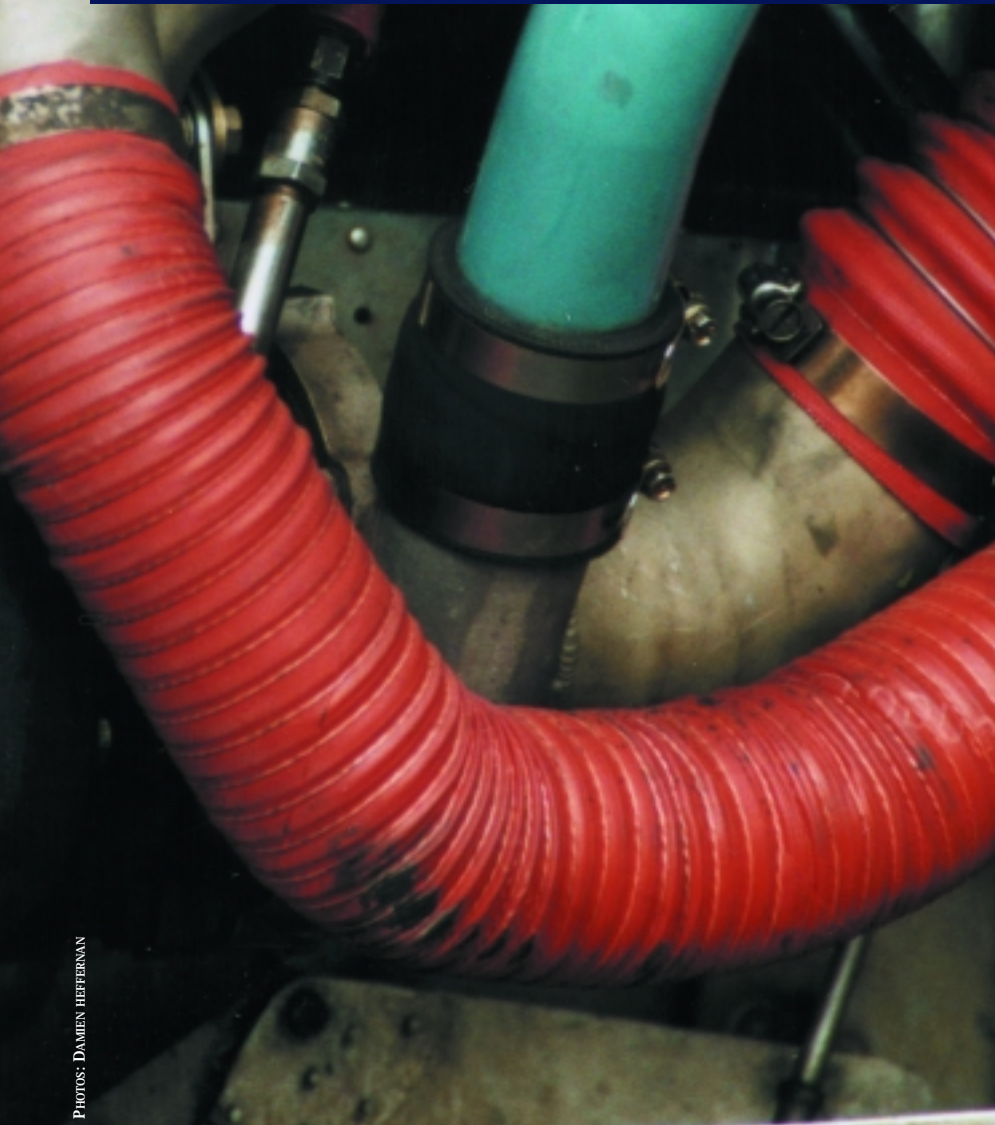


What makes an aircraft airworthy?



Once an aircraft has been designed, built, certificated and released as an airworthy product, it must be kept in an airworthy condition. An overview of who is responsible for what.

