



Civil Aviation Advisory Publication

November 2012

CAAPs provide guidance, interpretation and explanation on complying with the Civil Aviation Regulations (CAR) or Civil Aviation Orders (CAO).

This CAAP provides advisory information to the aviation industry in support of a particular CAR or CAO. Ordinarily, the CAAP will provide additional 'how to' information not found in the source CAR, or elsewhere.

A CAAP is not intended to clarify the intent of a CAR, which must be clear from a reading of the regulation itself, nor may the CAAP contain mandatory requirements not contained in legislation.

Note: Read this advisory publication in conjunction with the appropriate regulations/orders.

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Defect Reporting

The relevant regulations and other references

- Part 4B of CAR 1988, deals with reporting of defects on Australian aircraft or components.

This CAAP will be of interest to:

- Aircraft Registered Operators
- Certificate of Approval holders
- Air Operator's Certificate holders
- Aircraft Engineer Licence holder
- Pilots or other persons authorised to carry out maintenance.

Why this publication was written

Regulations 51, 51A, 51B and 52 of the Civil Aviation Regulations (CAR 1988), require the reporting of defects in aircraft and aircraft components to the Civil Aviation Safety Authority (CASA).

This Civil Aviation Advisory Publication (CAAP) provides guidance as to the kind of defects that must be reported to CASA and when. This CAAP does **not** deal with defect reporting required by Part 42 of the Civil Aviation Safety Regulations 1998 (CASR 1998).

Status of this CAAP

This CAAP replaces CAAP 51-1(1) dated June 2001. The CAAP has been amended to address a mismatch between established practices and new technology which has emerged over the past decade.

For further information

Contact the CASA Service Difficulty Reporting (SDR) Unit on 131 757

1. Acronyms

AD	Airworthiness Directive
AOC	Air Operator's Certificate
CAAP	Civil Aviation Advisory Publication
CAR	Civil Aviation Regulations 1988
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998
MLG	Main Landing Gear
OEM	Original Equipment Manufacturer
RO	Registered Operator
SDR	Service Difficulty Reporting

2. Definitions

The *CASR Dictionary* defines MAJOR DEFECT to mean:

- in relation to an aircraft, a defect of such a kind that it may affect the safety of the aircraft or cause the aircraft to become a danger to persons or property; and
- in relation to an aircraft component that is not fitted to an aircraft, a defect of such a kind that if the component is fitted to an aircraft it may affect the safety of the aircraft or cause the aircraft to become a danger to persons or property.

CASA regards a DEFECT as any defect that is not a major defect and is something that is an imperfection that impairs the structure, composition, or function of an object or system of an aircraft or component.

MALFUNCTION - when a part of an aircraft structure, aircraft engine, propeller, system or component fails to operate in the manner for which it was designed.

FAILURE - the lack of expected or satisfactory performance. (Example: the overloading or overstraining of a structure to such an extent that it can no longer perform its required function).

3. Introduction

3.1 The purpose of the defect reporting scheme is to:

- permit the assessment of reports to detect trends in the Australian aircraft fleet and products;
- permit timely airworthiness and safety oversight of the Australian aircraft fleet;
- provide feedback to industry to promote aircraft & product improvement; and
- assist in long term improvement in design, manufacturing and maintenance standards.

3.2 CASA uses SDRs as a means of identifying trends in design and maintenance reliability. Reports are entered into a database by CASA and a de-identified summary of submitted SDR data is available on CASA's website. It is of benefit to both CASA and the aviation industry that the database contains as much accurate information as possible. CASA may use this information as a basis for an Airworthiness Directive (AD), other advisory publications, such as Airworthiness Bulletins and other appropriate regulatory purposes. From this database, information may be obtained to provide reliability statistics and trend monitoring of aircraft, engines, propellers, systems and components. CASA shares this information with other regulatory authorities.

