NPA 2012-04, CRITICAL TASKS

ATTACHMENT TO AIRBUS COMMENT No. 65

PROPOSED CHANGES TO 145.A.165(b)3 AND ITS AMC & GM

145.A.65 Safety and quality policy, maintenance procedures and quality system

(a) The organisation shall establish a safety and quality policy for the organisation to be included in the exposition under 145.A.70.

(b) The organisation shall establish procedures agreed by the competent authority taking into account human factors and human performance to ensure good maintenance practices and compliance with this Part which shall include a clear work order or contract such that aircraft and components may be released to service in accordance with 145.A.50.

1. The maintenance procedures under this paragraph apply to 145.A.25 to 145.A.95.

2. The maintenance procedures established or to be established by the organisation under this paragraph shall cover all aspects of carrying out the maintenance activity, including the provision and control of specialised services and lay down the standards to which the organisation intends to work.

3. ~~With regard to aircraft line and base maintenance,~~ the organisation shall establish procedures to minimise the risk of multiple errors and capture errors on critical systems, and to ensure that no person is required to carry out and inspect in relation to a maintenance task involving some element of disassembly/reassembly of several components of the same type fitted to more than one system on the same aircraft during a particular maintenance check. However, when only one person is available to carry out these tasks then the organisation's work card or worksheet shall include an additional stage for re-inspection of the work by this person after completion of all the same tasks.

4. Maintenance procedures shall be established to ensure that damage is assessed and modifications and repairs are carried out using data approved by the Agency or by an approved Part-21 design organisation, as appropriate.

5. After completion of all maintenance a general verification must be carried out to ensure the aircraft or component is clear of all tools, equipment and any other extraneous parts and material, and that all access panels removed have been refitted.

AMC 145.A.65(b)3 Safety and quality policy, maintenance procedures and quality system

1. The purpose of this procedure is to minimise the rare possibility of an error being repeated whereby the identical aircraft components are not reassembled thereby compromising more than one system. ~~One example is the remote possibility of failure to reinstall engine gearbox access covers or oil filler caps on all engines of a multi-engined aircraft resulting in major oil loss from all engines.~~

~~Another example is the case of removal and refitment of oil filler caps, which should require a re-inspection of all oil filler caps after the last oil filler cap has supposedly been refitted.~~

2. Procedures should be established to detect and rectify maintenance errors that could, as minimum, result in a failure, malfunction, or defect endangering the safe operation of the aircraft if not performed properly. The procedure should identify the method for detection ~~capturing~~ errors, and the maintenance tasks or processes concerned.

2.1 In order to determine the work items to be considered as critical tasks, the ~~following~~ maintenance tasks should primarily be reviewed to assess their impact on safety:
~~For example~~ ***(see Airbus comments No. 60, 62, 66):***
~~- Installation, rigging and adjustments of flight controls,~~
~~- Installation of aircraft engines, propellers and rotors,~~
~~- Overhaul, calibration or rigging of components such as engines, propellers, transmissions and gearboxes~~
~~- Tasks that may affect the type of operation of the aircraft, such as ETOPS~~

~~but additional information should also be processed, such as:~~

- Information from the TC holder; such as .... ***(refer to Airbus comments No. 62, 66)***
- Information from the operator Aircraft Maintenance Program;
- accident reports;
- investigation and follow-up of incidents;
- occurrence reporting;
- flight data analysis;
- result of audits;
- normal operations monitoring schemes;
- feedback from training; and
- information exchange systems.

~~- Previous experiences of maintenance errors, depending on the consequence of the failure,~~
~~- Information arising from the 'occurrence reporting system' required by 145.A.60,~~
~~- Member State requirements for error capturing, if applicable.~~

2.2 In order to ensure that critical tasks will be properly addressed throughout the organisation, a list of those tasks should be reviewed on a regular basis and made available to the relevant part of the organisation.

2.3 In order to prevent omissions, every maintenance task or group of tasks should be signed-off. To ensure the task or group of tasks is completed, it should only be signed-off after completion. Work by unauthorised personnel (i.e. temporary staff, trainee,..) should be checked by authorised personnel before they sign-off. The grouping of tasks for the purpose of signing-off should allow critical steps to be clearly identified

Note: A “sign-off” is a statement by the competent person performing or supervising the work, that the task or group of tasks has been correctly performed. A signoff relates to one step in the maintenance process and is therefore different to the release to service of the aircraft. “Authorised personnel” means personnel formally authorised by the maintenance organisation approved under Part-145 to sign-off tasks. “Authorised personnel” are not necessarily “certifying staff”.

