Comment-Response Document
APM30 Night VFR Consultation

Commentor:	CAA UK
Para:	Para E Powerplant
Comment:	The 1st paragraph of this section advises that the engine fitted to this aircraft has been certificated to FAR 33 by ACG. However, NPA CS VLA/001 requires that an engine certificated to CS-E is fitted when night VFR approval is needed. This NPA requirement has not been included in the Special Condition. The requirement for a CS-E Certificated engine to be fitted for night VFR operation was introduced in the CS-VLA NPA in order to ensure improved engine reliability for night VFR operation. We recommend that in addition to the FAR 33 certification a review of the engine reliability data, including In flight shut downs, is carried out to ensure appropriate targets are achieved in combination with a failure assessment in accordance with CS-E 210.
Response:	The NPA CS VLA/001 requires that an engine certificated to CS-E is fitted when night VFR approval is needed. This requirement has been taken into account on the APM30 CRI A3 with Special Condition SCVLA.903. The point is that none piston engine has been already CS-E approved. Issoire Aviation has proposed to use an already EASA approved engine. This proposal ensures adequate engine reliability for night VFR operation. Issoire aviation intends to install Rotax 912S engine. This engine has been certified by AustroControl with Type certificate n° TW 9-ACG dated September 27, 2001. According EC 1702/2003 article 2 §3, this engine is deemed to be EASA type certificated. Therefore the team accepts Issoire Aviation to use Rotax 912S for APM30 night VFR certification because its FAR 33 certification supplies an adequate safety level equivalent to CS-E. Rotax 912S has received its AustroControl TC on September 27, 2001. According to EC 1702/2003 Part 21 §21A.21 (d), CS 23.901 and CS 23.903, this engine is suitable for installation on CS 23 certified aeroplane. A review of the engine reliability data, including in flight shut downs, carried out to ensure appropriate targets are achieved in combination with a failure assessment in accordance with CS-E 210 in addition to the FAR 33 certification is not applicable for day-night VFR and IFR CS 23 certified aeroplanes. Therefore the team does not agree with this comment.

Commentor:	CAA UK
Para:	Various
Comment:	Paragraph 2 of the Proposed Special Condition advises that the requirements have been based on NPA CS-VLA/001, which was produced by the EASA Drafting Group. There are the following differences between the Special Condition and the NPA: a) Para B Flight states 'In lieu of the requirements of CS VLA.773, the pilot compartment …..'. However, NPA CS-VLA/001 required compliance with this new requirement in addition to the existing requirements of VLA.773. It is recommended that the words 'in lieu of' are changed to 'in addition to' so that the Special Condition is consistent with the NPA. b) Editorial - the 3rd paragraph of Section E Powerplant states 'In addition to the requirements of CS-VLA.1107 ….'. As CS-VLA does not currently include paragraph VLA.1107, it is recommended

	that the words 'In addition to the requirements of CS-VLA.1107,' are deleted. c) Editorial - the 3rd paragraph of Section G Operating Limitations and Information – the sentence 'the kinds of operation …..must be listed' has been included twice in this paragraph.
Response:	The team agrees with this comment. The CRI A3 will be changed to include the comment concerning CS VLA.773. Concerning CS VLA.1107 and CS VLA.1583, it was a mistake on the consultation document but CRI A3 Special Conditions are correct.

Commentor:	CAA UK
Para:	Additional Requirement for VLA Night/IFR.
Comment:	To enable VLA to operate safely at night it would be wise to include an additional requirement for longitudinal dynamic stability, the phugoid, into VLA. This would ensure that pilot workload is kept to a manageable level in the conditions of limited visual reference that occur at night-time. We would suggest using the existing words from 23.181(c) for a new VLA 181(c) as follows:- "(c) Any long period oscillation of the flight path (phugoid) must not be so unstable as to cause an unacceptable increase in pilot workload or otherwise endanger the aeroplane. When in the conditions of CS-VLA 175, the longitudinal control force required to maintain speeds differing from the trimmed speed by at least plus or minus 15% is suddenly released, the response of the aeroplane must not exhibit any dangerous characteristics nor be excessive in relation to the magnitude of the control force released." Some AMC material taken from the Part 23 Flight Test Guide, as follows would also be appropriate as new AMC VLA 181(c) :- The long period or phugoid oscillation is characteristically lightly damped, sometimes even unstable. Mild levels of instability are acceptable as long as they do not significantly interfere with normal piloting tasks such as trimming to a desired speed or holding altitude. Useful guidelines are that the oscillation should be near neutrally stable if the period is less than 15 sec., or, for motions with longer period, the time to double amplitude should be greater than 55 sec.
Response:	The team agrees with this comment. In order to ensure that pilot workload is kept to a manageable level in the conditions of limited visual reference that occur during night VFR, CS 23.181 (c) and associated AMC 23.181 (c) are created as a Special Conditions : - SCVLA 181(c) : In addition to the CS VLA.181, it is added CS VLA.181 (c) stated : "(c) Any long period oscillation of the flight path (phugoid) must not be so unstable as to cause an unacceptable increase in pilot workload or otherwise endanger the aeroplane. When in the conditions of CS VLA 175, the longitudinal control force required to maintain speeds differing from the trimmed speed by at least plus or minus 15% is suddenly released, the response of the aeroplane must not exhibit any dangerous

