3.18. Noise Abatement Procedures

(DASR.139 AMC.50 CI 6g)

3.18.1. Fly Neighbourly Policy

3.18.1.1 There are no specific noise abatement procedures associated with Nowra Aerodrome, however all aircraft are expected to abide by the fly neighbourly policy that is published in FIHA AD2SUPP – Nowra. This includes adhering to Noise Sensitive Areas detailed in PFPS/FalconView Nowra Hazard and Noise Database (HAND) overlay. The FIHA AD2SUPP – Nowra can be found on the AIS-AF Homepage under 'Current Effective' documents.

3.18.1.2 Flying operations are to be conducted in a manner which is considerate of our local community, whilst maintaining safe operation of our aircraft and achieving the required levels of capability. All aerodrome users are required to:

a. Comply with published aerodrome noise abatement procedures

b. Use appropriate runway length for departures to maximise height over local residents

c. Limit the height of aircraft over populated areas

d. Minimise flight over residential areas and other noise sensitive buildings such as hospitals and schools

e. Avoid low flying over known noise sensitive areas such as livestock yards

f. Minimise flying late at night or early in the morning

g. Vary flight paths to share noise

h. Include aircraft noise awareness in pilot training and familiarisation

i. Notify local communities of major exercises or other non-routine training and flying activities.

3.18.2. Processing Noise Complaints

3.18.2.1 ACC is responsible for managing Aircraft Noise Complaints for *Albatross*, in doing so the department deals with members of the public, Staff Officer Aircraft Noise in AFHQ and the Aircraft Noise Ombudsman's Office when required. Social Media and contemporary communications such as email, websites and mobile phone apps enable complainants to access many levels of Defence and government. Failure to address complaints in a timely and respectful manner presents a risk to Navy reputation and may affect useable airspace and flying training areas. Below is the ACC process for managing noise complaints.

3.18.2.2 Upon receipt of the noise complaint, usually by phone, the ACC or the OPSTAR Duty Air Officer will take the details of the complainant and produce an OA 039 Noise Complaint Form. Complainants are to be encouraged to call and make complaints as soon as possible after the event to allow the collection of the most recent evidence. The primary evidence source comes from the OPSTAR provided ADSB receiver mounted on Nowra Hill and displayed in the ACC. The OPSTAR DAO uses a Screen Capture method, saves the file and emails it to ACC staff for processing. The ACC will file the screen captures with the OA 039 into the Aircraft Noise Database held in Objective. Other sources of evidence which can be used include, ATC, NWOC, flying squadrons and daily/weekly FLYPROs. The following day, ACC will publish the Daily Noise Complaint summary which is forwarded to *Albatross* HODs and other relevant parties.

3.18.2.3 The AD MGR is to complete the OA 039 form with an analysis of the complaint, signing off the Additional Comments and Executive Officer blocks before filing in Objective. If insufficient information is available the OA 039 will be forwarded to the relevant Squadrons for comment. Following completion of this process AD MGR is to ensure the complainant receives feedback, usually by phone. If additional more formal investigations are required the OA 039 is to be forwarded to the Legal Officer for action. If the complainant wishes to take the matter further they are to be invited to write to CO *Albatross*. If unsatisfied with this approach the complainants are to be advised to consult the ADF Aircraft Noise Website where they can find contact details for the ADF Staff Officer Aircraft Noise and the Aircraft Noise Ombudsman.

3.18.3. Noise Trend Analysis

3.18.3.1 Noise complaints are to be monitored for trends and potential problem areas, when a trend is suspected or identified the AD MGR is to be advised. The AD MGR will advise *Albatross* Command and HQ FAA where mitigation measures will be considered. If additional measures are required the AD MGR will consult flying squadrons, ATC, SO1 OPAW and SO1 OPS to develop the measures and procedures and submit them to the Fleet Air Arm Standards Working Group (FAASWG) meeting for endorsement. Following signoff by the FAASWG the mitigation measures will be published in SFI or SI, in the HAND and FalconView, by NOTAM or in the ERSA. ACC is primary agency for managing noise sensitive areas and procedures and is to keep up to date data on all areas and Noise Abatement Procedures in the Nowra training area. Aircraft Noise is a permanent action item of the FAASWG where noise mitigation measures and noise sensitive areas are reviewed for effectiveness and relevance at each meeting.

3.18.4. Noise Ombudsman Response

3.18.4.1 Complainants usually escalate beyond local contact following a perceived lack of responsiveness by *Albatross*. The Ombudsman's office and DGNCC advise to attempt to keep issues to a local level where possible, where relationships can be maintained and timely proactive solutions that consider the complainants grievances can be developed. It's important that any solution is proportional in response and considers Squadron flying requirements and FAA operational outcomes. Failing a local response AD MGR in conjunction with HQ FAA and *Albatross* Command will take the lead on all Ombudsman and other higher level complaints.

3.18.5. ACC Responsibilities

3.18.5.1 As custodian of *Albatross* Aircraft Noise Complaint and response measures ACC is responsible for the following when managing Aircraft Noise:

a. Publication of a sanitised version of the NAS Nowra FLYPRO on the ADF Aircraft Noise website. This site also carries information on the ANEF, helicopter noise and local exercise areas. The ACC will manage the site in conjunction with Air Force and update as required

b. NSA and other noise issues briefed at Night Flying

c. Process noise complaints using ADSB and other sources. This approach reduces the number of complaints filtering to Squadrons. The process relieves Squadrons of additional administration and allows a rapid response to the complainant

d. Maintain the Noise Complaint database in Objective using the OA 039

e. Publication of Weekly Noise Complaint Summary, sent to *Albatross* HODS

f. Response to complainants/agencies regarding Nowra based aircraft noise

g. Ensure Aircraft Noise issues are tabled as a Standing Agenda item at the quarterly Fleet Air Arm Standards Working Group

3.23.2.8 An Environmental Clearance Certificate (ECC) is required for all planned helicopter landings to areas excluding the designated helicopter landing site. Contact: Navysafe s47E(d) for additional information and advice.

3.23.2.9 **Transits.** Transits are possible through M441 during breaks in serials if required. Contact RCO/ARCO or Range Control by phone prior to entry for transit clearance.

3.23.2.10 **Helicopter No-Fly Areas.** When BWR is open to public access and the Honeymoon Bay and/or Bindijine Campgrounds are occupied (BWRSOs Chapter 1 paragraphs 1.29 to 1.36 refers), helicopters are to minimise overflight of those locations. Helicopters ARE NOT to 'operate in the hover' over either location, at any time when the campgrounds are occupied.