3.3 CASA publishes monthly and yearly summaries of SDR information on its website. Archived records are also available from the CASA SDR Unit. You can access summaries of Australian and Foreign defect reports from the following web sites:

CASA: <http://www.casa.gov.au/airworth/sdr/>

FAA: <http://av-info.faa.gov/sdrx/>

TC: <http://wwwapps3.tc.gc.ca/Saf-Sec-Sur/2/CAWIS-SWIMN/>

3.4 CASA also makes a selection of SDR summaries that may be of interest to the aviation community and publishes them in its Flight Safety magazine.

4. Reportable defects

4.1 Regulations 51, 51A, 51B and 52 of CAR 1988 state that those who own, operate or maintain Australian aircraft must advise CASA (in accordance with Regulation 52A of CAR 1988) of the existence of any:

- major defect related to an aircraft;
- defect discovered while complying with an AD or a direction given by the Authority under Regulation 38 of CAR 1988; and
- defect in an aircraft or an aircraft component that if installed in an aircraft would affect its safety or result in a danger to person or property.

4.2 The Regulations make a distinction between 'defects' and 'major defects'.

Regulation 51A of CAR 1998 - major defects

4.3 All major defects to which Regulation 51A of CAR 1988 applies discovered in an aircraft must be reported to the Authority immediately. Regulation 51A of CAR 1988 applies to major defects:

- that have caused, or that could cause, a primary structural failure in an aircraft;
- that have caused, or that could cause, a control system failure in an aircraft;
- that have caused, or that could cause, an engine structural failure in an aircraft; or
- caused by, that have caused, or that could cause, fire in an aircraft.

Other major defects or defects

4.4 All other major defects and other defects (being those covered by regulations 51, 51B and 52 of CAR 1988) must be reported to CASA within two (2) working days of their discovery. These include:

- a defect discovered in an aircraft in the course of complying with an Airworthiness Directive or a Regulation 38 of CAR 1988 direction (but if the defect discovered is a CAR 51A major defect it should be reported immediately);

- a defect discovered in an aircraft component when:
 - a person engaged in the maintenance of an aircraft component becomes aware of a defect in the component;
 - a person engaged in the maintenance of an aircraft becomes aware of a defect in an aircraft component that the person proposed to install in the aircraft in the course of that maintenance;
 - a person who holds a certificate of approval that covers the maintenance of aircraft components becomes aware of a defect in an aircraft component that he or she owns; or
 - a person who holds an Air Operator's Certificate (AOC) becomes aware of a defect in an aircraft component that he or she owns and intends to install in an aircraft used in operations under that AOC.

4.5 A list of examples of major defects can be found in Appendix A of this CAAP.

4.6 Failure to report a defect when required by the Regulations is an offence of strict liability and may result in prosecution and/or administrative action.

4.7 Any defective parts must be kept in a state that will allow CASA to investigate the defect for a period of 12 months after the defect is reported. CASA can and usually does, on request release parts for repair or disposal at an earlier time.

4.8 CASA encourages reporting of defects the Regulations do not require be reported, where the reporter considers the provision of such information could be of value to CASA or the aviation community. For example, a non-major defect found during the normal course of inspection may be reported if in the opinion of the person performing the inspection, the defect may highlight maintenance errors.

5. Reporting guidelines

5.1 General

5.1.1 To assist in reporting defects in accordance with the requirements of Regulation 52A of CAR 1988, CASA has produced a Defect Report Form (CASA Form 404). This form provides a standard format which facilitates the submission of complete data and reduces the time and cost associated with submitting a report. CASA Form 404 is available at <http://www.casa.gov.au/manuals/regulate/mdr/form404.pdf>.

5.1.2 When reporting a defect, you should provide as much descriptive information as possible on the cause of the problem. Any attachments, such as photographs and sketches of defective parts, are also appreciated. However, you should not submit any physical parts to CASA unless directed to do so by CASA.

5.1.3 A defect report must be submitted within the time limits required by the regulations. However, when all of the required information is not available within the required time for submitting the report, the submitter should state on the defect report that the report is still open. When the investigation has been completed, the submitter must file a final defect report. If the investigation will take more than two months to complete, the submitter should provide one or more follow-up (interim) reports. These reports should be submitted whenever the investigation has reached one of its milestones or a finding significant for the safety of operation has been established.