2.4 In order to detect maintenance errors the organisation should ensure that the error detecting methods are adequate to the disturbance of the system. A combination of several actions (visual inspection, operational check, functional test, rigging check) may be necessary in some cases.

Error detecting methods may consist of independent inspections.

2.4.1 Independent inspections should be carried out by at least two persons, to ensure correct assembly, locking and sense of operation. A technical record of the inspections should contain the signatures of both persons before the relevant CRS is issued.

2.4.2 An independent inspection is an inspection first made by an authorised person signing the maintenance release who assumes full responsibility for the satisfactory completion of the work, before being subsequently inspected by a second independent competent person who attests to the satisfactory completion of the work recorded and that no deficiencies have been found.

2.4.3 The second independent competent person is not issuing a maintenance release therefore is not required to hold certification privileges. However they should be suitably qualified to carry out the inspection.

2.4.5 The procedure for the qualification of the authorised persons performing independent inspections should be described in the organisation exposition *note:(existing chapter 3.7)*

2.4.5 The organisation should maintain a list of persons authorised to perform independent inspections including the extent of their qualification.

2.4.6 When checking control systems that have undergone maintenance, the person signing the maintenance release and the person performing the independent check should consider the following points independently:

- all those parts of the system that have actually been disconnected or disturbed should be inspected for correct assembly and locking;
- the system as a whole should be inspected for full and free movement over the complete range;
- cables should be tensioned correctly with adequate clearance at secondary stops.
- the operation of the control system as a whole should be observed to ensure that the controls are operating in the correct sense;

- if the control system is duplicated to provide redundancy, each system should be checked separately;
- if different control systems are interconnected so that they affect each other, all interactions should be checked through the full range of the applicable controls.

Note: A particular attention should be paid to the work items used to be performed in accordance with standard practices or requiring use of standard parts.

2.5. in order to minimise the possibility of an error being repeated in identical tasks and therefore compromising more than one system or function. Thus, the procedure should ensure that no person is required to carry out or inspect a maintenance task involving disassembly or reassembly of several components of the same type fitted to more than one system on the same aircraft or component during a particular maintenance check. However, when only one person is available to carry out these tasks then the organisation's work card or worksheet should include an additional stage for re-inspection of the work by this person after completion of all the same tasks;

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1. Examples of errors that could be repeated:

- One example is the remote possibility of failure to reinstall engine gearbox access covers or oil filler caps on all engines of a multi-engined aircraft resulting in major oil loss from all engines.

- Another example is the case of removal and refitment of oil filler caps, which should require a re-inspection of all oil filler caps after the last oil filler cap has supposedly been refitted.

2. The maintenance organisation should ensure that when carrying out a modification, repair or maintenance, Critical Design Configuration Control Limitations are not compromised; this will require the development of appropriate procedures where necessary by the maintenance organisation. The maintenance organisation should pay particular attention to possible adverse effects of any wiring change to the aircraft, even a change not specifically associated with the fuel tank system. For example, it should be common practice to identify segregation of fuel gauging system wiring as a Critical Design Configuration Control Limitation.

Maintenance organisations can prevent adverse effects associated with wiring changes by standardising maintenance practices through training, rather than by periodic inspection. Training should be provided to end indiscriminate routing and splicing of wire and to provide comprehensive knowledge of critical design features of fuel tank systems that would be controlled by a Critical Design Configuration Control Limitation. EASA guidance is provided for training to maintenance organisation personnel in an Appendix IV to be added to AMC to Part-145.

The maintenance of ignition prevention features is necessary for the inherent safety and reliability of an aircraft's fuel tank system. The aircraft cannot be operated indefinitely with the failure of an ignition prevention feature. The failure will have a direct adverse effect on operational safety. It could prevent the continued safe flight and landing of the aircraft or cause serious or fatal injury to the occupants. The fuel system review required will identify ignition prevention features of the design. The failure of any of these features may not immediately result in an unsafe condition, but it may warrant certain maintenance to support continued airworthiness.