTLING DUCK, GREAT EGRET, INTERMEDIATE EGRET,CATTLE EGRET, LITTLE EGRET, BLACK-CROWNED NIGHT HERON, BARN OWL, LITTLE CORMORANT BIRD WEIGHT: FM 300 UP TO 3000 GRAMS, MAX FLOCK LARGE SIZE: 26 BIRDS

How will this NOTAM benefit a pilot if there is NO reference to IAP. Pilots don’t carry AIPs onboard aircraft

What was originator thinking when publishing a NOTAM with this context ? Why would AIS have not queried such content?

Case study No.11 Cont’d

20.9.2.3 Supplementary information

L’attention des exploitants est attirée sur les difficultés probables d’écoulement du trafic de dégagement vers XXXX, lorsque c’est le terrain retenu, à la suite d’une réduction inopinée de la capacité de XXXX, en cas notamment de dégradation rapide des conditions météorologiques ou de fermeture de piste(s). Prévoir une quantité de carburant supplémentaire par rapport au minimum réglementaire pour tenir compte de l'allongement vraisemblable des trajectoires et des temps d'attente liés à la gestion du trafic. Users attention is drawn to the fact that difficulties may probably occur with traffic flow diverting to XXXX, when this AD is chosen, due to unexpected reduction of XXXX capacity, notably in case of quick deterioration of weather conditions or RWY(s) closure. Plan to take on board an extra amount of fuel compared to the minimum required, in order to take into account the fact that trajectories and holdings in relation with traffic management, are likely to be extended.

AIP statement for an airport. Could the originator have provided additional information to assist with fuel planning?

Conclusion

- Quality of information provided by State AIS regularly falls short of user requirements
- AIM community needs to consider end user requirement(s)
- Regulatory oversight
- Airlines, pilots, data houses and other end users require:
  - Timely
  - complete
  - Accurate
  - Aeronautical data of the required integrity & resolution
  - Data presented in the standardized Format

Thank You