5.1.4 It is the responsibility of the Registered Operator (RO) to ensure that any necessary investigation of the cause of the defect is carried out and the results submitted to CASA.

5.1.5 The use of abbreviations in defect reports should be kept to a minimum, unless used universally (e.g. MLG).

5.1.6 In relation to major defects, the RO of the aircraft may, in a contractual agreement with a maintenance organisation, assign the task of submitting the major defect report to CASA. However, the ultimate responsibility for submission of the required report remains with the RO of the aircraft.

5.1.7 Instructions for completing CASA Form 404 are included in Appendix B of this CAAP.

6. Where to submit defect reports

6.1 Defect Reports

6.1.1 You may submit a defect report to CASA by any of the following means:

- **By Mail:**

Mail, free of postal charge from anywhere within Australia, a completed Defect Report Form (CASA Form 404) to the following address:

Civil Aviation Safety Authority
SDR Unit
Airworthiness and Engineering Branch
Reply Paid 2005
Canberra ACT 2601

- **By Facsimile:**

Fax the CASA Form 404 to the following number: (02) 6217 1920

- **On-line:**

Submit a defect report through the CASA web site via the following link:
<http://www.casa.gov.au/airworth/sdr/>

- **Email:**

sdr@casa.gov.au

6.1.2 If you have your own reporting system and wish to submit reports generated by your system to CASA, please liaise with CASA SDR staff to organise the format of the report before commencing.

6.2 Major defect Reports

For defects requiring immediate notification, CASA only requires a notification of the defect. There is no need to complete either CASA Form 404 or the online form initially, CASA will expect a complete report to follow up the initial notification.

- **By Phone:**

Contact the AD/SDR cell on 131 757 (business hours)

- **On-line:**

Submit a defect report through the CASA web site via the following link:
<http://www.casa.gov.au/airworth/sdr/>

- **Email:**
sdr@casa.gov.au
- **By Facsimile:**
Fax a notification of the defect to the following number: (02) 6217 1920

7. Use and disclosure of reported information

7.1 CASA will only use or disclose information reported under the defect reporting scheme for purposes consistent with the interests of safety and in accordance with applicable laws.

Executive Manager
Standards Division
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Appendix A

Examples of Major Defects

Listed below are some representative examples of major defects. The list is **not** exhaustive. If you have any doubt about whether a defect is a major defect, you can seek advice from the CASA SDR Unit by email sdr@casa.gov.au or phone 131 757:

- (a) fires during flight, whether or not the related fire warning system operated correctly;
- (b) false fire warning during flight;
- (c) smoke, toxic or noxious fumes inside the aircraft;
- (d) an engine exhaust system that causes damage during flight to the engine, adjacent structure, equipment or components;
- (e) unscheduled engine shut-down;
- (f) on a multi-engine helicopter, loss of drive from one engine;
- (g) inability to feather or unfeather a propeller, to shut-down an engine or to control thrust;
- (h) fuel system malfunction affecting fuel supply and distribution;
- (i) significant contamination or leakage of fuel, oil or other fluids;
- (j) use of incorrect fuel, oil or other fluids;
- (k) landing gear failing to extend or retract, or uncommanded opening or closing of landing gear doors during flight;
- (l) brake system defects that result in inability or reduction in ability to brake when the aircraft is in motion on the ground;
- (m) malfunction, stiffness, slackness or limited range of movement of any flight controls;
- (n) significant failure or malfunction of the instrument, electrical, hydraulic, pneumatic, ice-protection, radio, navigation system or emergency equipment or a defect that could cause such a failure;
- (o) a defect causing uncontrollable cabin pressure;
- (p) cracks or corrosion in the primary structure:
 - Corrosion levels are defined as follows:
 - Level 1 – Corrosion damage occurring between successive inspections, that is localised and can be blended-out to within allowable limits as defined by the Original Equipment Manufacturer (OEM), and surface treated appropriately.
 - Level 2 – Corrosion damage occurring between successive inspections, that exceeds allowable limits as defined by the OEM that requires blending, rework or replacement as well appropriate surface treatment action.
 - Level 3 – Severe corrosion damage, significantly in excess of OEM guidelines, that requires urgent structural reinforcement, component replacement and appropriate surface treatment.
- (q) any malfunction, failure or defect that affects or could affect the performance of any system or component essential to the safe operation of the aircraft;

