Australian Government
Civil Aviation Safety Authority

ADVISORY CIRCULAR
AC 91-11 v1.0

Aeroplane low visibility operations - conduct and approvals

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Advisory circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory circulars should always be read in conjunction with the relevant regulations.

Audience

This advisory circular (AC) applies to:

- Australian aeroplane operators seeking to obtain an approval to conduct low-visibility operations (LVO), within Australia and overseas
- foreign aeroplane operators seeking to obtain an approval to conduct LVO within Australia.

Purpose

This AC provides information about the conduct of LVO and the processes and requirements for obtaining an approval to conduct LVO.

For further information

For further information, contact CASA's Flight Standards Branch (telephone 131 757).

Overseas operators: contact CASA International Operations on +61 2 6217 1111 or International_Ops@casa.gov.au

Status

This version of the AC is approved by the Manager, Flight Standards Branch.

Version	Date	Details
v1.0	October 2022	This AC replaces CAAP 257-EX-01 v2.1 - Approval to conduct low visibility operations.

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

Contents

1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Acronym	Description
AC	advisory circular
AD	airworthiness directive
AFM	aircraft flight manual
AH	alert height
AIP	aeronautical information publication
ALS	approach lighting system
AMP	approved maintenance program
ANZA	Australia New Zealand Aviation
ARN	aviation reference number
ATC	air traffic control
ATS	air traffic services
Autoland	automatic landing
CAAP	civil aviation advisory publication
CAO	Civil Aviation Order
CASA	Civil Aviation Safety Authority
CASR	*Civil Aviation Safety Regulation*
CAT	category
DA	decision altitude
DH	decision height
DME	distance measuring equipment
EASA	European Aviation Safety Agency
END	runway stop-end reporting location (related to RVR)
EVS	enhanced vision system
FAA	Federal Aviation Administration
FATAOC	foreign air transport air operators' certificate
FGS	flight guidance system
FO	fail-operational
FP	fail-passive

Acronym	Description
GBAS	ground based augmentation system
GLS	GBAS Landing System
GPS	global positioning system
HGS	head-up guidance system
HUD	head-up display
IAP	instrument approach procedure
ICA	instructions for continuing airworthiness
ICAO	International Civil Aviation Organization
ILS	instrument landing system
LHS	left hand seat
LVO	low-visibility operation
LVP	low-visibility procedures
LVTO	low-visibility take-off
MDA(H)	Minimum decision altitude (height)
MEL	minimum equipment list
MID	runway mid-point reporting location (related to rvr)
MMEL	master minimum equipment list
MOS	Manual of Standards
NAA	national aviation authority
NAVAID	navigation aid
NOTAM	notice to airmen
OEM	original equipment manufacturer
Ops Specs	operations specifications
PF	pilot flying
PIC	pilot in command
PICUS	pilot in command under supervision
PM	pilot monitoring
RA	radio altimeter
RCLL	runway centre line light(s)
RCLM	runway centre line marking(s)
REDL	runway edge light(s)
RHS	right hand seat

Acronym	Description
RO	registered operator
RV	runway visibility
RVR	runway visual range
SA	special authorisation
SA CAT	special authorisation category
SB	service bulletin
SBAS	satellite-based augmentation system
SLF	supervised line flying
STC	supplemental type certificate
SVS	synthetic vision system
TC	type certificate
TCDS	type certificate data sheet
TDZ	touchdown zone
V_1	take-off decision speed
V_2	take-off safety speed
VMC	visual meteorological conditions
ZFT	zero flight time

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this AC and the civil aviation legislation, the definition in the legislation prevails.

Most of the terms used in this AC are taken from International Civil Aviation Organization (ICAO) source documents or documents produced by overseas regulatory authorities. In such cases, the source is shown in brackets for each term. However, some terms have been uniquely defined for the Australian context and these definitions are indicated by an '*'.

Term	Definition
appointed person	A person appointed by an aerodrome operator as a runway visibility assessor in accordance with section 23.08 of the Part 139 Manual of Standards (MOS).
alert height	A height above the runway threshold, based on the characteristics of the aeroplane and its fail-operational landing system, above which a category III operation would be discontinued and a missed approach initiated if a failure occurred in one of the redundant parts of the landing system or in the relevant ground equipment. [FAA]
better weather	Weather conditions (cloud ceiling height and visibility) better than the minima

Term	Definition
conditions	specified for CAT I.
Category I (CAT I) operation	A precision approach operation with a decision height (DH) not lower than 200 ft and either a visibility not less than 800 m or a runway visual range (RVR) not less than 550 m. [ICAO]
Category II (CAT II) operation	A precision approach operation with a DH lower than 200 ft, but not lower than 100 ft; and an RVR not less than 300 m. [ICAO]
Category IIIA (CAT IIIA) operation	A precision approach operation with a DH lower than 100 ft or no decision height, and an RVR not less than 175 m. [ICAO]
Category IIIB (CAT IIIB) operation	A precision approach operation with a DH lower than 50 ft, or no decision height, and an RVR less than 175 m but not less than 50 m. [ICAO]
Controlling Zone RVR	In relation to RVR or runway visibility (RV), means the reported value of one or more RVR or RV reporting locations (touchdown, mid-point and stop-end) used to determine whether operating minima are or are not met.*
enhanced vision system (EVS)	A system to display electronic real-time images of the external scene achieved through the use of image sensors. [ICAO]
experienced	• CAT II - an operator who has held an approval for CAT II operations with RVR minima of 300 m or less for at least 1 year. • CAT III - an operator who has held an approval for CAT III operations with RVR minima of 175 m or less for at least 1 year.
fail-operational flight control system	A system capable of completing the specified phases of an operation, following the failure of any single system component, after passing a point designated by the applicable safety analysis (e.g. alert height) [FAA].
fail-passive flight control system	A system which, in the event of a failure, causes no significant deviation of aircraft flight path or attitude. [FAA].
flight simulator	A flight simulator certified to a least level C, in accordance with Part 60 Manual of Standards (MOS), with: • flight management and guidance systems relevant to the LVO conducted by the operator • relevant low visibility runway modelling and lighting standards for taxiways, runways and approach lighting systems.*
hybrid system	A combination of two or more flight control systems of dissimilar design used to perform a particular operation (e.g. head-up display [HUD] and autoland or HUD/EVS/SVS) [FAA].
head-up display (HUD)	A display system that presents flight information into the pilot's forward external field of view. [ICAO]
low-visibility precision approach	means an approach using minima for a runway that are below the category I precision approach minima for the runway published in the AIP.
low-visibility operation	means: • a low-visibility take-off; or • a low-visibility precision approach.
low visibility procedures	Procedures applied at an aerodrome for protecting aircraft operations during low visibility operations.*
low-visibility take-off	means a take-off with a runway visual range lower than 550 m.*

Term	Definition
radio altimeter (RA) height	The indication on a radio altimeter of the vertical distance between a point on the nominal glidepath at the decision height and the terrain directly beneath this point.
runway visual range (RVR)	means the range, measured using an electronic instrument, over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line. Note: Within Australia, the term runway visual range (RVR) is used exclusively in relation to RVR measured by an instrumented system.
runway visibility (RV)	The distance along a runway over which an appointed person can see and recognise a visibility marker or runway lights.*
special authorisation category I (SA CAT I) operation	A precision approach CAT I operation with a DH lower than 200 ft, but not lower than 150 ft; and an RVR not less than 450 m.*
special authorisation category II (SA CAT II) operation	A precision approach operation to a runway where some or all of the elements of the precision approach CAT II lighting system are not available, and with: • a DH lower than 200 ft, but not lower than 100 ft • an RVR not less than 300 m.*

1.3 References

Legislation

Legislation is available on the Federal Register of Legislation website https://www.legislation.gov.au/

Document	Title
Part 91 of CASR	General operating and flight rules
Part 91 MOS	Part 91 (General operating and flight rules) Manual of Standards 2020 **Note:** Chapter 15 of the Part 91 MOS contains the rules relating to IFR take-off and landing minima. Chapter 16 of the MOS contains rules relating to approach bans.
Part 121 of CASR	Australian air transport operations—larger aeroplanes
Part 135 of CASR	Australian air transport operations—smaller aeroplanes
Part 138 of CASR	Aerial work operations
Part 141 of CASR	Recreational, private and commercial pilot flight training, other than certain integrated training courses
Part 142 of CASR	Integrated and multi-crew pilot flight training, contracted training and contracted checking
Regulation 91.307 of CASR	IFR take-off and landing minima
Regulation 91.310 of CASR	Approach ban for IFR flights
Regulation 91.315 of CASR	Take-off and landing in low visibility

Document	Title
Regulation 121.195 of CASR	Exposition requirements for low-visibility operations
Regulation 135.170 of CASR	Exposition requirements for low-visibility operations
Regulation 141.260 of CASR	Part 141 operators--content of operations manual
Regulation 142.340 of CASR	Part 142 operators--content of exposition
Part 139 MOS	Part 139 (Aerodromes) Manual of Standards 2019
Part 173 MOS	Manual of Standards Part 173—Standards Applicable to Instrument Flight Procedure Design

Advisory material

CASA's advisory materials are available at https://www.casa.gov.au/publications-and-resources/guidance-materials

Document	Title
AC 1-04[1]	Operator management of continuing airworthiness
AC 91-12	Conduct of practice autoland operations

Forms

CASA form relating to Low visibility approvals is available at https://www.casa.gov.au/part-91-approval-low-visibility

Document	Title
	Part 91 Approval - Low Visibility

Other material

International Civil Aviation Organization (ICAO) documents are available for purchase from http://store1.icao.int/

Document	Title
AIP	Australian Aeronautical Information Publication
EASA Part-SPA AMC/GM	European Aviation Safety Agency (EASA) Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Annex V Specific approvals of Commission Regulation (EU) No. 965/2012 on air operations
FAA AC 120-28D	Criteria For Approval of Category III Weather Minima for Takeoff, Landing, and Rollout
FAA AC 120-118	Criteria for Approval/Authorization of All Weather Operations (AWO) for

[1] At the time of publication of this AC, AC 1-04 had not yet been issued but was anticipated to be published in November 2022.

Document	Title
	Takeoff, Landing, and Rollout
ICAO Doc 9365-AN/910	Manual of All-Weather Operations
Regulation (EU) No 965/2012	COMMISSION REGULATION (EU) No. 965/2012 of 05 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No. 216/2008 of the European Parliament and of the Council
ICAO Annex 10 Volume 1	Aeronautical Telecommunications - Radio Navigation Aids
ICAO Annex 14 Volume 1	Aerodromes -Aerodrome Design and Operations

2 Introduction

2.1 Background

2.1.1 In Australia, take-off and landing minima are established by Division 91.D.4 of *the Civil Aviation Safety Regulations 1998 (CASR)*. The take-off and landing minima requirements are contained in the Part 91 Manual of Standards (MOS) and are also reflected in the Aeronautical Information Publication (AIP) Australia book.

2.1.2 The minima requirements prescribed in the Part 91 MOS are intended for use by pilots and aircraft operators without the need for an approval. Subject to certain circumstances, the lowest of the prescribed minima permitted without an approval for LVO are for:

a. take-off with visibility not less than 550 m
b. landing with not less than precision approach category I (CAT I) minima.

2.1.3 Consistent with international practice, an approval is required for operations with lower than the 'general' minima (i.e., low-visibility operation (LVO)). CASA may grant operators an approval under regulation 91.045 of CASR, that permits the operator to conduct LVO, that is required to satisfy subregulation 91.315(1). The types of LVO include:

a. Low-visibility take-off LVTO.
b. Precision approach — Special Authorisation Category I (SA CAT I).
c. Precision approach — Category II (CAT II).
d. Precision approach — Special Authorisation Category II (SA CAT II).
e. Precision approach — Category III (CAT III).

2.1.4 Also consistent with international practice low-visibility precision approaches are only permitted where an aeroplane is operated by at least 2 pilots. Given the approval authority, a standard condition on any low-visibility precision approach approval is that the aeroplane operation is conducted as a multi-crew operation as defined in Part 61 of CASR.

2.1.5 Historically, LVO approvals for Australian operators were generally only granted to AOC holders. With the changes introduced by the commencement of the flight operations regulations (Parts 91, 119, 121, 135 and 138 of CASR), approvals to conduct LVO can now be granted to Australian AOC holders, aerial work certificate holders, Part 141 certificate holders and in the circumstances where an operator only conducts Part 91 operations, those operators also.

2.1.6 Consequently, several later sections of this AC, such as in relation to operating procedures and documentation and to flight crew training and checking are provided in the context of each of the operators to which low-visibility approvals may be granted; AOC holders, aerial work certificate holders, Part 141 certificate holders, and Part 91 only operators.

2.1.7 The requirement to be approved to conduct LVO in Australian territory also applies to foreign registered aeroplanes operating in Australian territory, apart from those that are

approved by their own NAA and are operated in Australian territory under a foreign air transport AOC (FATAOC), or a New Zealand AOC with ANZA privileges that is in force for Australia.

2.2 References to vision systems and helicopter LVO

2.2.1 This AC contains several references to enhanced vision system (EVS), synthetic vision systems (SVS). These references are included as placeholders only and are presently reserved for future use.

2.2.2 This AC relates specifically to aeroplane LVO. CASA may publish guidance in relation to helicopter LVO in the future.

2.3 Autoland operations to CAT I or unprotected runways

2.3.1 Information relating to the conduct of practice autoland operations on CAT I or unprotected runways is contained in AC 91-12.

3 Conduct of LVO

3.1 RVR and RV assessment

3.1.1 In Australia it is a requirement that a runway that is intended to support low-visibility take-off operations with visibility less than 350 m or precision approach CAT I operations with visibility less than 800 m, or lower minima precision approach operations, must have electronic runway visual range (RVR) equipment.

3.1.2 An RV assessment is a report on the visibility in the TDZ and MID reporting location of a runway that is assessed by an appointed person in accordance with the procedures implemented by the aerodrome operator for the purpose. The lower limit value permitted to be reported as an RV assessment is 350 m. If the runway visibility is below 350 m the RV is permitted to be reported as “less than 350 m”.

3.1.3 RVR assessments are required to be representative of the touchdown zone (TDZ) and of the midpoint zone (MID) and stop-end (END) of the runway. The site for observations to be representative of the TDZ should be located about 300 m along the runway from the threshold. The site for observations to be representative of the MID and END of the runway should be located at a distance of 1,000 to 1,500 m along the runway from the threshold and at a distance of approximately 300 m from the other end of the runway. The exact position of these sites and, if necessary, additional sites should be decided after considering aeronautical, meteorological and climatological factors such as long runways, location of navigation aids, adjacent structures or the location of swamps and other fog-prone areas. RVR assessments should be carried out at a lateral distance from the runway centre line of not more than 120 m. It is also recommended that RVR should be assessed at a height of approximately 2.5 m above the runway surface elevation.

3.1.4 At aerodromes not equipped with RVR equipment or where one or more RVR sensors are unserviceable, a Runway Visibility (RV) assessment may, under certain circumstances, be provided instead.

3.1.5 An RV assessment cannot be taken to be a substitute for a required RVR observation and cannot be used for the conduct of:

a. Low-visibility take-offs where the visibility is less than 350 m.

or

b. Precision approach CAT I when the visibility is less than 800 m

or

c. Low-visibility precision approach SA CAT I, CAT II, SA CAT II, or CAT III.

3.1.6 The reported RVR or permitted RV assessment value representative of the initial part of the take-off run for LVTO may be replaced by a pilot assessment.

3.2 RVR terminology - controlling

3.2.1 In relation to runway reporting location RVR, several terms are used throughout this AC and in the underpinning legislation. Included among those terms are:

a. Controlling
b. Required
c. Advisory

3.2.2 Controlling zone RVR is defined in section 1.07 of the Part 91 MOS. Effectively, a runway reporting location RVR is controlling where it is used to determine whether a specific operating minima is satisfied or not. Apart from the limited circumstances where a substitution is permitted, the TDZ RVR is controlling for the purposes of landing minima determination. For the purpose of general conduct of low-visibility precision approaches, this AC specifies for each type of low-visibility precision approach, which (if any) of the runway reporting locations are controlling.

3.2.3 It may also be the case that individual LVO approvals may have conditions applied where some or all required runway reporting location RVR values are specified and required to be controlling.