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3.25.2. Authorised RPAS

3.25.2.1 453SQN NWA FLT is the authority for approving RPAS operations above 400 FT within R421 or within the no-fly zone of HMAS *Albatross*. To notify airspace users of RPAS approvals, 453SQN NWA FLT may raise a NOTAM and inform ACC of authorised RPAS operations. ACC will then publish details on the Aerodrome Daily State. CASA *Part 101 (Unmanned Aircraft and Rockets) Manual of Standards* can be viewed at https://www.legislation.gov.au/Details/F2019L00593

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Defence FOI 165/26/27
Document 2
Internal review

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SI(NA) OPS 01-01

CONDUCT OF AIR OPERATIONS

DASR ORO.05

References:

A. Defence Aviation Safety Regulation (DASR) - ORO.05—Conduct of Flying Operations
B. ADF Flight Information Publications (FLIP)
C. SI(NA) OPS 01-13—Use Of Aeronautical Information In Navy Flying Operations
D. SI(NA) OPS 05-13—Electronic Flight Bag Operations
E. SI(NA) OPS 02-03—Aircrew Competency and Currency
F. SI(NA) OPS 02-07—Instrument Rating Assessment
G. ANP3300—Fleet Aviation Procedures
H. SI(NA) OPS 03-02—Low Flying and Terrain Flight
I. LWP–CA (AVN) 3-1-2—Aircraft Support, Chapter 6
J. SI(NA) OPS 03-05—Flying Rules for Special Missions and Tasks
K. FIHA AD2 SUPP - Nowra
L. SI(NA) OPS 01-05—Air Cargo Delivery - Carriage of Personnel in FAA Aircraft
M. SI(NA) LOG 3-01-04—Deferment of Maintenance
N. DCAM—Defence Continuing Airworthiness Manual
O. SI(NA) OPS 01-14—Command Clearance
P. Professional ADF Aviators' Reference Manual (PAARM)

INTRODUCTION

1. This instruction forms the basis for the conduct of baseline Navy FAA flying and aircraft operations. The content within this instruction is not exhaustive and shall be read in conjunction with the remainder of the SI(NA) publication suite.

2. **Aim.** This instruction describes the general operating limits imposed on the operation of Navy FAA aircraft IAW Reference A to ensure the continued safe operation of all Navy FAA aircraft.

AUTHORITY

3. This instruction is issued by Commander Fleet Air Arm (COMFAA). COMFAA is the Accountable Manager (AM), Navy Military Air Operator (MAO).

SCOPE

4. This instruction applies to all Navy FAA flying and aircraft operations and is applicable to all personnel within the FAA, including members from other ADF services or foreign nations who are posted or on exchange for aviation duties within the Navy FAA. This instruction also applies to civilian personnel, both APS or under contract, operating as crew for FAA unit flying operations. Members undergoing initial training are deemed crew for the purpose of this instruction.

DEFINITIONS

5. The terms used in this instruction are defined within *Defence Aviation Safety Regulation* (DASR) – Glossary, and Reference B *General Planning Australia* (GPA) - GEN 2.2. Important definitions relative to this instruction are listed below.

6. **Air Operational Orders, Instructions, and Publications (OIP).** Air Operational OIP[1] includes, but is not necessarily limited to:

a. Aircrew manuals (including aircraft type manuals) specific to the aircraft type,

b. General aircrew publications,

[1] As defined by DASR GM AO.GEN.05.A(1)

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c. Defence Instructions,

d. Standing Instructions (SI),

e. Temporary Flying Orders (TFO), Special Flying Instructions (SFI) and Standard Operating Procedures (SOP), and

f. Flight Information Documents (FID) published as part of the Defence Aeronautical Information Publication (AIP).

7. **Command Clearance.** An approval to deviate from an aviation systems' approved and certified Configuration, Role, or Environment (CRE), limitation, or condition, when mission requirements cannot be achieved otherwise. Command Clearances must contain appropriate conditions and limitations to ensure safety, which may also require an Operational Endorsement. Command Clearances should only be authorised in circumstances where there is a compelling reason.

8. **Compelling reason.** A compelling reason is one where a mission importance convinces a Commander that an aircraft should be operated outside of its approved CRE, limitations or conditions, when time or circumstance do not allow for the completion of normal approval processes.

9. **Operationally Essential.** The designation of a mission as operationally essential in peacetime is restricted to flights in a designated theatre of operations, special operations (e.g. counter-terrorist), or where the preservation of life is dependent upon the task. The operationally essential caveat means that the higher potential risk of injury/damage/loss to the crew, passengers and/or the aircraft, is deemed acceptable and justifiable where the aircrew need not comply with established regulations to achieve the task, but does not preclude risk minimisation.

10. **Military Airworthiness Authority (MAA) / National Airworthiness Authority (NAA).** The MAA is a person or organisation responsible for the safety oversight of military aviation. An MAA acts independently from the operational, acquisition and sustainment chains of command and is assigned responsibility through a formal instrument such as legislation or an order, directive or decree. For the ADF this is the Defence AA. The NAA (sometimes referred to as a National Aviation Authority), for a country:

a. Means the authority that is responsible for regulating civil aviation in the country; and

b. Includes:

(1) For Australia—the Civil Aviation Safety Authority;

(2) If the European Aviation Safety Agency (EASA) carries out functions on behalf of the country—EASA; and

(3) For China, for matters relating to Hong Kong—the Civil Aviation Department of Hong Kong.

OPERATION OF NAVY FAA AIRCRAFT

11. Navy FAA aircraft shall be operated IAW the procedures and limits as stipulated by Air Operational OIP, including:

a. Aircraft Military Type Certificate (MTC),

b. Military Air Operator's Certificate (MAOC) Operations Specification (OpSpec), and

c. Statement of Operating Intent and Usage (SOIU).

12. The only occasions that Navy FAA aircraft may operate outside of extant Air Operational OIP are when:

a. Specifically authorised by the Navy Delegate of the Safety Authority for Flight Test (DoSA-FT) for the conduct of a Categorised Flight Test (CFT) by the Aircraft Maintenance and Flight Trials Unit (AMAFTU),

b. Subject to an ADF Airworthiness Directive, or

c. Deemed *Operationally Essential* or under a *Command Clearance* for a *compelling reason*.

Air Operational OIP

13. Aircrew are to read all applicable ADF, FAA and squadron/type Air Operational OIP upon joining a squadron and before commencing flying operations. Aircrew are responsible for reviewing Air Operational OIP as needed to remain compliant. Air Operational OIP shall be reviewed following an amendment, change or re-issue; and will be recorded in AusPEX via the Flight Crew Information Files (FCIF) function.

14. Aircrew should be familiar with higher-level airworthiness instruments applicable to their aircraft type (i.e. MTC, MAOC OpSpec and SOIU) to ensure operation of the aircraft remains within the approved CRE and the bounds of the type certification.

15. In addition to the OIP and Aeronautical Information Product (AIP) requirements detailed in References C and D, the approved aircraft type aircrew checklists and/or Flight Reference Cards (FRC) must be readily accessible by the crew during flying operations.

16. Except where varied by SI(NA), flight by Navy FAA aircraft shall only be conducted by suitably qualified and authorised crew IAW the applicable Flight Rules IAW Reference B.

17. When required, Navy FAA aircraft must operate IAW the applicable Flight Rules stipulated by the National Airworthiness Authority (NAA) of the state applicable to the operation. This is pertinent during overseas operations or operations outside of the Flight Rules stipulated in Reference B. Use of foreign Aeronautical Information (AI) shall be IAW Reference C and guidance provided by AIS-AF.

Performance-Based Navigation

18. Navigation using the Global Navigation Satellite System (GNSS) in civil airspace is covered by the Performance Based Navigation (PBN) framework. Navy FAA aircraft may conduct Area Navigation (RNAV) and/or Required Navigation Performance (RNP) procedures provided:

a. The aircraft type is certified to the RNP specification required for the procedure; or

b. The aircraft type is covered by a statement of PBN equivalence, and

c. Approval has been granted through *Specific Approval* and the aircraft type SOIU for the RNP specification required for the procedure.

