

Impact Analysis

Proposed Part 43 of the *Civil Aviation Safety Regulations 1998*

Summary

CASA has reviewed the maintenance requirements applying to aircraft operating in the general aviation sector (private and aerial work operations). The review considered the regulatory objectives for general aviation to determine the appropriate regulatory requirements for maintenance.

CASA analysed data to assess the quality of maintenance for general aviation aircraft under the current regulatory requirements and whether maintenance contributes to adverse safety outcomes. The accident data indicates that the primary causes of incidents and accidents for general aviation aircraft are related to aircraft operation, not maintenance or technical issues.

Feedback from CASA audits of maintenance organisations and audits of aircraft maintenance also supported the view that there are no significant problems with the quality of maintenance carried out on general aviation aircraft. There are no widespread adverse safety findings, or major regulatory/safety breaches.

CASA considered the regulatory requirements for maintenance of general aviation aircraft within the US, European Union Aviation Safety Agency (EASA) and New Zealand. The review considered industry feedback that the existing regulatory requirements are more appropriate for airline operations and apply an unnecessary burden at the general aviation level and arguments that Australia should adopt the US Federal Aviation Administration (FAA) maintenance requirements in a new Part 43 of the *Civil Aviation Safety Regulations 1998* (CASR).

It is CASA's assessment that the US FAA maintenance regulations option would meet the regulatory objectives, in that the safety record of general aviation in the US over a number of years is comparable, or slightly better, than the Australian safety record and the option would reduce certain administrative requirements for industry.

The proposed CASR Part 43 would be based on the applicable FAA Federal Aviation Regulations with minor amendments. The two most significant amendments are to require the maintenance of Transport Category aircraft and turbine engines to be undertaken by an approved maintenance organisation.

The implementation of CASR Part 43 will only impact the maintenance of general aviation aircraft and will not affect the maintenance of aircraft operating outside of general aviation, including those undertaking air transport operations.

Background

General aviation covers all flying activity carried out in aircraft registered with CASA, other than scheduled and non-scheduled air transport operations¹. General aviation includes private flying and aerial work (flying training, mustering, firefighting and emergency service operations, community service flights, search and rescue, agricultural operations, aerial surveying and photography, and towing).

Current maintenance requirements for general aviation aircraft

Under the current maintenance regulations, primarily contained in Part 4 of the *Civil Aviation Regulations 1988* (CAR), aircraft engaged in general aviation are required to undertake periodic inspections, undertake maintenance tasks specified by a maintenance schedule, rectify defects and damage and complete required airworthiness tasks, including compliance with airworthiness directives. These activities are further explained below.

Periodic inspections

- A periodic inspection, for the purpose of issuing a maintenance release, must be completed every 12 months for aircraft used exclusively in private operations. For aerial work aircraft a periodic inspection is required every 12 months or every 100 hours of aircraft operating time, whichever comes first.

Ongoing Maintenance tasks

- The aircraft must be maintained according to one of three maintenance schedules, either the manufacturer's maintenance schedule, the CASA Maintenance Schedule in Schedule 5 to the CAR (often referred to as 'Schedule 5') or an approved system of maintenance. These schedules set out a range of maintenance tasks that must be undertaken based on aircraft operating hours, aircraft age, or time in service. Some examples of the tasks include replacing engine oil, inspecting control cables and structural inspections.
- The maintenance tasks must be undertaken by an individual or organisation approved by CASA, with the level of authorisation required varying depending on the task. Some basic preventative maintenance can be performed by the pilot/owner/operator, for example, replacing engine oil. Most major maintenance tasks must be undertaken and certified by a licensed engineer or someone holding a CASA authorisation for that task and the periodic maintenance release inspection must generally be carried out by an approved maintenance organisation.

Rectifying defects/damage

- In addition to ongoing maintenance tasks, the aircraft may incur damage or defect(s) that must be repaired. The rectification of damage or defects must be undertaken by an individual or organisation approved by CASA to perform such a task, this would be either an approved maintenance organisation, licensed engineer or someone holding a CASA authorisation.

Continuing airworthiness

- Separate from maintenance requirements, changes to an aircraft can be required in order to maintain its airworthiness. These can be airworthiness directives issued by the certifying authority of the aircraft or CASA, and service bulletins issued by the

¹ This definition includes VH registered limited category aircraft administered under CASR Part 132, but currently excludes flying in sailplanes (powered and unpowered), ultralight aircraft, hang gliders and autogyros that could potentially be registered by CASA.

aircraft manufacturer that must be complied with for aircraft not maintained under the CASA Maintenance Schedule. It is the responsibility of the registered operator to ensure these tasks are undertaken at the required point in time. These tasks must be undertaken by an individual or organisation approved by CASA to perform such a task, this would be either an approved maintenance organisation, licensed engineer or an individual holding a CASA authorisation.

Problem

The current maintenance requirements for general aviation aircraft were first developed in 1947 and were last reviewed over 30 years ago as part of the development of the *Civil Aviation Regulations 1988*.

Over time CASA has regularly engaged with the aviation sector through various formal and informal mechanisms and has received feedback from businesses, individuals and industry associations on the compliance burden of the existing regulatory requirements for the maintenance of general aviation aircraft. From this feedback it is clear that many operators in this sector believe that the current regulatory requirements impose an unnecessary regulatory burden, especially when compared to other countries.

During implementation of the Australian Government's Deregulation Agenda from 2014 formal feedback from industry stakeholders was requested. The feedback received indicated that the US or NZ maintenance requirements are superior for the general aviation sector than the Australian or EASA requirements.

A typical expression of this view is from the Aircraft Owners and Pilot Association of Australia:

EASA rules. The GA industry appears to be universally against this implementation. These rules are designed for and suit airline aircraft, not private GA. They are too complex for a typical small GA maintenance organization, and thus add more expense. Most GA aircraft are FAA type certificated. It is perverse and inappropriate to adopt European Rules. Other Pacific nations, including NZ (which has a thriving GA scene), use FAA regulations. In fact it is our belief that Australia should align ourselves with NZ, in regulation of individuals (not organizations), training and qualifications, and with inspection authorizations.²

A number of Parliamentary and Government Agency reports have made recommendations for CASA to minimise regulatory and administrative burden for the general aviation industry, which is further outlined below in Box 1.

