Australian Government
Civil Aviation Safety Authority

Civil Aviation Advisory Publication

November 2007

This publication is advisory but it is a CASA preferred method for complying with the Civil Aviation Regulations (CARs) 1988.

It is not the only method but experience has shown that if you follow this method you will comply with the Civil Aviation Regulations.

Always read this advice in conjunction with the appropriate regulations.

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Flight Crew Licensing Flight Reviews

The relevant regulations and other references

- Civil Aviation Regulation (CAR) 5.17A, 5.81, 5.91, 5.99, 5.108, 5.110, 5.124, 5.133, 5.154, 5.169, 5.171 and 5.178.
- Civil Aviation Order (CAO) 40.2.3, 40.1.7.
- 'Conducting an Effective Flight Review' available at http://www.faa.gov/.
- Federal Aviation Administration (FAA) Advisory Circular (AC) 61-98A. at http://www.faa.gov/.
- Flight Crew Licensing Procedures Manual available at http://www.casa.gov.au/.

Who this CAAP applies to

This CAAP applies to all private, commercial and air transport pilots.

Why this publication was written

Flight reviews have been a requirement to exercise the privileges of all licences since 1980. With the introduction of the Private Instrument Flight Rules (PIFR) rating in 2000, a flight review became a condition for the use of the privileges of that rating.

This CAAP provides guidance to licensed pilots, flight instructors authorised to conduct flight reviews, Approved Testing Officers (ATO) and Civil Aviation Safety Authority (CASA) Flight Operations Inspectors (FOI) about how flight reviews should be conducted. All these personnel are referred to as 'assessors' in this CAAP.

Status of this CAAP

This is the first CAAP to be written on this subject.

For further information

For application and policy advice contact CASA's Flight Crew Licensing Branch (Telephone 131 757).

Contents

1. Abbreviations

AC	Advisory Circular
AFR	Aeroplane Flight Review
AOC	Air Operators Certificate
ATC	Air Traffic Control
ATO	Approved Testing Officer
ATPL	Air Transport Pilot Licence
ATS	Air Traffic Service
BFR	Biennial Flight Review
CAAP	Civil Aviation Advisory Publication
CAO	Civil Aviation Order
CAR	Civil Aviation Regulation
CASA	Civil Aviation Safety Authority
CIR	Command Instrument Rating
CPL	Commercial Pilot Licence
EFATO	Engine failure after take-off
FAA	Federal Aviation Administration
FOI	Flight Operations Inspector
FTO	Flight Training Operator
GAPAN	Guild of Air Pilots and Navigators
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
MET	Meteorological Report
NOTAM	Notice to Airmen
PICUS	Pilot-in-command under supervision
PIFR	Private Instrument Flight Rules
POH	Pilot Operating Handbook
PPL	Private Pilot Licence
USA	United States of America
VFR	Visual Flight Rules

2. Definitions

Airspace cleared procedure Collision avoidance must always be practiced and a procedure followed to ensure a collision does not occur. This procedure is performed before all turns and manoeuvres. A commonly used technique for this procedure is:

- when turning left - 'Clear right, clear ahead, clear left-turning left'; or

- when turning right - 'Clear left, clear ahead, clear right-turning right'.

If an object is closing and remains on a line of constant bearing (stays at the same point on the windscreen) a collision will occur if avoiding action is not taken.

Bi-annual Twice a year.

Biennial Once every two years.

Checklist A checklist derived from information set out in the Flight Manual/Pilot Operating Handbook (POH), placards or other documents provided with the aircraft, necessary to ensure the safe operation of the aircraft.

Errors   Action, or inaction, that results in deviation from appropriate intentions.

Human factors Optimising the relationship within systems between people, activities and equipment.

Safe(ly) A manoeuvre or flight is completed without injury to persons, damage to aircraft or breach of aviation safety regulations, while meeting the standards specified by the Civil Aviation Safety Authority (CASA).

Stakeholders   Any person involved with, or affected by, the flying operation to be performed.

Standard operating procedures   Any procedure included in the operations manual of an Air Operators Certificate (AOC) or Operating Certificate (OC) holder.

Threats   Events or hazards whose occurrence is outside the control of the pilot(s) and which may threaten the safety of the flight.

Undesired aircraft state   Undesired aircraft states are flight-crew induced aircraft position or speed deviations, misapplication of flight controls, or incorrect systems configuration, associated with a reduction in safety margin.

3. Why this CAAP is issued

3.1   This CAAP is issued to all persons who undergo or conduct flight reviews. The aim is to explain the philosophy and intent of a flight review and to provide guidance to the pilots undertaking a flight review and instructors, Approved Testing Officers (ATO) and CASA Flight Operations Inspectors (FOIs) who may conduct a review.

3.2   Another purpose of this Civil Aviation Advisory Publication (CAAP) is to achieve consistency and standardisation with flight reviews to ensure a good safety outcome without incurring unreasonable expense. Flight reviews for all licences and categories of aircraft are addressed in this CAAP.

4. Philosophy and intent of a flight review

4.1   The concept of flight reviews was an initiative of the Federal Aviation Administration (FAA) of the United States of America (USA) to ensure that pilots maintained currency. The American flight review system is industry managed, and monitored by the regulator, and Australia has adopted a similar arrangement.

4.2   Commercial Pilot Licence (CPL) and Air Transport Licence (ATPL) holders are often part of a system that involves some form of training and checking, whereas the average private pilot is not. With the passage of time and lack of practice some skills and knowledge can degrade. A flight review affords the opportunity to restore these degraded skills and gain new knowledge.