3.2.4 One or more runway reporting locations may also be controlling for the purpose of commencing or continuing low-visibility precision approaches under the conditions of the approach ban legislation. The specifics of these are detailed for each type of low-visibility precision approach described in subsequent sections of this AC.

3.2.5 The TDZ RVR value, whether controlling or otherwise, is not specifically related to the missed approach visibility minima as the applicable visual references are prescribed that must be continuously visible and identifiable to the pilot in command (PIC), for each type of low-visibility precision approach.

3.2.6 Required runway reporting location RVR reports are effectively those that are necessary to have been provided to the PIC of the aeroplane conducting the low-visibility precision approach. They stem from the aerodrome equipment requirements necessary to support LVO.

3.2.7 For each type of low-visibility precision approach, this AC makes clear the circumstances where one runway reporting location RVR may be substituted for the adjacent runway reporting location and the circumstances where it is not permitted.

3.2.8 Advisory runway reporting location RVR reports are effectively those that are not necessary to have been provided to the PIC of the aeroplane conducting the low-visibility precision approach. Where they are provided, they should be considered in respect of the relevance to the safe conduct of the low-visibility precision approach.

3.3 Low-visibility take-off

3.3.1 This AC addresses criteria for take-off in low visibility conditions where additional aeroplane equipment is provided to assist the flight crew in a LVTO or is required to assure safe operations when using minima below values acceptable for exclusive use of visual reference.

3.3.2 In order for operators to be approved to conduct LVTO to the take-off minima contained in column 1 of Table 1, the relevant requirements in column 2 of Table 1 must be satisfied. The relevant requirements may include:

a. aeroplane equipment and certification

b. aerodrome runway lighting
c. RVR or RV assessment values and runway reporting location.

3.3.3 Given that some aerodromes have exceedingly lengthy runways relative to the aeroplane performance requirements, there may be instances where the END RVR information may be effectively irrelevant for LVTO, where the operation in that zone is unlikely to be above safe taxi speed. Some jurisdictions specify 40 knots as the criteria used as the determinant of relevance for a runway zone assessment.

Table 1: Aeroplane equipment and aerodrome facility requirements for specific LVTO minima

Take-off minima	Requirements
350 m	• Illuminated runway edge lighting (REDL) at spacing intervals not exceeding 60 m. • Runway centre line markings (RCLM) or illuminated runway centre line lighting (RCLL). • RVR or RV: TDZ and either MID or END information.
200 m	• Illuminated high intensity REDL[2] at spacing intervals not exceeding 60 m. • Illuminated RCLL. • RVR: TDZ and either MID or END information.
150 m	• Illuminated high intensity REDL at spacing intervals not exceeding 60 m. • Illuminated RCLL. • RVR: TDZ, MID and END information.
125 m	• Illuminated high intensity REDL at spacing intervals not exceeding 60 m. • Illuminated RCLL at spacing intervals not exceeding 15 m. • RVR: TDZ, MID and END information.
75 m	• The aeroplane is equipped with a certified lateral guidance system (including a HUD, or other approved systems) for take-off. • If the lateral guidance system requires GLS/ILS localiser input, runway protection and localiser facilities equivalent to CAT IIIB (ILS classification III/E/4) landing operations are provided. • Illuminated high intensity REDL at spacing intervals not exceeding 60 m. • Illuminated RCLL at spacing intervals not exceeding 15 m. • RVR: TDZ, MID and END information.

Conducting LVTO

3.3.4 The operator's procedures should include methods for confirming the required visibility/RVR, standard call-outs and responses for the pilot monitoring (PM) to advise the pilot flying (PF) of deviations from the runway centreline.

3.3.5 Usually where a LVTO is required to be conducted, aerodrome LVP will be in effect. If, however, LVP have not been instigated by ATC where an operator is required to conduct a LVTO, the flight crew should inform ATC at start up, where there is a requirement to conduct a LVTO that requires protected guidance provided by an ILS localiser.

[2] High intensity REDL is also known as high-intensity runway lighting (HIRL).

3.4 Precision approach — Special Authorisation Category I (SA CAT I)

Description

3.4.1 Precision approach - SA CAT I is effectively the means by which an otherwise approved precision approach - CAT II operation can conduct a CAT I IAP to lower minima than standard CAT I.

Aeroplane equipment and certification

3.4.2 Aeroplanes are eligible for precision approach - SA CAT I operations, if they are certified for precision approach - CAT II operations and equipped with:

a. a HUD system that is certified for at least CAT II operations

or

b. an approved fail-operational (FO) or fail-passive (FP) autoland system.

Conducting the approach

3.4.3 Precision approach - SA CAT I approaches should be conducted in accordance with the following provisions:

a. The TDZ RVR is required and is controlling.
b. A MID RVR report cannot be substituted for the TDZ RVR report in SA CAT I operations.
c. The PIC should not continue an approach below the SA CAT I DH unless the following visual references have been established and can be maintained:
   i. At least three consecutive longitudinally aligned lights, being the centreline of the approach lighting system (ALS), or the TDZ lights, or RCLL, or REDL, or a combination of these lights.
   ii. A lateral element of lighting—being an approach lighting crossbar, or landing threshold, or a barrette of TDZ lights, unless the approach is conducted using a HUD.
d. Minima relevant to the flight guidance of the aeroplane are as shown in Table 2.

Table 2: SA CAT I minima

DH (RA)	TDZ RVR	MID RVR (advisory)	END RVR (advisory)
150 ft	450 m	125 m	75 m

Landings

3.4.4 For a precision approach - SA CAT I approach using a HUD to satisfy 3.4.2(a):

a. Guidance from the aeroplane's HUD system should be used at least until the DH or to the initiation of missed approach.

b. If the HUD malfunctions during the approach, the flight crew should execute a missed approach unless visual reference to the runway environment has been established and the aeroplane is in a position to allow the safe continuation to a landing within the touchdown zone.

3.4.5 For a precision approach - SA CAT I approach using autoland system to satisfy 3.4.2(b), the autoland system should be used at least until touchdown.

Approach ban

3.4.6 When conducting precision approach - SA CAT I operations, the PIC must not descend below 1,000 ft above the aerodrome elevation where a TDZ RVR is reported by ATC as continually less than 450 m. If, after passing 1,000 ft above the aerodrome elevation, the TDZ RVR is reported by ATC as falling below 450 m, the IAP may be continued.

3.4.7 While the MID and END RVR values are advisory only and, where provided, are not taken to be controlling for the purpose of approach ban compliance. Nevertheless, operators may implement their own procedures that require MID and END RVR, where provided, and are to be treated as controlling.

3.5 Precision approach — Category II (CAT II)

Description

3.5.1 Precision approach - CAT II approaches are generally characterised by the minima being as low as safely permissible to allow sufficient visual reference to permit a manual landing to be conducted.

Aeroplane equipment and certification

3.5.2 Aeroplanes are eligible for precision approach - CAT II operations if they are equipped with a flight guidance or control system relevant to the operation that include:

a. For operations with an RVR of not less than 300 m, one of the following:
   i. An autopilot certified for precision approach - CAT II operations.

      or
   ii. A HUD system certified for precision approach - CAT II or CAT III operations.

      or
   iii. A flight director system or command guidance information certified for precision approach - CAT II operations that are provided for both pilots.

b. For operations with an RVR of less than 300 m:
   i. A certified FO or FP autoland system.

      or
   ii. A HUD system certified for precision approach - CAT III operations.

Conducting the approach

3.5.3 Precision approach - CAT II approaches should be conducted in accordance with the following provisions:

a. TDZ RVR is required and is controlling.
b. MID RVR or END RVR is required.
c. The PIC will not continue an approach below the precision approach - CAT II DH unless the following visual references have been established and can be maintained:
    i. At least three consecutive longitudinally aligned lights, being the centreline of the ALS, or the TDZ lights, or RCLL, or REDL, or a combination of these lights.
    ii. A lateral element of lighting—being an approach lighting crossbar, landing threshold or a barrette of TDZ lights unless the approach is conducted using HUD to touchdown.
d. Minima relevant to the flight guidance certification of the aeroplane are as shown in Table 3.

Table 3: Precision Approach - CAT II minima

Aeroplane flight guidance certification	DH (RA)	TDZ RVR	MID RVR	END RVR
CAT III (autoland or HUD to touchdown)	100 ft	300 m	125 m	75 m
CAT II	100 ft	350 m	125 m	75 m

Landings

3.5.4 For a precision approach - CAT II approach with an RVR of 350 m (or greater), the flight guidance or control system used to satisfy paragraph 3.5.2 are to be used at least to the DH.

3.5.5 For a precision approach - CAT II approach with an RVR of less than 350 m, the flight guidance (including a HUD/HGS) or control system used to satisfy paragraph 3.5.2 are to be used at least until touchdown

Approach ban

3.5.6 When conducting precision approach – CAT II operations, the PIC must not descend below 1,000 ft above the aerodrome elevation where a TDZ RVR is reported by ATC as continually less than the relevant minima for TDZ RVR. If, after passing 1,000 ft above the aerodrome elevation, the TDZ RVR is reported by ATC as falling below the relevant minima for TDZ RVR, the IAP may be continued.

3.5.7 Whilst the MID and END RVR values are not taken to be controlling for the purpose of approach ban compliance, operators may nevertheless implement their own procedures that require MID and END RVR to be treated as controlling.

3.6 Precision approach — Special Authorisation Category II (SA CAT II)

Description

3.6.1 Precision approach - SA CAT II approaches are the means by which an otherwise approved precision approach - CAT II operation can be permitted to use a lower minima than precision approach - CAT II provided additional measures are implemented and assured.

Aeroplane equipment and certification

3.6.2 Aeroplanes are eligible for precision approach - SA CAT II operations, if they are certified for precision approach - CAT III operations and equipped with a:

a. FO or FP autoland system

or

b. A HUD system certified to touchdown.

Conducting the approach

3.6.3 Precision approach - SA CAT II approaches should be conducted in accordance with the following provisions:

a. TDZ RVR is required and is controlling.
b. MID RVR or END RVR is required.
c. The PIC will not continue an approach below the precision approach - SA CAT II DH unless the following visual references have been established and can be maintained:
   i. At least three consecutive longitudinally aligned lights, being the centreline of the ALS; or the TDZ lights; or RCLL; or REDL; or a combination of these lights.
   ii. A lateral element of lighting—being an approach lighting crossbar, landing threshold or a barrette of TDZ lights unless the approach is conducted using HUD to touchdown.
d. Minima relevant to the aeroplane category are as shown in Table 4.

Table 4: Precision Approach - SA CAT II minima

Aeroplane category	DH (RA)	TDZ RVR[3]	MID RVR	END RVR
A – C	100 ft	350 m	125 m	75 m
D	100 ft	400 m	125 m	75 m

[3] Actual minimum TDZ RVR limited if runway is not provided with RCLL or TDZ lights. See section 5.3.1.

Landings

3.6.4 For a precision approach - SA CAT II approach, the autoland system or HUD used to satisfy paragraph 3.6.2 are to be used at least until touchdown.

Approach Ban

3.6.5 When conducting precision approach - SA CAT II operations, the PIC must not descend below 1,000 ft above the aerodrome elevation where a TDZ RVR is reported by ATC as continually less than 350 m for CAT A-C aeroplanes or 400 m for CAT D aeroplanes. If, after passing 1,000 ft above the aerodrome elevation, the TDZ RVR is reported by ATC as falling below than 350 m for CAT A-C aeroplanes or 400 m for CAT D aeroplanes, the IAP may be continued.

3.6.6 Whilst the MID and END RVR values are not taken to be controlling for the purpose of approach ban compliance, operators may nevertheless implement their own procedures that require MID and END RVR to be treated as controlling.

3.7 Precision approach — Category III (CAT III)

Description

3.7.1 Precision approach - CAT III approaches are generally characterised by the absence of visual reference sufficient to conduct a manual landing, hence necessitate automatic landing capability and in some circumstances rollout also.

Aeroplane equipment and certification

3.7.2 Aeroplanes are eligible for precision approach - CAT IIIA operations if they are certified for precision approach - CAT III operations and equipped with:

a. A FO or FP autoland system.

or

b. A FO or FP manual flight guidance system providing suitable head-up or head-down command guidance, and suitable monitoring capability at least to touchdown.

or

c. A hybrid system, using autoland capability as the primary means of landing.

3.7.3 Aeroplanes are eligible for precision approach - CAT IIIB operations with an RVR in any reporting location of not less than 125 m if they are certified for precision approach - CAT III operations and equipped with a flight guidance or control system that includes:

a. A FO landing system with a FO or FP automatic rollout system.

or

b. A FO hybrid autoland and rollout system with compatible manual flight guidance system, using autoland capability as the primary means of landing.

3.7.4 Aeroplanes are eligible for precision approach - CAT IIIB operations with an RVR of not less than 75 m if they are certified for precision approach - CAT III operations and equipped with both:

a. A flight guidance or control system that includes:
   i. A FO autoland system.

      or
   ii. A manual flight guidance system certified to meet FO system criteria.

      or
   iii. A hybrid system in which both the FP automatic system and the monitored manual flight guidance components provide approach and flare guidance to touchdown, and in combination provide full FO capability.
b. A FO rollout guidance or control system that can assure safe rollout to taxi speed, consisting of:
   i. A FO automatic rollout control system or FO manual flight guidance rollout system.

      or
   ii. A hybrid system consisting of at least a FP automatic rollout system and compatible FP manual flight guidance rollout control system.

Conducting the approach

3.7.5 Precision approach - CAT III approaches should be conducted in accordance with the following provisions:

a. All RVR location reports are required, except in the circumstances:
   i. For operations using an FP landing system with an FP or FO rollout system— if either the MID or END RVR is temporarily inoperative, the operation may be initiated and continued using the TDZ and remaining RVR reporting location.
   ii. For operations using FO landing systems with an FP or FO rollout system— if any one of the RVR reporting locations is temporarily inoperative, the operation may be initiated and continued using the two remaining RVR reporting locations.
b. Visual reference: Precision Approach - CAT III (FP or FO) – with a DH:
   i. For precision approach - CAT III operations utilising an FO landing system with a DH— the PIC will not continue an approach below the DH unless the relevant visual reference of at least one centreline light has been established and can be maintained.
   ii. For precision approach - CAT III operations utilising an FP landing system with a DH— the PIC will not continue an approach below the DH unless the relevant visual reference of at least 3 consecutive longitudinally aligned lights, being the centreline of the ALS, or the TDZ lights, or RCLL, or REDL, or a combination of these lights has been established and can be maintained.
   iii. For precision approach - CAT III operations utilising an FO hybrid landing system with a DH— the PIC will not continue an approach below the DH unless the relevant visual reference of at least three consecutive lights of the RCLL has been established and can be maintained.
c. Visual reference: Precision Approach CAT III FO – with no DH:

i. For precision approach - CAT III operations with no DH— the PIC is not required to see the runway prior to touchdown. The permitted RVR is dependent on the level of aeroplane equipment.
ii. A precision approach - CAT III runway may be taken to support operations with no DH unless notified or reported as unable, such as published in the AIP or Notice to Airmen (NOTAM).

d. Minima relevant to type of aeroplane systems are as shown in Table 5.

Table 5: Precision Approach - CAT III minima

Approach Category	Landing System	Rollout System	DH	TDZ RVR	MID RVR	END RVR
CAT IIIA	FO	None	< 100 ft or no DH[4]	175 m	175 m	75 m
	FP	None	50 ft	175 m	175 m	75 m
	FP	FP or FO		175 m	125 m	75 m
CAT IIIB	FO	FP	< 50 ft or no DH[4]	125 m	125 m	75 m
	FO	FO		75 m	75 m	75 m

Landings

3.7.6 For a precision approach - CAT IIIA approach:

a. The flight guidance or control system (including a HUD) is to be used until touchdown.
b. If an FP or FO rollout system is required, the flight guidance or control system is to be used through touchdown and rollout.

3.7.7 Precision approach - CAT IIIB approaches are to be conducted using the flight guidance or control system through touchdown and rollout.

Approach ban

3.7.8 When conducting precision approach - CAT III operations, the PIC must not descend below 1,000 ft above the aerodrome elevation where a TDZ RVR is reported by ATC as continually less than the relevant minima for TDZ RVR.

3.7.9 If, after passing 1,000 ft above the aerodrome elevation, the TDZ RVR is reported by ATC as falling below than 350 m for CAT A-C aeroplanes or 400 m for CAT D aeroplanes, the IAP may be continued.