The analysis of the safety data for general aviation aircraft indicates that there is no evidence to suggest aircraft maintenance is a significant contributor to accidents. Over the ten year period from January 2012 to January 2022, there were 882 general aviation accidents, of these the majority are operational or airspace related, with only 192 (approximately 22%) relating to a technical issue. The most common of these technical occurrences were partial or complete engine failures, lack of engine power and failures of

National Aviation Green Paper (2008): "the Government proposes to take the following initiatives: ensure CASA finalises its regulatory reform process to remove unnecessary regulatory impediments to the ongoing viability and growth of the general aviation sector.

² https://www.infrastructure.gov.au/aviation/asrr/submissions/files/070_aopa_25_jan_2014.pdf.

the landing gear. Based on our analysis, maintenance was a probable factor in only 7 of the 882 accidents over the 10 year period.³

Box 1: Selection of findings or recommendations relevant to the GA regulatory burden

Aviation Green Paper (2023) In relation to General Aviation ‘Some stakeholders consider CASA’s approach to regulation does not sufficiently consider industry burden, however other stakeholders have pointed to improvements in CASA’s regulatory approach.’

BITRE General Aviation Study (2017): “With CASA about to finalise many relevant parts of the regulatory framework applicable to GA, there is an opportunity to reduce the regulatory burden on GA through regulatory requirements that are more proportionate to the risks associated with GA activities but still maintain safety standards”.

ASRR (2014): Recommendation 28: The Civil Aviation Safety Authority establishes a safety oversight risk management hierarchy based on a categorisation of operations. Rulemaking and surveillance priorities should be proportionate to the safety risk.

National Aviation Policy White Paper (2009): “it is important that the cost of regulation does not place an unnecessary burden on the industry, and in particular on the regional and general aviation sectors”.

National Aviation Green Paper (2008): “the Government proposes to take the following initiatives: ensure CASA finalises its regulatory reform process to remove unnecessary regulatory impediments to the ongoing viability and growth of the general aviation sector.

Objective

The primary objective of the regulatory requirements for general aviation continuing airworthiness and maintenance, is to develop an efficient regulatory environment for the sector conducting private and aerial work operations. An efficient regulatory environment would help to achieve the lowest possible maintenance costs of aircraft while preserving appropriate levels of safety. Appropriate levels of safety take into account the degree to which General Aviation poses a safety risk for third parties (including individuals in other aircraft or individuals on the ground) and the extent to which individuals in General Aviation aircraft are informed of the safety risk involved in the operation of the aircraft and the ability of them to make decisions in response to that risk. CASA’s regulatory philosophy outlines in more detail the principles of how CASA makes these decisions.

Options

CASA considered two options that are discussed in this Impact Analysis document, the status quo and implementing the FAA regulations. At the time of CASA’s consideration of these options, the EASA regulations were not considered a viable option because EASA was in the process of reviewing their equivalent regulations. The New Zealand regulations are based on the FAA regulations with some minor implementation differences and, therefore, CASA saw no benefit in considering the New Zealand regulations as a separate option. For Option 2 (the FAA regulations) CASA did consider the limited number of known differences

³ There are a small number of accidents for which there is not an adequate explanation as to the cause and it is not possible to rule out aircraft maintenance as a factor, however, whilst maintenance factors cannot be ruled out, there is no evidence that aircraft maintenance was a contributing factor.

between the New Zealand regulations and the FAA regulations when choosing an implementation approach in Australia. Appendix 2 outlines in more detail the limited number of differences.

Option 1: Status quo

Under the current maintenance regulations, primarily contained in Part 4 of the *Civil Aviation Regulations 1988* (CAR), operators of aircraft engaged in general aviation are required to undertake periodic inspections, undertake maintenance tasks specified by a maintenance schedule, rectify defects and damage and complete required airworthiness tasks, including compliance with airworthiness directives.

For maintenance tasks that are normally required to be performed by a maintenance organisation, the CAR 30 maintenance approval requires the business to:

- develop a business manual to outline their processes for undertaking maintenance for Class A aircraft
- implement a Drug and Alcohol Management Plan, which if it is a small business with less than 10 employees, only requires a drug and alcohol education program for employees
- have suitable premises, necessary tooling and aircraft maintenance data
- employ licensed engineers
- for Class B aircraft, implement a Quality Management System which has evolved over time into a document that is similar in scope and complexity to the Class A procedures manual
- comply with ongoing surveillance
- submit variations to their manual.

For maintenance tasks requiring a licensed engineer there are different methods for obtaining an initial engineer licence. The primary method required by CASA regulations is the completion of a diploma at an approved training organisation to demonstrate competency to enable the individual to be issued with a licence. The other methods of obtaining a licence are self-study by the applicant, recognition of defence force qualifications or recognition of international qualifications. To obtain an aircraft type rating requires the engineer to complete a course provided by a training organisation authorised by CASA.

Maintenance tasks on general aviation aircraft can also be completed by an individual holding a CASA authorisation other than a licence or a maintenance organisation approval. Generally, these authorisations are issued for specific tasks or unique aircraft that are not covered by the current engineer licensing system, such as new aircraft types or warbirds. CASA issues the authorisation to individuals who have appropriate training and experience. For certain authorisations, such as welding authorisations, the regulations outline specific requirements for the issuing of the authorisation, whereas for other authorisations the criteria are determined on a case-by-case basis.

Option 2: New CASR Part 43 based on US Federal Aviation Regulations and selected other changes to reduce regulatory burden

This option would base the general aviation continuing airworthiness and maintenance requirements on the corresponding Federal Aviation Regulations (FARs), primarily FAR Part 43, and the necessary provisions in FAR Parts 65 and 91. FAR Part 65 covers the FAA's

maintenance personnel licensing system and FAR Part 91 covers basic requirements for aircraft operation.

For general aviation aircraft, Part 43 within Australia would be proposed to specify:

- detailed responsibilities of the various parties in relation to airworthiness and maintenance of aircraft
- continuing airworthiness standards that apply for an aircraft in service including what maintenance must be carried out and how it must be carried out
- who is permitted to carry out maintenance
- who is permitted to certify maintenance and release aircraft to service after maintenance
- requirements for annual inspection of aircraft to assess the aircraft against the design standards applicable to the aircraft and who is permitted to carry out such an inspection
- requirements for recording and rectifying defects
- requirements for keeping maintenance records.

As a result of the introduction of Part 43 under this option, existing CAR 30 Maintenance organisations that decide to operate under a Part 43 Inspection Authorisation to maintain small, simple general aviation sector aircraft:

- will no longer be required to have a manual, including a Drug and Alcohol Management Plan (although existing controls for individuals to comply with alcohol/drug and any other rules continue to apply), or have changes approved by CASA
- will no longer require a formal quality system and internal audits. This will free up time and resources, which some people have argued have been otherwise engaged in a non-productive annual activity that has no tangible safety benefit for maintenance of small, simple aircraft in this sector
- will no longer be limited by a Certificate of Approval and may take on any type of maintenance activity at its discretion (within the scope of its licence holders and with the appropriate facilities, data and equipment).