19. The qualification and currency requirements of References E and F shall be satisfied prior to PBN operations.

Standard Take-off Minima

20. Table 1 details the standard take-off minima to be applied to all flights commencing from ashore. The Aircraft Captain must ensure that:

a. Obstacle clearance can be maintained until reaching enroute LSALT (planning must account for any reduction in aircraft performance resulting from an OEI condition experienced during take-off), and

b. The aircraft's performance and endurance allow for flight to a suitable destination, should a return to the departure point not be possible following an OEI event during take-off.

Table 1. Standard Take-off Minima

TAKE-OFF ENVIRONMENT	CLOUD/CEILING	RVR/VISIBILITY
Runway with edge lighting at not more than 60 metres light spacing and either runway centreline lighting or centreline markings	Clear of cloud until attaining V_{yse}[(a)], V_{min}[(b)], V_{toss}[(c)], or V_{xse}[(d)] (whichever is appropriate)	550 metres
Other sites	Clear of cloud until attaining V_{yse}[(a)], V_{min}[(b)], V_{toss}[(c)], or V_{xse}[(d)] (whichever is appropriate)	800 metres

NOTE:

(a) V_{yse} is the best rate of climb airspeed (single-engine).
(b) V_{min} is the minimum speed for instrument flight (IFR) for helicopters.
(c) V_{toss} is the Category A helicopter take-off safety speed.
(d) V_{xse} is the best angle of climb airspeed (single-engine).

Lowest Safe Altitude (LSALT)

21. In addition to the LSALT calculation methods contained within Reference B[2], the following LSALT calculation methods are approved:

a. **OzRunways.** The 'Show LSALT Boundaries' function may be used provided the OzRunways area of consideration for LSALT fully encapsulates the area of consideration required IAW Reference B.

b. **Route Elevation Profile (REP) Tool.** Errors in the Digital Terrain Elevation Database (DTED) can cause the REP tool to calculate an incorrect LSALT. Therefore, use of the DTED to calculate LSALT is permitted provided that a cross check of LSALT is conducted with an alternate source of topographic data (i.e. approved for air navigation).

The following REP Tool configuration settings must be set:

(1) The Terrain Clearance Buffer (TCB) shall be set to 1360ft;

(2) The corridor shall contain the leg/route coverage area calculated IAW Reference B (i.e. the corridor width will depend upon the leg length and method of navigation); and

(3) The safety height generated by the REP tool shall be rounded up to the nearest hundred feet but not less than 1500ft AMSL.

22. Charts approved for air navigation by the applicable NAA/MAA and IAW Reference C shall be used to manually calculate LSALT.

Descent and Operations Below LSALT Overwater

23. The following instructions are intended to complement the requirements and procedures described in References B and G, and are to be used to determine minimum acceptable distances for descent and operations below LSALT overwater by IFR (day or night) or night VFR (unaided).

a. **IFR (day or night).** In IMC, over water letdown below the calculated LSALT may commence once established:

[2] Air route LSALT shall only be used by Navy FAA aircraft that satisfy or exceed RNP 2 specification (paragraph 14).

(1) **Radar.** 1 NM clear of the coast and heading seaward. Radar-equipped aircraft[3] and Air Traffic Control (ATC) radars (once positively identified) may be used. Once below LSALT, if the aircraft remains in less than VMC, or with no visual reference to the coast at night, the aircraft must remain no less than 1 NM seaward. This clearance may be reduced to 0.5 NM for radar-equipped aircraft by the FLTAUTHO after considering crew experience and currency.

(2) **GPS.** 2 NM clear of the coast and heading seaward. Once below LSALT, the aircraft must remain no less than 2 NM clear of the coast. The GPS receiver/unit must be continually monitored to ensure the Total System Error (TSE) does not exceed 1 NM[4].

(3) **TACAN or VOR/DME.** For a TACAN or co-located VOR/DME within 23 NM[5], the minimum acceptable distance is no less than 2 NM and heading seaward. Once below LSALT, the aircraft must remain no less than 2 NM clear of the coast. Outside of 23 NM, the minimum distance from land the aircraft is permitted to commence decent and operate below LSALT must include an aggregate error of at least two degrees[6].

(4) **Position Fix.** When using a *Position Fix* IAW Reference B (other than paragraph 23.a(3) above), the minimum acceptable distance is 5 NM and heading seaward. Once below LSALT, the aircraft must remain fixed no less than 5 NM clear of the coast.

b. **Night VFR (Unaided).** In unaided night VMC, over water letdown below the calculated LSALT may commence once established visually clear of the coast. If there is no visual reference to the coast, the minimum distance from the coast for descent below LSALT shall be IAW paragraph 18.a. Once below LSALT, the aircraft must remain over water and maintain visual reference to the coast. If visual reference is lost or cannot be maintained, operations below LSALT can only continue IAW paragraph 18.a.

24. For IMC and night unaided operations over water below 500' AGL, the aircraft's Radar Altimeter (RADALT) must be *Serviceable*.

25. EC135 may only descend to *Not Below* 400ft AMSL in IMC in an attempt to gain VMC.

26. Descent over water below 500ft AMSL is IAW Reference H.

MH-60R IFR Alternate Planning

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[3] For the purpose of this instruction, a radar-equipped aircraft is defined as one that is equipped with an all-round scan, high definition, warning radar suitable for surface contact avoidance and weather information that is working satisfactorily and is monitored by a competent operator (STANAG 1154).

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[5] Assuming an aggregate error (the algebraic sum of all systemic and environmental errors) tolerance of up to five degrees, aggregate error may exceed 2 NM when greater than 23 NM from the navigation aid.

[6] Aggregate error is almost always less than five degrees. An aggregate error of more than two degrees is considered rare.

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Helicopters Circling to Land

29. IAW the PAN-OPS (DOC8168) design procedures, helicopters are not required to conduct circling procedures. By day and when using NVD, helicopters are authorised to manoeuvre visually to a suitable landing area from the MDA either circling or straight-in if visibility permits subject to ATC approval.

Helicopter Landing Sites (HLS)

30. Compared to aeroplanes, helicopters are operationally extremely versatile. Consequently, not every helicopter departure or arrival will be from either an ICAO Annex 14 volume II compliant surface level, elevated heliport, helideck; or a certified aerodrome based on a runway with a protected obstacle environment.

31. The generic term for an aerodrome for helicopter operations is a helicopter landing site (HLS). Helicopters may operate to a spectrum of different standards of HLS. These range from certified aerodromes to unprepared sites barely larger than the helicopter in question (Figure 1).

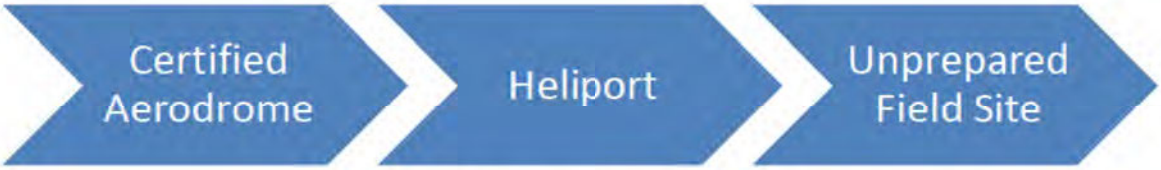


Figure 1. Spectrum of HLS Standards

32. Just as there is a spectrum of standards of HLS; there is also an increasing degree of risk associated with operating to an HLS, as you move along the spectrum towards the unprepared field HLS. In general, smaller the HLS, and the less knowledge a pilot has about the hazards presented by obstacles and surface conditions, the greater the risk associated with its use. Operations to HLS that are not purpose-built present safety challenges; which have to be considered, risk assessed and managed by the aircraft captain for safe operations.