4.3   The flight review must be seen in the context of a broader aviation safety philosophy. The flight review, although important (and required by legislation), is one process that contributes to the safety of a flight. A flight review every two years does not, in itself, ensure safety. Safety is achieved when each pilot takes responsibility for a continuing process of hazard identification and risk management for their own aviation activities. In addition to the flight review, this continuing process could include:

- maintaining existing knowledge;
- increasing knowledge;
- regularly practicing piloting skills;
- setting personal limits;
- applying robust human factors practices; and
- actively applying threat and error management (TEM) concepts.

In this continuing process of hazard identification and risk management, the two key aspects of a flight review are:

- to provide an opportunity for pilots to refresh their flying skills and knowledge; and
- to provide an independent assessment of a pilot's knowledge and skill.

These two aspects are important to the goal to keep aviation risks for the pilot at, or below, an acceptable level. Both elements (refreshing skill and knowledge, and the independent assessment) are equally important and the process should be a collaborative endeavour between the pilot undergoing the review and the assessor conducting it.

4.4   To be a successful collaboration, both the person undergoing the review and the assessor have a shared responsibility. This responsibility requires an honest statement of the flying activities that have been undertaken over the past two years, and an indication of what type of flying the pilot anticipates performing during the next two years. The assessor should then plan an appropriate flight review for the pilot's prevailing circumstances, and be willing to commit time and effort to identify deficiencies in skills and knowledge, and then to provide remedial instruction and advice.

4.5   Ideally the assessor should aim to make the event something that pilots look forward to, rather than dreading. This can be achieved by establishing good communications, clearly identifying the requirements of the flight review and committing to ensuring that the pilot will benefit from the exercise. Instructors should endeavour to provide positive feedback and, where deficiencies are identified, rectify the problems without making the candidate feel inadequate.

5. So, what is a flight review?

5.1   In this CAAP the process of undertaking a biennial assessment of a pilot's skills and knowledge is referred to as a flight review. In Australia the terms Aeroplane Flight Review (AFR) and Biennial Flight Review (BFR) are commonly used. However, the intention is to address flight reviews for all licences, categories of aircraft and appropriate ratings. Although the CAAP is numbered after Civil Aviation Regulation (CAR) 5.81, it is not limited to the Private Pilot Licence (PPL) and aeroplanes. The current regulations specify flight reviews for all licences and for the Private Instrument Flight Rules (PIFR) rating.

5.2   Appendix A of this CAAP summarises the range of skills, knowledge and behaviours to be assessed.

5.3   When a pilot holds more than one category of licence, a flight review must be conducted on each aircraft type; for example aeroplane and helicopter.

6. Who may conduct a flight review?

6.1   A flight review in an aeroplane may be conducted by:
- a Grade One instructor with an appropriate aircraft rating;
- a Grade Two instructor with an appropriate aircraft rating, who has 400 hours of instructional experience and has the written approval of a chief flying instructor to conduct a flight review;
- an Approved Testing Officer (ATO) with an appropriate aircraft endorsement; or
- a CASA FOI with an appropriate aircraft rating.

6.2   A flight review in a helicopter may be conducted by:
- a Grade One instructor with an appropriate aircraft endorsement;
- an ATO with an appropriate aircraft endorsement; or
- a CASA FOI with an appropriate aircraft endorsement.

6.3   A flight review in a balloon may be conducted by:
- a flight instructor with an appropriate aircraft endorsement;
- a CASA FOI with an appropriate aircraft endorsement; or
- an authorised person.

6.4   A flight review in a gyroplane or an airship may be conducted by:
- a flight instructor with an appropriate aircraft endorsement;
- an ATO with an appropriate aircraft endorsement; or
- a CASA FOI with an appropriate aircraft endorsement.

6.5   The CAR definition of an authorised flight instructor states that the flight instructor must either hold an AOC or be employed by, or instructs under, an arrangement with an AOC holder.

7. Substitutes for a flight review

7.1 Any licensed aeroplane or helicopter pilot, or commercial balloon pilot may substitute a flight review, if, within a period of two years before the proposed flight, they have:

- passed a flight test for the purpose of the issue of a licence, or issue or renewal of a pilot rating;
- satisfactorily completed a proficiency check and the conducting organisation has made an entry to that effect in the pilot's log-book; or
- satisfactorily completed aeroplane, helicopter or balloon conversion training conducted by the holder of a grade of instructor rating that allows them to conduct a flight review.

7.2 Any licensed gyroplane pilot may substitute a flight review, if, within a period of two years before the proposed flight, they have:

- passed a flight test for the purpose of the issue of a licence, or issue or renewal of a pilot rating; or
- satisfactorily completed a proficiency check and the conducting organisation has made an entry to that effect in the pilot's log-book.

7.3 Any licensed airship pilot may substitute a flight review, if, within a period of two years before the proposed flight, they have:

- passed a flight test for the issue or renewal of an airship grade of night Visual Flight Rules (VFR) rating;
- satisfactorily completed a proficiency check and the conducting organisation has made an entry to that effect in the pilot's log-book; or
- satisfactorily completed airship conversion training by the holder of a grade of instructor rating that allows them to conduct a flight review, and the instructor enters into the pilot's log-book that a successful flight review was completed.

7.4 This means that if, for example, a pilot renewed an instrument rating, undertook a proficiency check or completed an aircraft conversion within a two year period since the last review, they would not be required to do another review until two years after that date.

7.5 There is provision in the regulations for single place aircraft to be used for a flight review or proficiency check. For example an agricultural pilot could be observed from the ground by a suitably qualified ATO or FOI while conducting or simulating an agricultural operation. Additionally CASR 137.240(10) states that an agricultural proficiency check can serve as a flight review.

7.6 A command instrument rating initial issue or renewal also covers a PIFR flight review.

7.7   Conversely, a flight review satisfies the requirement for ATPL or CPL holders over the ages of 60 and 65 respectively who conduct commercial operations, to complete an annual or six-monthly proficiency check.