In addition, an organisation or independent licensed engineer may set up additional locations and carry out maintenance work at temporary locations without prior approval from CASA.

As a result of the introduction of Part 43 under this option, the following new/expanded maintenance provider options will be introduced:

- An individual licensed aircraft engineer may set up a maintenance facility without making application to CASA and, for small, simple aircraft, may carry out any maintenance, including the annual inspections for general aviation aircraft, that falls within the scope of their licence (subject to having the appropriate facilities, data and equipment).
- No CASA entry control inspection or assessment will be applicable for the activity mentioned in the preceding point, and no fees will be payable to CASA.

- Some complex maintenance such as transport category aircraft, turbine engine overhauls, annual inspections and major modifications are excluded from these arrangements or would require additional CASA approvals.
- These maintenance arrangements will remain subject to CASA oversight and surveillance.

The introduction of Part 43 under this option would also propose changes to the regime for annual inspections and major modifications:

- A licensed engineer will need to hold an Inspection Authorisation to release an aircraft to service after an annual inspection or a major modification or a major repair. Upon passing a CASA examination, the Inspection Authorisation will be issued to licensed engineers who hold the requisite licence, meet the experience requirements and have access to the required data, tooling and facilities.
- When performing the annual inspection, the Inspection Authorisation holder must review airworthiness directives relevant to the aircraft, and if found, airworthiness limitations or defects that are outstanding. The Inspection Authorisation holder provides the owner/operator of the aircraft with a list of required maintenance. At that time, the Inspection Authorisation holder has fulfilled his or her obligations and responsibility for correcting the discrepancies passes to the aircraft owner/operator.

The introduction of Part 43 under this option would also propose changes to the regime for maintenance certifications:

- An entry must be made in the aircraft records that describes the maintenance that has been carried out, the date the work was performed, the aircraft total time in service, and be signed by the person who supervised or performed the maintenance. The certification is also the release to service.
- When an inspection has been completed, the licensed engineer or Inspection Authorisation holder as applicable must make an entry stating that, with regard to the inspection, the aircraft is airworthy and released to service, or a statement that the aircraft is not approved for return to service and a list of discrepancies has been provided to the registered operator. These two entries will replace the current requirements stated in CARs 42ZE to 42ZN, 43 to 50 and CASA Schedule 6.

The introduction of Part 43 under this option would also propose changes to licensed engineer privileges:

- Part 43 will provide additional, more flexible means for licensed engineers to expand the use of their current certification privileges, subject to prescribed conditions and limitations.
- In addition to permissions from formal type ratings, a licensed engineer may certify a maintenance activity on a type rated aircraft if the engineer has satisfactorily carried out the maintenance under the supervision of a licensed engineer who has the privilege. What this will mean is that a licensed engineer will not be required to obtain type ratings to certify maintenance under Part 43 whether an aircraft is type rated or not; however, the scope can only be expanded incrementally, as competency is demonstrated task by task.

The introduction of Part 43 under this option would also propose changes to the scheme for independent inspections of critical flight control systems after maintenance:

- The independent inspection will be retained but will be considerably simplified. The inspection may be performed by any licensed engineer or a holder of a private pilot licence or higher.

The introduction of Part 43 under this option would also propose changes to the responsibilities of licensed engineers. A licensed engineer would be responsible for carrying out and certifying for maintenance. The licensed engineer would not be responsible for the following which will be clearly specified as responsibilities of the registered operator/owner of the aircraft:

- managing airworthiness of an aircraft
- ensuring compliance with airworthiness directives, except that at an annual inspection, the Inspection Authorisation holder will not authorise the aircraft for return to service if an applicable airworthiness directive that is due, has not been complied with
- assessing suitability of components, however a licensed engineer may not release an aircraft to service if a component has been fitted that is not acceptable according to the data for the aircraft.

The introduction of Part 43 under this option would also clarify the approval of minor modifications and repairs:

- The operator may have minor modifications and repairs incorporated on their aircraft by a licensed engineer in accordance with existing data, without the need for a dedicated Part 21 design approval.

Notably, the introduction of Part 43 under this option would not substantively change the continuing airworthiness requirements for transport category aircraft. Although such types of aircraft could fall under the Part 43 regime if they are only used in private or aerial work operations. Part 43 would operate to continue to require that maintenance is performed under a maintenance organisation, similar to the current requirements under the CAR. The requirements under Part 43 for these transport category aircraft are comparable to those under CASR Part 42, which means that aircraft are able to transition back to air transport operations with minimal additional maintenance requirements.

Summary of changes under Option 2

The following table outlines the key regulatory requirements for general aviation maintenance under the current regulations (Option 1) and under the FAA regulations of Option 2. In particular, the table outlines where current requirements are removed, where the new requirements are the same, where the new requirements are different, and where Option 2 will add requirements.

Table 1: Summary of options

	Option 1: current regulations	Option 2: FAA regulations
<i>Maintenance</i>		
Basic preventative maintenance	Permit operator/pilot maintenance	No change
Maintenance Data	Based on manufacturer, CASA schedule or individual data approved by CASA	No change
Periodic Inspections	Annual or every 100 hours	No change, but may be performed by holders of inspection authorisation instead of a CAR 30 maintenance organisation
<i>Airworthiness</i>		
Airworthiness directives	Must be complied with for all aircraft	No change
Minor aircraft repair/modifications	In accordance with existing data, including the relevant FAA Advisory Circular	In accordance with existing data with these sources, including the relevant FAA Advisory Circular clarified in Part 43
Major aircraft modifications	Must be undertaken by a Part 21 design organisation	No change
<i>Maintenance businesses</i>		
CASA approval	Required for issuing release to service after periodic inspections	Maintenance organisation approval no longer required for small, simple aircraft
Organisational manual	Required for businesses that undertake periodic inspections	No longer required for small, simple aircraft
Inspection authorisation	Not required	New requirement
Maintenance data and equipment	Businesses to provide evidence to CASA prior to commencing operations	No longer required to be provided to CASA before commencing operations
Record keeping	Businesses to provide evidence to CASA	Maintainer provides to operator in aircraft records
Maintenance on type rated aircraft	Must be undertaken by engineers with a type rating	Undertaken by an engineer with a type rating or with demonstrated competency on that aircraft type

