

**Twenty Seventh Meeting of the
Informal South Pacific ATS Co-ordinating Group
(ISPACG/27)**

**Auckland, New Zealand
27 February – 01 March 2013**

Agenda Item 4 – Review Open Action Items (AI 25-2)

FPL Item 15 Content in AIDC Messaging

Presented by Airservices Australia

SUMMARY

This working paper proposes that to support a resolution to the ongoing speed variation concern issue, the standardisation of Field 15 transmission between AIDC capable units will reduce the risks in compromising ATC separation standards through the electronic sharing of agreed enroute speed profiles.

1. INTRODUCTION

- 1.1 AI 25-2 (Speed Variation Concerns) has been an ongoing item to clarify to what extent flight crews can modify cruise speed without notifying ATC. This item has arisen largely as a result of unexpected closure rates being observed when reduced separation minima (D30, D50) have been applied on the expectation of speed in accordance with the “profile” held by the ATS Unit.
- 1.2 There are several factors affecting the enroute speed profiles applied by ATS Units for the application of ATC separation standards:
- Flight planning requirements & submission (Doc 4444);
 - Annex 2 reporting requirements for inadvertent changes to flight plan;
 - Flight crew actions and expectations for reporting speed changes;
 - Electronically communicated enroute speed information in AIDC messaging.

Inconsistencies currently exist within these factors between what is expected and applied both by flight crews and ATS units with respect to what enroute speeds should be applied for each phase of the aircraft’s flight plan.

- 1.3 While modern aircraft systems continue to demonstrate exceptional accuracy with respect to route adherence (lateral) and altitude keeping (vertical), significant variance continues to be observed in longitudinal accuracy (time and distance), largely due to lack of accurate knowledge of aircraft cruise speeds.

- 1.4 More recently, this issue has been masked by the automatic extraction and profiling of cruise speeds for data link-equipped aircraft by some ATS Units, negating the dependency on flight crew notifications to apply a different speed to the aircraft's profile in the automation system. The issue, however, is still very prevalent with non data link-equipped aircraft.
- 1.5 FPL Item 15 "Route" (Doc 4444) consists of:
- Field 15a – the first cruising speed;
 - Field 15b – the first cruising level, and
 - Field 15c – the route description (including changes of speed, level and/or flight rules.
- 1.6 However, there is currently no protocol in the Asia/Pacific ICD for AIDC to define exactly what speed information should be reflected in Item 15 contained in AIDC exchanges between ATS Units. A review of AIDC messages indicates that different ATS Units include different information in Field 15, various examples including:
- the first filed speed in Field 15a, with no speed/level changes indicated in Item 15c;
 - a current speed automatically extracted from data link downlinks as Item 15a, with no speed/level changes indicated in Item 15c;
 - the first filed speed in Item 15a, with the filed speed/level changes indicated in Item 15c.
- 1.7 This paper attempts to identify many of the inconsistencies that currently exist between flight crew and ATS unit expectations with respect to the application of enroute speeds. It is proposed that an agreed protocol for the standardised electronic transmission of Field 15 information will greatly reduce the risk in ATC separation standards being compromised as a result of the application of an incorrect speed profile when supported by both flight planning and Annex 2 requirements.

2. DISCUSSION

- 2.1 Field 15(c) of a filed flight plan permits an operator to notify ATS Units of "points along the route at which a change of speed (5% TAS or 0.01 Mach or more) or a change of level is planned to commence" (Doc 4444).
- 2.2 Annex 2 requires adherence to the current flight plan (or the applicable portion of the flight plan). Under Annex 2, flight crews are required to advise the ATS Unit if the average true airspeed between reporting points varies or is expected to vary by 5% of the true airspeed, from that given in the flight plan.
- 2.3 Apart from acting as pre-notified variations to enroute speed, speed/level changes notified in FPL Item 15 also have relevance to flight crew procedures in cases where an inflight loss of communication occurs (Doc 4444).
- 2.3 Although debate continues regarding what constitutes the "notified true airspeed given in the flight plan", the recent SASP-WG/WHL/21 proposed amendment to Annex 2 to

address un-notified speed variations recognises that “not all ANSPs rely on the first speed item in Field 15 of the flight plan on which to base separation”.

The final (Nov 2012) SASP proposal to amend the wording regarding *inadvertent deviations from the current flight plan* was:

Deviation from Mach number/true airspeed: if, for any reason, the Mach number / true airspeed at cruising level varies by plus or minus 0.02 Mach or more, or plus or minus 10 knots or more from that filed in the flight plan, the appropriate air traffic service unit shall be so informed.

SASP further acknowledges further issues were still present even with the above proposed change to Annex 2, which included:

- what is the significance of the speeds/flight level pairs in FPL Item 15 when subsequently during the flight the aircraft is not maintaining the flight level that was paired with the speed;
- how do ATS Units record a pilot reported speed and subsequently use and coordinate such speed within and between FIRs;
- what is the significance of a speed coordinated between FIRs as compared to the filed speed.

2.4 Anecdotal evidence suggests that flight crews do adhere to the speeds filed in the flight plan (when operating at the flight level at which the speed was to be paired), rather than the first filed speed. It is therefore expected that any notified variations to cruising speeds by flight crews would be with respect to those contained in Item 15c rather than the initial cruise speed filed in Item 15a.

2.5 AIDC messages which contain Item 15 information (in accordance with the Asia/Pacific AIDC ICD) include:

- ABI
- CPL
- PAC (Field 15 inclusion optional)
- CDN (Field 15 inclusion optional)

2.6 The ASIA/Pacific AIDC IDC (V3) provides the following guidance with respect to transmission of Item 15 information in inter-facility messaging:

Field 15 shall include subfields 15a, 15b and 15c. It shall describe the cleared route, beginning with the last significant point preceding the coordination point.