7.8   However, common sense should also prevail. If a person is within the two-year period after a flight review, but intends to undertake a flight in an aircraft they have not operated for some time or, for example, navigate in a remote area, it would be prudent to undergo an additional check with a flight instructor to ensure competence, confidence and safety.

8 How should a flight review be conducted?

8.1   It is now pertinent to restate the purpose of a flight review: to ensure that the pilot is safe to operate an aircraft. In this CAAP 'safe' means that a manoeuvre or flight is completed without injury to persons, damage to aircraft or breach of aviation safety regulations, while meeting the standards specified by CASA. If we analyse this definition, the term 'without injury or damage' requires no explanation. However, 'breach of aviation safety regulations' and 'meeting standards specified by CASA' does need clarification. Pilots rarely breach safety regulations intentionally, but sometimes, through lack of knowledge or inattention, this may occur. The same concept applies to meeting the CASA flight standards (or skills and knowledge). These standards are those specified in the relevant syllabus or Civilian Aviation Order. Few pilots intentionally fail to meet the skills and knowledge standards, but lack of practice or currency can lead to this outcome.

8.2   In the time available to conduct a flight review, it would be unrealistic to attempt to assess all of a pilot's skills and knowledge. However, it is possible and important to evaluate and guide a pilot through those safety-critical items of skills and knowledge or elevated risk that, if deficient, could result in 'damage to aircraft and/or injury to persons'. Some sequences that, if not conducted properly, could lead to damage or injury (unsafe flight) are:

- management of engine failures leading to forced landings or auto-rotations;
- asymmetric operations in multi-engine aeroplanes;
- cross-wind operations;
- steep turns and slow flight;
- stall recognition and recovery;
- take-off, approach and landing;
- missed or aborted approaches and landings;
- helicopter operations on rough or sloping ground;
- approach and operations in confined areas;
- awareness and avoidance of adverse aerodynamic situations such as stall, helicopter-vortex ring and dynamic rollover, operating a gyroplane behind the power curve, or balloon pilot awareness of power lines and obstructions;
- competent operation of all aircraft systems;

- management of emergencies; and
- application of threat and error management and human factors practice.

8.3   Misapplication of some aeronautical knowledge could result in dire consequences. It is important to ensure that a pilot is able to:
- interpret and apply meteorological and Notice to Airmen (NOTAM) information;
- calculate weight and balance and aircraft performance;
- demonstrate a sound understanding of weight, balance and performance limitations on an aircraft and any degrading effects on normal operations;
- apply robust checklist procedures;
- understand and operate all aircraft systems;
- understand and comply with air traffic requirements and procedures;
- understand airspace structure, procedures and any changes;
- recall critical emergency procedures; and
- interpret and certify a maintenance release and perform a daily inspection.

8.4   The two lists above are not comprehensive, and assessors should design a flight review that is appropriate for the applicant. To that end the shared responsibility comes into play. Applicants should accurately detail what flying they have completed over the last two years, and what flying they anticipate they will undertake in the future. It is also important to explain any areas of skills or knowledge where they feel deficient.

A pilot usually knows if he/she is uncomfortable or not confident with some flight sequences or aeronautical knowledge……tell the assessor and ask questions.

8.5   The assessor should establish clear and open communication and endeavour to draw from the applicant any information that will help him or her to design an appropriate flight review. This would also be an opportunity to look at the pilot's log-book. Once the assessor has determined what the flight review will involve, this should be clearly explained to the applicant. It would also be appropriate to advise the pilot to review the aircraft flight manual and other applicable publications. The assessor should then plan the exercise to ensure the most benefit to the person undertaking the review.

8.6   The pre-flight discussion should investigate and enhance the applicant's knowledge over a broad range of subjects, and be used to identify any weaknesses that could affect the safety of flight. As a measure, the assessor should concentrate on information that, if not known, could result in unsafe flight. For example, to be unaware of changes to airspace structure or procedures could lead to a dangerous violation of controlled airspace and subsequent collision. Assessors should be prepared to explain these changes and confirm that the candidate's knowledge is up-to-date.

During pre-flight planning, weight and balance and aircraft performance should be calculated and this will provide an opportunity to see if the pilot can apply this information in a practical sense. Aircraft system knowledge and familiarity with emergency procedures should also be explored. It is possible that pilots who do not fly regularly may pay little attention to these aspects. Finally, a lot of responsibility rests on the assessor's broad shoulders to determine any deficiencies in aeronautical knowledge, then to refresh the pilot and confirm their understanding.

The assessor may choose to use a written questionnaire to assist in assessing a pilot's underpinning knowledge.

8.7   The flight component of the review could vary significantly from pilot to pilot. If the pilot flies regularly, maintains currency and is competent, the review may just be a check with minimal instruction required. On the other hand, if a pilot has not done much flying, a lot of flight instruction may be required to restore lost skills and bring the pilot up to a safe standard. However, it is very important to ensure that those flying sequences which, if mishandled, could cause an accident, are looked at and addressed where required. For example, pilots often forget to apply a plan to a forced landing and the results can be spontaneous or 'hit or miss', rather than a thought-out and logical event. When assessors identify this type of deficiency, they should take the time to revitalise the pilot's flying and operating techniques.

8.8   Another important area that demands attention is threat and error management (TEM) and human factors (see Appendix A of this CAAP). TEM is discussed in more detail later and human factors are the 'mind skills' that are applied to TEM. These skills include:

- maintaining effective lookout;
- maintaining situation awareness;
- assessing situations and making decisions;
- setting priorities and managing tasks; and
- communications and interpersonal relationships.

