



*International Civil Aviation Organization*

**The Fourth Meeting of the Asia/Pacific ICAO Flight Plan and ATS Messages Implementation Task Force (FPL&AM/TF/4)**

Bangkok, Thailand, 2 – 3 June 2011

**Agenda Item 5: Aspects of implementation in Asia/Pacific region**

**OBSERVATIONS OF AMENDMENT 1 AND  
CONSIDERATIONS IN FLIGHT PLAN FORMAT ANALYSIS**

(Presented by Hong Kong, China)

**SUMMARY**

This paper presents the methodology adopted by Hong Kong, China in

- a) resolving the anomalies observed in Amendment 1 to PANS-ATM (Doc 4444) 15<sup>th</sup> Edition; and
- b) determining the flight plan format as PRESENT or NEW when data contents in these flight plans are common in both formats.

This paper relates to –

**Strategic Objectives:**

- A: Safety – Enhance global civil aviation safety*
- C: Environmental Protection and Sustainable Development of Air Transport – Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

**Global Plan Initiatives:**

GPI-12 Functional integration of ground systems with airborne systems

**1. INTRODUCTION**

1.1 In order to meet the new requirements on the ICAO Flight Plan and ATS Messages promulgated by Amendment 1 to ICAO PANS-ATM, Doc 4444, 15th Edition, the Hong Kong Civil Aviation Department (HKCAD) is making necessary system enhancements and provisions to handle NEW Flight Plan and ATS Messages format by 15 November 2012.

1.2 Prior to a complete replacement of ATC system by end 2013, HKCAD is presently in the process of developing two Front End Processors (FEP) to convert NEW Flight Plan and ATS Messages into the PRESENT format so that the existing Aeronautical Information Database (AIDB) and Flight Data Processing (FDPS) systems can continue to handle such messages with minimum change in handling procedures.

## 2. DISCUSSION

### Current Development

2.1 Hong Kong, China is fully compliant with the Asia/Pacific regional transition plan i.e. 3-phase approach with transition period commencing 1 January 2012 as follows:

- Phase 1 - 1 January to March 2012 - FEP(AIDB) and FEP(FDPS) delivery and internal testing
- Phase 2 - 1 April to 30 June 2012 - External testing with other ANSP and announcement of the capability to accept NEW format
- Phase 3 - 1 July to 15 November 2012 - Testing with airspace users and implementation

2.2 In the system design of Front End Processors (FEP), the following main functions have been incorporated (See Attachment 1 for the conceptual diagram):

- i) Interfacing and receiving all incoming ATS messages from the Aeronautical Message Handling System (AMSS);
- ii) Converting messages from NEW format to PRESENT format; and
- iii) Bypassing messages of PRESENT format to existing systems, i.e. AIDB and FDPS.

### Observations of Amendment 1 to PANS-ATM, Doc4444, 15th Edition

2.3 During the software design of FEP, differences in the NEW and PRESENT formats as described in the Amendment 1 were compared and analysed in detail for programming these FEP to differentiate NEW format messages for performing subsequent format conversions. During the process, an inconsistency was identified in Appendix 3 description on Field 10 (b) under “Surveillance equipment and capabilities”.

2.4 In Appendix 2 of the Amendment, sub-paragraph 2.2 “**Instructions for insertion of ATS data**” Field 10 (b) under “**Surveillance equipment and capabilities**”, while “N – NIL” is deleted, a new paragraph is added “Insert “N” if no surveillance equipment for the route to be flown is carried, or the equipment is unserviceable”. This makes provision for “N” to be used in the NEW Flight Plan Format (see Attachment 2).

2.5 In Appendix 3 of the Amendment, sub-paragraph 1.2 “**The standard types of field**” under Field 10 (b) “**Surveillance Equipment and capabilities**”, unlike in the above Appendix 2, while “N – Nil” is crossed out (see Attachment 3), no new provision for the use of “N” is inserted. This implies “N” cannot be used in this Field and operators will not be able to indicate either the equipment is not installed or unserviceable.

2.6 Hong Kong, China has determined qualifier “N” shall be accepted for both PRESENT and NEW formats.

Determination of Flight Plan Formats

2.7 The algorithm in identifying flight plan formats for conversion or by-pass was thoroughly analysed. In conclusion, differentiation of these formats shall be based on the data inserted in Flight Plan Items 10 and 18.

2.8 In the message format analysis, the FEP shall carry out format checking for unique data that will be used in NEW flight plan format only first and then unique data that will be used in PRESENT format only. If unique data for both NEW and PRESENT are not found, then the FPL is in a “COMMON” format that can be handled as either NEW or PRESENT.

2.9 For flights operating in the Hong Kong Flight Information Region (FIR), certain capabilities and equipment requirements indicated by the unique data for PRESENT format are not mandatory. These data may not be present in the majority of our flight plans, thus may result in a large number of such flight plans in the COMMON format. In the software design, it has been decided that flight plans in COMMON format will be processed as PRESENT before the NEW Flight Plan applicability date of 15 November 2012.

