FLIGHT OPERATIONS PANEL

FIRST MEETING

(FLTOPSP/1)

Montréal, 27 to 31 October 2014

Agenda Item 4: Active work programme items

4.14: HUD/EVS/SVS/CVS

HUD AND VISION SYSTEMS (EVS/SVS/CVS)
IN ANNEX 6 PARTS II AND III

(Presented by GASG and HSG)

SUMMARY

Action by the FLTOPSP/1 is in paragraph 3.

1. INTRODUCTION

1.1 The HUD/EVS/SVS and CVS SARPS were extensively revised in Amendment 33 to Annex 6, Part II. The revisions were the result of a major review of such systems and their use by the HUD, EVS, SVS & CVS (HESC) Sub-group of the FLTOPSP. The HESC sub-group presented WP/7 at the OPSP/WG/WHL/15 in June 2013. That paper proposed HUD/EVS/SVS and CVS SARPS for all Parts of Annex 6.

1.2 The proposed SARPS were subsequently incorporated into the OPSP report to the Air Navigation Commission (ANC) where they were accepted and included in a State letter. Subsequently they were incorporated into Amendment 33 to Annex 6, Part II and Amendment 19 to Annex 6, Part III. Along the way the SARPS were significantly modified from those proposed by the HESC and accepted by the FLTOPSP. Concerns with some of the HUD/EVS/SVS and CVS SARPS in amendment 33 to Annex 6 Part II and the in amendment 19 to Annex 6 Part III (GA) were discussed the FLTOPS/WG/1 meeting and it appears that some of the modifications were intentional and some were inadvertent.

1.3 The GASG and HSG have reviewed the provisions and are proposing modifications to keep the original intent. The proposed amendments to SARPS for Parts II and III are attached in Appendices A and B respectively of this working paper.
2. **BACKGROUND/DISCUSSION**

2.1 The intentional differences in Annex 6, Part II include the following changes to the SARPs which were proposed by the HESC:

   a) deletion of references to the State of the Operator from 2.2.2.2, 2.4.15, 3.4.2.7 and 3.6.13 because State of the Operator is not used in Annex 6, Part II other than as per Note 1 to Chapter 2.1; and

   b) deletion of the cross references from 2.2.2.2.2, and 3.4.2.7.2 as cross references are only used within Annex 6 when they are essential to understanding the text.

2.2 Based on recent discussions and analysis it would appear that the change from requiring approval for the use of HUD/EVS/SVS and CVS only when such systems are used to gain operational credits to:

   a) in 2.4.15.2 citing approval for the operational use of such systems; and

   b) in 3.6.12.1 (the previous section 3.6.13 was re-numbered as 3.6.12 with Amendment 33 to Annex 6, Part II) requiring approval for the use of such systems for the safe operation of the aircraft,

were inadvertent and may have occurred in the process of drafting the amendment.

2.3 Attachment 2.B to Annex 6, Part II presents guidance on and criteria for, the use of HUD/EVS/SVS and CVS for the safe operation of aeroplanes, and guidance on granting of operational credits for such systems. The guidance material is consistent with the original intent of the SARPs as presented by the HESC.

2.4 When the foregoing issues are corrected, it is noteworthy that the provisions in Annex 6, Part II, Section 3 would be duplications of the Section 2 provisions with one very minor difference. That difference is that automatic landing systems would be included in 3.6.12.1 and 3.6.13.2 but not in Section 2. As Section 2 applies to all GA aeroplanes it would appear logical to add automatic landing systems to paragraphs 2.2.2.2.1, 2.4.15.1 and 2.4.15.2 delete section 3.6.12 in total.

2.5 In the process of developing the proposed amendment to Annex 6 Part II it was noted that a similar situation exists in Annex 6, Part III, Section 3.

3. **ACTION BY THE FLTOPSP**

3.1 The FLTOPSP is invited to:

   a) note the information in this WP;

   b) review the amendments proposed for Annex 6, Parts II and III in Appendices A and B respectively;

   c) agree to propose an amendment to Annex 6, Parts II and III based on the Panel review as described in b) above and as amended by the meeting.
APPENDIX A

PROPOSED AMENDMENTS TO ANNEX 6, PART II

NOTES ON THE PRESENTATION OF THE AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

Text to be deleted is shown with a line through it. text to be deleted

New text to be inserted is highlighted with grey shading. new text to be inserted

Text to be deleted is shown with a line through it followed by the replacement text which is highlighted with grey shading. new text to replace existing text
TEXT OF PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES
OPERATION OF AIRCRAFT

ANNEX 6
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

PART II
INTERNATIONAL GENERAL AVIATION — AEROPLANES

... 