3.7.10 In the circumstances where a TDZ RVR is not provided due to unserviceability and it is permitted that the approach can be conducted using the MID and END RVR, then the substituted runway location RVR is required to be taken to be controlling.

[4] If no DH is specified, then minimum if specified in the AFM is required e.g., some aircraft require insertion of an AH.

3.7.11 Whilst the MID and END RVR values are not taken to be controlling for the purpose of approach ban compliance, operators may nevertheless implement their own procedures that require MID and END RVR to be treated as controlling.

4 Managing continuing airworthiness for LVO

4.1 Continuing airworthiness for LVO - general

4.1.1 Given the specific requirements for aeroplane equipment and certification applicable to conducting LVO, it is imperative that the continuing airworthiness of each aeroplane and its associated LVO equipment must be assured for those operations.

4.1.2 Each operator conducting LVO must have an approved maintenance program (AMP), an approved system of maintenance, or a maintenance schedule appropriate for the aeroplane type and the equipment required to conduct LVO. The scope and complexity of the AMP, the approved system of maintenance, or a maintenance schedule will depend on whether the operation is conducted under an AOC, an aerial work certificate, a Part 141 certificate or as a Part 91 only operation.

4.1.3 The AMP, the approved system of maintenance, or a maintenance schedule for aeroplanes used to conduct LVO operations must include any necessary provisions to address the operator's intended LVO (LTVO and/or low-visibility precision approaches) and the manufacturer's recommended maintenance program. The AMP, the approved system of maintenance, or a maintenance schedule is required to consider any applicable Airworthiness Directives (AD) or mandatory Service Bulletins (SB) that may relate to equipment required to conduct LVO.

4.1.4 Emphasis within the AMP, the approved system of maintenance, or a maintenance schedule should be on maintaining and ensuring total system performance, accuracy, availability, reliability, and integrity for the intended LVO.

4.2 Continuing airworthiness requirements – AOC holders, aerial work and Part 141 certificate holders

Airworthiness/maintenance program requirements

4.2.1 Under the applicable legislation, an AOC holder's exposition, or an aerial work or Part 141 certificate holder's operations manual must include a description of the arrangements for managing the continuing airworthiness of the operator's aeroplanes.

4.2.2 The AMP, the approved system of maintenance, or a maintenance schedule should be compatible with an operator's organisation and ability to be implemented and supervised. Maintenance personnel should be familiar with the operator's AMP, the approved system of maintenance, or maintenance schedule, their individual responsibilities in accomplishing that program, and availability of any resources within or outside of the maintenance organisation that may be necessary to ensure program effectiveness (e.g., SB or service letter information).

4.2.3 Provision for LVO equipment maintenance may be addressed as a specific program or may be integrated within the AMP, the approved system of maintenance, or a maintenance schedule.

4.2.4 Regardless of whether the maintenance program is integrated, or is designated as a specific LVO equipment maintenance program, the maintenance program should at least address the following:

a. Maintenance procedures necessary to ensure continued airworthiness in relation to LVO.
b. A procedure to revise and update the maintenance program.
c. A method to identify, record, or designate personnel currently assigned responsibility in managing the program, performing the program, maintaining the program, or performing quality assurance for the program. This includes identification of any contractor or sub-contractor organisations, or where applicable, their personnel.
d. Verification should be made of the LVO required systems and configuration status for each aeroplane brought into the LVO maintenance program. Each aeroplane should meet relevant criteria specified by the applicable aeroplane manufacturer or avionics manufacturer for associated systems and equipment (e.g., Valid type certificate (TC), appropriate Supplemental Type Certificate (STC) records and compliance, ADs, SBs, or other compliance).
e. Identification of modifications, additions, and changes which were made to qualify aeroplane systems for the intended operation or minima, if other than as specified in the Airplane Flight Manual (AFM), TC, or STC.
f. Identification of maintenance requirements and log entries necessary to change low-visibility precision approach minima status.
g. Any discrepancy reporting procedures that may be unique to the LVO program.
h. Procedures that identify, monitor, and report lower minimum system and component discrepancies for the purpose of quality control and analysis.
i. Procedures that define, monitor, and report chronic and repetitive discrepancies.
j. Procedures that ensure aeroplane remain out of lower minimum status until successful corrective action has been verified for chronic and repetitive discrepancies.
k. Procedures that ensure the aeroplane system status is placarded properly and clearly documented in the aeroplane logbook, in coordination with maintenance control, engineering, flight operations, or equivalent.
l. Procedures to ensure the downgrade of an aeroplane low-visibility capability status, if applicable, when maintenance has been performed by persons other than those trained, qualified, or authorised to use or approve procedures related to LVO equipment.
m. Procedures for periodic maintenance of systems ground check, and systems flight check, as applicable. For example, following heavy maintenance, suitable checks may need to be performed prior to return to service.
n. Provisions for an aeroplane to remain in a specific low-visibility capability status (e.g., CAT II, CAT III, fail operational (FO), fail passive (FP)) or other designated operational status used by the operator.

o. Provision should be made for periodic operational sampling of suitable performance. Typically, at least one satisfactory approach should have been accomplished within a specified period approved for that operator, unless a satisfactory systems ground check has been accomplished. A recording procedure for both satisfactory and unsatisfactory results should be included.

Return to service procedures

4.2.5 Procedures should be included to upgrade or downgrade aeroplane system status concerning LVO equipment capability. The method for controlling operational status of an aeroplane should ensure that flight crew, maintenance and inspection departments and other necessary personnel are appropriately aware of aeroplane LVO capability and system status.

4.2.6 The appropriate level of testing should be specified for each component or system. The manufacturer's recommended maintenance program or maintenance instructions should be considered when determining the role built-in test equipment (BITE) should play for return to service procedures, or for use as a method for LVO status upgrade or downgrade. Additional consideration is given for systems certified to be continuously monitored and require no testing following maintenance.

4.2.7 Maintenance personnel should follow the operator's AMP, the approved system of maintenance, or a maintenance schedule to approve an aeroplane's return to service. The operator is responsible for ensuring that contract organisations and personnel are appropriately trained, qualified, and authorised.

Configuration control and system modifications

4.2.8 The operator should ensure that any modification to systems and components approved for use in LVO are not adversely affected when incorporating software changes, SBs, hardware additions, or modifications. Any changes to system components should be consistent with the aeroplane manufacturer, avionics manufacturer, industry, or CASA accepted criteria or processes.

Airworthiness records

4.2.9 The operator should keep suitable records (e.g., both the operator's own records and access to records of any applicable contract maintenance organisation). This is to ensure that both the operator and CASA can determine the appropriate airworthiness configuration and status of each aeroplane.

4.2.10 Contract maintenance organisations should have appropriate records and instructions for coordination of records with the operator.

Periodic systems evaluation

4.2.11 Unless the approved AMP, the approved system of maintenance, or the maintenance manual specifies another method to assure the satisfactory performance of a low-visibility flight guidance system (e.g., autoland or HUD), the operator should periodically use the relevant system and note satisfactory performance in an aeroplane technical

logbook entry or aircraft communications addressing and reporting system. The intervals between assessment events should be not less than:

a. 6 months for precision approach - SA CAT I, SA CAT II and CAT II operations
b. 30 days for precision approach - CAT III operations.

4.2.12 Fleet sampling is not typically acceptable in lieu of individual aeroplane assessment.

4.2.13 In cases where performance was not satisfactory, the record entry should include system malfunction, location (specific runway/airport), and weather conditions. This level of detail will assist in troubleshooting to include determination if the fault was the result of factors external to the aeroplane.

4.2.14 Periodic FGS and/or autoland system checks for aeroplanes not certified as continuously monitored, should be conducted in accordance with procedures recommended by the aeroplane or avionics manufacturer (e.g., ICA, SB, service letter compliance).

4.2.15 Reference to aeroplane system checking or periodic LVO system evaluation should be included in the exposition or operations manual as a requirement for crew compliance; however, this requirement does not impose a flight crew operational limit for crew recency purposes.

Reliability reporting and quality control

4.2.16 No special reliability reporting or quality control requirements are applicable to precision approach - CAT I. For low-visibility precision approach CAT II or CAT III, a monthly summary should be submitted to the certificate holding office for a period of one year after an applicant has received an authorisation. The following information should be reported:

a. The total number of approaches tracked, the number of satisfactory approaches tracked, by aeroplane/system type, and visibility RVR, if known or recorded.
b. The total number of unsatisfactory approaches, and reasons for unsatisfactory performance, if known, listed by appropriate category (e.g., poor system performance, aeroplane equipment problem/failure; ground facility problem, Air Traffic Service (ATS) handling, lack of critical area protection, or other).
c. The total number of unscheduled removals of components of the related avionics systems.

4.3 Continuing airworthiness requirements – Part 91 only

Airworthiness/maintenance program requirements

4.3.1 It is the responsibility of the aeroplane's registered operator (RO) to ensure the continuing airworthiness of that aeroplane. Given that the RO need not be the same as the operator (PIC or flight crew) approved to conduct LVO in the aeroplane, there are some differences in the requirements that apply to Part 91 only operations.

4.3.2 Essentially, the differences arise from the necessity for the RO and the operator to each ensure that the procedures and requirements that would otherwise be described in an

exposition or operations manual pertaining to LVO (see section 4.2 above) are satisfied to an extent that ensures total system performance, accuracy, availability, reliability, and integrity for the intended LVO.

4.3.3 The RO and the Part 91 only operator approved to conduct LVO, must ensure that at least the following matters, as applicable, are addressed:

a. The RO clearly identifies and communicates the aeroplane and LVO system status including any:
   i. Clearly articulated capability to conduct LVO.
   ii. System limitations or unserviceability, if any.
   iii. System downgrade under MEL or MMEL and consequential limitations on LVO.
   iv. AD, SB or other maintenance action necessary for LVO that has not been carried out.
   v. Requirements to conduct periodic assessment of LVO equipment performance, success criteria and applicable reporting requirements.
b. The operating crew to communicate and report:
   i. Any system abnormalities or unserviceabilities.
   ii. Results of LVO system performance in LVO.
   iii. Results of periodic assessment of LVO equipment performance in better weather conditions if required to be conducted.

4.4 Continuous monitoring – General

4.4.1 It is generally a condition of an approval to conduct LVO that the operator is required to continuously monitor operations to detect any undesirable trends so that potential hazards can be proactively managed or eliminated. Flight crew reports may be used for this purpose.

4.4.2 Where applicable, the procedure should be integrated into the operator's safety management system.

4.4.3 The operator should establish and maintain a system for recording approach and/or automatic landing success and failure for precision approach - CAT II, SA CAT II and CAT III operations.

4.4.4 The operator should retain the following information:

a. For a period of 12 months: the total number of approaches by aeroplane type, during which the airborne precision approach - CAT II or CAT III equipment was used to make satisfactory, actual or practice approaches to the applicable precision approach - CAT II, SA CAT II or CAT III minima.
b. For a period of 2 years: reports of unsatisfactory approaches and/or autolands by aerodrome and aeroplane registration in the following categories:
   i. airborne equipment faults
   ii. ground facility difficulties
   iii. missed approaches because of ATC instructions

iv. other reasons.

4.5 Criteria for a successful precision approach - CAT II, SA CAT II, CAT III approach and automatic landing

4.5.1 The criteria listed in the paragraphs 4.5.2 and 4.5.3 are used for determining whether a successful approach and landing for the purposes of paragraph 4.4.3 has been achieved.

4.5.2 Unless otherwise specified by the original equipment manufacturer (OEM), an approach may be considered to be successful if:

a. from 500 ft to start of flare:
   i. airspeed remains within ±5 kt of the intended value, disregarding rapid fluctuations due to turbulence
   ii. no relevant system failure occurs.
b. from 300 ft to DH:
   i. no excess deviation occurs
   ii. no centralised warning gives a missed approach procedure command (if installed).

4.5.3 Unless otherwise specified by the OEM, an automatic landing may be considered to be successful if:

a. no relevant system failure occurs
b. no flare-failure occurs
c. no de-crab failure occurs (if installed)
d. main wheel touchdown occurs in the touchdown area
e. nose wheel touchdown occurs within 8 m of centreline
f. bank angle at touchdown does not exceed 7
g. pitch angle at touchdown does not exceed the maximum value for a safe tail clearance
h. rollout lateral deviation does not exceed 8 m
i. no rollout failure occurs.

4.5.4 The criteria listed in the paragraphs 4.5.2 and 4.5.3 are also used for determining whether successful approach and landings occurred for the purposes operational approvals specified in:

a. Subparagraph 8.5.1 (b).
b. Subparagraph 8.7.3 (b.)
c. Subparagraph 8.7.3 (c).
d. Subparagraph 8.7.6 (b).
e. Subparagraph 8.7.9 (b).

5 Aerodrome related requirements

5.1 ATC and aerodrome capability

5.1.1 LVO are permitted to be conducted at aerodromes where air traffic control (ATC) services are in operation and when ATC has declared that low-visibility procedures (LVP) are in effect. Additionally, LVO are permitted to be conducted within:

a. Australia: if the aerodrome and runway satisfy the regulatory standards for operations at the visibility minima specified for the particular LVO
b. a foreign country: if the aerodrome and runway is authorised by the foreign regulatory authority for operations at the minima specified for the particular LVO.

5.2 Eligible aerodrome and runway verification

5.2.1 Each aeroplane type/runway combination should be verified by the successful completion of at least one approach and landing in CAT II or better conditions before conducting CAT III operations for that aeroplane type/runway combination. It is acceptable for the verification to be conducted either in the aeroplane type or a flight simulator for the aeroplane type with the applicable terrain and aerodrome runway modelling.

5.2.2 For runways with irregular pre-threshold terrain or other foreseeable or known deficiencies, each aeroplane type/runway combination should be verified by successful operations to precision approach - CAT I minima or better conditions prior to commencing precision approach - SA CAT I, CAT II, SA CAT II or CAT III operations for that aeroplane type/runway combination.

5.3 Required aerodrome/runway facilities

5.3.1 For LVTO, the required aerodrome/runway requirements are set out in Table 1. Additionally, the aerodrome operator is required to publish the low visibility taxi procedures for the aerodrome.

5.3.2 The aerodrome/runway facilities normally required for low-visibility precision approaches at aerodromes are set out in Table 6.

Table 6: Facilities required for low-visibility precision approaches

Component	SA CAT I	CAT II	SA CAT II	CAT III
Minimum ILS classification[5]	HUD only: Standard CAT I Autoland: I/T/1	RVR ≥ 300 m: II/T/2 RVR < 300 m: II/D/2	II/D/2	RVR ≥ 200 m: III/D/3 RVR ≥ 175 m: III/E/3 RVR < 175 m: III/E/4
CAT I ALS	Yes	Not required	Yes	Not required
CAT II/III ALS	Optional	Yes	Optional	Yes
Outer Marker, GPS, GLS or ILS Distance Measuring Equipment (DME)	Yes	Yes	Yes	Yes
Middle Marker	No	No	No	No
Inner Marker, GPS, GLS or ILS DME	No	Yes	Yes	Yes
Electronic RVR – TDZ	Yes	Yes	Yes	Yes
Electronic RVR – MID[6]	No	Yes	Yes	Yes
Electronic RVR – END[6]	No	No	No	Yes
High Intensity REDL	Yes	Yes	Yes	Yes
TDZ lights	No	Yes	For RVR < 450m but > 400 m: TDZ lights or RCLL For RVR ≤ 400 m: RCLL	Yes
RCLL	No	RVR ≥ 350 m: Yes – ≤ 30m spacing RVR < 350 m: Yes – 15m spacing		Yes

[5] The ILS classification (for each of the 3 alphanumeric characters)– specified for the facility must be equal to or better than each of the 3 alphanumeric values specified in the table for the particular procedure. For details of the ILS classification system, refer to Volume I of Annex 10 to the Chicago Convention.

[6] The requirement for both MID and END RVR is specifically determined by the operating minima. In some cases both are not required.