- (r) (removed);
- (s) malfunction of systems or components, or a defect that could cause such a malfunction - including auxiliary power units, essential to the safe operation of those aircraft approved for extended diversion time operations irrespective of the type of operation being, or intended to be, conducted;
- (t) failure of helicopter driveline components;
- (u) separation of any part of an aircraft, which may become a hazard to the aircraft or persons;
- (v) Failures in digital computer based equipment and systems, categorised as critical or essential (i.e. level A or B software), and the digital computer software used in this equipment, or system which is software whose anomalous behaviour, would cause or contribute to a failure of system function resulting in a hazardous condition for the aircraft.
- (w) any other defect which the operator believes may be of interest to the regulator or the aviation community.

Note: *Definitions for the classification of equipment, systems and software are contained in Radio RTCA Inc. publication RTCA/DO-178B.*

Appendix B

Instructions for completing CASA Form 404 by the submitter:

1. *Aircraft Registration* - Enter the complete aircraft registration mark.
2. *Date of occurrence* - Enter the date the failure, malfunction, or defect occurred, or was discovered. This entry should be made in a numeric format (dd/mm/yy).
3. *Operator Name* - Enter the name of the registered operator of the aircraft.
4. Major Equipment Identity:
 - AIRCRAFT - Enter the aircraft manufacturer's name.
 - Aircraft Model - This should be the official designation of the aircraft as listed in the Aircraft Specification or Type Certificate Data Sheets.
 - Aircraft Serial Number - The serial number assigned by the manufacturer.
 - Time Since New (TSN) - Enter the aircraft's total time since new in whole hours. Enter the aircraft's accumulated cycles. Mark the appropriate box to indicate the time units used.
 - Time Since Last Maintenance Check (TSLMC) - Enter the aircraft's total time since its last maintenance check in whole hours. If applicable, enter the aircraft's accumulated cycles. Mark the appropriate box to indicate the time units used.
 - Engine - Enter the engine manufacturer's name, model/series and serial number. Engine time related information is TSN or TSO (Time Since Overhaul).
 - Propeller - Enter the propeller manufacturer's name, model/series, and serial number should be entered. The propeller's time related information is TSN or TSO.

Note 1: When an engine or propeller problem or condition is being reported, it is a requirement to include engine or propeller information and the aircraft make and model information. This information is needed because of the interchangeability of engine and propeller models on various aircraft.

Note 2: Model and serial numbers should include prefix letters, if appropriate, but should not incorporate dashes, slashes, or blank spaces. If the component is amateur built, use the kit name. Avoid informal names and marketing titles.
5. Aeronautical Product (Component):
 - Name - Enter the name of the aeronautical product that contains the part. For example, when the defective part is a bearing, the aeronautical product will be the unit that contains the bearing, such as a starter or alternator. For a defective exhaust valve, enter the cylinder identity, etc. This level of identification is important for output data sorting, interrogation, and trend analysis. A defect report submitted as an open report may only contain information on the aeronautical product until teardown reveals the specific part that was defective.
 - Manufacturer - Enter the manufacturer's name of the component/assembly being reported.
 - Model Number - Enter the applicable manufacturer's model number of the aeronautical product.
 - Serial Number - Enter the applicable manufacturer's serial number of the aeronautical product.