* Further information on the requirements of Part 43 can be found at: [Part 43 of CASR Maintenance of aircraft in private and aerial work operations | Civil Aviation Safety Authority \(casa.gov.au\)](#)

Impact of proposed Option 2 arrangements including new CASR Part 43

Summary of impacts

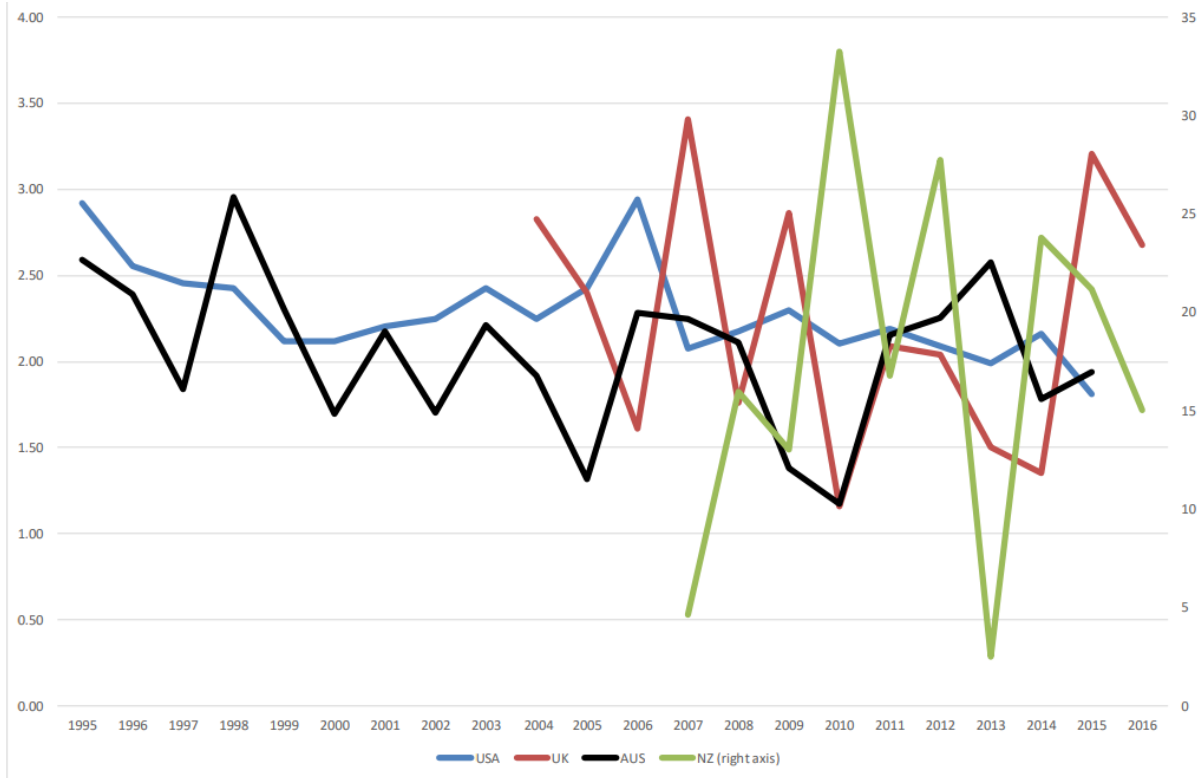
Option 2 is assessed as having the following high level impacts in areas of regulatory interest:

1. Aircraft owners/operators that operate exclusively in general aviation are likely to see an increase in the number of businesses that provide annual inspections and perform maintenance, with future service providers under the Part 43 arrangements to encompass both traditional CASA approved maintenance organisations and individual CASA licensed engineers. Certain aircraft owners are likely to benefit from the clarification of the airworthiness requirements.
2. Existing CAR 30 maintenance organisations that decide to conduct activities through an Inspection Authorisation, held by an individual within the organisation, will save compliance costs of maintaining their CASA approval. That is, they will no longer be required to incur the compliance cost of updating manuals, undertaking periodic audits or maintaining certain administrative records. Existing maintenance organisations may be faced with additional competition from new business entrants based on the obtainment of an Inspection Authorisation being a less costly initial approval process than that of a CAR 30 authorisation.
3. Part 43 will lower the barriers for persons to conduct maintenance on most aircraft used only in general aviation operations. New entrants will no longer require an organisational approval from CASA in order to undertake the annual inspections of most general aviation aircraft.
4. Part 43 will clarify the process for approval of a minor modification. As this is a clarification, Part 43 will not have a significant impact on Part 21 design organisations.
5. Consultation feedback to CASA was that Part 43 is likely to expand the availability of maintenance services in rural and remote areas. CASA is of the view that this is likely to occur through the expansion of regulatory privileges of existing engineers located in rural and remote areas, rather than from a movement of resources from other geographic areas.
6. As the changes that Part 43 will introduce are relatively minor compared to the existing maintenance requirements, CASA does not expect any significant changes to the quality of maintenance or safety outcomes. It is relevant to note that the US and NZ, which have a similar Part 43, have a comparable or a slightly better safety record for general aviation when the favourable operating environment of Australia is taken into account. This was highlighted by a BITRE study⁴ of General Aviation that included an international comparison of the GA fatal accident rate (figure 1).

⁴ [Microsoft Word - C2_General Aviation Study.docx \(bitre.gov.au\)](#)

Figure 1: GA fatality rate per million hours flown - international comparison

Fatality Rate per million flight hours



These impacts are further explained below and in Appendix 3.

Approval of maintenance

The most significant impact of introducing Part 43 will be permitting a wider range of maintenance on general aviation aircraft to be undertaken by a licensed engineer outside of a CASA-approved maintenance organisation. This change will benefit existing maintenance organisations and licensed engineers who will no longer be required to obtain (and maintain) a maintenance organisation approval to conduct operations that they are trained and qualified to complete. This is also likely to result in some savings for the operators of general aviation aircraft.

Maintenance organisation approval savings

The savings from avoiding the need to obtain an initial maintenance organisation approval will provide a benefit to the business, in particular because the business would avoid the need to prepare a manual and incur the cost of a CASA approval process that can take approximately six months. CASA has estimated the initial approval savings per business at approximately \$45,000 (Appendix 1).

There will also be significant cost savings for existing organisations on an ongoing basis from avoiding the need to have variations to the organisation’s activities approved by CASA and being subject to CASA audits of the organisation’s documentation and procedures (CASA will be moving to an oversight system based on auditing the maintenance undertaken on a specific aircraft). CASA has estimated the organisational approval variations at

approximately \$940 per variation and estimated the audit savings at approximately \$1280 per audit (Appendix 1). The frequency of audits for CAR 30 organisations is based on a risk assessment, with most organisations audited either once every year or once every second year. The total cost estimates for the industry are based on 345 audits being undertaken by CASA every year.