5.4 Failed or downgraded equipment – effect on landing minima

5.4.1 Table 7 details the limitations imposed by failed or downgraded aerodrome equipment.

5.4.2 The failure effect limitations are intended for use both pre-flight and in-flight. Where failed or downgraded equipment is announced prior to passing 1 000 ft above aerodrome elevation, the failure or downgraded equipment's effect on the approach minima as set out in Table 7 should be considered. This may result in the approach being discontinued by the PIC. Where failed or downgraded equipment is announced after passing 1 000 ft above aerodrome elevation, consideration of the failure or downgraded equipment's effect on the approach minima and the continuation of the approach are at the PIC's discretion.

5.4.3 The following conditions apply to the application of failed or downgraded equipment's effect on the approach minima in Table 7:

a. Multiple failures of runway lighting, other than those permitted in Table 7, are not acceptable.
b. Deficiencies of approach and runway lights are permitted to be treated separately
c. For precision approach - CAT II and CAT III operations, a combination of deficiencies in runway lights and RVR assessment equipment are not permitted.
d. Other than for ILS transmitter, failures will only affect RVR minima requirements (i.e., not DH).

Table 7: Effect on landing minima of failed/downgraded equipment

Failed or downgraded equipment	SA CAT I	SA CAT II	CAT II	CAT IIIA	CAT IIIB with DH	CAT IIIB (no DH)
ILS standby transmitter	No effect				RVR 200 m	Not allowed
Outer marker	No effect if replaced by height check at a suitable point after glide path intercept					
Middle marker	No effect					
TDZ RVR	Not allowed				Not allowed unless any two RVR values are available	
MID or END RVR	No effect					
ALS	RVR 800 m	RVR 700 m	Not allowed	Not allowed for operations with DH > 50 ft		No effect
ALS except the last 210 m	RVR 650 m	RVR 600 m	Not allowed	No effect		
ALS except the last 420 m	RVR 550 m	RVR 450 m	No effect			

<table>
<tr><th>Failed or downgraded equipment</th><th>SA CAT I</th><th>SA CAT II</th><th>CAT II</th><th>CAT IIIA</th><th>CAT IIIB with DH</th><th>CAT IIIB (no DH)</th></tr>
<tr><td>Standby power for approach lighting</td><td colspan="6">No effect</td></tr>
<tr><td rowspan="2">Runway edge lights, threshold lights and runway end lights</td><td colspan="6">Day: No effect</td></tr>
<tr><td colspan="3">Night – not allowed</td><td>Night: RVR 550 m</td><td colspan="2">Night – no effect</td></tr>
<tr><td rowspan="2">RCLL</td><td rowspan="2">No effect</td><td rowspan="2">If TDZ lights available: RVR 400 m, otherwise RVR 450 m</td><td>Day – RVR 350 m</td><td>Day – RVR 300 m</td><td rowspan="2">Not allowed</td><td>Day – RVR 200 m</td></tr>
<tr><td>Night: RVR 550 m or RVR 400 m with HUD to touchdown or autoland</td><td>Night – RVR 400 m</td><td>Night – not allowed</td></tr>
<tr><td>RCLL spacing increased to 30 m</td><td colspan="4">No effect</td><td colspan="2">RVR 150 m</td></tr>
<tr><td rowspan="2">TDZ lights</td><td rowspan="2">No effect</td><td rowspan="2">If RCLL lights available: no effect, otherwise RVR 450 m</td><td colspan="2">Day – RVR 300 m</td><td>Day – RVR 200 m</td><td rowspan="2">No effect</td></tr>
<tr><td colspan="2">Night – RVR 550 m</td><td>Night – RVR 300 m</td></tr>
<tr><td>Taxiway light system</td><td colspan="6">No effect – except delays due to reduced movement rate</td></tr>
</table>

6 LVO procedures and documentation

6.1 General

6.1.1 The requirements prescribed in the operations legislation pertinent to published operating procedures and documentation vary according to the type of operation being conducted. The three broad types of operations being those conducted by AOC holders, aerial work or Part 141 certificate holders, or Part 91 only operators.

6.1.2 Consequently, there are some differences in how the relevant legislation deals with requiring (or not) the provision of published operating procedures and documentation for the flight crew and the matters and depth of detail required (or not) to be contained therein. The following is provided in the context of each of the operators to which low-visibility approvals may be granted.

AOC holders

6.1.3 The legislation requires that AOC holders provide the details of procedures and processes implemented to safely conduct their operations in their exposition. Further, for Part 121 and Part 135 operators, it is a requirement contained within the legislation that the operator's exposition must include:

a. each type of LVO conducted by the operator.
b. the aeroplane systems required to be used for each type of LVO.
c. the aerodrome facilities required to conduct each type of LVO.
d. the requirements to be met by the flight crew during each type of LVO.

Aerial work or Part 141 certificate holders

6.1.4 Aerial work and Part 141 certificate holders are required to provide in their operations manual the details of procedures and processes to be followed to safely conduct their operations. It is recommended that compliance with that requirement be satisfied for LVO by inclusion in the operations manual of at least the matters described in paragraph 6.1.3 above.

Part 91 operations

6.1.5 Although not required under any specific Part 91 provision, in order for a Part 91 operator to be approved to conduct LVO, it is as a condition of that approval, that the operator must have operating procedures and documentation that assure safe conduct of LVO. It is recommended that the procedures and documentation contain at least the relevant matters described in paragraph 6.1.3 also.

6.2 Procedures, checklists and instructions

Procedures and instructions

6.2.1 In order to safely conduct LVO it is imperative that the operating flight crew are provided with adequate descriptions and instruction for the operational procedures to be followed.

6.2.2 The precise nature and scope of procedures and instructions given should depend upon the airborne equipment used and the standard operating procedures to be followed. The operational procedures should clearly define flight crew member duties during take-off, approach, flare, rollout and missed approach. Particular emphasis should be placed on flight crew responsibilities during transition from non-visual conditions to obtaining the required visual references, and on the procedures to be used in deteriorating visibility or when failures occur.

6.2.3 Whilst certain legislation requires a minimum flight crew of 2 pilots, not all of the licensing or operational legislation parts do so. Consequently, operations conducted under the legislation that do not otherwise require a minimum flight crew of 2 pilots should ensure that the procedures, checklists and briefings required to safely conduct LVO are developed and used in a manner that ensures the appropriate use of a minimum flight crew of 2 pilots.

Checklists and briefings

6.2.4 It is recommended that operators provide a LVO checklist that includes all applicable relevant information for:

a. Briefings required prior to conducting:
   i. LVTO

   or

   ii. low-visibility precision approaches.
b. Identifying the aeroplane and ground equipment necessary for carrying out the LVO.
c. A means of determining the RA minima where no defined RA minima is provided on the IAP chart for the runway.
d. Any other specific matters necessary to be addressed by use of a checklist.

6.2.5 If a runway has no defined RA minima, the operator may determine the RA minima from a study of the Precision Approach Terrain Charts available from the relevant aerodrome operator. Appendix A shows a method for determining RA minima.

6.3 On-board documentation

6.3.1 The aeroplane operator should ensure that the documents on board each aeroplane contain:

a. The necessary flight crew procedures required for a safe LVO.
b. Details of the aeroplane equipment required for the LVO.
c. A copy of the operator's Ops Spec which includes the LVO approval.

d. LVO checklist.
e. Details of each of the aerodromes and runways approved for LVO.,
f. The applicable minima for the approved aerodromes and runways, including:
    i. The LVTO minima.
    ii. The RA height that equates to the approved precision approach - SA CAT I, CAT II, SA CAT II or CAT III DH for each listed runway that is approved for such operations.

7 Flight crew training and competency for LVO

7.1 General

7.1.1 At the most elementary level, it is a requirement that flight crew only conduct operations for which they are competent. The requirements applied to how the competency of flight crew are assured varies dependent upon whether the operations are conducted under an AOC, an aerial work or Part 141 certificate, or as a Part 91 operation only.

7.1.2 There are no licence ratings or endorsements that apply specifically to conducting LVO, however there is a presumption that LVO are conducted under the IFR and that the operator and the PIC have the appropriate authorisations to conduct IFR operations. Consequently, this section is divided into subsections that each address the requirements applicable to the elements of training and experience required to ensure that flight crew have the necessary competency to conduct LVO. While some elements, such as initial theory and practical training are likely to have some commonality, many of the requirements will vary dependent upon whether the LVO is being conducted for an AOC holder, an aerial work or Part 141 certificate holder, or for Part 91 operations only.

7.1.3 The phases of training addressed in this section include:

a. LVO initial training (theory and practical).
b. LVO initial competency.
c. LVO recurrent training and competency.
d. LVO re-qualification training.
e. LVO upgrade training.
f. LVO type transition training.

7.1.4 Generally, LVO training for flight crew would be conducted for AOC holders and certificate holders within their training and checking systems. That training may not necessarily be required to be conducted by a Part 141 or 142 organisation. Traditionally, LVO initial training for type-rated aeroplanes used to conduct air transport operations have been conducted as an add-on module of training following the type-rating training undertaken for the operator.

7.1.5 LVO initial and recurrent training for Part 91 operators would be expected to be provided by an organisation that would otherwise be approved to conduct IFR training and training suitable for the type of aeroplane being approved to conduct LVO.

7.1.6 Given the variability of LVO approvals that operators may granted, ranging from LVTO to precision approach – CAT IIIB, the extent to which the contents of the following subsections apply, will also vary.

7.1.7 Finally, in relation to approvals to conduct LVO, there are no specified requirements in the legislation for other than the PIC to be approved to conduct LVO in a Part 91 only operation. The matters pertaining to the second flight crew member in a multi-crew Part 91 operation conducting LVO are also discussed.

7.2 LVO initial theory training

7.2.1 The LVO initial theory training for flight crew who are to be approved to conduct LVO should, where the elements are applicable to the LVO approval, include at least the following thematic aspects; environmental, technical, procedural, and legislative.

7.2.2 Acceptable methods of delivery of theory training can include classroom or virtual classroom (instructor lead) instruction, self-guided review of pre-prepared instruction presentation, computer-based interactive instruction, or self-instruction using appropriate reference materials.

7.2.3 The degree to which theory training that is provided through self-guided learning or review from appropriate reference materials (e.g., flight-crew operating manual), is acceptable is at the discretion of the operator for Part 91 only operations. For AOC holders and aerial work or Part 141 certificate holders the initial check of flight crew LVO competency should verify that the necessary theory knowledge has been acquired.

7.2.4 Given the variability in licence level (PPL thought to ATPL) of flight crew that may be granted an LVO approval, theory training should therefor take into account the variability in underpinning knowledge relevant to LVO.

Environmental aspects

7.2.5 LVO initial theory training should be provided in relation to the characteristics of environmental and meteorological phenomena that produce low-visibility conditions or impact LVO, including:

a. Characteristics of fog, mist, blowing snow, rain, smoke, dust, etc.
b. The effects of precipitation, ice accretion, low-level windshear and turbulence.
c. Principles and limitations of light transmission.

Technical aspects

7.2.6 LVO initial theory training should be provided in relation to the characteristics, capabilities and limitations of technical equipment used to conduct or support LVO including the aerodrome and its equipment and the relevant aeroplane equipment.

7.2.7 Aerodrome technical matters to be addressed, as applicable, include:

a. NAVAIDs; characteristics and limitations of the ILS, microwave landing system (MLS) and/or GLS[7].
b. Visual aids.
c. Runway markings.
d. Runway lighting.
e. Approach lighting.
f. Taxiway marking and lighting for LVO.
g. Provision and limitations of RVR and RV assessment systems.

7.2.8 Aeroplane technical equipment matters to be addressed, as applicable, include:

[7] Ground-based augmentation system (GBAS) landing system (GLS) or SBAS

a. operational characteristics, capabilities, and limitations of each appropriate airborne system element, as applicable to the LVO including:
    i. Flight guidance systems (FGS) including appropriate autopilot modes to be used for different circumstances or procedures and associated landing and roll-out systems, or go-around capability, as applicable.
    ii. Flight director (FD) systems including appropriate modes to be used for different circumstances or procedures and associated landing and roll-out systems, or go-around capability, as applicable.
    iii. HUD/HGS systems including appropriate modes to be used for different circumstances or procedures and associated landing and roll-out guidance, or go-around capability, as applicable.
    iv. Automatic throttle control system if applicable. Mixed mode autoflight/autothrottle operations should be addressed, if necessary.
    v. Display systems and situation information displays including any applicable limits for acceptable approach performance to continue an approach.
    vi. Status, alerting and warning displays or other associated instrumentation and displays, as applicable, including any monitoring displays, status displays, mode annunciation displays, failure or warning annunciations, and associated system status displays that may be relevant.
b. Other flight deck system operations or use, as applicable to the LVO, including any associated limitations, characteristics, or constraints, for systems such as:
    i. Auto brakes.
    ii. Auto spoilers.
    iii. Aeroplane internal and external lighting.
c. Aeroplane handling limitations, characteristics, or constraints relevant to low-visibility precision approaches including:
    i. Correct cockpit seating position and eye height.
    ii. Cockpit visibility cut-off angles for low-visibility precision approaches and the effects of different flap settings and approach speeds.
    iii. Touchdown pitch up or pitch down tendency of certain auto spoiler or auto brake settings.
d. Aeroplane handling limitations, characteristics, or constraints relevant to go-around including:
    i. Proper airborne system use for go-around.
    ii. Consideration of height loss during transition to a go-around.
    iii. Performance assurance for obstacle clearance.
    iv. Management of any necessary mode changes.
    v. Assurance of appropriate vertical and lateral flight path tracking.
    vi. Any time delays or auto-deactivation features associated with go-around functionality.
e. Recognition and response to pertinent non-normal or failure conditions, and related non-normal procedure and checklist use for flight guidance, instrument, and supporting systems (electrical, hydraulic, and flight control systems).

Procedural aspects

7.2.9 LVO initial theory training should be provided in relation to crew duties and procedures for conducting LVTO and low-visibility surface movement procedures including:

a. Appropriate crew duties, monitoring assignments, appropriate automatic or crew initiated call-outs to be used.
b. Recognition of and action to be taken in the event of failure of ground equipment.
c. Procedures and precautions to be followed with regard to surface movement during operations when the RVR is less than 550 m and any additional procedures required for take-off in conditions below 150 m (200 m for category D aeroplanes)

7.2.10 LVO initial theory training should be provided in relation to crew duties and procedures for conducting low-visibility precision approaches including:

a. Appropriate crew duties, monitoring assignments, transfer of control during normal operations, appropriate automatic or crew initiated call-outs to be used, applicable minima for normal configurations or for alternate or failure configurations and reversion to higher minima in the event of failures.
b. Proper application of meteorological visibility criteria and requirements, including their respective use and limitations, and the determination and application of controlling RVR and advisory RVR.
c. Proper use of instrument approach procedures and charts including application of Decision altitude (height) (DA(H)) and Minimum decision altitude (height) (MDA(H),) and when to use DA, DH, or MDA as applicable, including proper use and setting of barometric or radar altimeter alerts (bugs).
d. The availability and limitations of visual references encountered, both on approach before and after DA(H), if a DA or DH is applicable.
e. Procedures for an unexpected deterioration of conditions to less than the minimum visibility specified for the procedure during an approach, flare. or roll out including the proper response to a loss of visual reference or a reduction of visual reference below the specified values when using a DA(H) or MDA(H) and prior to the time that the aeroplane touches down.
f. The importance and significance of alert height (AH), if applicable, and the actions required in the event of any failure above and below the AH.
g. Procedures for transitioning from non-visual to visual flight for the pilot flying and pilot monitoring, during an approach.
h. Procedures for transitioning from monitoring displays to external visual references for systems that include electronic monitoring displays.
i. Recognition of the limits of acceptable aeroplane position and flight path tracking during approach, flare and, if applicable, roll out. This should be addressed using appropriate displays or annunciations for the aeroplane type.
j. The recognition and proper reaction to significant aeroplane system failures experienced prior to and after reaching the final approach fix and experienced prior to and after reaching DA(H), as applicable. Expected crew response to failures

prior to touchdown should be addressed, particularly for precision approach – CAT II operations.

k. Correct recognition and react to ground or navigation system faults, failures, or abnormalities at any point during the approach, before and after passing DA(H) and in the event an abnormality or failure which occurs after touchdown.

l. Appropriate go-around techniques, systems to be used either automatically or manually, consequences of failures on go-around systems which may be used, the expected height loss during a manual or automatic go around considering various initiation altitudes, and appropriate consideration for obstacle clearance in the event that a missed approach must be initiated below DA(H).