33. HLS operations are approved to the selected HLS ashore when the following requirements are met:

a. **Owner operator permission.** Appropriate landing permission has been received through the site owner/operator or manager.

b. **Surface.**

(1) **Certified Aerodrome/Heliports.** Pad PCN, weight limitations, and/or other requirements must support aircraft type. (e.g. many hospital pads in NSW have an operating limit of 5400kg or 6800kg)

(2) **Unprepared Field Site.** The surface at the Landing Point of the HLS must be even and sufficiently firm to accommodate the landing weight of the aircraft, and without damage/indentation that is unacceptable to the site owner.

c. **Size/Dimensions.** Sufficient size to maintain minimal obstacle clearance as detailed in OIP.

d. **Downwash.** All features of the HLS and surrounds shall be assessed for impacts and hazards from downwash IAW *Rotor Downwash Management* from paragraph 35 below.

e. All embarked HLS operations are IAW Reference G.

34. **Unaided Night HLS.** Unaided night non-airfield operations to night approach aids at sites other than the western and southern pads at Naval Air Station (NAS) Nowra, or Jervis Bay airfield, are not to be conducted unless the site has been surveyed IAW Reference I. Unaided approaches to single light source aids at night by Navy FAA aircraft are not permitted. Reference I provides lighting requirements for unaided approaches to HLS.

Alternate and Recovery Planning

35. Alternate planning is IAW FIHA.

36. IAW FIHA, alternate planning for DAY VFR or NVD operations is not required, however under these circumstances all FAA units are to apply recovery planning IAW Table 2.

37. The primary factor impacting the suitability of a destination HLS in this context is a deterioration of weather conditions, which may result in conditions dropping below VMC criteria. When suboptimal weather conditions exist, or are forecast, it is prudent to develop a recovery plan.

Table 2. Meteorological Conditions and Recovery Planning

Item	CONDITIONS IN AREA OF AIRCRAFT OPERATIONS See note (a)	RECOVERY PLANNING REQUIREMENTS
1	**Normal conditions:** Both forecast and actual conditions are at least: - 1000 ft cloud base, and - 3000 m visibility.	Nil
2	**Limited conditions:** (see note (b)) Terminal forecast and/or actual conditions are less than Normal Conditions but equal to or better than conditions that allows the aircraft to be flown: - clear of cloud - in sight of ground or water at all times with a minimum visibility of 800 metres, and at a speed to avoid cloud, obstacles and other aircraft	In accordance with note (c)
3	**Poor conditions:** When the Terminal forecast or actual conditions are worse than those specified for **Limited Conditions**.	No take off. If conditions deteriorate to Poor Conditions during flight, either: - land, or - initiate IMC recovery plan.

NOTE:

(a) ARFORs do not contain the fidelity to accurately predict weather in any given location. Therefore, forecast limited or poor conditions on an ARFOR do not automatically preclude flight. These conditions may need to be assessed in flight.

(b) If a Terminal forecast includes TS or the probability of TS at the destination, flight can still be conducted, however, an IMC recovery plan must not be utilised unless an aircraft weather radar is used.

(c) Recovery Plan Requirements. Forecast or actual weather must allow visual recovery (able to achieve 'Limited Conditions') at the approach minima where a published Instrument Approach Procedure is available, or enroute LSALT.

Rotor Downwash Management

38. Rotor downwash is a fundamental effect of helicopter aviation, present to some extent during all stages of flight. In forward flight or hover, close to the ground, downwash has the potential to negatively interact with personnel and objects external to the individual aircraft. Aircrew are at all times to be cognisant of the downwash hazard generated by their aircraft. The planning and flying of sorties shall be so as to minimise the risk of downwash induced damage to personnel or infrastructure.

39. Annex A provides further information and guidance to inform FAA planning and flying with respect to helicopter downwash. The effects of downwash shall be assessed, and the necessary treatments developed and applied, as part of normal Aviation Safety Risk Management processes for

any landing to a HLS within an urban or built-up area, or for any low level flight where there are personnel, infrastructure or property within the immediate vicinity. This includes operations at dedicated helipads, heliports, HLS, flight within harbour areas, air capable ships alongside, and any other nominated areas meeting the above criteria.

40. Downwash effect analysis is to occur during the planning phase of a sortie and appraised as part of the Flight Authorisation process by the FLTAUTHO when known prior to becoming airborne. Consideration of downwash and appropriate analysis with ground hazards shall also occur airborne by the crew immediately prior to flight below 300ft HAO and *effective translational lift* (ETL). In order to minimise the risk to personnel and property during low level and HLS operations the Aircraft Captain shall maintain suitable separation between their aircraft; and personnel, vulnerable infrastructure, any unsecured temporary structures, and/or other identified hazards from downwash.

41. The *illustrative data for FAA helicopter types* contained in Annex A, Table A.1 shall be used as a starting point for determining suitable separation. The illustrative data at Table A.1 will most likely have to be varied on the basis of the content within Annex A, which includes the following considerations:

a. the presence of any funnelling or channelling features, which may direct, concentrate or accelerate downwash (increase the separation);

b. the presence of any loose, light or unsecured structures or equipment (use minimum separation or greater);

c. the presence of any loose debris (use minimum separation or greater); and

d. environmental conditions that may redirect rotor downwash (the separation distance should be increased downwind by an additional 20m per 10 knots of wind, as appropriate).

Weight & Balance

42. Aircraft Weight and Balance (Centre of Gravity (C of G)) data shall be calculated for flight IAW the aircraft type certified endorsed/approved method. Alternate methods shall be approved by the aircraft's Military Type Certificate Holder (MTCH).

43. Flights with significant changes in load-out such as releasable stores changes, or air cargo delivery and passenger operations, shall have appropriate calculations made to ensure the aircraft's Weight and Balance state remains within the approved envelope for each potential load-out state of the planned mission. Those differing load-out conditions shall also be assessed for their effects on required performance data planning.

Aircraft Performance Data

44. Aircraft performance data shall be derived by the aircraft's type certified approved method. Alternate third party methods of calculating performance data shall be validated and endorsed through the aircraft MTCH, and approved by COMFAA.

45. Minimum aircraft flight Performance Data calculation requirements are to be promulgated within unit/type OIP. Performance Data requirements for an aircraft type's differing configurations, roles, and/or approved environments shall be specified where deemed necessary.

Fuel Reserves

s33(a)(ii)



Aircraft Lighting

48. The procedures contained within Reference B are to be observed, except when non-compliance is deemed operationally essential. The procedures for use of aircraft lights during formation and/or aided operations shall be detailed in unit/type OIP.

49. The use of lights may be varied to meet training and/or safety requirements, provided those variations are authorised by Reference G, Reference J, or other equivalent FIHA AD2 Supplement, or unit/type Air Operational OIP and are covered by a documented risk assessment.

