



International Civil Aviation Organization

**The Twentieth Meeting of APANPIRG ATM/AIS/SAR Sub-Group
(ATM/AIS/SAR/SG/20)**

Singapore, 05 – 09 July 2010

Agenda Item 5: Consider Problems and Make Specific Recommendations concerning the Provision of ATM/AIS/SAR in the Asia/Pacific Region

SID/STAR LEVEL REVISIONS

(Presented by the Secretariat)

SUMMARY

The Air Navigation Commission, after becoming aware that several States, air navigation services providers (ANSP) and aircraft operators had encountered difficulties with the implementation of the procedures relating to published altitude restrictions on standard instrument departure (SID) and standard terminal arrival (STAR) procedures, requested the Secretariat to investigate the situation. It has become clear that the potential for misunderstanding exists due largely to inconsistent implementation across all States.

This paper relates to

Strategic Objectives:

A: Safety – Enhance global civil aviation safety

Global Plan Initiatives:

GPI-10 Terminal area design and management

GPI-11 RNP and RNAV Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs)

1. INTRODUCTION

1.1 The Air Navigation Commission, after becoming aware that several States, air navigation services providers (ANSP) and aircraft operators had encountered difficulties with the implementation of the procedures relating to published altitude restrictions on standard instrument departure (SID) and standard terminal arrival (STAR) procedures contained in the amendment to the Fifteenth Edition of the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444) which became applicable on 22 November 2007, requested the Secretariat to investigate the situation. In this regard, State letter AN 13/2.1-09/25, dated 3 April 2009, was circulated to determine the extent and severity of the difficulties.

2. DISCUSSION

2.1 Upon analysis of the replies it has become clear that the potential for misunderstanding exists due largely to inconsistent implementation across all States. Therefore, immediate action must be taken by all States, ANSPs and aircraft operators to ensure that no confusion exists as to the intent of ATC clearances when aircraft are cleared to levels above those specified on SIDs or below those specified on STARs.

2.2 It has become clear to the air navigation commission and the secretariat that immediate action must be taken by all States, ANSPs and aircraft operators to ensure no confusion exists between ATC and flight crews when aircraft are cleared to levels above those specified on SIDs or below those specified on STARs. Particular recommended actions include, inter alia:

- a) promulgate any difference from the PANS-ATM SID/STAR provisions;
- b) ensure air traffic controllers are familiar with existing differences;
- c) develop and provide flight crew training material for operators;
- d) consider additional actions, such as promulgation of local procedures; and
- e) review current SID/STAR designs to confirm their efficacy.

2.3 In this respect, ICAO invited States' full and immediate consideration to this matter.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information in the State letter Ref: AN 13/2.1-10/12 dated 17 February 2010 on the SID/STAR level revisions.

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Ref.: AN 13/2.1-10/12

17 February 2010

Subject: SID/STAR level revisions

Action required: Review air traffic control procedures
and take action as appropriate

Sir/Madam,

I wish to refer to State letter AN 13/2.1-07/36, dated 22 June 2007, in which States were notified of the approval of an amendment to the Fifteenth Edition of the *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), relating to air traffic services, which became applicable on 22 November 2007.

The Air Navigation Commission, after becoming aware that several States, air navigation services providers (ANSP) and aircraft operators had encountered difficulties with the implementation of the procedures relating to published altitude restrictions on standard instrument departure (SID) and standard terminal arrival (STAR) procedures contained therein, requested the Secretariat to investigate the situation. In this regard, State letter AN 13/2.1-09/25, dated 3 April 2009, was circulated to determine the extent and severity of the difficulties. Upon analysis of the replies it has become clear that the potential for misunderstanding exists due largely to inconsistent implementation across all States. Therefore, immediate action must be taken by all States, ANSPs and aircraft operators to ensure that no confusion exists as to the intent of ATC clearances when aircraft are cleared to levels above those specified on SIDs or below those specified on STARS.

In this respect, I wish to invite your full and immediate consideration to this matter. Background information and recommended action that States should initiate to support a comprehensive clarification to the situation is in Attachment A. Excerpts of relevant PANS-ATM provisions are in Attachment B.

Accept, Sir/Madam, the assurances of my highest consideration.

Raymond Benjamin
Secretary General

Enclosures:

- A – Guidance regarding SID/STAR provisions
- B – PANS-ATM Excerpts

Attachment A to State letter AN 13/2.1-10/12

Guidance regarding SID/STAR provisions

Analysis of responses to State letter AN 13/2.1-09/25, dated 3 April 2009

State letter AN 13/2.1-09/25, dated 3 April 2009, was circulated to determine the extent and severity of difficulties being encountered as a result of flight crew confusion regarding the vertical profiles of SIDs and STARs when ATC assigns new levels. Three questions were posed:

- a) Has your State implemented the procedures and associated phraseologies as specified? If not, please explain why;
- b) Has your State encountered difficulties following the implementation of the procedures and associated phraseologies? If so, please explain; and
- c) Does your State have a different procedure which you have determined to be effective that might be considered for global applicability? If so, please include it with an explanation as to why your State chose the procedure.