8.9   Assessors should discuss these subjects with candidates before flight and assess their airborne performance in the application of these skills. Most aircraft accidents can be traced to the breakdown of human factors skills, rather than poor handling, or technical failures. Therefore, the importance of these aspects is high and pilots should be aware of the implications of deficiencies in these skills. Pilots conducting a flight review should be able to objectively assess these single-pilot human factors by observing the pilot's behaviour and the outcome of his or her flight activities and decisions.

8.10   When designing a flight review to suit the particular needs of a pilot, assessors should address those items considered 'obligatory' because, if mishandled, these could lead to unsafe flight; and include any other aspects that may be appropriate to a specific person. The flight review forms at Appendices B to H have attempted to identify these items and a space is left on the forms for the assessor to enter any other items they see fit. However, it should be remembered that a flight review should be a collaborative endeavour between the reviewing pilot and the person undergoing the review with the aim to provide maximum benefit to the pilot being assessed, and trained where appropriate.

8.11   In summary, it is important to note that a flight review is not a flight test. Consequently, the assessor is both permitted and expected to provide instruction, when required. Nevertheless, assessment of competency is the outcome required by a flight review Accordingly, after conducting remedial training in whichever sequences are necessary, the pilot must be able to demonstrate competency in that sequence in observed conditions. In other words, a flight review should be neither solely training, nor only assessment, but an appropriate blend of the two. The final outcome is the pilot being assessed as competent to exercise the privileges of his or her licence.

9. Private IFR Rating flight review

9.1   The holder of a PIFR must do a flight review every two years. However, if the PIFR holder also has a Command Instrument Rating (CIR) a flight review is covered by a CIR issue or renewal. Additionally, a multi-engine aeroplane or helicopter PIFR also covers the equivalent single-engine aircraft, but the reverse does not apply.

9.2   PIFR flight reviews may be conducted by:
- a CASA FOI;
- an ATO holding a delegation authorising the conduct of a flight test for the issue of a CIR; or
- a flight instructor authorised to conduct a flight review and training for the issue of a CIR in the appropriate category of aircraft.

9.3   A PIFR flight review should examine the holder's knowledge of:
- flight management and operational fuel planning;
- management of pre- and post-flight actions; and
- all the Flight Procedure Authorisations endorsed in the holder's log-book.

9.4   The in-flight element of the review should check the holder's skills in:

- conduct of flight using IFR procedures;
- compliance with air traffic rules and procedures;
- management of emergency procedures;
- task management;
- conduct of instrument flight using full and limited panel; and
- the relevant flight procedures in the holder's log-book.

9.5   Detail of PIFR flight review requirements is available in CAO 40.2.3 Appendix 1.

9.6   As with a flight review for a licence, the pilot being reviewed and the person conducting the review should take every opportunity to enhance the candidate's knowledge and skills. This would be an excellent opportunity to refresh any lapsed instrument flying skills. Successful completion of a flight review must be entered into the candidate's log-book by the pilot who conducted the review.

9.7   PIFR flight review forms for aeroplanes and helicopters are at Appendices G and H.

10. How long should a flight review take?

10.1   A flight review for a licence, which does not involve navigation, should take a minimum of about two hours. This would entail an hour of discussion and questions and one hour of flight time. Realistically, a pilot should set aside at least half a day to meet this requirement. If time is a factor, there is nothing to prevent a flight review from being conducted over a number of days.

10.2   An additional 1.5 to 2.0 hours of flight time should be allowed for when the assessor deems a navigation exercise necessary. A PIFR flight review would also require a flight time of about 2.0 hours, with the additional time for pre-flight discussion and planning.

10.3   Notwithstanding all of the above, any pilot should approach the exercise as an opportunity to improve their skills and knowledge, re-acquaint themselves with the aviation culture and enjoy the experience. Dedicating one day every two years to this event is not a great price to pay.

11. How should I choose a person to conduct a flight review?

11.1   When choosing a person to conduct a flight review, pilots should select someone that they feel they will gain the most benefit from. It is important to ensure the person communicates well with you and is able and willing to provide good flight instruction. Previous experience with an assessor is probably one of the more reliable guides, but word of mouth is also a method to select an assessor who suits your needs.

11.2 In many cases, because of remoteness or unique circumstances, the availability of persons qualified to conduct a flight review may be limited. However, pilots should not take flight reviews lightly; it is an opportunity to ensure you and your passenger's safety; and to learn.

12. What aircraft should I use?

12.1 The CARs clearly state that a flight review must be conducted in the aircraft in which the pilot had flown the most flight time during the last ten flights undertaken. In most circumstances this would probably represent the flying activities that the pilot generally conducts.

However unique situations may occur where, for example, a pilot may have completed one flight of 5.5 hours in one aircraft type and 5.0 hours on nine other flights in another type. The person conducting the review may choose to use the latter aircraft for convenience or aircraft availability. The decision about which aircraft to use can be made by the flight instructor, ATO or FOI.

12.2 If a pilot operates both single-engine and multi-engine aircraft, logic dictates that the multi-engine aircraft should be used as it is the more complex aircraft and has unique single-engine characteristics that should be reviewed. As a guide the assessor should refer to the definition of safe, and decide if he or she is confident that the pilot being reviewed could operate both types of aircraft safely during all normal and abnormal flight.

12.3 A CASA approved synthetic flight trainer may be used for a flight review.

13. Logging of flight time

13.1 The person conducting a flight review is pilot-in-command. In the majority of cases, a private pilot will receive some flight instruction and should log the flight time as dual. CAR 5.40 precludes private pilots from logging any flight time as pilot-in-command under supervision (PICUS). However, a commercial or air transport pilot licence holder, undergoing a proficiency check could log PICUS time as long as all the applicable conditions in CAR 5.40 were met.