Bob Hoy

SO WHERE DOES the concept of airworthiness all begin? It starts when an aircraft manufacturer designs and builds an aircraft for a specific purpose. By international agreement, the aircraft design must meet very searching design standards as specified by the design rules, for example US federal aviation regulations (FAR) 23 or FAR 25.

These standards ensure the aircraft is fit



for the purpose and has safety features and performance equal to a standard considered normal for a well designed and built aircraft.

So now we have an aircraft which has been designed, built, certificated and released as an airworthy product.

However, before you can legally use an aircraft for commercial purposes it requires:

- a current certificate of registration.
- a current certificate of airworthiness.
- a current maintenance release or other approved document for the purpose.
- operation under the control of the holder of an air operator's certificate.

So what is this business of continuing airworthiness all about? The International Civil Aviation Organization describes it as: "Covering all of the processes ensuring that, at any time in their operating life, all aircraft comply with the airworthiness requirements in force and are in a condition for safe operation."

Who then is responsible for continuing airworthiness?

The answer is anyone who has an involvement with the aircraft – be they the holder of the certificate of registration, the owner, the operator, the chief pilot, the chief flying instructor, the pilot in command, the holder of a certificate of approval, the licensed aircraft maintenance engineers (LAMEs) and the aircraft maintenance engineers (AMEs). And, of course, the Civil Aviation Safety

Authority (CASA) has a role to play in setting and enforcing standards.

The crux of any discussion on this subject is the acceptance by of all parties that despite the best endeavours of the designer and manufacturer, an aircraft will degrade to a state of being unairworthy through ageing, through lack of maintenance, failure to repair damage or defects or failure to correctly operate the aircraft within its design or flight envelope.

It is a fact of life that "prevention is better than cure" and that we shouldn't be waiting for a defect to cause a failure or malfunction in flight. Rather, action through adequate inspections and preventative maintenance should be the norm.

Regrettably, there remains a notion in the aviation industry that the continuing airworthiness of an aircraft is the sole responsibility of LAMEs and maintenance organisations.

Certainly, while an aircraft is undergoing maintenance, it is the responsibility of the holder of the certificate of approval/LAME who is covering the maintenance to ensure all required maintenance is performed in a professional manner, by experienced and qualified personnel, using only current and approved data, approved parts, and test equipment which meets recognised calibration requirements. Similarly, a pilot who carries out maintenance covered by Schedule 8 should also adhere to the above.

It is the responsibility of the holder of the

certificate of registration to ensure information he or she receives (for example, airworthiness directives) is actioned by the maintenance organisation.

It is also the responsibility of the holder of the certificate of registration to review (or arrange a competent person to do so on their behalf) service bulletins, service letters and other information published from time to time by the manufacturer.

If you, as a certificate of registration holder, arrange for a person to review this data on your behalf, you still have some statutory obligations.

Note that whether the holder of the certificate of registration elects to incorporate a service bulletin or not is their decision. However, this decision needs to be documented.

The fact that a manufacturer identifies a service bulletin as mandatory is not a regulatory requirement in Australia, unless CASA mandates that service bulletin via an airworthiness directive (see box on page 38).

So, having established we all have a responsibility for continuing airworthiness let us look at what and where some of those responsibilities are.

Continuing airworthiness is a complex subject but it involves simple philosophies with each player carrying the responsibility to ensure the correct actions are taken. It is important that everyone appreciates where they fit in the chain of events necessary to



ensure that an aircraft continues to meet the design standard and therefore the airworthy state of the aircraft.

It is also important for everyone to appreciate their individual and/or collective responsibilities to ensure the chain is not broken due to their lack of required action, whether that action be physical or information transfer to the next link.

Maintenance releases: This document or its approved alternative is the prime document which establishes the status of the aircraft and it is frequently misunderstood. When used correctly it provides the following:

- the period of its validity in hours to run or calendar time or both.
- along with the log book statement, identifies the daily inspection requirements by identifying the correct inspection schedule to be used.
- certification for completion of the daily inspection.
- maintenance which is required to be carried

out during its validity.