By 30 July 2009, fifty-two replies had been received from forty-nine Contracting States, and three international organizations. The nature of the replies from States and international organizations were diverse. More than half of the replies indicated compliance with the provisions. Among the forty-nine States which replied, twenty-eight indicated they had implemented the procedures; four indicated the procedures were not relevant for their airspace and therefore they were not adopted; and five indicated they had not yet implemented the changes but would in the future. Five of the States which had implemented the procedures and phraseologies had experienced some problems. Nine States indicated they did not intend to implement the procedures for a variety of reasons, including identified safety concerns. The three international organizations indicated that problems were being encountered on a widespread basis. Concern was expressed that flight crews operating internationally are unable to determine easily whether individual States have implemented the procedures as set forth in *Procedures for Air Navigation Services — Air Traffic Management* (PANS-ATM, Doc 4444), a variation thereof, or have alternative procedures in place.

Two primary causes of flight crew confusion were evident in the responses:

1. inconsistent implementation of the PANS-ATM provisions across States, as well as within certain States. Because many States apply the PANS-ATM procedures while others do not, flight crews are left uncertain as to whether the SID/STAR altitude restrictions continue to apply or are cancelled when ATC assigns a new level; and
2. level restrictions issued on frequency to en-route aircraft must be repeated with any new level assignment if they are to remain in effect, while restrictions which are published on SID/STAR charts remain in effect unless specifically cancelled by ATC.

The resulting confusion has led to numerous queries on frequency as flight crews and ATC clarify the vertical parameters of the clearance. This has caused an increase in radio telephony verbiage at numerous aerodromes and in a few instances resulted in aircraft operating on other than the vertical trajectory anticipated by ATC.

Recommended actions

It has become clear to the Air Navigation Commission and the Secretariat that immediate action must be taken by all States, ANSPs and aircraft operators to ensure no confusion exists between ATC and flight crews when aircraft are cleared to levels above those specified on SIDs or below those specified on STARs. It is recommended that ANSPs work closely with aircraft operators to identify and resolve any such confusion in a strategic manner. Particular recommended actions include, inter alia:

- a) promulgate, with urgency, any difference from the PANS-ATM SID/STAR provisions in the national aeronautical information publication (AIP);
- b) ensure air traffic controllers are familiar with existing national and international differences so as to be alert to possible flight crew misunderstandings;
- c) develop and provide flight crew training material for operators, foreign and domestic, addressing SID/STAR provisions utilized at aerodromes within your State/territory highlighting local provisions and any differences from those contained in PANS-ATM;
- d) consider any additional actions, such as promulgation of local procedures on the SID/STAR charts, as appropriate, to further ensure flight crew awareness; and
- e) review current SID/STAR designs to confirm their efficacy, considering airspace design, terrain, traffic flows, necessity for altitude restrictions and radio telephony verbiage. Update the procedures, as appropriate, to ensure efficiency and clarity.

Concurrent with the above identified actions for States, ANSPs and aircraft operators, the Secretariat will be analysing options for a global solution that will meet the goal for safe and efficient communication between ATC and flight crew. It is recognized that the current provisions have not provided the intended simplicity and efficiency, and with the large number of flight crews operating across multiple States and regions, standardization across the globe is critical to ensuring flight safety. The Secretariat will be working expeditiously to determine the optimum solution and will coordinate with States, ANSPs and international organizations. Certain parties may be requested to conduct simulations in furtherance of this effort.

Excerpts from *Procedures for Air Navigation Services — Air Traffic Management*, Fifteenth Edition
(PANS-ATM, Doc 4444)

CHAPTER 6. SEPARATION IN THE VICINITY OF AERODROMES

6.3.2 Standard clearances for departing aircraft

6.3.2.4 CLIMB CLEARANCE ABOVE LEVELS SPECIFIED IN A SID

Note. — *See also 11.4.2.6.2.5.*

When a departing aircraft on a SID is cleared to climb to a level higher than the initially cleared level or the level(s) specified in a SID, the aircraft shall follow the published vertical profile of a SID, unless such restrictions are explicitly cancelled by ATC.

6.5.2 Standard clearances for arriving aircraft

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6.5.2.4 DESCENT BELOW LEVELS SPECIFIED IN A STAR

NOTE.— *SEE ALSO 11.4.2.6.2.5.*

When an arriving aircraft on a STAR is cleared to descend to a level lower than the level or the level(s) specified in a STAR, the aircraft shall follow the published vertical profile of a STAR, unless such restrictions are explicitly cancelled by ATC. Published minimum levels based on terrain clearance shall always be applied.

CHAPTER 11. AIR TRAFFIC SERVICES MESSAGES

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11.4.2.6.2 CLEARANCE MESSAGES

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11.4.2.6.2.5 Level restrictions issued by ATC in air-ground communications shall be repeated in conjunction with subsequent level clearances in order to remain in effect.

CHAPTER 12. PHRASEOLOGIES

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12.3 ATC PHRASEOLOGIES

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12.3.1 General

Circumstances

Phraseologies

12.3.1.2 LEVEL CHANGES, REPORTS AND RATES

... clearance to cancel level restrictions(s) of the vertical profile of a SID during climb

z) CLIMB TO *(level)* [LEVEL RESTRICTION(S) *(SID designator)* CANCELLED *(or)* LEVEL RESTRICTION(S) *(SID designator)* AT *(point)* CANCELLED]

... clearance to cancel level restriction(s) of the vertical profile of a STAR during descent

aa) DESCEND TO *(level)* [LEVEL RESTRICTION(S) *(STAR designator)* CANCELLED *(or)* LEVEL RESTRICTION(S) *(STAR designator)* AT *(point)* CANCELLED]

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