14. Log-book entries for flight reviews

14.1 When a pilot successfully completes a flight review, the person conducting the review must make an entry into the pilot's log-book stating that he or she has successfully completed the flight review. If the pilot completes a proficiency check or aircraft conversion training, he or she is deemed to have completed a flight review, and an entry should be made to that effect in the pilot's log-book by the organisation or person who completed the training. The wording on the 'cut off' sheets on the forms at Appendices B to H could be used. Notwithstanding the previous sentences, it is not mandatory to make an entry in the pilot's log-book for a rating issue or renewal or conversion training, other than the appropriate sticky strip.

14.2   The forms in the appendices may be used by assessors. It is important to complete the form and CASA recommends that the assessor retains the form and gives a copy to the pilot who is assessed. All the items covered in the 'pre-flight', airwork' and 'navigation/FPA' columns should be addressed and assessors can add any other information or sequences they think appropriate. Additionally, the back of the form could be used to detail any further training or other information that could benefit the pilot undertaking the flight review.

14.3   When pilots have an electronic log-book, they must also compile a bound, printed version that can be signed by the person who conducted the flight review.

14.4   The flight review forms at Appendices B to H have cut off sections that may be stuck into the pilot's log-book if desired. CASA recommends that the person conducting the flight review retains the form for at least three years. Flying schools are required to maintain a record of all flight reviews conducted, for a minimum of three years.

15. Unsatisfactory completion

15.1   If a pilot is unable to successfully complete a flight review, their log-book must not be certified. In such a case the person conducting the flight review should provide guidance to the pilot on what action to take to achieve a safe standard. When a pilot is still within the two-year period of the previous review, he or she may continue to act as pilot-in-command for operations where qualified, but the assessor should provide guidance to ensure safety. However, if the two-year period since the last review has expired, then only dual flying can be conducted.

16. Difference between PPL and CPL/ATPL

16.1   When conducting a flight review an assessor must be clear to determine the different standards required of PPL and CPL or ATPL holders.

16.2   A private pilot should demonstrate that control of the aircraft or procedure is maintained at all times but if the successful outcome is in doubt corrective action is taken promptly to recover to safe flight.

16.3   A commercial or air transport pilot should demonstrate that control of the aircraft or procedure is maintained at all times so that the successful outcome is assured.

17. Threat and error management and single-pilot human factors

17.1   The International Civil Aviation Organization (ICAO) has recommended that threat and error management becomes an integral component of all pilot training. CASA plans to introduce TEM and single-pilot human factors into pilot training in early 2008, and flight instructors, ATOs and FOIs should develop their assessing and teaching skills to incorporate these items into flight reviews.

The Guild of Air Pilots and Navigators (GAPAN) has conducted courses throughout Australia, and may conduct more in 2008, to train flight instructors to apply TEM techniques when training pilots. Flight standards for TEM and single-pilot human factors (entitled 'Manage Flight') are available at Appendix A of this CAAP.

17.2   TEM is an operational concept applied to flight that includes the traditional role of airmanship and provides a structured and proactive approach that pilots can apply to identify and manage threats and errors that could affect the safety of flight. An inseparable link exists between TEM and crew resource management or single-pilot human factors.

The single-pilot human factors are listed in paragraph 8.8 of this CAAP, and instructors are required to develop methods to explain how human factors are applied to TEM. For example, how to apply the components of situation awareness (awareness of aircraft systems, external environment, time) and decision making (problem definition and diagnosis, option generation, risk assessment and option selection, outcome review) to managing threats and errors. Practical scenarios should be developed as a means of both teaching and assessing.

17.3   The flight review forms at Appendices B to H have in the '**Pre-flight**' column of the table, under '**Discussion & Application**', a list of the single-pilot human factors. Persons conducting flight reviews should take the time to address these items in both the pre-flight discussion and during the flying component of the review.

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Appendix A to CAAP 5.81-1(0)

Generic Range of Variables

Range of Variables
• Performance standards are to be demonstrated in flight in an aircraft of the appropriate category equipped with dual flight controls and electronic intercommunication between the applicant and the instructor or examiner.
• Consistency of performance is achieved when competency is demonstrated on more than one flight.
• Flight accuracy tolerances specified in the standards apply under flight conditions from smooth air up to, and including, light turbulence.
• Where flight conditions exceed light turbulence appropriate allowances as determined by the assessor may be applied to the tolerances specified.
• Infrequent temporary divergence from specified tolerances is acceptable if the pilot applies <u>controlled corrective action</u>.
• Units and elements may be assessed separately or in combination with other units and elements that form part of the job function.
• Assessment of an aircraft operating standard also includes assessment of the threat and error management and human factors standards applicable to the unit or element.
• Standards are to be demonstrated while complying with approved checklists, placards, aircraft flight manuals, operations manuals, standard operating procedures and applicable aviation regulations.
• Performance of emergency procedures is demonstrated in flight following simulation of the emergency by the instructor or examiner, except where simulation of the emergency cannot be conducted safely or is impractical.
• Assessment should not involve simulation of more than one emergency at a time.
• **Private pilots** should demonstrate that control of the aircraft or procedure is maintained at all times but if the successful outcome is in doubt, corrective action is promptly taken to recover to <u>safe</u> flight.
• **Commercial and air transport pilots** should demonstrate that control of the aircraft or procedure is maintained at all times so that the successful outcome is assured.
• The following evidence is used to make the assessment:
– The applicant's licence and medical certificate as evidence of identity and authorisation to pilot the aircraft.
– For all standards, the essential evidence for assessment of a standard is direct observation by an instructor or examiner of the applicant's performance in the specified units and elements, including aircraft operation and threat and error management.
– Oral and written questioning of underpinning knowledge standards.
– Completed flight plan, aircraft airworthiness documentation, appropriate maps and charts and aeronautical information.
– Aircraft operator's completed flight records to support records of direct observation.
– Completed achievement records for evidence of consistent achievement of all specified units and elements of competency.
– The applicant's flight training records, including details of training flights and instructors comments, to support assessment of consistent achievement.
– The applicant's log-book for evidence of flight training completed.
• For licence and rating issue:
– Completed application form, including, licence or rating sought, aeronautical experience, Chief Flying Instructor's recommendation and the result of the flight test.
– Completed flight test report indicating units and elements completed.
– Examination results and completed knowledge deficiency reports.