Seat Safety Harnesses

50. Inertia reel seat harnesses are to remain 'locked[7] and tight' at all times when the aircraft is operated below 1000ft AGL, except where this interferes with the safe operation of the aircraft or the conduct of the required duties in this phase of flight. Above 1000ft AGL inertia reels should remain locked to the maximum extent practicable.

51. Cockpit seat harnesses should remain secured during flight. The flying pilot shall have their seat harness secured at all times during flight. A cockpit harness should only be unsecured during flight with Aircraft Captain approval to facilitate movement to/from the cockpit where squadron/type OIP details the specific procedures for personnel moving to/from the cockpit seats. Otherwise, personnel moving to/from the cockpit seats is not permitted.

52. Cabin crew shall remain secured in a seat with a tightened and locked seat harness to the maximum extent possible as is applicable to carry out their specific in-flight task and duty position. Only with the Aircraft Captain's approval and when all aircraft external doors are closed, may cabin crew members move about the cabin unsecured. Cabin crew members must be secured to a Personal Restraint Tether, prior to becoming unsecured from a seat harness whilst any aircraft cabin external door is open.

53. Passengers shall remain fastened in a seat with harness firmly secured at all times during flight. The only exception to this is for *Mission Essential Passengers* and Non-Standard Aircraft Restraint and Seating (NSARS) operations IAW Reference L.

Personal Restraint Tether

54. A Personal Restraint Tether (PRT) is a device provided for cabin crew to perform *out-of-seat* duties and tasks in-flight with an open cabin door (e.g. AWAE Cabin Helicopter Aircrew Device (CHAD)). The PRT is not a crashworthy restraint; and therefore the time spent in the PRT shall be kept to an absolute minimum consistent with the safe completion of the required out-of-seat tasks.

55. Aircraft Captains are to approve each occasion for use of PRT by crew. PRT wearers must:

a. Ensure the PRT is secured only to approved aircraft anchor points IAW type Flight Manual/OIP[8], and

b. Constantly monitor and manage the length of the PRT line/strap to:

i) Prevent the risk of fall,

ii) Limit the degree movement to minimise flail injury during a crash/hard landing,

iii) Minimise placement of the body outside an aircraft and;

iv) Minimise the risk of inadvertent activation of the double action snap hook.

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7 'locked' - where manual locking lever fitted for inertial reel system

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56. The PRT harness length should be adjusted to ensure that the wearer's body (excluding limbs) normally remains inside the safe bounds of the cabin of the aircraft, provided such adjustment does not impede safe completion of essential duties.

57. PRTs are not to be utilised by passengers except for *Mission Essential Passengers* under the requirements for NSARS IAW Reference M.

Unplanned Landings (Precautionary or Emergency Landing)

58. An unplanned landing is any landing made in response to an abnormal in-flight occurrence or suspected malfunction (i.e. precautionary landing), or where directed by the aircraft type checklist (e.g. Land as soon as Practicable) in response to a malfunction. Following an unplanned landing, the Aircraft Captain should obtain all reasonable knowledge of the issue, as determined by the circumstance and context, prior to making a decision on a course of action.

59. Any *Defect*[9] of the aircraft leading to an unplanned landing, including ones that are only suspected, shall be managed IAW References M and N. The aircraft shall not be flown again until the *Defect* is rectified or deferred by an authorised delegate.

60. If there is a compelling reason for the aircraft to fly again before the *Defect* can be rectified or deferred, this can only occur under the provisions of a Military Permit To Fly (MPTF), or Command Clearance IAW Reference O.

61. When an unplanned landing has been made, the Aircraft Captain shall inform their Flight Authoriser / Flying Supervisor at the earliest opportunity.

Ground Runs

62. All aircraft ground runs shall be conducted IAW Reference O. Aircraft engines (including Auxiliary Power Units (APU)) shall only be ground run by suitably type-qualified pilots, or other personnel (e.g. maintenance) who have completed the appropriate aircraft engine running course and are authorised to do so.

63. Only suitably type qualified pilots may conduct rotor-engaged ground runs.

Smoking

64. Smoking or vaping (e-cigarettes) is not permitted in Navy FAA aircraft or within 15 metres of any aircraft on the ground.

REVIEW

65. This SI is to be reviewed 1 years from date of publication. Review dates are tracked within Microsoft Teams.

Related regulations, orders, instructions, and publications:
Defence Aviation Safety Regulation (DASR) – ORO.70—Carriage of Personnel on Defence Aircraft
DASR – SPA.10—Command Clearance
DASR – SPA.30—Flying Displays and Flypasts
Military Air Operator's Certificate (MAOC) Operations Specification (OpSpec)

Policy Sponsor: SO1 OPAW
Content Officer: SO2 PLT STDSf

Annex:
A. Rotor Downwash Factors

[9] Defect as defined within Reference N.

ROTOR DOWNWASH FACTORS

1. Rotor downwash is a fundamental effect of helicopter aviation, present to some extent during all stages of flight. Rotor downwash factors are briefly described in PAARM (Reference P); Volume 12, Part 1, Chapter 3 and Volume 13, Part 1, Chapter 2. The following additional information is provided to inform FAA aircrew, aircraft captains and authorisation officers of aspects for considerations related to rotor downwash. Rotor downwash from helicopters constantly varies as a result of many factors and exact quantification of effects is not possible. However, awareness of these factors can inform sound decision making both during sortie conduct planning and in flight.

Free Air Hover Downwash

2. In a free air hover, a helicopter rotor induces a downward flow of air through the rotor disc, this is known as rotor downwash.

3. The velocity of rotor downwash for a helicopter in a steady hover (ie; not climbing or descending) will peak between approximately 1.5 to 2 rotor diameters (RD) below the aircraft due to flow contraction.

4. An estimate of this peak can be calculated for Sea Level on an ISA day as follows:

$$Downwash\ Velocity = 2\ x \sqrt{\frac{Aircraft\ Weight}{2\ x\ Air\ Density\ x\ Disc\ Area}}$$

(Wt – lbs, Density – slugs/ft³, Area - ft², Velocity – MPH)

5. Changes to these calculation inputs, or other aerodynamic factors, will affect downwash velocity:

a. A % increase in Aircraft weight will increase downwash velocity by the same %.

b. Increase in Density Altitude (DA) will reduce Air Density and increase downwash velocity.

c. Smaller Disc Area for the same Aircraft weight will increase downwash velocity.

d. Any transient (or sustained) increase in collective position/power setting will cause a corresponding increase in downwash velocity (Lifting underslung load).

e. Horizontal airspeed or wind will reduce induced flow and reduce downwash velocity (not significantly below translational lift).

f. Any recirculation will act in addition to induced flow and will increase downwash velocity.

Hover in the Vicinity of the Ground

6. Downwash will dissipate below the helicopter. Operational experience and academic research indicates that downwash will not significantly impact the ground environment with the aircraft above 5 RD height. Research further suggests that a minimum of 3RD is required to considerably reduce the intensity of the rotor downwash on the ground.

7. If the helicopter is hovering close to the ground the downwash will interact with the ground where the direction of airflow is changed from vertical to generally horizontal, this may be referred to as outwash. This outwash dynamic pressure is maintained to 2RD and generally dissipates by approximately 3.5RD from the aircraft in nil wind.

