



The authorised staff:

Another concept of competent person defined by AMC 145 related to the quality system is the personnel 'authorised' by the organisation to sign off tasks:

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

- 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, trainees, etc.) 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 sign-off 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'.

Based on the above current requirements, the following issues need to be addressed and/or clarified:

- Which procedures should the Part-145 organisation submit in order to qualify and authorise those personnel authorised for sign-off? Do they need to consider different levels of qualification and, accordingly, different levels of tasks which they can sign off?
- Who is responsible to evaluate the complexity of each task and assign it to the personnel authorised for sign-off with the appropriate level or to non-authorised personnel? This could be done by the B1 and B2 support staff, or could be already predefined in the task cards by the Part-145 organisation.
- Do the personnel authorised for sign-off need to be under the supervision of B1 and B2 support staff or can it be assumed that, because they are authorised, they are already competent to perform the authorised task to the required standard?
- What are the actions to be taken by the personnel authorised for sign-off and by B1 and B2 support staff when there is a defect/problem during the performance of a particular maintenance task? How do B1 and B2 support staff ensure that they are performed to the required standard?
- What type of supervision is required from B1 and B2 support staff when tasks are performed by non-authorised personnel (personnel not authorised for sign-off)?
- Is there a need for the B1 and B2 support staff to further endorse (sign) all the tasks performed by personnel authorised for sign-off? What does this endorsement mean: taking responsibility for the task or only to certify that the task has been completed by authorised personnel?

**2.2 What are the risks (probability and severity)?**

The study proposed here essentially deals with the clarification of the rule with regard to the competency of the staff and the certification of tasks by 'support staff', therefore there may be some risks as follows:



- Currently the risk is that some tasks could be signed off by unauthorised staff (the concept is described in the Guidance Material), whose competency is not 100 % controlled.
- No environmental risk identified.

**Table 1: Safety risk matrix<sup>1</sup>**

Some examples extracted from accident investigation board reports support the selection of a Risk Index of  $1 \times 8 = 8$ :

- The fatal accident of an Air France Concorde whose probable cause was the loss of a metallic strip from a DC-10 engine cowl. At the investigation, Continental maintenance organisation which is the organisation where the engine cowl was repaired, reported that the release certificate of the DC-10 aircraft was signed by the certifying staff based on the confidence it had on the mechanic who wrongly repaired the engine cowl.
- Accident of a BOEING 747-100/200 on 27/02/2000 at Rhodes Island whose cause was a maintenance error by a mechanic: failure of the maintenance personnel to reconnect the pitot connections to the elevator feel computer which resulted in an elevator control surface deflection which was outside of the normal autopilot elevator authority.
- An accident on a helicopter on 24/05/2000 was due to a maintenance error: in-flight separation of a tail rotor blade tip weight resulting in tail rotor assembly imbalance and separation due to the installation of an unapproved rotor blade by the company's maintenance personnel.
- A fatal crash of a CASA 212 AVIOCAR in October 2006 was caused by an inadequate maintenance system in respect of inspections for fatigue cracks.
- A fatal accident occurred to a CESSNA 402 on 27/04/1999 whose cause was that the fatigue failure of the right wing spar as a result of inadequate quality control during manufacture of the spar. A factor was the inadequate inspection of the right wing by the maintenance personnel, who failed to detect the crack.

This short list of accidents was selected among reports related to maintenance errors where there has been no clear determination of the root cause of the accident, whether they come from the organisation, the procedure, or the personnel.

The frequency and severity of examples found lead us to determine the point of evaluation 'severity/frequency' as follows:

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<sup>1</sup> Enter the risk index in the appropriate box. For example, an issue that has been identified as 'improbable' and 'catastrophic' would get a risk index of  $2 \times 8 = 16$ . Put the result in the appropriate box of the table.



| Probability of occurrence   |   | Severity of occurrence |       |       |           |              |
|-----------------------------|---|------------------------|-------|-------|-----------|--------------|
|                             |   | Negligible             | Minor | Major | Hazardous | Catastrophic |
|                             |   | 1                      | 2     | 3     | 5         | 8            |
| <b>Extremely improbable</b> | 1 |                        |       |       |           | X            |
| <b>Improbable</b>           | 2 |                        |       |       |           |              |
| <b>Remote</b>               | 3 |                        |       |       |           |              |
| <b>Occasional</b>           | 4 |                        |       |       |           |              |
| <b>Frequent</b>             | 5 |                        |       |       |           |              |