SECTION II
GENERAL AVIATION OPERATIONS

... 

CHAPTER 2.2  FLIGHT OPERATIONS

... 

The amendment to para 2.2.2.2.1.1 brings automatic landing systems from Section 3 as
the provision would apply to all GA aeroplanes.

2.2.2  Aerodrome operating minima

... 

2.2.2.1.1 The State of Registry may approve operational credit(s) for operations with aeroplanes equipped
with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such approvals shall not
affect the classification of the instrument approach procedure.

... 

Note 2.— Guidance on operational credit for aircraft equipped with automatic landing systems, a HUD or
equivalent displays, EVS, SVS and CVS is contained in Attachment 2.B and in the Manual of All-Weather
Operations (Doc 9365).

...
The amendments to 2.4.15 are required for consistency within the paragraph and to meet the original intent of amendment 33 to Annex 6 Part II. It is also consistent with the language used for the EFB SARPS which were introduced with Amendment 33 to Annex 6 Part II, and brings automatic landing systems from Section 3 so the provision would apply to all GA aeroplanes.

2.4.15 Aeroplanes equipped with automatic landing systems, a head-up display (HUD) or equivalent displays, enhanced vision systems (EVS), synthetic vision systems (SVS) and/or combined vision systems (CVS)

2.4.15.1 Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, criteria for the use of such systems for the safe operation of an aeroplane shall be established by the State of Registry.

2.4.15.2 In approving the operational establishing operational criteria for the use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the State of Registry shall ensure that:

a) the equipment meets the appropriate airworthiness certification requirements;

b) the operator/owner has carried out a safety risk assessment associated with the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;

c) the operator/owner has established and documented the procedures for the use of, and training requirements for automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

Note 2.— Guidance on establishing operational approvals criteria is contained in Attachment 2B.

With the foregoing amendments paras 3.4.2.7.2 and 3.6.12 are now redundant and can be deleted in total.

3.4.2.7.2 The State of Registry may approve operational credit(s) for operations with aeroplanes equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such approvals shall not affect the classification of the instrument approach procedure.

Note 1.— Operational credit includes:

a) for the purposes of an approach ban (2.2.4.1.2), a minima below the aerodrome operating
minima:

b) reducing or satisfying the visibility requirements; or
c) requiring fewer ground facilities as compensated for by airborne capabilities.

Note 2. — Guidance on operational credit for aircraft equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS and CVS is contained in Attachment 2.B and in the Manual of All-Weather Operations (Doc 9365).

Note 3. — Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (Doc 9365).

3.6.12 Aeroplanes equipped with automatic landing systems, a head-up display (HUD) or equivalent displays, enhanced vision systems (EVS), synthetic vision systems (SVS) and/or combined vision systems (CVS)

3.6.12.1 Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, or EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of an aeroplane shall be approved by the State of Registry.

Note. — Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (Doc 9365).

3.6.12.2 In approving the operational use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the State of Registry shall ensure that:

a) the equipment meets the appropriate airworthiness certification requirements;
b) the operator has carried out a safety risk assessment associated with the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;
c) the operator has established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.


Note 2. — Guidance on operational approvals is contained in Attachment 2.B.

...
APPENDIX B

PROPOSED AMENDMENTS TO ANNEX 6, PART III

NOTES ON THE PRESENTATION OF THE AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

Text to be deleted is shown with a line through it.

New text to be inserted is highlighted with grey shading.

Text to be deleted is shown with a line through it followed by the replacement text which is highlighted with grey shading.

new text to be inserted

new text to replace existing text
The amendments to 4.11 are required for consistency within the paragraph and to meet the original intent of Amendment 19 to Annex 6, Part III. It is also consistent with the language used for the EFB SARPS which were introduced with Amendment 19.

4.11.2 In approving the operational establishing operational criteria for the use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the State of Registry shall require that:

a) the equipment meets the appropriate airworthiness certification requirements;

b) the operator/owner has carried out a safety risk assessment of associated with the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;

c) the operator/owner has established and documented the procedures requirements for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.
Note 2.— Guidance on establishing operational approvals criteria is contained in Attachment I.