Unit C6: Manage Flight – Flight Standard

Unit Description: Skills, knowledge and behaviour to plan, direct and control all aspects of a flight.

Element	Performance Criteria
C6.1 Maintain effective lookout	• Maintains lookout and traffic separation using a systematic scan technique at a rate determined by traffic density, visibility and terrain. • Maintains radio listening watch and interprets transmissions to determine traffic location and intentions of traffic. • Performs airspace cleared procedure before commencing any manoeuvres.
C6.2 Maintain situation awareness	• Monitors all aircraft systems using a systematic scan technique. • Collects information to facilitate ongoing system management. • Monitors flight environment for deviations from planned operations. • Collects flight environment information to update planned operations.
C6.3 Assess situations and make decisions	• Identifies and analyses problems. • Identifies solutions and assesses solutions and risks. • Decides on a course of action. • Communicates plan of action and allocates tasks, if appropriate. • Takes actions to achieve optimum outcomes. • Monitors progress against plan. • Re-evaluates plan to achieve optimum outcomes.
C6.4 Set priorities and manage tasks	• Organises workload and priorities to ensure completion of all tasks relevant to the safety of the flight. • Puts the safe and effective operation of the aircraft ahead of competing priorities and demands. • Plans events and tasks to occur sequentially. • Anticipates critical events and tasks to ensure safe completion of the task or flight. • Uses technology to reduce workload and improve cognitive and manipulative activities. • Avoids fixation on single actions, tasks or functions.
C6.5 Maintain effective communications and interpersonal relationships	• Establishes and maintains effective and efficient communications and interpersonal relationships with all stakeholders to ensure the safe outcome of the flight. • Defines and explains objectives to applicable/involved stakeholders. • Demonstrates a level of assertiveness that ensures the safe completion of the flight. • Encourages passengers to participate in, and contribute to, the safe outcome of the flight.
Range of Variables	
• All flight and ground operations. • Interaction with stakeholders. • Single- or multi-engine aircraft.	
Underpinning Knowledge	
N/A	

Unit C7: Threat and Error Management – Flight Standard

Unit Description: Skills, knowledge and behaviour to recognise and plan, direct and control threats and errors.

Element	Performance Criteria
C7.1 Recognise and manage threats	• Identifies relevant environmental or operational <u>threats</u> that are likely to affect the <u>safety</u> of the flight. • Develops and implements countermeasures to manage <u>threats</u>. • Monitors and assesses flight progress to ensure a <u>safe</u> outcome or modifies actions when a safe outcome is not assured.
C7.2 Recognise and manage <u>errors</u>	• Applies <u>checklists</u> and <u>standard operating procedures</u> to prevent aircraft handling, procedural or communication errors; and identifies committed errors before <u>safety</u> is affected or aircraft enters an <u>undesired aircraft state</u>. • Monitors aircraft systems, flight environment and crewmembers, and collects and analyses information to identify potential or actual <u>errors</u>. • Implements countermeasures to prevent <u>errors</u> or takes action in the time available to correct <u>errors</u> before the aircraft enters an <u>undesired aircraft state</u>.
C7.3 Recognise and manage undesired aircraft states	• Recognises undesired aircraft states. • Prioritises tasks to ensure management of undesired aircraft states. • Manipulates aircraft controls or systems, or modifies actions or procedures, to maintain control of the aircraft and return to normal flight operations in the time available.
Range of Variables	
• All flight and ground operations	
Underpinning Knowledge	

- Explain the principles of threat and error management by detailing a process to identify and mitigate or control threats and errors during multi-crew operations.
- Give an example of how an undesired aircraft state can develop from an unmanaged threat or error.
- Identify the aspects of multi-crew operations that can prevent an undesired aircraft state.
- Explain how the use of checklists and standard procedures prevents errors.
- Give an example of a committed error and how action could be taken to ensure safety of flight.
- Explain how prioritising and managing workload can reduce the occurrence of errors.
- Explain how establishing and maintaining interpersonal relationships can ensure safety of flight.
- Explain how checklists and standard operating procedures can help to recognise, prevent and/or correct errors.

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Aeroplane Flight Review

Name	ARN	Date
Address		
Aeroplane type and registration	**Licence held**	**Flight time**
Flight route	**Assessor**	

Flying completed last two years:
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Flying anticipated next two years:
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Signature of reviewed pilot……………………………………………………………

Pre-flight		**Airwork**		**Navigation (Optional)**	
Maintenance release use	☐	Pre-flight preparation	☐	Flight planning	☐
Calculate weight & balance	☐	Checklist usage	☐	Cockpit organisation	☐
Calculate aircraft flight performance	☐	Radio telephone (R/T) procedures	☐	Navigation technique	☐
Interpret & apply meteorological report and Notice to Airmen (MET/NOTAM)	☐	Normal take-off & landing	☐	Map reading	☐
		Engine failure after take-off	☐	Airspace management & procedures	☐
		Cross-wind take-off	☐	Diversion procedure	☐
Airspace knowledge	☐	Cross-wind landing	☐	**Other (enter)**	
Airspace procedures	☐	Missed approach/landing	☐	………………………………………	☐
Aircraft systems knowledge	☐	Steep turns	☐	………………………………………	☐
Discussion & Application		Stall recognition & recovery	☐	………………………………………	☐
Threat & error management	☐	Forced landing	☐	………………………………………	☐
Lookout	☐	Instrument flying	☐	………………………………………	☐
Situation awareness	☐	Emergency procedures	☐	………………………………………	☐
Decision making	☐	**Other (enter)**		………………………………………	☐
Task management	☐	………………………………………	☐	………………………………………	☐
Communications & interpersonal relationships	☐	………………………………………	☐	………………………………………	☐
		………………………………………	☐	………………………………………	☐
		………………………………………	☐		
		………………………………………	☐		
Satisfactory √		Unsatisfactory X		Not assessed N	