Additionally,

Note 1. In accordance with PANS-ATM Doc 4444 the truncation indicator shall only follow a significant point or significant point/Cruising Speed and Cruising level in Field 15 and shall not follow an ATS route designator.”

This note suggests the inclusion of speed/level change information as filed in FPL Item 15 may (is expected to?) form part of the transmitted Item 15 content in relevant AIDC messages.

- 2.7 The following is an example of a flight with associated AIDC exchanges for a non-data link equipped aircraft with filed speed/level changes in FPL Item 15:

```
FPL-ANZ105-IS
-B763/H-SDHIRWZ/P
-NZAA0400
-M072F260 DCT PEBLU/M071F260 N759 SASRO/M079F360 M636
  PLUGA DCT SHARK N774 MARLN DCT
-YSSY0257
-EET/NZZO0032 YBBB0126 PLUGA0224 SHARK0244 YMMM0249
  REG/ZKNCJ SEL/BGAF PER/D NAV/RNP10
  RMK/TCAS EQUIPPED
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Field 15a: M072

Field 15b: F260

Field 15c: DCT PEBLU/M071F260 N759 SASRO/M079F360 M636 PLUGA...

AIDC exchanges for the flight which contained Item 15:

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ABI-ANZ105/A0242-NZAA-SASRO/0544F260-YSSY
-8/IS
-9/B763/H
-15/M072F260 PEBLU N759 SASRO M636 PLUGA SHARK N774 MARLN
  DCT
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Field 15a: M072 (retained from F15a of FPL Item 15)

Field 15b: F260 (current cleared level)

Field 15c: PEBLU N759 SASRO M636 PLUGA SHARK ... (route information)

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ABI-ANZ105/A0242-NZAA-SASRO/0544F380-YSSY
-8/IS
-9/B763/H
-15/M072F380 PEBLU N759 SASRO M636 PLUGA SHARK N774 MARLN
  DCT
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Field 15a: M072 (retained from F15a of FPL Item 15)

Field 15b: F380 (current cleared level – although strictly not in accordance with Filed Field 15c!)

Field 15c: PEBLU N759 SASRO M636 PLUGA SHARK ... (route information)

The cruise speed for the flight was reflected by the receiving unit as M0.72.

When the flight crew reported at the FIR boundary, the flight crew reported a cruise speed of M0.79, as filed, resolving a discrepancy of 6 minutes in the ensuing 60 minute leg due to the transmission of M0.72 in Field 15a in the ABI without any further qualification in Item 15c.

- 2.8 For data-link equipped aircraft, some ATS Units are extracting the current cruise speed from data link reports and sending this speed as Item 15a for any AIDC messages which contain Item 15. This provides a better representation of current cruise speed (but again does not address any downstream level changes which may have been indicated in the filed FPL Item 15). Exchanging this current speed information for data link aircraft has dramatically improved observed speed variations in YBBB.
- 2.9 Some ATS Units transmit Item 15 information as filed in AIDC messaging:

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ABI-ACA034/A1504
-YSSY-TEKEP/0256F310
-CYVR-8/IS-9/B77L/H-10/SDE3FGHIJ2J3J5LM1ORVWXYZ/SB1D1-
15/N0498F310 DIPSO GOVER ALLOC TEKEP/N0493F310 B450
NF/N0489F330 B450 DOLSI/N0489F330 B450 TUT G457
LAKER/N0485F350 G457 ELLMS/N0482F370 DCT 04N165W DCT
DASNE DCT CARRP DCT ZIGIE DCT 28N155W 33N150W 36N145W
39N140W 43N135W 46N130W/N0482F390 DCT SHARI/N0477F390
DCT PEKAA SHARK8-18/PBN/A1B2B3B4B5C1D1 NAV/RNVD1E2A1
DOF/130121 REG/CFNND EET/YBBB0010 NZZO0120 NZZO0347
SEL/ARJM RALT/YSSY NWWW NSTU PHNL KSFO RMK/TCAS ADSB
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Note that there are some not insignificant changes to notified cruise speeds as filed in FPL Field 15c.

- 2.10 DARPs add another complexity, where the downlinked route request contains no speed/level changes. There is therefore no reference point on which to base notification of changes (unless the first filed speed in Item 15 is taken as the reference point).
- 2.11 There are benefits and drawbacks to each of the Item 15 AIDC implementations described above. This paper does not attempt to identify which implementation best suits ATS requirements, as this also needs to be appropriately supported by both flight planning requirements and Annex 2 requirements. However, only once a consistent information sharing protocol for Item 15 can be determined, can flight crew-reported speed variations be meaningful and appropriately shared between ATS units.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to:
- Note the ongoing issue of speed variation concerns, and the inconsistencies that currently exist between filed speed information in FPL Item 15, Annex 2 reporting requirements, flight crew expectations and the Item 15 information transmitted between ATS Units via AIDC.
 - Consider the establishment of a standardised protocol with respect to Field 15 transmission in AIDC messaging to enable ATS Units to apply a baseline speed profile on which they can base conflict detection strategies, supported by

an agreed approach as to whether the filed FPL Field 15c information should be used as the basis on which notified speed changes should be made by flight crews or whether it should be based on FPL Item 15a.

- c) Discuss whether (and how) the communication of flight crew-advised enroute speed variations in accordance with the proposed Annex 2 requirements can be effectively achieved between ATS units.