7.2.11 Flight crew must know the requirements for when to make cold weather temperature corrections for altimeter systems and how to apply correction procedures, when necessary.

Legislative aspects

7.2.12 LVO initial theory training should be provided in relation to legislative aspects including:

a. Applicable legislation pertinent to LVO.
b. Approval requirements necessary to conduct LVO.
c. Aerodrome equipment and runway light requirements for LVO.
d. Aeroplane systems and certification requirements for LVO.

7.3 LVO initial practical training

General

7.3.1 LVO initial practical training for flight crew will vary subject to a number of factors. The variable nature of the licences of the flight crew undertaking the LVO initial practical training and the breadth of skills and experience of the flight crew will necessitate that the practical training is modified accordingly.

7.3.2 Where flight crew receiving LVO initial practical training do not hold CPL or ATPL, additional training may be required to ensure the flight crew possess appropriate underpinning competency related to crosswind take-off and landing skills, ability to fly to an adequate level of accuracy using raw data, ability to assess and safely cope with adverse runway friction, make adverse weather avoidance judgments.

7.3.3 Given the nature of the practical training required to acquire competency in LVO, it is presumed that the practical training will be conducted in a synthetic training device, including where necessary a flight simulator, suitable for the purpose and which can appropriately represent the limiting visual conditions related to the minima which are applicable.

7.3.4 LVO initial practical manoeuvres and procedures trained should be relevant to the types of LVTO and low-visibility precision approaches intended to be used by the operator, the environment in which they are likely to be flown, and any special considerations that

may apply to their safe application. Operating policies, procedures, and documentation representative of that which is applicable to the particular operator should also be used.

7.3.5 LVO initial practical manoeuvre and procedure training should ensure that LVTO and low-visibility precision approaches can be safely conducted considering at least the following factors, as applicable to the specific operator:

a. Types of low-visibility precision approach procedures used (standard and SA, if applicable).
b. The operator's manuals, charts, and checklists.
c. Aeroplane types and variants flown.
d. Flight guidance system used.
e. NAVAIDs and visual aids used.
f. Flight crew procedures used (e.g., PF/PM duties, monitored approach, callouts).
g. Aerodrome characteristics typically experienced (e.g., visual aids, transition level, air traffic procedures, meteorological procedures, signs and markings, unusual aerodrome features (elevations, slope) as applicable).
h. Runway characteristics typically experienced (e.g., representative field lengths, grooving, marking).
i. Nearby critical terrain or obstruction environment, if applicable.
j. Relevant environmental conditions (e.g., wind, turbulence, shear, visibility and ceiling conditions, contaminated runways, rain or snow effects on visibility).

7.3.6 LVO initial practical training should include some means of demonstrating the expected visual references where the weather is at acceptable minimum conditions for LVTO and low-visibility precision approaches as applicable. Additionally, the expected sequence of visual cues during a low-visibility precision approach in which the visibility is at or above the specified landing minimums. This may be done using simulation, video or other presentation of simulated landings or actual landings, images showing expected visual references, computer-based reproductions of expected visual references or other acceptable means.

7.3.7 Procedures for dealing with pilot incapacitation appropriate to LVTO and low-visibility precision approach procedures should also be covered during initial practical training.

7.3.8 The following paragraphs describe the matters applicable to LVO initial practical training for specific LVO manoeuvres and procedures (LVTO and low-visibility precision approaches). Not all the specific matters must be addressed individually as discrete training items. For example, it may be that some matters for one category of low-visibility precision approach are addressed by the training for a different category of low-visibility precision approach; however, where differences exist, they must be addressed.

7.3.9 While the number of simulator periods, training flights, or length of simulator periods for training are not specified, the training should provide sufficient training to ensure that flight crew members can competently perform each of the required manoeuvres or procedures to an acceptable degree of proficiency necessary for each of the required manoeuvres to be properly and reliably performed in operations.

LVTO practical training

7.3.10 In addition to the applicable general training matters mentioned in the preceding paragraphs, for LVTO initial practical training, flight crew should undergo training that specifically address the following matters:

a. Normal take-off in minimum approved RVR conditions.
b. Rejected take-off from a point prior to V1 (including an engine failure).
c. Continued take-off following failures including engine failure between V1 and V2, or as soon as safety considerations permit, and any critical failures for the aeroplane type which could lead to lateral asymmetry during the take-off.
d. Rejected take-off which involves transfer of control to the PIC, if non-PIC flight crew are permitted to conduct take-offs under the specified low visibility conditions (if applicable).

7.3.11 The conditions under which the LVTO initial training is conducted should include appropriate limiting cross winds, wind gusts and runway surface friction levels representative of the intended or approved operations. Training should be conducted at aeroplane weights or on runways that represent a critical field length.

7.3.12 Where the applicable LVTO flight guidance devices used have not been shown to have failure characteristics which are extremely improbable, training should include a take-off and rejected take-off with failure of the flight guidance device at a critical point of the take-off.

Low-visibility precision approach practical training

7.3.13 In addition to the applicable general training matters mentioned in the preceding paragraphs, for initial low-visibility precision approach practical training, flight crew should undergo training that specifically address the following matters:

a. Approach using the appropriate flight guidance, autopilots and control systems installed in the aeroplane to the appropriate DH and to include transition to visual flight and landing.
b. Normal landings at the lowest applicable Category I or precision approach – CAT II minima, using representative autoflight configurations or combinations of configurations authorised for use (e.g., flight director, autopilot, auto-throttles).
c. A missed approach from the lowest applicable DA(H) and MDA(H), (may be combined with other manoeuvres).
d. A balked landing or missed approach from a low altitude that could result in a touchdown during go-around (balked landing or rejected landing - may be combined with other manoeuvres).
e. Appropriate aeroplane and ground system NAVAID failures (may be combined with other manoeuvres).
f. Engine failure prior to or during approach (if specific flight characteristics of the aeroplane or operational authorisations require this manoeuvre).
g. Manual roll out with low visibility at applicable minima (may be combined).

h. Landings with environmental conditions at a representative sample of limiting values for IAP minima (e.g., regarding wind magnitude, headwind and crosswind components, turbulence, and runway surface friction characteristics (wet, snow, slippery) may be combined).
i. Representative non-normal configuration approaches and landings in simulated weather minima above, or well above, the lowest minima permitted. Minima should be at levels that might typically be experienced in line operations, for a landing with the non-normal condition used. During these approaches, representative autoflight, instrument, and aeroplane system configurations or combinations of configurations should be conducted in training (e.g., flight director, autopilot, auto-throttles, raw data, inoperative electrical or hydraulic components).
j. Checks of satisfactory functioning of aeroplane equipment, both on the ground and in flight.
k. Approach ban requirements and actions.

7.3.14 Where applicable, the low-visibility IAP training for precision approach - CAT III should also include:

a. A missed approach from the AH or DH (may be combined with other manoeuvres).
b. A missed approach from a low altitude that could result in a touchdown during go-around (rejected landing).
c. Except for aeroplanes using an automatic Fail Operational roll out system, manual roll out in low visibility at applicable minima (may be combined).
d. The handling of the aeroplane when, during a FP precision approach - CAT III approach, the fault causes the autopilot to disconnect at or below DH when the last reported RVR is 300 m or less.

7.3.15 The low-visibility precision approach training for HUD/HGS equipped aeroplanes should include, where appropriate, approaches where failures of the HUD/HGS equipment at low level require either:

a. Reversion to head down displays to control missed approach.

or

b. Reversion to flight with no HUD or downgraded HUD/HGS guidance to control missed approaches from DH/AH or below, including those that may result in a touchdown on the runway.

7.4 LVO initial competency

7.4.1 The assurance of flight crew competency following LVO initial training will have varied requirements dependent upon whether the training was conducted for the purpose of operations under an AOC, an aerial work or Part 141 certificate, or as a Part 91 operation only.

7.4.2 For LVO conducted under an AOC or an aerial work or Part 141 certificate, the operator’s training and checking system is required describe the requirements for assessing flight crew competence in LVO. For a Part 91 only operator, subject to any

relevant conditions placed upon the LVO approval, the competence of the flight crew in conducting LVO are the responsibility of the PIC.

7.4.3 Consequently, the competency elements described in the following paragraphs are intended to convey the minimum acceptable demonstrated competency standards upon completion of LVO initial training. This demonstration of competency would be to an appropriate person assigned to assess competency under a training and checking system, when required. In the circumstance of a Part 91 only operation, the competency elements described are to be taken to represent the minimum acceptable competency standards required to be demonstrated by a PIC or any other flight crew member upon completion of initial LVO training.

General competency

7.4.4 There are general requirements in relation to demonstrating competency in LVO that are applicable to all operators, irrespective of whether the operations are conducted under an AOC, an aerial work or Part 141 certificate or as a Part 91 operation only.

7.4.5 General competency elements for LVO include:

a. Acquisition and retention of the necessary LVO theory knowledge.
b. Establish and maintain manual control, or reversion to manual control of the aeroplane, if necessary, (for FBW aeroplanes, normal law or configuration is acceptable).
c. Appropriate use of automation.
d. Appropriate planning and situation awareness, including terrain awareness.
e. Ability to detect and cope with adverse environmental conditions (e.g., applicable crosswinds, turbulence, windshear, convective weather, or adverse airport conditions such as slippery runways).
f. Ability to detect and cope with adverse ground system, space system, or NAVAID failures or anomalies.
g. Proper crew coordination, and crew resource management.
h. Application of appropriate PF or PM duties by each crew member, including:
    i. During each of the manoeuvres or procedures, flight crew are expected to perform their respective assignments or duties as applicable
    ii. Flight crew should typically be able to perform either PF or PM duties in LVO, unless otherwise limited by the operator’s policies or aeroplane characteristics (e.g., if operator policy permits only PIC or system installation (HUD) as PF during certain adverse weather take-offs or landings).
    iii. Each flight crew member should individually demonstrate the required manoeuvres or procedures. Relevant procedures are those involving manual control of the aeroplane, rather than procedures such as autoland, which may not involve significant differences in PF or PM skills.
    iv. Ability to detect and cope with crew incapacitation.

LVTO competency

7.4.6 In addition to the general competency elements applicable, each flight crew member can be taken to be competent for LVTO upon completion of their LVTO initial training by successfully demonstrating:

a. One take-off with an engine failure at, or after, V1.
b. One rejected take-off with an engine failure or other appropriate failure near but prior to, V1.

Low-visibility precision approach competency

7.4.7 In addition to the general competency elements applicable, if not otherwise addressed by a competency demonstration for precision approach - CAT III, for precision approach – SA CAT I, CAT II and SA CAT II approved operations each flight crew member should also successfully demonstrate:

a. One normal approach to a landing.
b. One normal approach to a go-around at or near precision approach - CAT II minima.
c. One approach with related aeroplane system, navigation system, or flight guidance failure.
d. If authorised for engine-inoperative precision approach - CAT II capability: one engine-inoperative approach.
e. If authorised for automatic landing:
    i. At least one landing which includes use of an automatic landing system
    ii. If applicable, one automatic go-around from a low approach (at or after DA(H) but before touchdown). The approach or go-around may be conducted in either normal or non-normal conditions.
f. Where HUD/HGS and manual flight guidance and control systems are required:
    i. One landing from the lowest applicable minima.
    ii. One go-around from low altitude below DA(H).
    iii. At least one response to a failure condition during the approach or missed approach.
g. Recognition and proper response to other representative non-normal conditions or adverse weather situations (e.g., outage NOTAM, NAVAID failure, variable or below minima weather, ILS critical area protection anomaly).

7.4.8 In addition to the general competency elements applicable, for precision approach - CAT III each flight crew member should also successfully demonstrate:

a. For automatic systems:
    i. One automatic landing.
    ii. One go-around from a low approach at, or after, decision or AH.
b. For manual systems:
    i. One landing at the lowest applicable minima.
    ii. One go-around from low altitude below AH or DH.

c. At least one response to a failure condition during the approach to a landing or a missed approach.

7.4.9 Demonstration of competency that simultaneously address multiple low-visibility precision approach category need not repetitively test each type of approach at each landing Category.

7.4.10 For the purposes of demonstrating landing proficiency, the exercise should be taken to be completed when the aeroplane is at or below safe taxi speed for the conditions. Go-around or missed approach demonstration can be taken to be completed when the aeroplane is configured for en-route climb or similar.

Competency demonstration conditions

7.4.11 Conditions under which the demonstration of LVO competency should be conducted are:

a. For LVTO, the conditions that include appropriate limiting cross winds, wind gusts, and runway surface friction levels representative of likely operational locations used. The demonstration should be conducted at aeroplane weights or on runways that represent a critical field length for the aeroplane.
b. For low-visibility precision approaches, environmental conditions at a representative sample of limiting values relevant to the IAP minima for that operator (e.g., regarding wind magnitude, headwind and crosswind components, turbulence, and runway surface friction characteristics.

7.5 LVO recurrent training and competency

LVO recurrent training

7.5.1 LVO recurrent training should, irrespective of whether the training is conducted for the purpose of operations conducted under an AOC, an aerial work or Part 141 certificate, or as a Part 91 operation only, at least refresh LVO initial training and where circumstance permit, enhance and develop further the competency gained in LVO initial training.

7.5.2 The periodicity of LVO recurrent training should be in accordance with the applicable requirements specified in the respective training and checking systems for AOC holders and certificate holders, usually not less than annually. For Part 91 only operations, it is likely to be a condition on the LVO approval that LVO recurrent training is conducted not less than annually.

7.5.3 LVO recurrent theory training should provide any necessary review of topics required under LVO initial theory training to assure continued knowledge applicable to those topics. Emphasis should be placed on any program modifications, changes to aeroplane equipment or procedures, review of any occurrences or incidents that may be pertinent. Additional emphasis may be placed on re-familiarisation with mode annunciations for failure conditions or other information which the flight crew may not routinely see during operations.

7.5.4 LVO recurrent practical training should be tailored to include any necessary review of LVTO and low-visibility precision approaches, as applicable and necessary to address reduction in skills borne out of periods were conducting one or more specific LVO procedure was not undertaken, such as no recent precision approach – CAT III experience.

7.5.5 As an example of tailored LVO recurrent training, where a flight crew member has not had recent precision approach - CAT III or simulated precision approach – CAT III experience; training should be provided that includes the conduct of one approach requiring a go-around from a low altitude below AH or DH prior to touchdown.

LVO recurrent competency for AOC and certificate holders

7.5.6 For LVO conducted under an AOC or an aerial work or Part 141 certificate, the operator's training and checking system is required to describe the requirements for conducting the LVO recurrent competency assessment of flight crew knowledge and ability in performing the procedures approved for the operator. The operator's training and checking system should also describe the attributes of the personnel appropriately assigned to assess LVO recurrent competency.

7.5.7 The LVO recurrent competency assessment requirements for LVTO should include at least:

a. One take-off with an engine failure at, or after, V1.
b. One rejected take-off with an engine failure or other appropriate failure near but prior to, V1.
c. In conditions that include:
    i. Minimum approved RVR conditions.
    ii. Appropriate limiting cross winds, wind gusts.
    iii. Runway surface friction levels representative of likely operational locations.
    iv. At aeroplane weights or on runways that represent a critical field length for the aeroplane.

7.5.8 The LVO recurrent competency assessment requirements for low-visibility precision approaches should, as applicable to the operator's LVO approval, include general LVO competency elements and at least the specific procedures for each flight crew member described in the following paragraphs.

7.5.9 For precision approach - SA CAT I, CAT II and SA CAT II approved operations:

a. One normal approach to a landing.
b. One normal approach to a go-around at or near precision approach - CAT II minima.
c. One approach with related aeroplane system, navigation system, or flight guidance failure.
d. If authorised for engine-inoperative Precision approach – CAT II capability: one engine-inoperative approach.
e. If authorised for automatic landing:
    i. At least one landing which includes use of an automatic landing system.

ii. If applicable, one automatic go-around from a low approach (at or after DA(H) but before touchdown). The approach or go-around may be conducted in either normal or non-normal conditions.

f. Where HUD/HGS and manual flight guidance and control systems are required:
   i. One landing from the lowest applicable minima.
   ii. One go-around from low altitude below DA(H).
   iii. At least one response to a failure condition during the approach or missed approach.