2.10 After the applicability date and/or subject to the implementation progress of other ANSPs, COMMON flight plans will then be processed as NEW. An option has been built-in our software design to select either PRESENT or NEW in the categorization of COMMON format flight plans, thus providing us with full flexibility in handling flight plan formats.

Discussion

2.11 The use of “N” in Field 10 (b) should be allowed to indicate equipment unavailability or unserviceability, but it is not allowed as per Appendix 3 of the Amendment.

2.12 Operational issues and additional workload that may be arisen from different implementation algorithms used by different ANSP, and a need to harmonize our implementation is considered necessary.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to

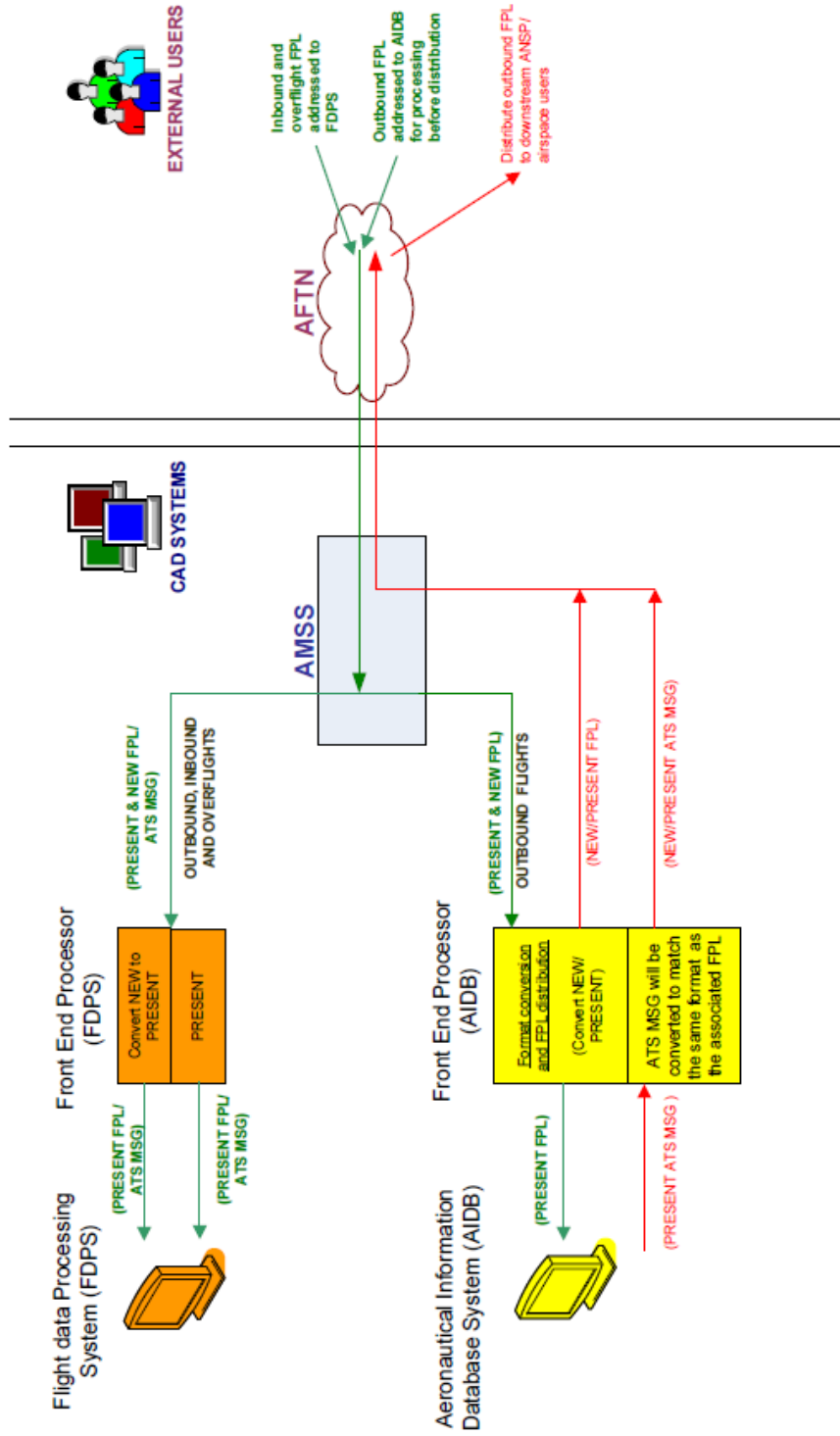
- a) note the inconsistency of information regarding qualifier “N” as published in Appendices 2 and 3, Amendment 1 to PANS-ATM, Doc 4444, 15th Edition, and determine if the qualifier “N” is still required for Field 10 (b) in Appendix 3 and seek clarification from the ICAO Headquarters as necessary to ensure a harmonized global implementation.
- b) share their experience on system design to determine the flight plan format as PRESENT or NEW when data content of both flight plan formats are common.