………………………………………stick in pilot's log-book…………………………………………………

Name……………………….. ARN……………..……..

has successfully completed a single/multi-engine (delete N/A) aeroplane flight review on
……………………….. (Date)

Reviewing pilot's signature…………………………………………… ARN……………..……

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Helicopter Flight Review

Name		ARN	Date
Address			
Helicopter type and registration		**Licence held**	**Flight time**
Flight route		**Assessor**	

Flying completed last two years:

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Flying anticipated next two years:

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Signature of reviewed pilot…………………………………………………………………………………

Pre-flight	Airwork	Navigation (Optional)
Maintenance release use ☐	Pre-flight preparation ☐	Flight planning ☐
Calculate weight & balance ☐	Checklist usage ☐	Cockpit organisation ☐
Calculate aircraft flight performance ☐	Use of power & control on ground ☐	Navigation technique ☐
Interpret & apply meteorological report and Notice to Airmen (MET/NOTAMS) ☐	Normal take-off & landing ☐	Map reading ☐
	Engine failure after take-off ☐	Airspace management & procedures ☐
	Forced landing ☐	Diversion procedure ☐
Aircraft systems & limitations knowledge ☐	Steep turns ☐	**Other (enter)**
Discuss vortex ring/reduced power operations/dynamic rollover ☐	Remote area landing ☐	………………………………………☐
	Slope landing ☐	………………………………………☐
Discussion & Application	Single-engine operations (multi-engine helicopter) ☐	………………………………………☐
Threat & error management ☐	Engine failure at hover ☐	………………………………………☐
Lookout ☐	Emergency procedures ☐	………………………………………☐
Situation awareness ☐	**Other (enter)**	………………………………………☐
Decision making ☐	………………………………………☐	………………………………………☐
Task management ☐	………………………………………☐	………………………………………☐
Communications & interpersonal relationships ☐	………………………………………☐	………………………………………☐
	………………………………………☐	………………………………………☐
Satisfactory √	Unsatisfactory X	Not assessed N

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Name……………………………………………………………………..ARN………………….

has successfully completed a single/multi-engine (delete N/A) helicopter flight review on

(Date) ………………… ..

Reviewing pilot's signature……………………………………………………. ARN………………

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Gyroplane Flight Review

Name	ARN	Date
Address		
Gyroplane type and registration	**Licence held**	**Flight time**
Flight route	**Assessor**	

Flying completed last two years:

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Flying anticipated next two years:

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Signature of reviewed pilot…………………………………………………………………

Pre-flight	**Airwork**	**Navigation (Optional)**
Maintenance release use ☐ Calculate weight & balance ☐ Calculate aircraft flight performance ☐ Interpret & apply meteorological report and Notice to Airmen (MET/NOTAMS) ☐ Aircraft systems knowledge ☐ **Discussion & Application** Threat & error management ☐ Lookout ☐ Situation awareness ☐ Decision making ☐ Task management ☐ Communications & interpersonal relationships ☐	Pre-flight preparation ☐ Checklist usage ☐ Engine failure after take-off ☐ Normal take-off & landing ☐ Glide approach ☐ Cross-wind take-off ☐ Cross-wind landing ☐ Steep turns ☐ Slow flight ☐ Forced landing ☐ Emergency procedures ☐ **Other (enter)** …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐	Flight planning ☐ Cockpit organisation ☐ Navigation technique ☐ Map reading ☐ Airspace management & procedures ☐ Diversion procedure ☐ **Other (enter)** …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐ …………………………☐
Satisfactory √	Unsatisfactory X	Not assessed N

………………………………….stick in pilot's log-book………………………………………..

Name……………………………………………………………ARN………..…….……   has successfully completed an gyroplane flight review on ………………………..(Date)   Reviewing pilot's signature…………………………………………… ARN………..……………

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Balloon Flight Review

Name	ARN	Date
Address		
Balloon type and registration	**Licence held**	**Flight time**
Flight route	**Assessor**	

Flying completed last two years:

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Flying anticipated next two years:

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Signature of reviewed pilot………………………………………………………………

Pre-flight	**Airwork**	**Navigation**
Maintenance release use ☐	Pre-flight preparation ☐	Flight planning for a 30 minute flight ☐
Calculate weight & balance ☐	Check-list usage ☐	Cockpit organisation ☐
Calculate balloon flight performance ☐	Balloon inflation ☐	Navigation technique ☐
Interpret & apply meteorological report and Notice to Airmen (MET/NOTAMS) ☐	Passenger management ☐	Map reading ☐
	Take-off balloon ☐	Airspace management & procedures ☐
Balloon systems knowledge ☐	Land balloon ☐	Diversion procedure (unplanned landing) ☐
Explain actions in event of gas leak ☐	Balloon deflation ☐	**Other (enter)**
Explain actions in event of fire airborne ☐	Avoid power lines ☐	…………………………………☐
Discussion & Application	Conduct aborted landing ☐	…………………………………☐
Threat & error management ☐	Emergency procedures ☐	…………………………………☐
Lookout ☐	**Other (enter)**	…………………………………☐
Situation awareness ☐	…………………………………☐	…………………………………☐
Decision making ☐	…………………………………☐	…………………………………☐
Task management ☐	…………………………………☐	…………………………………☐
Communications & interpersonal relationships ☐	…………………………………☐	…………………………………☐
	…………………………………☐	…………………………………☐
	…………………………………☐	…………………………………☐
	…………………………………☐	…………………………………☐
Satisfactory √	Unsatisfactory X	Not assessed N

………………………………………stick in pilot's log-book……………………………………………..