Inspection Authorisation

Whilst the need for a maintenance organisation approval is removed under Part 43 for specific maintenance activities, a licensed engineer must hold an Inspection Authorisation in order to undertake an annual inspection. This would involve the engineer sitting and passing an examination with the cost of this activity estimated at \$200. Whilst the renewal cost is likely to be less than \$200, the worst-case scenario would be that the renewal would cost \$200 if an examination is required.

Maintenance tasks

Another benefit of introducing Part 43 would be the clarification of what maintenance is required and the removal of non-safety related maintenance tasks from mandatory requirements.

Clarification

Under the current regulations there is a perceived ambiguity as to the definition of what defects are required to be rectified at a periodic inspection before the aircraft can be issued with a release to service certificate (maintenance release). Under Part 43 it will be made clear that the required maintenance will be the rectification of any defect in order to ensure that the aircraft meets the relevant Part 21 certification standards, and that any essential survival or role equipment is functional.

Whilst there will be no new continuing airworthiness requirements for a periodic inspection, some industry stakeholders may perceive the requirement to check that the aircraft meets the Part 21 type certificate as a new requirement. However, this requirement is not expected to have a significant impact because that has been the underlying intent of the currently required maintenance schedules.

Compliance with service bulletins

Aircraft manufacturers issue documents (e.g. service bulletins) from time to time advising of maintenance actions that can be carried out. The reasons behind these service bulletins range widely. In some cases, service bulletins address a known safety issue, but more often these documents cover a range of minor subjects such as reliability enhancements and alternative parts. The current regulations are unclear as to whether service bulletins must be carried out in some situations, resulting in inconsistent application over time. Part 43 will be clear that a service bulletin is not automatically required unless it is specified in an airworthiness directive or an airworthiness limitation section. Registered operators, Inspection Authorisation holders and maintenance providers will be responsible for assessing the airworthiness of an aircraft in relation to the aircraft's type certification, airworthiness directives and the current condition of the aircraft – those considerations will be the basis for the decision on whether or not other service bulletins should be carried out on that aircraft.

Simplified record keeping

There will be additional savings from a simplified record keeping system. The maintenance organisation under the current regulations must now retain maintenance work sheets for two years.

Under Part 43 this record keeping requirement will be removed (for maintenance organisations) – all required maintenance information will be held in the aircraft's records system.

Summary of financial impact

Under Option 1, the status quo remains in place and is estimated to impose an annual compliance cost of approximately \$1m (Table 2). The current scheme draws criticism from industry for being overly burdensome without delivering additional safety benefits. Option 2 is estimated to impose a compliance burden of \$2,400 (Table 2).

The following table summarises the cost impact of Option 1 and Option 2, with Appendix 1 providing further information on the derivation of the estimates.

Table 2: Annualised cost impact by Option

	<i>Option 1</i>	<i>Option 2</i>
<i>Organisational approval scheme</i>	\$544,800*	\$0
<i>Inspection Authorisation scheme</i>	\$0	\$2,400**
<i>Manual variations</i>	\$51,700	\$0
<i>Audit costs</i>	\$441,600	\$0
Total annual costs	\$1,038,100	\$2400

*Assumption of 12 new Maintenance Organisation approvals each year

** Assumption of 12 new Inspection Authorisation approvals each year

In terms of a quantified summary, the total annualised cost saving of implementing Option 2 is estimated at approximately \$1m (Table 2). CASA has attempted to analyse this in the context of the total maintenance costs incurred by the General Aviation sector, in part to show the significance of this impact.

The BITRE estimates a total number of general aviation flight hours of 1.15m flight hours for the year 2021 (p.13, BITRE 2022). Whilst the BITRE does not provide an estimate of the maintenance cost per flight hour, the US FAA reports (p.4-14, FAA 2021) the maintenance costs per flight hour of general aviation aircraft, to be an estimated \$90 per hour for a single engine fixed wing aircraft, which would equate to \$128 per hour when converted to Australian dollars using an exchange rate of 0.7. Therefore, this would indicate that a maintenance cost of \$128 per flight hour when applied to the 1.15m flight hours for Australian general aviation aircraft would generate a total maintenance cost of \$147m per annum.

It is possible to use this general aviation maintenance cost of \$147m to put the estimated savings of implementing Option 2 into context. A \$1m cost saving of introducing Option 2

would represent less than 1% of the total annualised general aviation maintenance cost of \$147m.

The impact of implementing the Part 43 option will differ by individual or organisation. CASA has attempted to summarise the distribution of the impact in Appendix 3.

Consultation

In July 2018, the then Minister for Infrastructure, Transport and Regional Development advised industry that CASA had commenced work on the development of a new set of modernised maintenance regulations for general aviation, in co-operation with the sector.

In August 2018, CASA consulted with industry representatives and the general public on the intended policies for the new maintenance regulations. The consultation has shown overwhelming support for a set of maintenance regulations based on the FARs of the USA, in preference to the current scheme using maintenance organisations approved under CAR 30.

An overwhelming 78 per cent of respondents indicated a preference for the United States – Federal Aviation Regulation’s (US-FARs) model. Of the 11 per cent of respondents who indicated a preference for the New Zealand Civil Aviation Regulations (NZ-CARs), most indicated the FARs as their second choice. CASA acknowledges that whilst considerable effort is made to engage industry in consultation, many affected people do not respond to these consultation surveys. However, through industry seminars, consultation presentations in the regions and the technical working group for this project, CASA considers the survey results to be generally representative of the wider general aviation industry.

CASA has also conducted a detailed technical review of the US FARs. CASA considers the US FARs to be a well-established set of regulations that are readily accepted by the FAA and US aviation industry. The FAA requirements are clear and scalable across a wide range of aircraft and operations, promote pathways for industry growth, and obtain good safety outcomes that are historically slightly better than those in Australia.

A Technical Working Group (TWG) appointed by the Aviation Safety Advisory Panel met in September 2018, reviewed the consultation feedback and considered the policy options. As a result of the technical review and this industry consultation and engagement, a CASR Part 43 based on the US FARs was confirmed as the best model for regulating maintenance on general aviation aircraft.