8. The depth of the outwash flow close to a helicopter is approximately 10%-20% of the RD.

Wind Effect on Downwash

9. Helicopter rotor downwash is very susceptible to ambient wind. Horizontal wind component will move the location of downwash relative to the aircraft, and as it reduces induced flow, downwash velocity will be reduced.

10. In nil wind conditions downwash is generally symmetrical around the centre of the rotor disc. Increasing ambient wind fundamentally changes the shape of the rotor downwash footprint, including the formation of a U shaped vortex (Figure A.1) on the upwind side of the rotor downwash zone (visible during over water/dust/snow operations).

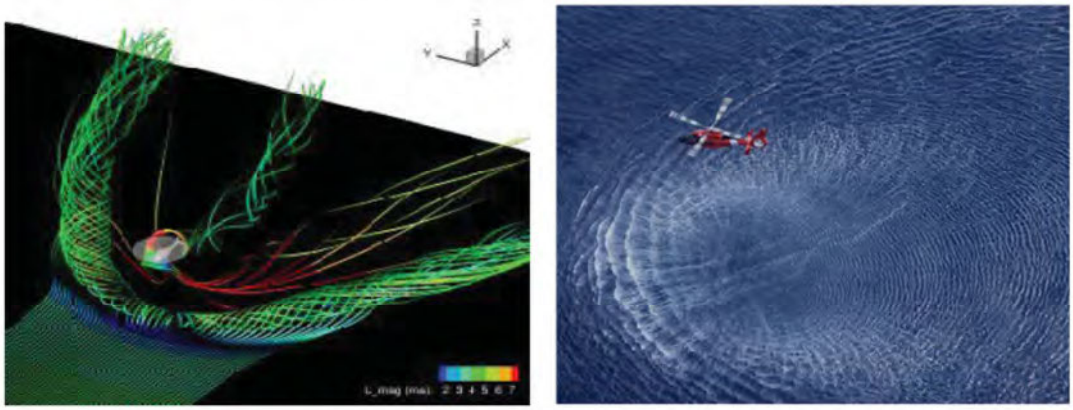


Figure A.1. Illustration of U shaped vortex formed by rotor downwash interaction with wind

11. Although wind flow increases the efficiency of the rotor, reducing the magnitude of induced velocity, it combines with the dynamic pressure leading to an increase in dynamic pressure downwind of the aircraft.

12. Wind will also shift and focus the downwash interaction downwind from the aircraft. The amount is dependent on hover height and wind strength but research modelling indicates that this is approximately 20m for every 10kts of ambient wind (Figure A.2). For a flat surface directly below the aircraft the horizontal outflow of air will form a channel that is approximately between 10% and 20% of the rotor diameter.



Figure A.2. Modelling of downwash at 10, 20 and 40 kts headwind

13. This is also indicative of the downwash effect during a slow shallow approach to the hover creating a longer downwash path when compared to a steep or vertical approach to a landing.

Ground or Structure Influence

14. Any surface below the aircraft will deflect, channel or redirect the downwash. Obstructions and natural terrain with linear aspect or gentle curves can potentially channel or focus downwash. Buildings, walls, terrain depressions, channels such as creek lines and embankments have proven effective to channel or deflect airflow (Figure A.3).

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SI(NA) OPS 03-02

LOW FLYING AND TERRAIN FLIGHT

DASR SPA.20

References:

A. ADF Flight Information Publications (FLIP)
B. SI(NA) OPS 05-03—*Mission Planning Systems*
C. SI(NA) OPS 01-13—*Use of Aeronautical Information In Navy Flying Operations*
D. SI(NA) OPS 01-04—*Flight Authorisation*
E. ANP 3300—*Fleet Aviation Procedures*
F. SI(NA) OPS 01-01—*Conduct of Air Operations*
G. AFTP 1—*Australian Fleet General Order* (AFGO) – AFGO 404
H. SI(NA) OPS 03-03—*Air Displays and Public Events*
I. Flight Information Handbook Australia AD2 Supplement Nowra
J. EC135T2+ Statement of Operating Intent (SIOU)

INTRODUCTION

1. Defence policy for low flying operations directs requirements to detail minimum low flying heights and lateral separation distances from obstacles and hazards. Low flying safety controls, underpinned by effective mission planning processes and tools, ensures suitability for flight is not compromised.

2. **Aim.** This instruction aims to detail the Navy Fleet Air Arm (FAA) policy that ensures safe management of low flying activities IAW DASR SPA.20 – Low Flying.

AUTHORITY

3. This instruction is issued by Commander Fleet Air Arm (COMFAA). COMFAA is the Accountable Manager (AM), Navy Military Air Operator (MAO).

SCOPE

4. This instruction applies to all Navy FAA flying and aircraft operations. It applies to all personnel within the FAA, including members from other ADF services or foreign nations, and civilian aircrew, who posted or on exchange for aviation duties within the Navy FAA.

DEFINITIONS

5. The terms used in this instruction are defined within *Defence Aviation Safety Regulation* – Glossary, *Australian Defence Glossary* and Reference A. Important definitions relative to this instruction are as follows:

6. **Low Flying.** Low flying is defined in FIHA ENR 1.1 General Rules, excluding flying approaches to and from the hover into confined areas and overwater.

7. **Terrain Flight.** Terrain flight is defined in GPA GEN 2.2 Definitions and Abbreviations.

8. **Low Flying Area (LFA).** A surveyed area that is approved for use and unlimited aircraft manoeuvring within the LFA boundaries to an authorised height.

9. **Low Flying Route (LFR).** A surveyed route that is approved for use and assures obstacle and terrain clearance will exist within the LFR boundaries to an authorised height.

10. **Surveyed Route or Area.** A route or area is considered surveyed when it is flown in VMC by day and all hazards and obstacle data that may compromise suitability for flight has been identified and recorded. (See paragraphs 16 to 20)

11. **Overwater.** The aircraft is operating or has a flight path over a body of water, which includes enclosed waters, inland waterways and seaward of the coastline.

INSTRUCTION

Conduct Of Low Flying

12. Low flying height is IAW Reference A, 500 feet AGL/AMSL overwater and overland. Before any low flying is conducted, the crew shall assess the requirement to low fly. The hazards associated with low flying should be managed SFARP, which includes elimination if possible. Once the requirement has been established, the crew must:

a. Conduct appropriate mission planning IAW Reference B

b. Carry required and appropriate Aeronautical Information map/charts IAW Reference C

c. Observe the authorised minimum height and lateral separation for the flight

d. Be cognisant of their aircraft's performance and capability, and exercise vigilance to avoid ground and air hazards, including UAS

e. Avoid known terminal air traffic areas

f. Avoid built-up or closely settled areas

g. Avoid operating mines, quarries, ships, offshore installations or other industrial centres

h. Avoid, as far as practicable, farmhouses, livestock, marine wildlife and known sensitive areas.

13. The Aircraft Captain must inform the Flight Authorisation Officer (FLTAUTHO) or, if the FLTAUTHO is unavailable, the Squadron Commanding Officer (SQN CO) as soon as practicable after operating below the minimum authorised height due to an in-flight emergency and/or stress of weather.

14. IAW Reference B, formal and informal sources of hazard and vertical obstruction data can be displayed on JMPS and EFB overlays.