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### Implementation of NEW ICAO Flight Plan Format

Two Front End Processors (FEP) to process both PRESENT and NEW formats  
 PRESENT - Existing ICAO FPL and ATC Messages  
 NEW - New ICAO FPL and ATS Messages (Amendment 1 to PANS-ATM 15<sup>th</sup> Edition)



**Attachment 2**

**Appendix 2 of Amendment 1 to PANS-ATM, Doc 4444, 15<sup>th</sup> Edition**  
(Sub-paragraph 2.2, “Instructions for insertion of ATS data” Item 10(b)  
under “Surveillance equipment and capabilities”)

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*Note 1.*— ~~If the letter S is used, standard equipment is considered to be VHF RTF, ADF, VOR and ILS, unless another combination is prescribed by the appropriate ATS authority.~~

*Note 2.*— ~~If the letter G is used, the types of external GNSS augmentation, if any, are specified in Item 18 following the indicator NAV/ and separated by a space.~~


~~*Note 25.*— If the letter Z is used, specify in Item 18 the other equipment carried or other capabilities, preceded by COM/ and/or NAV/ and/or DAT, as appropriate.~~

~~*Note 3.*— If the letter J is used, specify in Item 18 the equipment carried, preceded by DAT/ followed by one or more letters as appropriate. See RTCA/EUROCAE Interoperability Requirements Standard For ATN Baseline 1 (ATN B1 INTEROP Standard – DO-280B/ED-110B) for data link services air traffic control clearance and information/air traffic control communications management/air traffic control microphone check.~~

~~*Note 46.*— Information on navigation capability is provided to ATC for clearance and routing purposes.~~

~~*Note 54.*— Inclusion of the letter R is used, the performance based navigation levels that can be met are specified in Item 18 following the indicator PBN/. Guidance material on the application of performance based navigation to a specific indicates that an aircraft meets the RNP type prescribed for the route segment(s), route(s) and/or area concerned is contained in the Performance-Based Navigation Manual (Doc 9613).~~


Surveillance equipment  
and capabilities

 **INSERT** N if no surveillance equipment for the route to be flown is carried, or the equipment is unserviceable.

**OR**

**INSERT** one or ~~two~~ more of the following letters descriptors, to a maximum of 20 characters, to describe the serviceable surveillance equipment carried and/or capabilities on board:

~~SSR equipment~~ **SSR Modes A and C**

-  ~~N Nil~~
- A Transponder — Mode A (4 digits — 4 096 codes)
- C Transponder — Mode A (4 digits — 4 096 codes) and Mode C

**SSR Mode S**

- ~~X Transponder — Mode S without both aircraft identification and pressure-altitude transmission~~
- E Transponder — Mode S, including aircraft identification, pressure-altitude and extended squitter (ADS-B) capability
- H Transponder — Mode S, including aircraft identification, pressure-altitude and enhanced surveillance capability
- I Transponder — Mode S, including aircraft identification, but no pressure-altitude capability
- L Transponder — Mode S, including aircraft identification, pressure-altitude, extended squitter (ADS-B) and enhanced surveillance capability
- P Transponder — Mode S, including pressure-altitude, but no aircraft identification

**Appendix 3 of Amendment 1 to PANS-ATM, Doc 4444, 15<sup>th</sup> Edition**  
(Sub-paragraph 1.2 “The standard types of field” under Field Type 10 (b)  
under “Surveillance Equipment and capabilities”)

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OBLIQUE STROKE

|   |  |
|---|--|
| (b) <i>Surveillance Equipment and capabilities</i>  |  |
| ONE OR TWO LETTERS MORE of the following descriptors, to a maximum of 20 characters, to describe the serviceable surveillance equipment carried and/or capabilities on board: |  |
| SSR equipment Modes A and C   |  |
| N   | Nil  |
| A   | Transponder — Mode A (4 digits — 4 096 codes)  |
| C   | Transponder — Mode A (4 digits — 4 096 codes) and Mode C   |
| <b>SSR Mode S</b>   |  |
| X   | Transponder — Mode S without both aircraft identification and pressure-altitude transmission   |
| E   | Transponder — Mode S, including aircraft identification, pressure-altitude and extended squitter (ADS-B) capability                        |
| H   | Transponder — Mode S, including aircraft identification, pressure-altitude and enhanced surveillance capability                            |
| I   | Transponder — Mode S, including aircraft identification, but no pressure-altitude capability   |
| L   | Transponder — Mode S, including aircraft identification, pressure-altitude, extended squitter (ADS-B) and enhanced surveillance capability |
| P   | Transponder — Mode S, including pressure-altitude, but no aircraft identification transmission capability                                  |
| I   | Transponder — Mode S, including aircraft identification transmission, but no pressure-altitude transmission                                |
| S   | Transponder — Mode S, including both pressure altitude and aircraft identification transmission capability                                 |
| X   | Transponder — Mode S with neither aircraft identification nor pressure-altitude capability   |
| <i>Note.— Enhanced surveillance capability is the ability of the aircraft to down-link aircraft derived data via a Mode S transponder.</i>                                    |  |
| <b>ADS-B</b>  |  |
| B1  | ADS-B with dedicated 1090 MHz ADS-B “out” capability   |
| B2  | ADS-B with dedicated 1090 MHz ADS-B “out” and “in” capability  |