Public Consultation

CASA published the proposed Part 43 requirements for consultation in 2022. Whilst the majority of the feedback was supportive of Part 43, CASA did receive feedback that existing maintenance organisations could be negatively impacted by Part 43. One argument was that existing maintenance organisations have made substantial investments in documentation and procedures that the proposed Inspection Authorisation holder would not be required to make and, as such, the Inspection Authorisation holder will have a lower cost base and be able to undercut the prices and take market share from existing maintenance organisations.

The main investment of existing maintenance organisations is obtaining a CAR 30 approval from CASA, including procuring appropriate facilities, tools and data, as well as developing acceptable documentation. The argument received in consultation feedback was that a new Inspection Authorisation holder may be able to avoid these investment costs.

CASA does not believe there will be a significant negative impact on existing maintenance organisations for three reasons.

The most significant reason is that the cost base of an Inspection Authorisation holder is expected to be broadly similar in terms of the delivery of services, exclusive of CASA regulatory costs, to that of an existing CAR 30 business. In particular, the component of the 'cost base' of an existing CAR 30 organisation arising from compliance with CASA requirements, including obtaining the CAR 30 authorisation, is understood to be only a small portion of the overall cost base for the organisation. Similarly, the ongoing costs of a CAR 30 authorisation holder are expected to be largely the same as that of a new Inspection Authorisation holder – for example, costs of maintaining facilities, tooling and insurance. It is for this reason that only modest savings to industry are expected from the Part 43 scheme, despite the savings expected from reduced CASA administrative compliance costs for new entrants to the sector for the provision of general aviation maintenance. This is important because it means that an existing CAR 30 will not be disproportionately burdened with servicing the sunk costs of establishing their CAR 30 organisation.

In this regard, the approximately \$45,000 one-off cost that a new entrant obtaining an Inspection Authorisation will avoid (compared with obtaining a CAR 30 approval) is not considered significant in the context of other set up costs, or the ongoing cost base of the business. This cost difference is not expected to lead to any undercutting of prices of existing CAR 30 businesses, as outlined above the expected savings are less than 1% of total maintenance costs for the sector.

Secondly, further supporting this assessment of a comparable cost base between CAR 30 organisations and new Inspection Authorisation holders in Australia, there is evidence in the US that Inspection Authorisation holders generally operate in a similar way to existing Australian CAR 30 maintenance organisations, in that they generally have a permanent building, with access to tooling and maintenance data.

A third reason is that with a similar ongoing cost base, and therefore prices charged to customers, for both new Inspection Authorisation holders and existing CAR 30 organisations, it is likely that aircraft operators will continue to choose their existing maintenance organisation, especially if they are satisfied with the quality of the service provided.

Some commenters submitted responses to the public consultation generally opposing the introduction of Part 43 because of a perceived, unacceptable lowering of safety standards. The main issues included:

- the perceived need for maintenance organisation approvals to ensure appropriate levels of safety
- arguments that all Part 43 maintenance permissions should be CASR Part 66 licences
- the proposed policies and draft legislation do not sufficiently align with the US FARs in all regards
- concerns about the consultation process.

CASA has reviewed and considered these issues in collaboration with the Part 43 technical working group, and including in the light of the general aviation safety outcomes in the US. After further engagements with the TWG, CASA considers that these issues have been appropriately considered and addressed where appropriate.

In addition, CASA has provided specific detail on the consultation responses and summarised the feedback on the proposed Part 43 option by issue in a separate Summary of Consultation document. This Summary of Consultation also outlines CASA's response to the

issues raised during consultation, including the reasoning for CASA's response and whether changes were made as result of the issues raised during consultation.

Implementation and Review

In pursuit of the preferred Option 2 above, CASA will incorporate the applicable FAR regulations into the CASR with minimal amendments that primarily relate to:

- changing words, titles, phrases or legal terminology that are incompatible with Australian legal terms
- clarifications to remove ambiguity or uncertainty
- making necessary formatting, paragraph structure and numbering changes
- incorporating any differences to the proposed policy outcomes that have been consulted with the general aviation sector
- accommodating some variations that are appropriate for the contemporary Australian environment, including the integration with the existing Australian engineer licensing requirements that do not align with the FAA engineer licensing requirements.

The new rule set will not introduce a new Aircraft Maintenance Engineer (LAME) licence. Some changes will be made to accommodate the Inspection Authorisation and expanded scope of maintenance, but these changes will be limited to maintenance under Part 43. The changes will not affect maintenance under Part 42 of CASR that principally relates to maintenance on aircraft used for air transport operations.

Transition

The intention is for the regulations to be made in 2024 and be effective from late 2024. However, there will be a transition period of at least three years to ensure that aircraft owner/operators, maintenance organisations and licenced engineers have sufficient time to understand the new maintenance requirements, in particular for the periodic inspection requirement and allow industry participants an extended period of time to make and implement decisions on how they will comply.

During the transition period:

- CASA will provide information material to all existing licensed engineers and maintenance organisations to minimise the cost to engineers and maintenance organisations of this regulatory change.
- Licensed engineers can apply to CASA for an Inspection Authorisation and once received will be able to exercise the privileges of that authorisation
- All existing maintenance organisations will maintain their existing regulatory authority, including the ability to certify maintenance on General Aviation aircraft. Maintenance organisations will have the ability to certify maintenance under the existing *Civil Aviation Regulations 1988* or under Part 43 of the *Civil Aviation Safety Regulations 1998*
- For aircraft owners/operators Part 43 will be optional and there will be choice of maintaining aircraft under the existing *Civil Aviation Regulations 1988* or Part 43 of the *Civil Aviation Safety Regulations 1998*

At the end of the transition period the periodic inspection for General Aviation aircraft must be done by the holder of an Inspection Authorisation, or a CASR Part 145 Maintenance Organisation. CASA will consult a further legislative amendment to conclude to the end of the transition period. Transition will be optional for affected industry participants, including aircraft owners, operators, and maintenance providers, until that amendment is made.

Review

CASA will undertake ongoing monitoring of the industry sector to examine the performance of Part 43. Measuring the successfulness of the implementation of Part 43 and the need for any further refinements will be based on the following metrics:

- The extent to which industry understands the requirements contained in Part 43, which in part will be determined by industry feedback on the CASA guidance material provided during the transition
- Feedback to CASA from Inspection Authorisation applicants on the reasonableness of the examination and application process
- The extent to which industry complies with the new requirements, to be based on routine CASA oversight and surveillance of industry
- The level of reported safety incidents involving General Aviation aircraft and changes in the number of accidents involving General Aviation aircraft that could be attributed to maintenance issues.