7.5.10 For precision approach – CAT III approved operations:

a. For automatic systems:
   i. One automatic landing.
   ii. One go-around from a low approach at, or after, decision or AH.
b. For manual systems:
   i. One landing at the lowest applicable minima.
   ii. One go-around from low altitude below AH or DH.
c. At least one response to a failure condition during the approach to a landing or a missed approach.

7.5.11 For precision approach – CAT III, where operators are approved to conduct CAT III operations using aeroplane with an FP flight control system, or have procedures allowing aeroplane to be dispatched with a FO flight control system downgraded to FP condition, flight crew must each at least once over the period of three consecutive proficiency assessments, demonstrate at least one missed approach as a result of autopilot failure at or below DH/AH and with RVR being 300 m or less.

7.5.12 Conditions under which LVO recurrent competency for low-visibility precision approaches should be conducted include:

a. Minimum approved RVR conditions.
b. Appropriate limiting cross winds, wind gusts.
c. Runway surface friction levels representative of likely operational locations,

7.5.13 Demonstration of competency that simultaneously address multiple low-visibility precision approach category need not repetitively test each type of approach at each landing precision approach -category.

LVO recurrent competency for Part 91

7.5.14 Despite a Part 91 only operation not being required to be subject to a training and checking system, the competency elements described in relation to LVO recurrent competency in the preceding paragraphs are to be taken to represent the minimum acceptable competency standards required to be demonstrated by a PIC or any other flight crew member upon completion of LVO recurrent training.

7.5.15 It is likely to be a condition of an LVO approval for a Part 91 only operation that LVO recurrent training and competency demonstration be conducted not less than annually and that the training is provided by an entity that would otherwise be approved to provide LVO training and checking for an AOC holder or a certificate holder.

7.6 LVO re-qualification training

Description

7.6.1 LVO re-qualification training means the training that may be required for a flight crew member necessary to conduct LVO following a period where LVO recent experience requirements were not maintained or were allowed to lapse for an extended period.

Requirements

7.6.2 General principles of recent experience requirements for complex operations suggest that where relevant LVO experience has not been maintained for a period greater than three years, the flight crew should be taken to require LVO initial training to regain competency. For periods of less than three years since conducting relevant LVO in the same type and operation, the flight crew member should be provided with training tailored by the operator for the circumstance.

7.6.3 For AOC holders and aerial work or Part 141 certificate holders, the flight crew LVO re-qualification training should ensure that the flight crew regain the necessary LVO initial theory knowledge specified in subsection 7.2 and LVO initial practical training specified in subsection 7.3 of this AC applicable to their assigned duties for LVO including any LVTO or low-visibility precision approach procedures approved for the operator.

7.6.4 For LVO re-qualification training in circumstances where a flight crew member's LVO recent experience has lapsed for less than three years, it is acceptable that the training provided to regain LVO competency be tailored to the circumstances. In many cases the LVO re-qualification training may cover the same material as LVO recurrent training for the aeroplane type and operation with an increased emphasis on the relevant specific elements contained in subsection 7.5 of this AC.

LVO re-qualification competency

7.6.5 For LVO re-qualification training conducted for operations under an AOC or an aerial work or Part 141 certificate, the operator's training and checking system is required to describe the requirements for conducting the LVO re-qualification competency assessment of flight crew knowledge and ability in performing the procedures approved for the operator. The operator's training and checking system should also describe the attributes of the personnel appropriately assigned to assess LVO re-qualification competency.

7.6.6 Following LVO re-qualification training, the competency elements described in relation to LVO initial competency subsection 7.4, are to be taken to represent the minimum acceptable competency standards required to be demonstrated by a PIC or any other flight crew member upon completion of LVO re-qualification training.

7.7 LVO upgrade training

Description

7.7.1 LVO upgrade training means the training that may be required for a flight crew member necessary to conduct LVO for which they have not previously received training.

7.7.2 For operators, this is commonly associated with aeroplane types that have modifications to install HUD/HGS or other upgrades that introduce the capability to perform LVTO to reduced minimum RVR or for low-visibility precision approaches to a higher category (lower minima), e.g., from precision approach - CAT II to precision approach - CAT III.

7.7.3 For flight crew members LVO upgrade training is often associated with commencing operations with a new operator that is approved to conduct LVO that the previous operator was not approved to conduct.

7.7.4 LVO upgrade training may also include the circumstances where a flight crew member is upgrading from RHS duties to LHS duties (e.g., command upgrade), or an experienced LHS flight crew member is being trained to perform LVO as dual-seat qualified from both the LHS and RHS.

7.7.5 LVO upgrade training does not include transition from LVO on one aeroplane type to another. That is covered later in LVO type transition training.

LVO upgrade theory training

7.7.6 LVO upgrade theory training for flight crew who have previously been approved to conduct LVO should address the differences necessary to ensure knowledge is acquired as applicable to the LVO upgrade including technical, procedural and legislative thematic aspects.

7.7.7 Particular attention should be paid to the following matters where differences exist as described in this AC:

a. Aeroplane technical matters as described in paragraph 7.2.8.
b. Procedural matters as described in paragraph 7.2.9 and paragraph 7.2.10.
c. Legislative matters as described in paragraph 7.2.12.

LVO upgrade practical training

7.7.8 LVO upgrade practical training for LVTO and for low-visibility precision approaches, should identify and address any differences which exist in order to ensure that the flight crew member is able to perform the duties to which they may be assigned.

7.7.9 Particular attention should be paid to ensure that all relevant differences that could lead to flight crew misunderstanding of appropriate characteristics or procedures, that are the basis of the LVO upgrade, such as new equipment fitment or aeroplane systems or a new flight crew seat assignment are adequately addressed.

LVO upgrade competency

7.7.10 For LVO upgrade training conducted for operations under an AOC or an aerial work or Part 141 certificate, the operator’s training and checking system is required to describe the requirements for conducting the LVO upgrade competency assessment of flight crew knowledge and ability in performing the procedures approved for the operator. The operator’s training and checking system should also describe the attributes of the personnel appropriately assigned to assess LVO upgrade competency.

7.7.11 Following LVO upgrade training, the competency elements described in relation to LVO initial competency subsection 7.4of this AC, relevant to the upgrade are to be taken to represent the minimum acceptable competency standards required to be demonstrated by a PIC or any other flight crew member upon completion of LVO upgrade training.

7.7.12 Where the LVO upgrade training pertains to flight crew position changes, competency need only be demonstrated in procedures or manoeuvres where the flight crew position creates significant differences, such as manual flight or in circumstances where flight crew position has significant differences in crew actions or procedures. For flight crew who can be assigned to either of two flight crew positions, competency specific to each flight crew position should demonstrated as applicable.

7.8 LVO type transition training

7.8.1 Traditionally within an AOC holder's training and checking system, where a flight crew member transitions to a new aeroplane type, LVO training is provided as an additional module of LVO initial training at completion to the type rating training, irrespective of prior LVO experience.

7.8.2 However, there may be instances where a complete module of LVO initial training is not provided following type rating training. Where a flight crew member transitions to a new aeroplane type and where a flight crew member has significant LVO experience, abbreviated training in the form of LVO type transition training may be undertaken.

7.8.3 For flight crew members with prior LVO experience gained on previous aeroplane types, the LVO type transition training for the new type-rated aeroplane should address the LVO theory training and LVO practical training pertaining to any differences that exist in order to ensure that the flight crew member is able to perform the duties to which they may be assigned.

7.8.4 Particular attention should be placed on ensuring that all differences that could lead to flight crew misunderstanding of appropriate characteristics or procedures in the new aeroplane type are addressed.

LVO type transition competency

7.8.5 Following LVO type transition training, the competency elements in relation to LVO re-current training competency described in paragraphs 7.5.6 to 6.5.15 of this AC, relevant to the type transition training are to be taken to represent the minimum acceptable competency standards required to be demonstrated by a PIC or any other flight crew member upon completion of LVO type transition training.

7.8.6 For LVO type transition training conducted for operations under an AOC or an aerial work or Part 141 certificate, the operator's training and checking system is required to describe the requirements for conducting the LVO type-transition competency assessment of flight crew knowledge and ability in performing the procedures approved for the operator. The operator's training and checking system should also describe the attributes of the personnel appropriately assigned to assess LVO type transition competency.

7.9 LVO recent experience

7.9.1 There are no legislative recency interval requirements specifically for LVO that are in addition to the normal IFR recent experience requirements.

LVO recent experience for AOC holder and Certificate holder operations

7.9.2 Despite the absence of specific LVO recent experience requirements in legislation, the necessity for an AOC holder or an aerial work or Part 141 certificate holder to specify LVO recent experience interval requirements for their flight crew remains. For most AOC holders or aerial work or Part 141 certificate holders, the specification of what constitutes or satisfies LVO recent experience requirements would be articulated in the operator's exposition or operations manual. In many cases these requirements are part of the 'qualification' for LVO required by the various operations legislation (Part 121, 135 and 138 of CASR) for the purpose. Further discussion in relation to management of LVO qualification is provided in subsection 7.10.

7.9.3 Given the variations in types of LVO that can be approved for an operator, specifying recent experience requirements for some operations and circumstances may not be suitable for others. The general 3D instrument approach, such as precision approach – Category I, recent experience requirement is 90 days as prescribed in the legislation. Similar requirements are prescribed in the applicable legislation for general take-off and landing recent experience. In some instances, these can be varied by operator exposition inclusions with mitigations applied.

7.9.4 It is acceptable for operators to specify LVO recent experience requirements within the context of their operations and training and checking systems. Additionally, as a generally acceptable means of ensuring LVO competency, mitigating LVO skill and knowledge erosion during intervals without conducting LVO, the following recent experience limitations are recommended (where not specified differently in an exposition or operations manual):

a. To conduct a LVTO, the flight crew must have conducted, in the preceding 6 months:
   i. At least one LVTO.

      or

   ii. At least one take-off using the required LVTO aeroplane equipment and procedures from an aerodrome/runway approved for the operator to conduct LVTO.

b. To conduct a low-visibility precision approach, the flight crew must have conducted in the preceding 90 days:
   i. At least one low-visibility precision approach of the same category (SA CAT I, CAT II, SA CAT II or CAT III) to a landing, using the aeroplane equipment and procedures required for the approach approval.

      or

   ii. At least one low-visibility precision approach of a higher category (lower minima), to a landing, provided it is flown using the aeroplane equipment and procedures required for approval of the lowest approach minima.

or

iii. Where aeroplane equipment and procedures required do not significantly vary between low-visibility precision approach category; at least one low-visibility precision approach of any category to a landing, provided it is flown using the appropriate aeroplane equipment and procedures required.

7.9.5 In the event special circumstances exist where flight crew members may not have exposure to particular aspects of the flight guidance system for extended intervals, the operator should ensure that the necessary recent experience is addressed prior to flight crew conducting relevant LVO.

7.9.6 As a minimum, flight crew should be exposed to autoland system operations and procedures annually during LVO re-current training or operator re-current training if the flight crew have not otherwise conducted line landings using an automatic system within the previous 12 months.

7.9.7 If the flight crew have not otherwise had an opportunity to conduct line approaches or landings using the manual flight guidance system required for low-visibility precision approaches within the previous 90 days, one of the following mediums should be used to re-establish recency of experience with that system:

a. By use of a flight simulator.

or

b. Undertaking LVO re-current training or competency demonstration.

or

c. Line operational use in visual meteorological conditions (VMC).

or

d. During a flight with an appropriately assigned check pilot.

or

e. Any other means specified in the operator’s exposition or operations manual for the purpose.

LVO recent experience requirements for Part 91 only operations

7.9.8 For Part 91 only operations, there are no specific legislative recent experience requirements that apply to LVO. The underpinning legislative requirement of Part 61 of CASR for the subsequent limitations on exercising the privileges of a pilot licence is that flight crew must be competent to conduct flight procedures they undertake. As recent experience in LVO is one of the means by which competency can be assured, the absence of recent experience may increase the likelihood of a flight crew member no longer being adequately prepared to conduct LVO to the required performance standards or to an acceptable level of safety.

7.10 Flight crew LVO qualification

LVO qualification – AOC holder or certificate holder

7.10.1 For LVO conducted under an AOC or an aerial work or Part 141 certificate, the operator's exposition or operations manual is required to include the qualifications required by flight crew to conduct LVO. In broad terms, qualification to conduct LVO can be taken to be comprised of 3 elements; LVO training, competency and recent experience requirements. The LVO qualification requirements and management are required to be contained in the operator's exposition or operations manual.

7.10.2 AOC holder and aerial work or Part 141 certificate holder training and checking systems are required to specify the manner in which an operator manages the qualification of flight crew to conduct LVO including any limitations imposed. Where the operator has determined that additional experience is required prior to conducting LVO, supervised line flying (SLF) may be required. As appropriate, the experience requirements and the processes for managing the flight crew LVO qualification should be described in the exposition or operations manual.

LVO qualification – Part 91 only operation

7.10.3 There are no specific legislative flight crew qualifications specific to LVO. As such Part 91 only operations usually refer to being qualified for LVO as being in the circumstances where the applicable LVO training, competency and recent experience requirements to satisfy the conditions (if any) of the LVO approval are present.

7.11 Supervised line flying

7.11.1 It is generally accepted that, despite the effectiveness of modern flight simulators in replicating real conditions, exposure to some elements of LVO aeroplane equipment functions, procedures and handling characteristics during actual line aeroplane operations are beneficial for the flight crew involved. Also, there may be circumstances where the characteristics of the flight simulator used to conduct LVO training may not adequately replicate every aspect required by the operator for LVO qualification.

7.11.2 Hence, some AOC holders or aerial work or Part 141 certificate holders may specify that flight crew are required to undertake SLF for the purpose of acquiring additional experience in particular aspects of LVO in line operations prior to being qualified to conduct unrestricted LVO for the operator.

7.11.3 Where operators conduct SLF of low-visibility precision approach procedures in low-visibility weather conditions, the operator's training and checking system should describe the attributes of the personnel appropriately qualified to be assigned to conduct the SLF and any conditions or restrictions imposed.

7.11.4 Prior to unrestricted LVO for an operator, the following examples of suggested SLF are provided:

a. For low-visibility precision approaches – SA CAT I, CAT II and SA CAT II, when a manual landing or a HUD/HGS approach to touchdown is required, as applicable, at least:

i. Three landings from autopilot disconnect at the appropriate approach minima.
ii. Four landings with HUD/HGS used to touchdown and roll-out as appropriate.

b. For low-visibility precision approach – CAT III where autoland is required for the LVO approval, at least two autoland operations, except that:
   i. Only one autoland is required when the relevant LVO training has been conducted in an appropriately qualified flight simulator.
   ii. It may be acceptable that no additional autoland operations are required during SLF when the relevant LVO training has been carried out in an appropriately qualified flight simulator qualified, capable of being used for ZFT type rating training and the flight crew member has successfully completed that training for the operator.

c. For low-visibility precision approach – CAT III where HUD/HGS used to touchdown and roll-out as appropriate is required for the LVO approval, at least four approaches and landings, using that configuration.

7.12 Type and command experience

7.12.1 Given the relatively narrow margins within the design parameters of LVO procedures, it is presumed that most flight crew benefit from more than the minimum initial type rating training experience on an aeroplane type before reliably acquiring adequate skills and knowledge to conduct LVO to the required standards in operational circumstances. For this reason and as a mitigator to potential regression to previous type techniques or procedures, additional type and command experience recommendations are described in paragraphs 7.12.2 to 7.12.4.

AOC Holders, aerial work or Part 141 certificate holders

7.12.2 AOC holders or aerial work or Part 141 certificate holders may specify for their operations that a PIC should acquire the following additional experience and where appropriate, apply the recommended limitations prior to conducting low-visibility precision approach – SA CAT I, CAT II, SA CAT II or CAT III operations:

a. The earlier of 50 hours or 20 sectors on the aeroplane type with the operator.
b. Where the low-visibility precision approach operation requires a manual landing or use of HUD/HGS to touchdown, 100 m should be added to the applicable precision approach - SA CAT I, CAT II or SA CAT II RVR minima the until:
   i. The earlier of 100 hours or 40 sectors on the aeroplane type.
   ii. Where the flight crew member has been previously qualified for equivalent operations with another operator, the earlier of 50 hours or 20 sectors, on the aeroplane type with the current operator.
c. For HUD/HGS operations, it is recommended that the number of sectors be the determinant and not the flight hours specified otherwise.
d. For low-visibility precision approach – CAT III operations 100 m should be added to the applicable precision approach - CAT III RVR minima the until:
   i. The earlier of 100 hours or 40 sectors on the aeroplane type.

ii. Where the flight crew member has been previously qualified for equivalent CAT III operations with another operator, the earlier of 50 hours or 20 sectors, on the aeroplane type with the current operator.