15. Low flying can be planned and conducted, ensuring all available overlays are loaded and displayed (VVOD/TFADS-O, AIS-VO, HAND), on;

a. EFB, Physical JMPS products or ADTS digital maps within Nowra military airspace.

b. Physical JMPS products or ADTS digital maps when outside of Nowra military airspace.

Authorisation Of Low Flying

16. Specific flight authorisation IAW Reference D is required for all low flying operations. The FLTAUTHO must:

a. Consider the crew's competency and recency in low flying, including in the conduct of low level emergency training.

b. Consider aircraft equipment that provides height information and alerting, which may warn the crew of dangerous flight trajectories and mitigate the risk of controlled flight into terrain/water (CFIT/W).

c. Ensure the flight is planned to avoid populated areas and operating mines, quarries, ships, offshore installations or other industrial centres.

d. Ensure the environmental and weather aspects have been considered (where applicable).

e. Annotate the minimum heights to be flown, along with any route restrictions, in the authorisation record.

f. Ensure that the crew are aware of:

(1) The height and lateral separation limitations as well as obstacles and other known hazards.

(2) The mission planning requirements, including obstacle data sources.

(3) The aircraft's performance and capability in relation to the likely ground and air hazards.

(4) Known sensitive areas or other airspace concerns.

Minimum Equipment

17. Minimum equipment shall include a serviceable radar altimeter (RADALT) with an adjustable height warning function. Unit/Type SIs must detail any additional minimum equipment for low flying operations if required.

18. Low height alert procedures shall involve the use of a RADALT and the adjustable height warning function. The height warning function must be set such that, when an alert is raised, the system has given:

a. A positive indication of a low flight path

b. Sufficient warning to allow the flying pilot to take positive action and avoid CFIT/W.

19. Unit/Type SIs must specify SOPs for the setting of height alert indicators and must ensure aircrew are trained to take positive action to each alert, including perceived erroneous alerts.

20. Low flying below 400 feet AMSL, in IMC or at night, over water, must be conducted with reference to a serviceable RADALT and with an Autopilot Altitude height hold function engaged.

Minimum Heights And Separation Distances

21. The hazards associated with low flying overland and overwater are subtly different. The intent of minimum heights is to eliminate or mitigate the hazards within each domain SFARP. Lateral separation from land when operating overwater is IAW Reference F. The following minima apply to all FAA aircraft low flying/terrain flight in the following contexts and are to be specifically authorised:

a. **Over land**

(1) **Surveyed LFA.** By day, or night aided, in VMC:

(a) Not below 200 feet AO at normal operating speeds.

(b) Not below 50 feet AO at normal operating speeds, when in an LFA approved for terrain flight in Reference I and when specifically authorised for terrain flight.

(c) Not below 20 feet AO at reduced speeds IAW relevant Unit/Type OIP, when in an LFA approved for terrain flight in Reference I and when specifically authorised for Nap Of the Earth (NOE) flight.

(2) **Surveyed LFR.** By day, or night aided, in VMC: not below 200 feet AO

(3) **Unsurveyed LFA or LFR.** If an LFA or LFR is unsurveyed or the previous survey has lapsed (see paragraphs 16 to 18): not below 500 feet AO

(4) **Lateral Separation from Terrain and Obstacles.** Where low flying and terrain flight is routinely conducted over terrain that requires valley flying or other recognised mountain flying techniques, the Unit/Type OIPs shall specify the minimum lateral separation distances appropriate to the type of operations being conducted.

b. **Over Water.** Aircraft equipment relevant for low flying overwater include AFCS with collective axis function and aircraft radar[1] for obstacle avoidance. Minimum heights are IAW the table below;

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(3) **Lateral Separation Overwater**

(a) Night unaided flight below 300 feet AMSL is considered to be IMC[2]. All IMC and night unaided flight below LSALT overwater shall maintain separation from land IAW Reference F.

(b) Lateral separation from ships shall be IAW Reference G.

c. **Flypasts and Flying Displays.** Minima that apply to Navy helicopters participating in a flying display, handling demonstration or flypast are described in Reference H.

d. **Built-up Areas.** Low flying over built-up areas shall be conducted IAW Reference A.

Promulgation Of Low Flying Routes And Areas

22. COs of flying units are responsible for approving LFRs outside designated LFAs. LFRs should be planned to avoid aerodromes by at least the CTR / CTAF-R boundary, and other known landing areas by a minimum of 3NM or 1500 feet above ground level (AGL). Routes should also be planned to avoid sensitive and noise nuisance areas. These LFRs shall be promulgated in unit OIP.

Low Flying Route And Area Survey

23. The purpose of surveying an LFA or LFR is to safely pinpoint, and record the location of, overhead wires and other obstructions that present a significant hazard to aircraft conducting low

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1 For the purpose of this instruction, a radar-equipped aircraft is defined as one that is equipped with an all-round scan, high definition, warning radar suitable for surface contact avoidance and weather information that is working satisfactorily and is monitored by a competent operator (STANAG 1154).

2 For the purpose of a night approach to an air capable ship, below 300 feet IMC ceases once the aircraft reaches a position where visual reference to the ship is achieved and can be maintained to conduct an approved approach procedure.

flying in the LFA or along the LFR. Once completed, a survey is valid until the next periodic survey becomes due.

24. CO 723 SQN is responsible for ensuring that LFAs, listed in Reference I, are surveyed on a six monthly basis.

25. The SQN CO is responsible for ensuring that the LFRs promulgated by their unit are surveyed or flown on a three monthly basis.

26. **Conduct of Surveys.** The SQN CO responsible for conducting surveys of intended LFAs and LFRs shall ensure:

a. A thorough pre-flight investigation is undertaken to ascertain whether any inconspicuous hazards exist (this investigation should include liaison with appropriate authorities).

b. The crew employed is suitable for the task and authorised IAW Reference D.

c. The crew exercise due care and conduct a thorough aerial inspection of any ridgeline, with the aim of detecting wire supports, before flying below the height of that ridgeline.

d. LFR surveys are flown by a competent crew at a suitable height and speed which will allow them to identify obstructions along the route and out to 1 NM either side of track.

e. On completion of the survey, the Aircraft Captain submits a report to the relevant SQN CO detailing the nature and location of all located hazards, together with an indication of the Aircraft Captain's confidence in the validity of the report.

27. Local area hazard data shall be managed IAW Reference B.

Policy Sponsor: SO1 OPAW
Content Officer: SO2 PLT STDS

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SI(NA) OPS 04-04

CARRIAGE OF RELEASABLE STORES

References:

A. Defence Explosive Ordnance Publication 101
B. Nowra Aerodrome Manual (E6305553)
C. Jervis Bay Aerodrome Manual (E6305552)
D. Explosives Limit Licenses (ELL) and Safeguarding Maps
E. FIHA AD2 Supplements
F. EnRoute Supplement Australia (ERSA)
G. SI(NA) OPS 05-09—Aircraft Fuelling Operations
H. AFGOs Part Four—Warfare Considerations
I. AFGOs Part Three—Support and Sustainment
J. Environment Reporting System Library
K. COMFAA Directive 02/24—FAA CCIR Jan 24 (BS48268101)
L. ANP3300—Fleet Aviation Procedures
M. ANP4412-4900—Naval Armament Systems

INTRODUCTION

1. Carriage and Release of stores is not governed by Defence Aviation Safety Regulations (DASR). The authority for management of Explosive Ordnance (EO) in Defence is detailed in Reference A. Unit instructions shall detail specific carriage and release procedures related to each store/ordnance.