Name……………………………………………………………….ARN………………...

has successfully completed a balloon flight review on …………………….……………(Date)

Reviewing pilot's signature…………………………………………… ARN…………………

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Airship Flight Review

Name		ARN	Date
Address			
Airship type and registration		**Licence held**	**Flight time**
Flight route		**Assessor**	

Flying completed last two years:

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Flying anticipated next two years:

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Signature of reviewed pilot……………………………………………………………………

Pre-flight		**Airwork**		**Navigation (Optional)**	
Maintenance release use	☐	Pre-flight preparation	☐	Flight planning	☐
Calculate weight & balance	☐	Checklist usage	☐	Cockpit organisation	☐
Calculate aircraft flight performance	☐	**To be completed** **Other (enter)**		Navigation technique	☐
Interpret & apply meteorological report and Notice to Airmen (MET/NOTAM)	☐	……………………………☐		Map reading	☐
		……………………………☐		Airspace management & procedures	☐
Aircraft systems knowledge	☐	……………………………☐		Diversion procedure	☐
Discussion & Application		……………………………☐		**Other (enter)**	
Threat & error management	☐	……………………………☐		……………………………☐	
Lookout	☐	……………………………☐		……………………………☐	
Situation awareness	☐	……………………………☐		……………………………☐	
Decision making	☐	……………………………☐		……………………………☐	
Task management	☐	……………………………☐		……………………………☐	
Communications & interpersonal relationships	☐	……………………………☐		……………………………☐	
		……………………………☐		……………………………☐	
		……………………………☐		……………………………☐	
Satisfactory √		Unsatisfactory X		Not assessed N	

………………………………………stick in pilot's log-book…………………………………………………..

Name……………………………………………………………….…………..ARN………………..……..
has successfully completed an airship flight review on …………………………(Date)
Reviewing pilot's signature……………………………………………..…………ARN………………..……

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Private IFR Rating Flight Review (Aeroplane)

Name		ARN	Date
Address			
Aeroplane type and registration		**Licence held**	**Flight time**
Flight route		**Assessor**	

Flying completed last two years:
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Flying anticipated next two years:
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Signature of reviewed pilot………………………………………………………………………

Pre-flight		**Airwork**		**Flight Procedure Authorisations (FPAs)**	
Maintenance release use	☐	Checklist usage	☐	Flight planning	☐
Calculate weight & balance	☐	Conduct of flight using Instrument Flight Rules (IFR)		Cockpit organisation	☐
Calculate aircraft flight performance	☐	procedures	☐	**FPAs held**	
Flight management and operational and fuel planning	☐	Compliance with air traffic rules and procedures	☐	……………………………………☐	
Management of pre- and post-flight actions	☐	Management of emergency procedures	☐	……………………………………☐	
Discussion & Application		Task management	☐	……………………………………☐	
Threat & error management	☐	Conduct of instrument flight using full panel	☐	……………………………………☐	
Lookout	☐	Conduct of flight using limited instrument panel	☐	……………………………………☐	
Situation awareness	☐	**Other (enter)**		……………………………………☐	
Decision making	☐	……………………………………☐		……………………………………☐	
Task management	☐	……………………………………☐		……………………………………☐	
Communications & interpersonal relationships	☐	……………………………………☐		……………………………………☐	
		……………………………………☐		……………………………………☐	
Satisfactory √		Unsatisfactory X		Not assessed N	

………………………………………stick in pilot's log-book…………………………………………….

Name……………………………………………………………………………ARN………………..

has successfully completed a single/multi-engine (delete N/A)   aeroplane PIFR flight review
………………… ………(Date)

Reviewing pilot's signature…………………………………………. ARN…………………

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Private IFR Rating Flight Review (Helicopter)

Name		ARN	Date
Address			
Helicopter type and registration		**Licence held**	**Flight time**
Flight route		**Assessor**	

Flying completed last two years:

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Flying anticipated next two years:

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Signature of reviewed pilot……………………………………………………………………

Pre-flight	**Airwork**	**Flight Procedure Authorisations (FPAs)**
Maintenance release use ☐ Calculate weight & balance ☐ Calculate aircraft flight performance ☐ Flight management and operational and fuel planning ☐ Management of pre- and post-flight actions ☐ **Discussion & Application** Threat & error management ☐ Lookout ☐ Situation awareness ☐ Decision making ☐ Task management ☐ Communications & interpersonal relationships ☐	Checklist usage ☐ Conduct of flight using Instrument Flight Rules (IFR) procedures ☐ Compliance with air traffic rules and procedures ☐ Management of emergency procedures ☐ Task management ☐ Conduct of instrument flight using full panel ☐ Conduct of flight using limited instrument panel ☐ **Other (enter)** ………………………………………☐ ………………………………………☐ ………………………………………☐ ………………………………………☐ ………………………………………☐	Flight planning ☐ Cockpit organisation ☐ **FPAs held** …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐ …………………………………☐
Satisfactory √	Unsatisfactory X	Not assessed N

…………………………………………stick in pilot's log-book…………………………………………………..

Name……………………………………………………………………………..ARN……………..…

has successfully completed a single/multi-engine (delete N/A) helicopter Private Instrument Flight Rules (PIFR) flight review on ……………………….(Date)

Reviewing pilot's signature………………………………………………………… ARN……………..