Conclusion

The current maintenance regulations for general aviation were originally developed in 1947 and updated on an ad hoc basis since that time with the last major update and re-issue in 1988.

CASA has recently reviewed the maintenance requirements applying to aircraft operating in the general aviation sector. The review considered the maintenance requirements for aircraft operating in general aviation against the regulatory objectives to determine the appropriate regulatory requirements. The review was undertaken against the background of significant industry feedback that the existing regulatory requirements apply an unnecessary burden given the safety risks involved in private and aerial work operations and many argued for Australia to adopt the FAA maintenance requirements.

CASA assessed the current quality of maintenance for general aviation aircraft and the related issue of the extent to which maintenance contributes to adverse safety outcomes. Whilst technical issues are linked to approximately 22 per cent of accidents, analysis of these indicates that the majority of these are not related to improper or insufficient aircraft maintenance. Feedback from CASA audits of maintenance organisations and audits of aircraft maintenance also supported the view that there are no significant problems with the quality of maintenance carried out on general aviation aircraft. In addition, CASA's review of the maintenance standards that are applied in other countries provide a case for the removal of some regulatory requirements that do not contribute to safety and the repeal of which would not adversely affect safety outcomes.

Based on CASA's assessment that the FAA maintenance regulations would meet the regulatory objectives and have widespread industry support, CASA is now proposing to adopt the FAA maintenance rules with minimal amendments for aircraft operated in the general aviation sector. This covers all flying activity carried out in VH registered aircraft other than air transport operations. This includes flying training, mustering, firefighting and emergency service operations, search and rescue, agricultural operations, aerial surveying and photography, towing, and private flying operations.

References:

Bureau of Infrastructure and Transport Research Economics (BITRE) 2022, Australian Aircraft Activity 2021, Statistical Report, BITRE, Canberra, Australia.

FAA (2021) *ECONOMIC VALUES FOR FAA INVESTMENT AND REGULATORY DECISIONS, A GUIDE: 2021 Update*, FAA Office of Aviation Policy and Plans, U.S. Federal Aviation Administration Washington, DC 20591.

Appendix 1: Estimated savings

CAR Part 4 requires a business undertaking aircraft maintenance to be CASA approved. The CAR Part 30 maintenance approval requires the business to:

- develop a business manual to outline their processes for undertaking maintenance
- implement a Quality Management System
- comply with ongoing surveillance
- submit variations to their manual.

In 2014 CASA surveyed a number of businesses that had recently obtained a CAR 30 approval, varied their existing manual or had been subject to ongoing surveillance. The purpose of the survey was to determine the time and resource cost involved in complying with the CAR Part 4 requirements. The major findings were:

- the average time to prepare the manual was six weeks of full-time work for one person
- 3 days to complete other associated paperwork, including the application form
- 1 day for a CASA site visit
- 2 days for other miscellaneous requirements, including corresponding with CASA
- CASA assessment fees of \$3,000.

Delay costs

Approximately 75% of businesses reported that the time between submitting their application and obtaining the approval, typically 6 months, represented a delay cost during which they incurred costs for maintaining a building and maintenance data without any ability to undertake revenue producing work. The point was made that the business was required to demonstrate in their application that they had a suitable building and data which necessitated purchasing or leasing hangars, equipment, special tooling and a data library before they could submit an application or commence work.

The average annual cost of purchasing these is estimated at approximately \$40,000 in total, including \$25,000 for a leased building and \$15,000 for maintenance data. A six-month delay in the use of the building and data would result in a delay cost of approximately \$20,000.

Number of Initial approvals, variations and audits

There had been 61 initial CAR 30 approvals issued from July 2009 to July 2014, representing an average of 12 per year. There had been 273 CAR 30 variations issued over the same time period, representing an average of 55 per year. CASA audits CAR 30 maintenance organisations, which typically require the lost revenue time of one person for 2 days per year.

Table 3 shows CAR 30 compliance costs for industry based on an hourly wage rate of \$80.

Table 3: CAR 30 Compliance Costs for Industry

	Average number of days	Cost per day	Total cost
<i>Initial</i>			
Time to prepare the manual	30	\$640	\$19,200
Other time associated with the application	5	\$640	\$3,200
Delay costs			\$20,000
CASA assessment costs			\$3,000
Total cost per initial issue			\$45,400
Number of initial approvals issued per year			12
Annual industry cost – new entrants			\$544,800
<i>Variations</i>			
Time to prepare the manual variation	0.5	\$640	\$320
Other time associated with the variation	0.5	\$640	\$320
CASA assessment costs			\$300
Total cost per variation			\$940
Number of variations per year			55
Annual industry cost - variations			\$51,700
<i>Audit costs</i>			
Time to comply with audit	2	\$640	\$1,280
Number of businesses			345
Annual industry cost – CASA audit			\$441,600
Total annual CAR 30 cost to industry			\$1,038,100

Appendix 2: EASA and New Zealand Regulations

EASA and New Zealand regulations, similarities and differences

Most like-minded countries and regulators recognise that a proportionate approach needs to be taken for general aviation regulation and this is reflected in their general aviation continuing airworthiness and maintenance rules.

Of particular note, New Zealand and, more recently, EASA have recognised that an approach similar to that of the US FAR Part 43 is the most appropriate approach for continuing airworthiness and maintenance of general aviation aircraft. Common features are less need for maintenance organisation approvals and more flexibility for maintainers and operators compared with the requirements for air transport operations.

However, there are some differences in the application of the regulations in each jurisdiction and between current and proposed EASA and New Zealand Civil Aviation Authority (NZ CAA) regulations and CASA's proposed Part 43. Each regulator applies, or is proposing to apply, their regulation set (comparative to CASA's Part 43) to different sectors of their industry.

CASA's proposed Part 43, EASA and NZ CAA regulations all contain consistent provisions for:

- how maintenance is performed
- record keeping
- the requirement to use appropriate data, tooling and parts
- critical system independent inspections
- defect reporting.

EASA's current and proposed regulations are restricted to relatively small simple aircraft. EASA operators are required to contract airworthiness control to an approved organisation for aircraft conducting commercial operations.

There are no provisions for extending engineer licencing privileges outside formal training in the EASA system. EASA has introduced a "light" licence which requires practical experience and examinations.

The NZ CAA Part 43 is very similar to CASA's proposal. In one respect, the NZ regulations are less restrictive in that they apply to most aircraft across their industry. However, several areas of their regulations are more restrictive than our proposal. For example:

- more component maintenance must be carried out by an approved maintenance organisation
- aircraft must have a technical log, or alternative approved by the regulator
- following major modifications or repairs, the holder of an Inspection Authorisation is required to complete and submit Form 337 to the operator and NZ CAA.
- The licencing system does not provide for "out of category" extension to licence privileges by practical experience, without approval by the authority.