7.12.3 The recommendations in paragraphs 7.12.1 and 7.12.2 are not intended to be narrowly applied as requirements that are necessary for compliance with, or as part of approval conditions. Further, it is the prerogative of the AOC holder or aerial work or Part 141 certificate holder to prescribe what, if any, additional experience is required for their flight crew to acquires following initial LVO competency demonstration. As such, the hours may, at the AOC holder or aerial work or Part 141 certificate holder's discretion apply to a PIC or to any other flight crew based on the assessed necessity.

Part 91 only operators

7.12.4 It is recommended that prior to conducting an approved LVO the PIC and any other flight crew of a Part 91 only operation give consideration to applying the following command and type experience as limitations:

a. For the PIC, 100 hours command or PICUS on the aeroplane type.
b. For any other required flight-crew, 100 hours on the aeroplane type.

8 Processes for gaining an LVO approval

8.1 Applications for LVO approval

General

8.1.1 The following types of operators require an approval to conduct LVO:

a. Operators of Australian registered aeroplanes conducting:
   i. Air transport operations (AOC holder).
   ii. Integrated and multi-crew pilot flight training, contracted training and contracted checking (AOC holder)
   iii. Aerial work operations (aerial work certificate holder).
   iv. Recreational, private and commercial pilot flight training, other than certain integrated training courses (Part 141 certificate holder)
   v. Part 91 only operations.
b. Operators of Foreign registered aeroplanes within Australian territory conducting:
   i. Non-scheduled air transport operations.
   ii. Part 91 only operations.

Operators not requiring LVO approval

8.1.2 The following operators are not required to hold an approval under Part 91 of CASR to conduct LVO in Australian territory:

a. New Zealand AOC holders with ANZA privileges that are in force for Australia.
b. Foreign air transport AOC (FATAOC) holders.

8.1.3 Those FATAOC holder's operations are subject to the conditions imposed by their NAA and subsequent CASA acceptance of those conditions subject to the provisions of Part 129 of CASR - Foreign air transport operators - certification and operating requirements. This is discussed further in subsection 8.10of this AC.

8.1.4 Regulation 129.100 of CASR - Foreign air transport operations—low-visibility operations, is presently reserved for future use.

Application resources and forms

8.1.5 The CASA website makes available information resources for operators seeking to apply for approval to conduct LVO:

a. For air transport AOC holders, the guidance in provided on the 'Apply for or vary an air transport air operator's certificate' page located at: https://www.casa.gov.au/licences-and-certificates/air-operators/air-transport-air-operators-certificate/apply-or-vary-air-transport-air-operators-certificate.
b. For aerial work certificate holders, the guidance is provided on the 'Apply for an aerial work certificate (Part 138)' page located at: https://www.casa.gov.au/licences-and-certificates/air-operators/apply-aerial-work-certificate-part-138.

c. For Part 91 only operations including Part 141 operators, the guidance is provided on the 'Guidance for Part 91 approvals' page located at: https://www.casa.gov.au/licences-and-certificates/air-operators/guidance-part-91-approvals.
d. For foreign registered aeroplane operators requiring an approval, the guidance is provided on the 'Non-scheduled and other flight permissions' page located at: https://www.casa.gov.au/licences-and-certificates/air-operators/foreign-operators/non-scheduled-and-other-flight-permissions.

8.1.6 CASA has also provided a form that is to be used by operators in applying for an initial approval to conduct LVO or to change or add to an existing approval to conduct LVO: https://www.casa.gov.au/part-91-approval-low-visibility

8.1.7 The following subsections 8.2 to 8.7 provide detailed information in relation to the pertinent aspects required to be provided and assessed for an approval to conduct LVO be issued or amended.

8.2 Application for LVO approval – AOC holders, aerial work and Part 141certificate holders.

General

8.2.1 The form referred to in subparagraph 8.1.6(a) is used for an Australian AOC holder to apply for an initial approval to conduct LVO or to change or add to an existing approval to conduct LVO. For an aerial work or Part 141 certificate holder, the initial approval to conduct LVO form is referred to in subparagraph 8.1.6(b) that is also used to submit an application to add or change the LVO approval. In addition to the application form, supporting documentation is also required to be provided.

8.2.2 Once an operator has provided CASA with the completed form and the supporting documentation, CASA will conduct an initial assessment. CASA will then arrange a suitable time for an interview. At the interview, CASA will provide a cost estimate for the time required to fully assess the application. Having agreed to progress with the application CASA will then conduct the full assessment evaluation of the provided form and supporting documentation.

8.2.3 An initial application for an approval to conduct LVO must be assessed in relation to the following matters being addressed by the operator: The matters and their specific requirements are:

a. Aeroplane and aeroplane systems certification for relevant LVTO (Section 3.3 of this AC) and low-visibility precision approaches (Paragraphs 3.4.2, 3.5.2, 3.6.2, 3.7.2, 3.7.3, and 3.7.4 of this AC).
b. Operator's exposition or operations manual inclusion of published procedures for the description of the arrangements for managing the continuing airworthiness of the operator's aeroplane(s) and aeroplane systems for the relevant LVTO and low-visibility precision approaches. (Section 4.2 of this AC).

c. Operator's exposition or operations manual inclusion of published procedures for the conduct of the relevant LVTO and low-visibility precision approaches (Chapter 6 of this AC).
d. Training and competency checking requirements for flight crew (and of the personnel assigned to conduct training and checking) for the relevant LVTO and low-visibility precision approaches (Chapter 7 of this AC).

Applying for changes to LVO approval

8.2.4 An application to change or add to an existing approval to conduct LVO, each constitute a 'significant change' under the applicable provisions of Part 119 of CASR, Part 138 of CASR., Part 141 of CASR or Part 142 of CASR.

8.2.5 Where an operator seeks to apply for a change to their existing LVO approval, the process follows the same methodology as the initial application, albeit with only those aspects that generate differences being required to be assessed. In other words, the existing unchanged aspects of the LVO approval need not be submitted or re-assessed for the amended LVO approval to be granted.

8.2.6 Consequently, the forms to be used to apply for a change to an LVO approval are the same as those used for an initial LVO approval application. The forms will describe the requirements and it is usual for only aspects of the approval subject to change are required to be provided for submission including any supporting information relevant to those changes.

8.3 Specific criteria for low-visibility precision approach approvals

8.3.1 The following subsections 8.4 to 8.7 identify the key criteria that are required to be satisfied in certain circumstances for the issuing of specific LVO approvals to AOC holders and aerial work or Part 141 certificate holders (Part 91 only operators should refer to subsection 8.9 of this AC). The criteria represent one of the means, but not the only means of satisfying the acceptable level of safety required in relation to system performance, accuracy, availability, reliability, and integrity of the intended LVO.

8.3.2 Where an operator can demonstrate an alternative means of ensuring that the intended LVO can be conducted to an acceptable level of aviation safety, that alternative means would need to be provided and be assessed prior to the approval being issued. The alternative means must include a specific safety risk assessment for the intended LVO.

8.4 Low-visibility precision approach – SA CAT I approval

8.4.1 In addition to the matters prescribed in paragraphs 8.2.3 (a) to (d) of this AC requiring assessment prior to approval to conduct LVO, for an approval to conduct low-visibility precision approach – SA CAT I, operators must also:

a. Be approved to conduct (or apply to conduct):
   i. low-visibility precision approach – CAT II.

   or
   ii. low-visibility precision approach – CAT III.

b. Only conduct the LVO in aeroplanes equipped with:
   i. A HUD/HGS that is certified for at least low-visibility precision approach - CAT II operations with a 300 m RVR minima (or lower), using HUD/HGS to DH or touchdown.

      or

   ii. A fail-operational (FO) or fail-passive (FP) autoland system.

8.5 Low-visibility precision approach – CAT II approval

8.5.1 In addition to the matters prescribed in paragraphs 8.2.3 (a) to (d) requiring assessment prior to approval to conduct LVO, for an approval to conduct low-visibility precision approach – CAT II, operators must also have successfully completed:

a. A six-month demonstration of maintenance and flight crew operations.
b. At least 30 landings in precision approach CAT I conditions (or better), using the relevant low-visibility landing system installed in each applicable aeroplane type or variant.

8.5.2 The requirements prescribed in paragraph 8.5.1 apply in the following circumstances:

a. Initial low-visibility precision approach – CAT II applications.

   or

b. For operators that have held a current low-visibility precision approach – CAT II or CAT III approval for greater than 12 months when:
   i. Introducing low-visibility precision approach – CAT II operations with a new aircraft type or variant.

      or

   ii. Introducing new aeroplane flight control equipment or systems, such as introduction of a HUD/HGS or autoland system upgrade from FP to FO.

8.6 Low-visibility precision approach – SA CAT II approval

8.6.1 In addition to the matters prescribed in paragraphs 8.2.3 (a) to (d) requiring assessment prior to approval to conduct LVO, for an approval to conduct low-visibility precision approach – SA CAT II, operators must also:

a. Be approved to conduct (or apply to conduct):
   i. Low-visibility precision approach – CAT II.

      or

   ii. Low-visibility precision approach – CAT III.
b. Only conduct the LVO in aeroplanes equipped with:
   i. A HUD/HGS that is certified for at least low-visibility precision approach - CAT II operations with a 300 m RVR minima (or lower), using HUD/HGS to touchdown.

      or

   ii. A FO or FP autoland system.

8.7 Low-visibility precision approach – CAT III approval

8.7.1 In addition to the matters prescribed in paragraphs 8.2.3 (a) to (d) requiring assessment prior to approval to conduct LVO, for an approval to conduct low-visibility precision approach – CAT III, operators must also comply with the following paragraphs that are applicable to the operator's circumstances and LVO application.

Operators with no CAT II or CAT III experience – CAT III approval

8.7.2 Operators are taken to have no precision approach - CAT II or CAT III experience where they have not held a low-visibility precision approach – CAT II or CAT III approval for greater than 12 months.

8.7.3 Where an operator has no previous low-visibility precision approach – CAT II or CAT III experience, for an approval to conduct low-visibility precision approach CAT IIIA (RVR minimum 175 m or greater), operators must also have successfully completed:

a. A six-month demonstration of maintenance and flight crew operations.
b. At least 30 landings in CAT I conditions (or better), using the low-visibility landing procedures and the system installed in each applicable aeroplane type or variant (if the requested DH is 50 ft or higher).

   or

c. At least 100 landings in CAT I conditions (or better), using the low-visibility landing procedures and the system installed in each applicable aeroplane type or variant (if the requested DH is less than 50 ft).

8.7.4 After an operator has successfully completed 90% of the required landings in CAT I conditions (or better), and 3 months of the six-month demonstration of maintenance and flight crew operations, they may be approved to conduct low-visibility precision approach – CAT II operations to RVR 300 m minima for the remainder of the demonstration period. The RVR 300 m minimum permitted in this circumstance is predicated on the use of CAT III landing systems (autoland or HUD).

8.7.5 For an approval to conduct low-visibility precision approach CAT IIIB (RVR minimum 125 m or 75 m) where an operator has no previous low-visibility precision approach – CAT II or CAT III experience, operators must also have successfully completed a second six-month demonstration of maintenance and crew operations to low-visibility precision approach – CAT IIIA minima.

Experienced CAT II operator - CAT III approval for new aeroplane type

8.7.6 Where an operator has held an approval to conduct low-visibility precision approach – CAT II for greater than 12 months, for an approval to conduct low-visibility precision approach – CAT IIIA (RVR minimum 175 m or greater) operations with a new aeroplane type the operator must also have successfully completed:

a. A six-month demonstration of maintenance and flight crew operations.
b. At least 50 landings in CAT I conditions (or better), using the low-visibility landing procedures and the system installed in each applicable new aeroplane type or variant.

8.7.7 After an operator has successfully completed 90% of the required landings in CAT I conditions (or better), and three months of the six-month demonstration of maintenance and flight crew operations, they may be approved to conduct low-visibility precision approach – CAT II operations to RVR 300 m minima for the remainder of the demonstration period. The RVR 300 m minimum permitted in this circumstance is predicated on the use of precision approach - CAT III landing systems (autoland or HUD).

8.7.8 Where an operator has held an approval to conduct low-visibility precision approach – CAT II for greater than 12 months, for an approval to conduct low-visibility precision approach CAT IIIB (RVR minimum 125 m or 75 m), operators must also have successfully completed a second six-month demonstration of maintenance and crew operations to low-visibility precision approach – CAT IIIA minima.

Experienced CAT II operator - CAT III approval for existing aeroplane type and equipment

8.7.9 Where an operator has held an approval to conduct low-visibility precision approach – CAT II for greater than 12 months, for an approval to conduct low-visibility precision approach – CAT IIIA (RVR minimum 175 m or greater) or CAT IIIB (RVR minimum 125 m or 75 m) operations with an existing aeroplane type and aeroplane equipment, the operator must also have successfully completed:

a. A six-month demonstration of maintenance and flight crew operations.
b. At least 50 landings in CAT II conditions (or better), using the low-visibility landing procedures and the system installed in each applicable existing aeroplane type or variant.

8.7.10 After an operator has successfully completed 90% of the required landings in CAT II conditions (or better), and three months of the six-month demonstration of maintenance and flight crew operations, they may be approved to conduct low-visibility precision approach – CAT IIIA operations to RVR 175 m minima for the remainder of the demonstration period.

Experienced CAT III operator - new airports/runways

8.7.11 Where an operator has held an approval to conduct low-visibility precision approach – CAT III for greater than 12 months, the operator is permitted to use new airports/runways with a published low-visibility precision approach – CAT III procedure, without further demonstration, if the approved aeroplane and aeroplane equipment systems will be used.

Experienced CAT III operator - new or upgraded airborne system capability

8.7.12 Where an operator has held an approval to conduct low-visibility precision approach – CAT III for greater than 12 months, the operator is permitted to use new or upgraded airborne system capabilities/components to the lowest authorised minima established for those system capabilities/components.

8.7.13 Examples of this provision include addition of a new capability, such as a ‘one engine inoperative’ autoland for a system currently approved for ‘all engine operative’ CAT III, and introduction of an updated flight guidance system software version on an aeroplane

previously authorised for CAT III for that operator. In such cases, the lowest authorised minima may be used, or continue to be used, without additional demonstration.

8.7.14 This provision does not apply to circumstances where fundamental differences to aeroplane equipment used for low-visibility precision approach – CAT III are made such as the change from autoland to HUD equipment.

Experienced CAT III operator - new CAT III aeroplane type or variant

8.7.15 Where an operator has held an approval to conduct low-visibility precision approach – CAT III for greater than 12 months, new aeroplane types or variants, may be approved to conduct low-visibility precision approach – CAT III operations without being required to complete the full demonstration periods, where the demonstration requirements will be established (on an individual basis), considering any applicable criteria, such as:

a. Applicability of previous operator service experience.
b. Experience with that aeroplane type or variant by other operators.
c. Experience of flight crews of that operator in CAT III operations.
d. The type of systems involved.
e. Any appropriate minima reduction steps appropriate for an abbreviated demonstration period, consistent with prior operator experience, NAVAIDs and runways and procedures to be used.

8.7.16 For operators approved to conduct low-visibility precision approach – CAT III operations using one type of system (e.g., autoland), to be approved to conduct low-visibility precision approach – CAT III operations with a significantly different type of system (e.g., manually flown CAT III using a HUD), must also meet the requirements prescribed in paragraph 8.7.15 of this AC.

Experienced CAT III operator - new CAT II aeroplane type or variant

8.7.17 Where an operator has held an approval to conduct low-visibility precision approach – CAT III for greater than 12 months, an approval to conduct low-visibility precision approach – CAT II for a new aeroplane type or variant that is only certified to conduct CAT II operations, the operator must also have successfully completed at least 50 landings at CAT I weather minimums or better using the CAT II systems.

8.7.18 Upon successful completion of 90 % of the landings, the operator may be approved to conduct low-visibility precision approach – CAT II operations to RVR 500 m for the remaining duration of the six-month demonstration period. Upon successful completion of the demonstration period, a further approval may be granted for low-visibility precision approach – CAT II operations to RVR 300 m (as appropriate).