6. *Part* - Enter information about the specific part causing the problem. For example, bearing, spar, etc. In some instances, it may be possible to further identify the specific part, within a aircraft component, that failed, malfunctioned or was defective. For example, if a VHF communication system malfunctions and during the investigation of the VHF system, a damaged wire is discovered to have caused the malfunction. In this example, the wire is the specific part to be reported. The submitter would, therefore, be required to report all information pertaining to the wire:

- Part Name - Enter the manufacturer's part name of the specific part causing the difficulty.
- Part Number - Enter the applicable manufacture's part number.
- Part Condition - Enter the word(s) that best describes the condition of the part. Avoid the use of such terms as "unserviceable" or "repairable." If multiple word(s) are needed to describe the condition, enter the most significant word in the "Part Condition" block.
- Location on Aircraft - Enter location of the defective part or the defect. For example, right gearbox, aeroplane jack point, left outboard, etc.
- Time Since New (TSN) - Enter the total service time of the part since new in whole hours (HRS), accumulated cycles (CYCS) or landings (LNDS), or the part's total calendar time in months (MTHS), as applicable. Mark the appropriate box to indicate the time units used. In the case of a turbine engine, it is required to enter the number of cycles since new.
- Time Since Overhaul (TSO) - Enter the service time of the part since the last overhaul, in whole hours (HRS), accumulated cycles (CYCS) or landings (LNDS), or the part's total calendar time in months (MTHS), and mark the appropriate box to indicate the time units used, if applicable. If the part has not been overhauled since it was new, no information would be entered in this block.
- Available for Inspection - Mark the appropriate box if the defective part is available for inspection by the Authority.

7. When was the defect found?

Mark the appropriate box that best describes the stage of flight, ground or maintenance operation the aircraft was engaged in when the reported malfunction, failure or defect occurred, or was observed. This includes defects found after an accident, during compliance with an AD or Service Bulletin. Mark the box 'Other' if the stage of operation is unlisted and enter the operation - for example, preflight check.

If any AD, Service Bulletin, modification etc. exists, enter the document reference and mark the appropriate compliance status box.

8. *Opinion as to the cause of the defect* - At times, it is likely that the defect may appear to have been due to multiple reasons that led ultimately to the, failure, malfunction or defect. Seek to be as objective as possible in determining the contributing factor or root cause.

Mark the box or boxes, provided in this section of the form, that best describe the reason for the failure as follows:

- Design - Where the component does not meet its intended function or it is being required to do something outside the design scope.
- Manufacture - Where the component has not been appropriately manufactured or properly finished. For example, stress concentrators were not removed.
- Fatigue - Where the defect or failure exhibits classic fatigue symptoms.
- Corrosion - Corrosion, environment and age are closely related, particularly in older aircraft.

- Inadequate maintenance - Where the defect or failure is attributed to poor maintenance practices arising from lack of data, incorrect procedures, inadequate quality control, lack of appropriate training etc.
- Human factors - Where the defect occurred as a result of personnel error while carrying out maintenance. For example, failure to follow the correct instructions, use of inappropriate equipment/tools, or the use of incorrect fuel or lubricants.
- Suspected unapproved parts - Where the defect occurred as a result of the use of counterfeit or life expired parts. With older aircraft and the lack of approved spares, counterfeit parts are an increasing problem. This can also be related to personnel error or inadequate maintenance. The identification of counterfeit parts is of paramount importance.
- Operational - Where the defect occurred as a result of incorrect, inadvertent or uncommanded operation. This can also be related to personnel error other than during maintenance.

9. Defect description and investigation result - describe the defect, the circumstances under which it occurred, any indications or warnings and its non-apparent effects on the aircraft or other systems. State the probable cause, action taken to rectify the defect and recommendations to prevent recurrence.

10. Submitter's details - Enter the submitter's name, Aviation Reference Number (ARN) if any, company name, address (including postcode), telephone number (including area code) where the submitter or another person with knowledge of the defect may be contacted if the Authority needs further clarification regarding the defect report.

Enter the date when the report is submitted to the Authority. This is not the date when the failure, malfunction, or defect was discovered.

11. Defect Report Type - Mark the appropriate box as follows:

- Notification of defect with complete investigation results - Where no further submissions are anticipated.
- Initial defect notification only - Where the report does not contain all the required information or investigation results and a follow-up report is required to be submitted.
- Follow-up report from earlier defect notification - Where additional information or investigation results are being submitted following the initial defect notification.

12. Submitter Reference Number - Enter your own report reference number for future reference.