	characteristics nor be excessive in relation to the magnitude of the control force released (see AMC VLA 181 (c)).” - SC AMCVLA 181 (c) : In addition to the CS VLA AMC, it is added AMC VLA 181 (c) stated : “The long period or phugoid oscillation is characteristically lightly damped, sometimes even unstable. Mild levels of instability are acceptable as long as they do not significantly interfere with normal piloting tasks such as trimming to a desired speed or holding altitude. Useful guidelines are that the oscillation should be near neutrally stable if the period is less than 15 sec., or, for motions with longer period, the time to double amplitude should be greater than 55 sec.” This issue of the phugoid has not appeared in the NPA CS-VLA/001 and the team considers that it would be appropriate to include this SCVLA 181 (c) and this SC AMCVLA 181 (c) to the EASA NPA CS-VLA/001 in accordance with this consultation.

Commentor:	ACG
Para:	Various
Comment:	The latest document that I have as a member of the Drafting group is from 7.2.2005. The SC does not contain all the Items of this document, some details and comments are missing. I propose to review this in detail. The most important Item from my side is that the AMC material is missing, as long as the VLA change is not done this must be a part of the SC, to ensure that the applicant uses the intended way of compliance.
Response:	The team agrees with the comment concerning the AMC material. Special Condition concerning CS VLA 1309 and 1321 and AMC are added to the CRI A3. These SC are the following : - SCVLA 1309 : In addition to the requirements of CS VLA.1309, reference to the AMC VLA.1309 is done. - SCVLA 1321 : In addition to the requirements of CS VLA.1321, reference to the AMC VLA.1321 is done. - SC AMC VLA 807 : In addition to the CS VLA AMC, it is added AMC VLA.807 stated : “Self-illuminating placards or signs are acceptable”. - SC AMC VLA 1143 : In addition to the CS VLA AMC, it is added AMC VLA.1143 stated : “When throttle linkage separation occurs, the fuel control should go to a setting that will allow the pilot to maintain level flight in the cruise configuration.” - SC AMC VLA 1147 : In addition to the CS VLA AMC, it is added AMC VLA.1147 stated : “When mixture linkage separation occurs, the mixture control should go to a full rich setting.” - SC AMCVLA 1309 : In addition to the CS VLA AMC, it is added AMC VLA.1309 stated : “For night VFR operations, the installations of complex systems may require an assessment as required by CS 23.1309 b).” - SC AMCVLA 1321 : In addition to the CS VLA AMC, it is added AMC VLA.1321 stated : “For night VFR operations, the following arrangement of instruments is acceptable: (a) For each aeroplane the flight instruments required by CS-VLA 1303 and, as applicable, by the Operating Rules should be grouped on the instrument panel and centred as nearly as practicable about the vertical plane of the pilot’s forward vision. In addition – (1) The instrument that most effectively indicates the attitude should be on the panel in the top centre position; (2) The instrument that most effectively indicates airspeed should be adjacent to and directly to the left of the instrument in the top centre position; (3) The instrument that most effectively indicates altitude should be adjacent to and directly to the right of the instrument in the top

	centre position; and (4) The instrument that most effectively indicates direction of flight, other than the magnetic direction indicator required by CS-VLA 1303(c), should be adjacent to and directly below the instrument in the top centre position. (b) If a visual indicator is provided to indicate malfunction of an instrument, it should be effective under all probable cockpit lighting conditions. Considering NPA CS-VLA/001 items CS-VLA 1384 to CS-VLA 1401, the team has not created SC because present CS VLA.1384 requirement is adequate for night VFR operation.