8.8 Demonstrations

8.8.1 Demonstrations may be conducted in line operations or any other flight where the operator's LVO procedures are being used.

8.8.2 In unique situations where the completion of the required successful landings could take an unreasonably long period of time and equivalent reliability assurance can be

achieved, a reduction in the required number of landings may be considered on a case-by-case basis.

8.8.3 A justification is required if the number of landings to be demonstrated is to be reduced. This justification should consider factors including:

a. The operator's overall experience in LVO.
b. The number of aeroplanes available to the operator.
c. Limited opportunities to use runways having low-visibility precision approach – CAT II or CAT III procedures.

or

d. The inability to obtain air traffic services (ATS) sensitive area protection during periods of non-LVP.

8.8.4 However, at the operator's request, demonstrations may be made in a simulator or on other runways and facilities. Sufficient information should be collected to determine the cause of any unsatisfactory performance (e.g., sensitive area was not protected).

8.8.5 If the operator has different variants of the same type of aircraft utilising the same basic flight control and display systems, or different basic flight control and display systems on the same type of aircraft, the operator should demonstrate that the multiple variants have satisfactory performance, but a full operational demonstration for each variant may not be required.

8.8.6 If possible, not more than 30% of the demonstration flights should be made on the same runway.

Data collection for operational demonstrations

8.8.7 Data should be collected whenever an approach and landing is attempted utilising the low-visibility precision approach – CAT II or CAT III system regardless of whether the approach is abandoned, unsatisfactory, or is concluded successfully.

8.8.8 The data should, as a minimum, include the following information:

a. Inability to initiate an approach: Identify deficiencies related to airborne equipment that preclude initiation of a low-visibility precision approach – CAT II or CAT III.
b. Abandoned approaches: Give the reasons and altitude above the runway for discontinuing the approach or disengaging the automatic landing system.
c. Touchdown or touchdown and rollout performance:
    i. Describe whether the aeroplane landed satisfactorily within the desired touchdown area, with lateral velocity or cross track error which could be corrected by the pilot or automatic system to remain within the lateral confines of the runway without unusual pilot skill or technique.
    ii. The approximate lateral and longitudinal position of the actual touchdown point, in relation to the runway centre line and the runway threshold, should be indicated in the report.

iii. This report should also include any low-visibility precision approach – CAT II or CAT III system abnormalities that required manual intervention by the pilot to ensure a safe touchdown or touchdown and rollout, as appropriate.

Data analysis

8.8.9 Unsuccessful approaches, due to the following factors, may be excluded from the analysis:

a. ATS factors including:
   i. Situations in which a flight is vectored too close to the final approach fix/point for adequate localiser and glide slope capture.

      or
   ii. Lack of protection of instrument landing system (ILS) sensitive areas.

      or
   iii. ATS requests the flight to discontinue the approach.
b. Faulty NAVAID signals: NAVAID (e.g., ILS localiser) irregularities, such as those caused by other aircraft taxiing, over-flying the NAVAID (antenna).
c. Other factors: Any other specific factors that could affect the success of precision approach – CAT II or CAT III operations that are clearly discernible to the flight crew should be reported.

8.8.10 Section 4.5 contains the criteria to be used in determining the success status for a precision approach - CAT II, SA CAT II, CAT III approach and automatic landing.

8.9 Application for LVO approval – Part 91 only operations

8.9.1 This section applies to Part 91 only operators and for foreign operators not disapplied by regulation 91.020 of CASR seeking to obtain an approval to conduct LVO.

8.9.2 Prior to the commencement of the CASR operational parts on 2 December 2021, approvals to conduct LVO were only provided to operators who held an AOC, including aerial work AOCs. Consequently, many of the requirements to be satisfied by Part 91 only operators to be approved to conduct LVO will be substantially similar to those that apply to AOC and certificate holders with due accommodation for the recognised differences in operational context.

8.9.3 The range of variables that could conceivably be presented by an operator to obtain an LVO approval is beyond the scope of this AC. It is highly likely that some of the following operational contexts would generate an application for LVO approval:

a. A PIC that is successfully participating in a training and checking system of a Part 121, Part 135 or aerial work operation that holds an LVO approval may apply for an equivalent Part 91 approval to conduct essentially the same LVO as a Part 91 operation for a different registered operator.
   i. For example, a Bombardier C604 type-rated PIC who is employed by a LVO approved Part 121 C604 air transport operation seeking to obtain an approval

to conduct LVO in a C604 as a Part 91 operation where the RO is not the Part 121 operator.

Note: The LVO approval granted to an AOC or certificate holder also permits a Part 91 operation to be conducted for that operator, without the PIC requiring a specific PIC LVO approval.

b. A PIC that is no longer participating in a training and checking system of a Part 121, Part 135 or Part 138 operation (with or without LVO approval) and the PIC has extensive LVO experience that seeks to obtain an approval to conduct LVO as a PIC of a Part 91 only operation.

Constraints

8.9.4 In addition to the requirements for the conduct of the low-visibility precision approaches described in subsections 3.4, 3.5, 3.6 and 3.7 of this AC approval will only be provided in the circumstances where the low-visibility precision approach approval application is for an aeroplane that is operated by a flight crew comprising at least 2 pilots.

8.9.5 For any LVO conducted as Part 91 only operation, an approval to conduct LVO is required to be held by the PIC. The individual ARN specific approval would also require that the PIC is assured that the other flight crew members are satisfactorily competent for the operation.

8.10 Acceptance of foreign NAA LVO approval for certain operators

8.10.1 As Part 91 of CASR is disapplied for operations conducted in Australia by New Zealand AOC holders with ANZA privileges and foreign air transport AOC (FATAOC) holders, those operators are not required hold an approval from CASA to conduct LVO in Australian territory.

8.10.2 When operating in Australia, a particular foreign aircraft operator's NAA has the primary responsibility for determining that the operator complies with the special requirements it specifies for LVO at any airport. The operator's NAA also has the responsibility for authorising and/or restricting operating minimums for any operation by that foreign air transport operator.

8.10.3 CASA will accept an approval issued by the NAA of the country of a FATAOC holder to conduct LVOs within Australia according to the principles that an operator of a foreign registered aeroplane, operating under a FATAOC is not permitted to conduct:

a. LVTO or low-visibility precision approach operations in Australia unless the operator is authorised by its NAA to conduct the same or equivalent LVO.
b. LVTO or low-visibility precision approach operations in Australia with operating minimums that are lower than equivalent operating minimums authorised by its NAA.
c. LVTO or low-visibility precision approach operations in Australia with operating minimums as approved by its NAA that are lower than equivalent operating minimums in Australia, i.e., low-visibility precision approach - CAT IIIB 75m RVR.

Foreign air transport AOC (FATAOC) holders

8.10.4 Operators issued with a FATAOC by CASA will be required to operate in Australian territory in accordance with the conditions placed on that FATAOC. The conditions will include that the operator is permitted to conduct LVO subject to the requirements of their foreign certificate and any included Ops Spec for LVO and consistent with the principles described in paragraph 8.10.3 of this AC.

8.10.5 While the FATAOC holder is not required to hold an approval under Part 91 of CASR to conduct LVO, the mechanism that permits LVO within Australian territory is provided by the relevant conditions on the FATAOC. The acceptance of the foreign NAA Ops Spec as a condition on the FATAOC is managed through the FATCOC application or amendment processes established for the purpose by CASA.

8.10.6 The documentation required to be provided to support the initial application or amendment of a FATAOC in relation to LVO, is in most instances consistent with the requirements described in section 8.3.1 of this AC for the relevant elements.

8.10.7 Where a FATAOC holder or FATAOC applicant is from a recognised foreign State, as defined in the CASR Dictionary, the foreign certificate and foreign NAA issued Ops Spec for LVO will be taken to satisfy the following aspects of paragraph 8.2.3 of this AC, without necessary additional supporting documentation.

8.10.8 Where a FATAOC holder or FATAOC applicant is NOT from a recognised foreign State, the foreign NAA issued Ops Spec for LVO may be taken to satisfy some aspects of section 8.2 of this AC. Additional supporting documentation may be required, such as documents equivalent to those specified in section 8.2 of this AC.

9 Supporting documentation

9.1 AOC Holders and certificate holders

General

9.1.1 The supporting documentation required to be submitted along with the application for approval to conduct LVO must include sufficient detail to satisfy the requirements specified in the preceding sections where they are relevant to the application.

Specific thematic supporting documentation

9.1.2 Part 121, Part 135 and Part 142 of CASR contain provisions that require the operator's exposition, as does Part 138 and Part 141of CASR require the operator's operations manual, to include in relation to LVO, the matters identified below:

a. Each type of LVO conducted using the aeroplane.
b. The aeroplane systems required to be used for each type of those operations.
c. The aerodrome facilities required to conduct each type of those operations.
d. The training and qualifications required for the aeroplane's flight crew members for each type of those operations.
e. The requirements to be met by the aeroplane's flight crew members during each of those operations.

9.1.3 In addition to the matters required to be contained in an operator's exposition or operations manual, supporting documentation will also be required to accompany any application for LVO approval in at least the following thematic areas:

a. Aeroplane certification or aeroplane equipment certification pertinent to the relevant LVO.
b. Continuing airworthiness or maintenance requirements and procedures pertinent to the relevant LVO.
c. Procedures, processes, checklists, briefings, aerodrome or ATC requirements pertinent to the LVO.
d. Flight crew training, competency, LVO qualifications and recency pertinent to the LVO.

9.2 Part 91 only operators

General

9.2.1 For a Part 91 only LVO approval, the approval would be granted to an individual PIC. This differs from the AOC or certificate holder approval that is issued to the AOC or certificate holder, not the individual PICs within those operations.

9.2.2 Consequently, the supporting documentation required to be submitted along with the application for approval to conduct LVO for Part 91 only operators differ to that required from AOC and certificate holders.

9.2.3 Firstly, a Part 91 only operation may not otherwise necessarily be required to have a published general procedure manual in the same sense as an exposition or an operations manual.

9.2.4 However, for LVO it is a requirement that certain matters are contained in an appropriate published form that is available to the personnel involved in the LVO, including those associated with the continuing airworthiness of the aeroplane.

9.2.5 Without constraining the forms of publications, the matters may be contained in one or more documents that include:

a. An operations manual written for the purpose by or for the PIC.
b. An operations manual or exposition LVO excerpt provided to the PIC by an AOC or certificate holder.
c. Aeroplane OEM or LVO equipment OEM published procedures.
d. Aeroplane LVO training provider documentation, procedures, briefings, checklists etc.

10 Conditions on LVO approvals

10.1 Operations within Australia

10.1.1 Australian registered aeroplanes and foreign registered aeroplanes that are not otherwise exempt, are permitted to conduct LVOs within Australia where the operators have been approved under regulation 91.045 to do so and where applicable by inclusion of the approval on the AOC OPS Spec.

Note: Regulation 91.020 of CASR specifies that Part 91 of CASR does not apply to certain foreign registered aircraft.

10.2 Operations outside Australia

10.2.1 Australian operators intending to conduct LVO outside Australian territory will need the following:

a. A copy of the Ops Specs carried on board, showing the LVO specific approval issued by CASA.
b. Where applicable, an approval from the applicable foreign regulatory authority to conduct the relevant LVO, including:
    i. For low-visibility precision approach operations, a statement confirming the aerodrome and runway terrain details and charts, including the calculations used to determine the applicable minima.
    ii. If issued, a copy of the Ops Spec or equivalent approval, from the foreign National Aviation Authority (NAA) for LVO.

10.3 Conditions on approvals

10.3.1 CASA may impose conditions on approval granted to Australian operators to conduct LVO. These conditions will be standardised for all LVO approvals as much as possible; however, CASA may need to vary these conditions for particular cases.

General conditions and specific conditions

10.3.2 One condition applicable, that is not specified in the operations legislation is the limitation on not using RV for certain low-visibility operations (essentially all low-visibility precision approaches, and for LVTO where the RV is less than 350M, need to be conditions on every low-visibility approval granted by CASA.

11 Hybrid systems

11.1.1 Hybrid systems (e.g., an FP autoland system used in combination with a monitored HUD flight guidance system) may be considered for CAT III operations if:

a. the individual elements of the system can be shown to independently meet suitability criteria for CAT III
b. the components, when combined, provide an equivalent level of performance and safety to a non-hybrid system applicable to the minima sought (e.g., FO CAT IIIB)
c. the system is certified with supporting information in the AFM.

11.1.2 Hybrid systems with autoland capability should be based on a design concept that uses the autoland system as the primary means of control, with the manual flight guidance system serving in backup mode or reversionary mode.

11.1.3 Manual rollout flight guidance capability should be provided for hybrid systems that do not have automatic rollout capability. Such manual rollout flight guidance should have been shown to have performance and reliability at least equivalent to that of an FP automatic rollout system.

11.1.4 Any transition between hybrid system elements (e.g., control transition from autoland to manual control with the use of HUD, or for response to failures) should be acceptable for use by qualified flight crews. Transitions should require normal pilot skill.

11.1.5 For any system that requires a pilot to initiate manual control shortly before or after touchdown, the transition from automatic control prior to touchdown to manual control using the remaining element of the hybrid system (e.g., HUD) after touchdown should be shown to be safe and reliable and requiring only standard handling procedures.

11.1.6 If one of an aircraft's hybrid system elements (e.g., an automatic system or flight guidance system) fails prior to touchdown, operational procedures may require the pilot to initiate a missed approach even though the operator should have demonstrated that the aircraft was capable of completing a safe landing and rollout.

11.1.7 CASA may approve a hybrid system for CAT III operations if it meets the performance criteria specified in FAA AC 120-28D, or an acceptable alternative, as in force at the time of application for approval.

Note: FAA have indicated an intention to withdraw AC 120-28D and publish the airworthiness performance criteria contained within AC 120-28D in FAA AC 20-191.

11.1.8 An operator may receive approval to use an autoland system and a manual flight guidance system as a hybrid system provided that:

a. each system individually meets appropriate airworthiness assessments
b. the operator can successfully demonstrate the hybrid system's capability to meet the applicable provisions of this section in an operational environment.

11.1.9 For hybrid systems used in CAT III operations, the operator should use a DH/AH of 50 ft or higher unless otherwise approved by CASA.

Appendix A

Calculation of RA height

A.1 Calculation of RA height

A.1.1 To determine RA height, the operator must:

a. determine the distance (d) from landing threshold to the point where the decision altitude (DA) occurs
b. obtain the terrain elevation on final approach course at distance (d) feet from the landing threshold
c. subtract the terrain elevation from the DA to calculate the RA (see Figure 1).

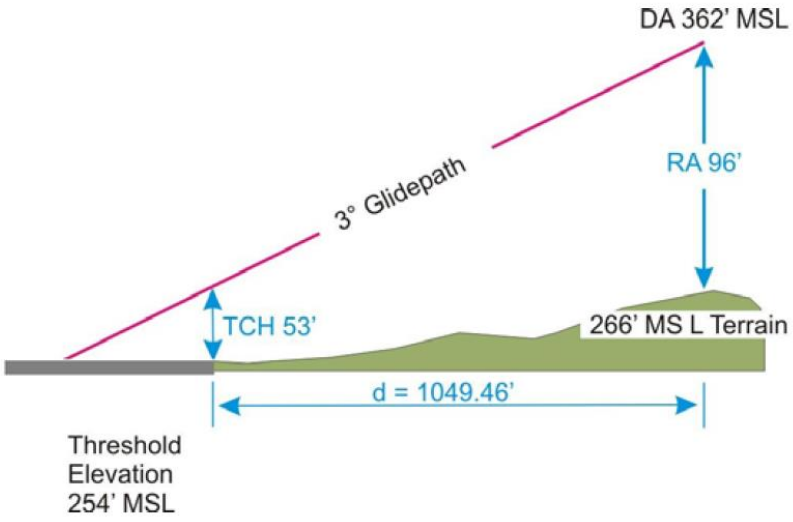

Figure 1: Calculating RA height

$d = \frac{DA-(Threshold\ Elev+TCH)}{\tan(Glidepath\ angle)} \rightarrow d = \frac{362-(254+53)}{\tan(3)} \rightarrow$ d = 1049.46 ft (319.87 m) from threshold

RA = DA – terrain elevation → RA = 362 – 266 → **RA = 96 ft**