

**SPECIAL CONDITION**  
**RPAS Human Factors**Doc. No. : **SC-RPAS.HF-01**Issue : 1  
Date : 26/04/2016

Ref. : CRI B-52

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**SUBJECT** : **RPAS Human Factors**  
**CERTIFICATION SPECIFICATION** : **CS-VLA**  
**PRIMARY GROUP / PANEL** : **Panel 01 (Flight)**  
**SECONDARY GROUPE / PANEL** : **All System Panels**  
**NATURE** : **SCN**

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**SPECIAL CONDITION****RPAS Human Factors**

This special condition is applicable to any RPAS:

- for which a type certification is requested,
- for which the kinetic energy assessment in accordance with section 6 of the EASA policy E.Y013-01 results in an initial certification basis according to CS-VLA and
- with no occupant on board.

**SC-RPAS.HF-01 General**

- a) Environmental conditions and system operation in a RPAS differ from manned aircrafts. The information is provided to the pilot in displays similar to the display of integrated flight decks. The RPAS operation could be based on high level commands following the concept of autopilot commands in manned aviation. If the operations involve crew different than the ones in the control station, the applicant shall identify all the ground crew involved in the operations, their role and communication between different crew. This could be applicable for instance to all ground operations such as engine start, taxi, engine run up, take off, landing, final taxi and engine shut down. The applicant shall identify who is in control for each phase of operation and how the control is switched over. Any specific Human Factors potential issue that may be related to non-conventional crew distribution shall be identified and scrutinized (e.g. CRM issues, task sharing, communication, crew coordination, etc.)
- b) The design of the RPAS Ground Control Station (GCS), must adequately address the foreseeable performance, capability and limitations of the crew.
- c) Due to the separation between aircraft and pilot, the pilot is deprived of a range of sensory cues available to a manned aircraft pilot. For this reason, adequate information and alerts shall be provided to the pilot for the kind of operation for which certification is requested.
- d) The workload during normal and abnormal situations shall remain within an acceptable level for the kind of operation for which certification is requested.
- e) The following aspects of the human-machine interface design shall be assessed as adequate by the Agency:

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- 1) Ease of operation including automation;
- 2) Effects of pilot errors, including the potential for error, the possible severity of the consequences, and the provision for recognition and recovery from error;
- 3) Clear and unambiguous:
  - presentation of controls and information;
  - feedback following crew or automation actions
  - representation of system condition by display of system status;
  - indication of failure cases, including aircraft status;
  - indication when pilot input is not accepted or followed by the system;
  - indication of prolonged or severe compensatory action by a system when such action could adversely affect aircraft safety;
  - indication of reversionary modes and back-up status
- 4) Adequacy of flight crew alerting:
  - flight crew alerts must provide the flight crew with the information needed to:
    - (i) identify non-normal operation or aeroplane system conditions, and
    - (ii) determine the appropriate actions, if any;
  - flight crew alerts must be readily and easily detectable, intuitive and intelligible by the flight crew under all foreseeable operating conditions, including conditions where multiple alerts are provided;
  - satisfactory alerts must be provided to avoid unintended excursions outside the permitted flight area;
  - the alerts must be removed when the alerting condition no longer exists;
  - warning and caution alerts must be prioritised based on the urgency of flight crew awareness and response:
  - warning and caution alerts must provide timely attention-getting cues through at least two different senses by a combination of aural, visual, or tactile indications;
  - warning and caution alerts must permit each occurrence of the attention-getting cues to be acknowledged and suppressed, unless they are required to be continuous;
  - the alert function must be designed to minimise the effects of false and nuisance alerts, preventing the presentation of an alert when it is inappropriate or unnecessary.