Methodology for the review of ATC procedures

Anders Hallgren
ARISE+ ATM Expert

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- Proposing changes to ICAO Doc 4444 and 7030
    - Methodology used in Europe, including preparatory work, discussions in working arrangements, and presenting it to ICAO for inclusion in their documentation.

- Example of process for safety assessment activities

ICAO Documentation

- The structure of international rules, procedures and provisions for ANS:
    - The Convention of International Civil Aviation
    - ICAO provisions that have world-wide applicability:
        - ✓ Standards and Recommended Practices (SARPS)
        - ✓ Procedures for ANS (PANS)
    - ICAO provisions that have regional applicability
        - ✓ Regional Supplementary procedures (SUPPs)

Standards and Recommended Practices (SARPS)

- ○ Found in the Annexes (Annex 11 for Air Traffic Services)
- ○ Secure highest degree of uniformity in
    - ✓ Regulations
    - ✓ Standards
    - ✓ Procedures, and
    - ✓ Organisation, in all matters in which such uniformity will improve air navigation and its safety.

Procedures for Air Navigation Services (PANS)

- o Found in Doc 4444, PANS-ATM
  - ✓ Specify, in greater detail than the SARPS, the actual procedures to be applied,
  - ✓ Specify the regional differences allowed.

- o Designed to assist in the application of SARPS

- o An amplification of the basic principles in the SARPS

- o Recommended to States for world-wide application, may eventually become mature enough to be placed in the SARPS.

Regional Supplementary Procedures (SUPPs)

- o Developed to meet those needs of specific areas which are
  - ✓ not covered by world-wide provisions, or
  - ✓ where regional deviations are allowed
- o Complement the Air Navigation Plan, the procedural part of the ANP
- o Recommended for application in the States of the FIRs to which they are related.

- **Standards**

  - Recognised as necessary for the safety or regularity of international air navigation (shall);

  - States will conform in accordance with the Convention;

  - If impossible to comply, obliged to notify ICAO of differences to Standards

- **Recommended Practices**

  - Recognised as desirable in the interest of safety, regularity or efficiency of international air navigation (should)

  - States will endeavour to conform in accordance with the Convention;

  - If impossible to comply, not obliged but expected to notify ICAO of differences to Standards

- **SARPS**
  - "Adopted" (two-third majority) by Council
- **PANS and SUPPs**
  - "Approved" (simple majority) by Council
- **But**
  - The same type of procedure must be applied for amending these documents.

1. **Is there an operational requirement?**

   ✓ New rule or ATM concept;

   ✓ Capacity;

   ✓ Safety;

   ✓ Cost…..

2. **Is a new procedure the best way to meet this requirement?**

   ✓ Investigate other possible means to meet requirement

3. **Team develop brainstorm solutions**

   ✓ Initial proposal for a procedure drafted

4. **ATM experts from Member States involved**

   ✓ European working arrangements activiated

   ✓ Include national investigation between meetings

   ✓ Adapted and agreed

- **Incident Maastricht UAC**

- **ICAO reply: always repeat!**

- **German representative: "What about published level restrictions"?**

- **Three options identified:**

  1. **Change so level restrictions always remain in effect;**
  2. **Do nothing; all restrictions need to be repeated; or**
  3. **Differeniate between published/non-published.**

6.5.2.4 CLEARANCES ON A STAR

6.5.2.4.1 Clearances to aircraft on a STAR with remaining published level and/or speed restrictions shall indicate if such restrictions are to be followed or are cancelled. The following phraseologies shall be used with the following meaning:

a) DESCEND VIA STAR TO *(level)*:

    i) descend to the cleared level and comply with published level restrictions;
    ii) follow the lateral profile of the STAR; and
    iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

b) DESCEND VIA STAR TO *(level)*, CANCEL LEVEL RESTRICTION(S):

    i) descend to the cleared level; published level restrictions are cancelled;
    ii) follow the lateral profile of the STAR; and
    iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

c) DESCEND VIA STAR TO *(level)*, CANCEL LEVEL RESTRICTION(S) AT *(point(s))*:

    i) descend to the cleared level; published level restriction(s) at the specified point(s) are cancelled;
    ii) follow the lateral profile of the STAR; and
    iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

d) DESCEND VIA STAR TO *(level)*, CANCEL SPEED RESTRICTION(S):

    i) descend to the cleared level and comply with published level restrictions;
    ii) follow the lateral profile of the STAR; and
    iii) published speed restrictions and ATC-issued speed control instructions are cancelled.

e) DESCEND VIA STAR TO *(level)*, CANCEL SPEED RESTRICTION(S) AT *(point(s))*:

    i) descend to the cleared level and comply with published level restrictions;
    ii) follow the lateral profile of the STAR; and
    iii) published speed restrictions are cancelled at the specified point(s).

f) DESCEND UNRESTRICTED TO *(level)* or DESCEND TO *(level)*, CANCEL LEVEL AND SPEED RESTRICTION(S):

    i) descend to the cleared level; published level restrictions are cancelled;
    ii) follow the lateral profile of the STAR; and
    iii) published speed restrictions and ATC-issued speed control instructions are cancelled.