When considered as overall regulation sets, as applicable to their respective general aviation sector aircraft, the EASA and NZ CAA regulations are more restrictive in some areas than CASA's proposal for the same kinds of aircraft.

Appendix 3: Distribution of Impacts

What is the impact of Part 43 on aircraft owners?

The aircraft owners/operators that operate exclusively in general aviation will be impacted by Part 43 in two primary ways:

- The introduction of the Inspection Authorisation is likely to increase the number of businesses that provide annual/100 hourly inspections.
- Whilst less certain, Part 43 is also likely to increase the overall number of maintenance providers for general aviation aircraft. Whilst independent engineers can provide a range of maintenance under the existing regulatory requirements, Part 43 will codify these and may provide an incentive for a greater number of engineers to provide these services as a business.

The specific impact of Part 43 will vary for particular, or different categories, of aircraft.

One category of aircraft that will not be significantly impacted is transport category aircraft that are operated exclusively in general aviation operations. These aircraft, which are generally complex and/or large aircraft, can be maintained under Part 43, however, the continuing airworthiness and maintenance requirements will not be changed significantly from the existing regulatory requirements. The Part 43 maintenance requirements for transport category aircraft are comparable to those specified in CASR Part 42 and will require all aircraft maintenance to be undertaken by a maintenance organisation approved under CASR Part 145.

There is likely to be a spectrum of impacted aircraft owner/operators in practical terms depending on the type of maintenance that is undertaken, compliance with service bulletins and the decision of the existing maintenance organisation to transition to an Inspection Authorisation or Part 145. It is possible that some aircraft owner/operators may not observe an impact if they continue to obtain maintenance from an existing business that moves from an organisational CAR 30 arrangement to an individual Inspection Authorisation. It is also possible that such a business observes a modest reduction in the costs of such maintenance.

What is the impact of Part 43 on existing maintenance organisations?

The implementation of Part 43 is designed to enable existing maintenance organisations to opt in to the new requirements over 3 years, after which the CAR 30 scheme will cease to be available for maintenance on general aviation aircraft.⁵ Whilst existing maintenance organisations will be able to operate unaffected during the transition period, at the expiry of 3 years in order to continue to undertake maintenance on general aviation aircraft they will be required to either:

- transition to approval as a maintenance organisation under CASR Part 145
- obtain an Inspection Authorisation to enable annual inspections, and/or employ suitable LAMEs to undertake maintenance.

One benefit for existing organisations that relinquish their CAR 30 authorisation in favour of a new Inspection Authorisation is that they will save some compliance costs of maintaining their CASA approval. That is, they will no longer be required to incur the compliance cost of updating manuals, undertaking periodic audits and maintaining administrative records. This

⁵ The new maintenance organisation arrangements will be legislated through a separate regulatory change activity with proposed amendments to Parts 42 and 145 of CASR, at which point CASA proposes to repeal the CAR 30 scheme. The final timing for these new arrangements is yet to be determined.

is estimated to be a saving of approximately \$1,000 per audit and \$800 per manual variation (Appendix 1).

Existing maintenance organisations may be faced with additional competition from new business entrants based on the obtainment of an Inspection Authorisation being a less costly approval than that of a CAR 30.

What is the impact of Part 43 on potential new maintenance organisations, compared with existing entry control rules?

Part 43 will lower the barriers to persons to enter the market for maintenance on general aviation aircraft. New entrants will no longer require an organisational approval from CASA in order to undertake the annual inspections of most general aviation aircraft. These new entrants will avoid the need to:

- prepare a business operations manual
- demonstrate to CASA the existence of premises, tooling and aircraft maintenance data before undertaking revenue producing work
- interact with CASA and pay CASA fees for routine audits and business variations.

CASA estimates avoiding these requirements would save each new entrant approximately \$40 000 in establishment costs (Appendix 1).

What is the impact of Part 43 on Part 21 design organisations?

Part 43 will clarify the process for approval of a minor modification and when a modification requires the modification design to be undertaken by a Part 21 approved design organisation. These changes are a clarification of existing industry practice and therefore are not expected to impact the operation of Part 21 design organisations. This finding was supported by informal consultation with Part 21 design organisations, that confirmed that they expected no impact on their business from the introduction of Part 43.

What is the impact of Part 43 on safety?

The changes that Part 43 will introduce are relatively minor and do not affect the core requirements for General Aircraft to be:

- subject to continuing airworthiness requirements, including the rectification of defects
- maintained according to approved maintenance data
- maintained by qualified individuals, and for maintenance to be certified by qualified individuals
- subject to CASA oversight/audit.

Part 43 is replacing the requirement for a CASA organisational approval to undertake annual inspections for non-complex general aviation aircraft with the requirement for a CASA approval of an individual to certify for such inspections.

Some stakeholders have expressed concern about the increased flexibility for licence holders to expand privileges outside the formal Part 66/147 training system. The CASR Part 43 policy is based on the corresponding policy of the USA, which has demonstrated acceptable safety outcomes across all sectors. The additional flexibility under CASR Part 43 is limited to Part 43 maintenance, so there will be no effect on air transport aircraft. CASA

has prepared extensive information for industry to explain the new arrangements and the associated limitations.

The US and NZ, which have a similar Part 43, have evidence of a comparable or a slightly better safety record for general aviation than Australia.

What is the impact of Part 43 on the availability of maintenance services in rural and remote areas?

Consultation feedback to CASA was that Part 43 is likely to expand the availability of maintenance services in rural and remote areas.

Under the current regulatory requirements, a maintenance organisation requires CASA approval in order to undertake maintenance at a particular location. Given the cost of such an approval, this limits the approved locations to those areas that provide a sufficient volume of work and generally precludes locations that only provide sporadic work, in particular rural and remote areas.

Further, the feedback to CASA was that with the introduction of Part 43, with the removal of the need to have maintenance locations subject to CASA approval, this will increase the incentive for maintenance providers to provide maintenance in rural and remote areas.

It is also possible that slightly different business models will evolve, such as an Inspection Authorisation holder specialising in providing annual inspections in rural and remote areas and they effectively travel from location to location. However, they do not provide the maintenance that is required based on the inspection, rather this could be provided by either a specialist engineer who travels to rural areas or the aircraft owner knowing what maintenance is required can specifically take it to a maintenance provider who specializes in that type of maintenance.