- a section for the recording of defects which occur or are found during operations. (Not necessarily grounding an aircraft but providing an important interface between the pilot and the LAME.)
- the facility to record the hours flown on completion of each day's flying.
- provision for clearing/certifying for required maintenance or defects by a LAME or an approved maintenance organisation. This includes maintenance which may be performed by a pilot under schedule 8.
- The operational category of the aircraft: private, aerial work, charter or regular public transport (RPT). The operational category is essential information for an air operator's certificate holder as well as the holder of a certificate of approval.

For example, an AOC holder cannot legally use an aircraft for charter operations with a current maintenance release identified as aerial work.

Equally, if the certificate of registration holder has identified via a log book statement (LBS) which identifies CASA schedule 5 or a system of maintenance and the operational category is identified on the LBS as charter, the maintenance organisation is required to ensure compliance with the requirements of AD/general/65 (fire extinguisher). In aerial work this requirement is not mandatory.

Further, if the log book statement specifies an operational category of private and requires only an annual inspection, then the maintenance organisation issuing the maintenance release is more likely to endorse several

items on part 1 of the maintenance release even though those requirements are not due to be carried out within 100 hours time in service. The reason being the maintenance organisation does not know how many hours will be flown during the calendar period.

The definition of private in this case is found in schedule 5 of the Civil Aviation Regulations: An aircraft is a class B aircraft and has a maximum take-off weight of 5,700kg or less and is used in private operations by the owner of the aircraft or a person to whom the owner has provided the aircraft without receiving any remuneration from the person.

The aircraft flight manual: This document contains the approved limitations within which the aircraft is considered to be airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft. The aircraft must, by law, be flown in accordance with the AFM.

In summary, the most important and effective way of ensuring continued airworthiness of an aircraft is by:

- operating the aircraft in accordance with the aircraft flight manual.
 - maintaining it in accordance with the correct, current and appropriate maintenance data.
 - correctly recording all relevant details of all flights, including flight time, weight and balance information and, where necessary, height/pressure differentials.
 - recording and reporting any defects.
 - establishing open and honest communications with not only your maintenance organisation but your local CASA office.
 - having maintenance performed as and when required, including proper daily inspections, by competent and appropriately trained personnel.
 - not relying on your memory when carrying out checks.
 - ensuring decals and printed instructions are legible and in place at all times.
- Remember, continuing airworthiness takes an effort by everyone concerned. It is not possible for one party to leave the responsibility to others. It is unwise to leave all maintenance decisions to the LAME. It certainly is not an excuse in law to claim you relied on the LAME to tell you about the requirements.

Bob Hoy is a former acting regional manager and district airworthiness manager for CASA.

Service bulletins: mandatory or not?

A MANUFACTURER'S service bulletin is not mandatory in Australia until CASA mandates that service bulletin through an airworthiness directive.

Even those service bulletins stamped as "Mandatory" by the safety regulator of the country of manufacturer are not mandatory in Australia until CASA issues an airworthiness directive.

Some manufacturers also stamp their service bulletins as "Mandatory". No matter how the service bulletin has been identified from the country of origin, it is not mandatory until an airworthiness directive has been issued by CASA.

However, if the Certificate of Registration holder has chosen to adopt an approved sys-

tem of maintenance under regulation 42M, then a manufacturer's service bulletin may be mandatory if it has been included in that approved system of maintenance.

However you need to be aware that if a manufacturer identifies in a service bulletin how a particular inspection should be carried out on a part then that becomes part of approved maintenance data and must be complied with. That is, service bulletins are approved maintenance data.

Certificate of registration holders should be aware that they – or their agents – must review manufacturers' maintenance data to ensure that their schedule or system of maintenance is OK.

*– Ken Cannane,
head of maintenance standards, CASA.*