6.5.2.4.2 If there are no remaining published level or speed restrictions on the STAR, the phrase DESCEND TO *(level)* should be used.

a) DESCEND VIA STAR TO *(level)*:

    i)   descend to the cleared level and comply with published level restrictions;

    ii)   follow the lateral profile of the STAR; and

    iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

b) DESCEND VIA STAR TO *(level)*, CANCEL LEVEL RESTRICTION(S):

    i)   descend to the cleared level; published level restrictions are cancelled;

    ii)   follow the lateral profile of the STAR; and

    iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

5. ## **Validation**

    - ✓ Ensure that the procedure meet the operational requirements;

    - ✓ Within agreed levels of safety;

    - ✓ Usually involves simulation and safety assessment methodology

6. ## **Trial application**

    - ✓ Costly and difficult but may be necessary for big changes;

- **Safety Plan**
  - ✓ Details safety assessment activities;
  - ✓ Fulfills the requirements of the Safety Management System (SMS)
  - ✓ Document in a formal manner:
    - ✓ Operational environment, possible scenarios and assumptions;
    - ✓ Functional hazard assessment undertaken;
    - ✓ Preliminary System Safety Assessment (PSSA)

- **Functional Hazard Analysis**
  - ✓ To identify hazards, i.e. what can go wrong;
  - ✓ To identify the associated effects on operations of the hazards;
  - ✓ To assess the severities of these effects;
  - ✓ To establish the safety objectives expressing the maximum acceptable frequency of the hazard's occurrence.

- **Preliminary System Safety Assessment**
  - ✓ To identify the various causes and failure modes which may lead to the hazards identified during the FHA;
  - ✓ To determine suitable risk mitigation means, which either eliminate, reduce or control the hazards and/or their effects, as well as set the development effort to be applied during the further procedure development;

- **Finish with a number of Safety Requirements (SR) that can be expected to meet the safety objectives!**

Tactical Parallel Offset

- **Amendment proposal to the EUR SUPPs**
  - ✓ Initiated by RNDSG;
  - ✓ Meant to increase capacity by reducing ATCO workload by:
    - ✓ Facilitating uninterrupted climb/descend;
    - ✓ Facilitating situations with overtaking aircraft;
    - ✓ Creating temporary tracks to solve specific ATC situations; and
    - ✓ Reduction in r/t as compared to radar vectoring

17.8.3 Tactical parallel offset procedure – ATC initiated

Note 1: Tactical parallel offset is not a separation method, but a technique to achieve lateral distance. Separation will be based on radar or ADS-B.

Note 2: See PANS-ATM, 12.3.2.9 for related RTF phraseology and Annex 2, 3.6.5 for communication failure procedures.

17.8.3.1 Tactical parallel offset shall be achieved by ATC instructing an aircraft to fly parallel to a route, left or right, at a specified distance.

17.3.8.2 Tactical parallel offset shall only be applied to aircraft with automatic offset programming capability. A flight crew unable to comply, as a result of RNAV system limitations, shall immediately advise ATC.

17.3.8.3 The tactical parallel offset procedure shall only be applied at or above minimum flight altitudes and when continuous ATS surveillance service s provided. Offset path shall remain within controlled airspace.

17.3.8.4 Tactical parallel offset shall only be used after the last point of the SID and before the first point of a STAR.

- **During development of procedure address concerns**
  - ✓ Terrain clearance;
  - ✓ communication failure;
  - ✓ Difference in onboard capabilities;
  - ✓ Additional phraseology;
  - ✓ ICAO provisions for the use of tactical parallel offset in Europe;
  - ✓ Safety assessment.

- **Safety Assessment**
  - ✓ Means to meet the concerns expressed;
  - ✓ Show how identified safety concerns are addressed;
- **Identified two main hazards**
  - ✓ Incorrect use of the procedure by ATC;
  - ✓ Incorrect use of the procedures by flight crew.
- **Resulted in the identification of six Safety Requirements (SR)**

Tactical Parallel Offset

- ✓ **SR1:** Controllers to receive specific training in the correct application of the procedure.

- ✓ **SR2:** Specific awareness and guidance material to be developed.

- ✓ **SR3:** ATCOs reminded regularly of the need to apply correct phraseologies.

- ✓ **SR4:** amendment include a reference to Annex 2 concerning actions to be taken in the event of com failure.

- ✓ **SR5:** Specific awareness and guidance material for flight crews to be developed.

- ✓ **SR6:** flight crews be reminded of the need to apply correct RTF phraseologies.

Tactical Parallel Offset

- **Training and awareness package developed**
  - ✓ Aircraft capabilities (types of aircraft)
  - ✓ FMS performances (turn performance, range automated capability)
  - ✓ Radar monitoring
  - ✓ Applicability (not on SID/STARs)
  - ✓ Terrain clearance responsibility
  - ✓ Human errors
  - ✓ Use of correct phraseology
  - ✓ Com failure procedure
  - ✓ Differences as compared to radar vectoring
  - ✓ Etc etc

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7. **Processed through approval processes**

   ✓ Member State internal;

   ✓ European level;

   ✓ ICAO

8. **Training material**

9. **Implementation and monitoring**

10. **Change as required!**

Thank you for your attention!

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