2. **Aim**. The aim of this instruction is to detail the requirements and considerations for the carriage and release of aircraft stores.

SCOPE

3. This Instruction applies to all RAN aviation operations and is applicable to all personnel within the RAN Fleet Air Arm (FAA), all personnel who operate Naval aircraft in other Navy Commands, and all Naval personnel who operate non-defence registered aircraft on behalf of the RAN. This includes members from other ADF services or foreign services who are posted or on temporary duty for aviation duties with the RAN. Members undergoing initial aircrew training are deemed aircrew for the purpose of this Instruction. Non-Defence personnel employed in an aircrew capacity must be assessed IAW policy issued by the Commander Fleet Air Arm (COMFAA). This instruction does not detail considerations for the carriage and release of equipment associated with Search and Rescue (SAR), training (box knocking etc.) or external load lifting.

AUTHORITY

4. This instruction is issued by Commander Fleet Air Arm (COMFAA). COMFAA is the Accountable Manager (AM), Navy Military Air Operator (MAO).

DEFINITIONS

5. The following terms used in this instruction are defined in the Glossary of Terms from Reference A and the Australian Defence Glossary (ADG). Where there is a discrepancy in definitions, the ADG takes precedence.

6. **Explosive Ordnance (EO).** All munitions containing explosives, nuclear fission or fusion materials and biological and chemical agents.

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7. **Aircraft Stores.** An aircraft store is any device, excluding air cargo, intended for internal or external carriage. An external store is normally mounted on aircraft suspension and release equipment, whether or not the item is intended to be separated in flight from the aircraft. Categorised as follows:

a. **Expendable Store** – is an aircraft store normally separated from the aircraft in flight, such as practice, inert or explosive ordnance, such as – sound underwater signals, marine markers, torpedos, sonobuoys and ordnance.

b. **Non-Expendable** – is an aircraft store which is not normally separated from the aircraft in flight, such as – external fuel tanks, store suspension equipment and countermeasure pods.

8. **Abnormal release.** An abnormal release of an aircraft store is deemed to have occurred when one or more of the following have occurred:

a. **Inadvertent Release** – the unintended release, firing or jettison of an aircraft store, or air cargo, which occurs as a direct result of aircrew actions and is not attributable to an irregular functioning of an aircraft system or component,

b. **Irregular Release** – the release, firing or jettison of an aircraft store, or air cargo, which can be attributed to the irregular functioning of an aircraft system or component,

c. **Negative Release** or **Hung Store** – the non-release, non-firing or non-jettison of an aircraft store or air cargo **after release action was commanded**. For example – a weapon that cannot be fired after a hangfire event or cannot be jettisoned because of a system failure with bomb rack or jettison circuit malfunction resulting in an unknown weapon station status;

(1) **Misfire** – a store/weapon that has failed to fire after receiving a crew commanded firing pulse (the motor does not ignite),

(2) **Hangfire** – the weapon motor ignites after receiving a crew commanded firing pulse but remains fully or partially in/on the weapon pod or bomb rack/rail. A hung store can occur due to a failure of either, the weapon retention mechanism, motor failure or the release impeded by FOD/damage.

d. **Store Malfunction** – the abnormal behaviour of an aircraft store following normal release, firing or jettison. Abnormal behaviour is defined when one, or any combination thereof, of the following failures occurs:

(1) failure of the store to follow its expected trajectory,

(2) failure of the store to detonate or operate as intended,

(3) detonation or operation of the store prematurely,

(4) detonation or operation of the store after an excessive time delay, after target impact,

(5) ordnance or pyrotechnic falls outside the authorised Weapon Danger Zone (WDZ)/Weapon Danger Area (WDA), or

(6) ordnance or pyrotechnic falls in a location where it may constitute a direct hazard to shipping.

9. **Aircraft Safety Point (ASP).** An authorised location where aircraft stores delivery systems are changed to a state of readiness or where the fitment of safety devices or the disconnection of energy sources reduces the state of readiness. Additionally, aircraft stores that have malfunctioned or have not been released due to a malfunction of the aircraft stores delivery system may be unloaded at an ASP if this is considered necessary for safety reasons.

10. **Ordnance Loading Apron (OLA).** An area on an airfield, authorised by a competent authority, where the loading and unloading of explosive ordnance to an aircraft stores delivery system, or the stowing of explosive ordnance in an aircraft is performed, or where aircraft containing explosive ordnance (loaded and/or stowed) may be parked and where sufficient explosive ordnance may be held ready for immediate loading and stowing.

11. **Explosive Ordnance Area / Explosives Area (EOA)**. An explosives ordnance area or Explosives Area is an area used for the handling, processing and storing of explosive ordnance. Where there is no fence, it is taken as being the area within a radius of 50m from any building or stack containing explosive ordnance.

12. **Hazard Classification Code (HCC).** A HCC is composed of the HD designation (e.g. '1.1') and the assigned compatibility group letter (e.g. 'B'), to give in this example, '1.1 B'. The simple alphanumeric code indicates the hazard present and degree of compatibility for storage and transport.

13. **Hazard Division (HD).** In accord with the UN Orange Book—Recommendations on the Transport of Dangerous Goods—Model Regulations, ST/SG/AC.10/1, explosives, including explosive ordnance, that are deemed not too dangerous to be accepted for transport, are categorised as Dangerous Goods Class 1. Note: This class is divided into six divisions, commonly known as hazard divisions and are:

a. (Hazard) Division 1.1—substances and articles which have a mass explosion hazard

b. (Hazard) Division 1.2—substances and articles which have a projection hazard but not a mass explosion hazard

c. (Hazard) Division 1.3—substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard

d. (Hazard) Division 1.4—substances and articles which present no significant hazard

e. (Hazard) Division 1.5—very insensitive substances which have a mass explosion hazard

f. (Hazard) Division 1.6—extremely insensitive articles which do not have a mass explosion hazard.

14. **Net Explosive Quantity (NEQ).** The total explosives content of an ammunition, unless it has been determined that the effective quantity is significantly different from the actually quantity. It does not include such substances as white phosphorus, war gases or smoke and incendiary compositions unless these substances contribute significantly to the dominant hazard of the hazard division concerned.

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Table 1. Common EO Store HD and NEQ Data

EO STORE	DEOP	HCC	NEQ (Kg)
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16. Unless awaiting an EO load, the requirements for separation detailed in Reference A do not apply to aircraft containing installed/stowed EO of the following types:

a. quantities of small arms ammunition for crew use,

b. pyrotechnic signalling devices,

c. egress system components,

d. squibs, fire extinguisher cartridges and ejector cartridges, or

e. explosive components of emergency kits and equipment.

Nowra and Jervis Bay Aerodrome Operations

17. Procedures relating to aircraft stores, hung stores/ordnance, refuelling and emergency procedures are at Reference B. Procedures for the OLAs at both Nowra and Jervis Bay Aerodromes are detailed in Chapter 14 and 12 respectively. The description and ELL, including remarks, for each OLA, EOA, ASP at Nowra and Jervis Bay is detailed in Reference D under 'Navy'.

Helicopter Support Facility (HSF) Operations

18. s33(a)(ii) . The description and ELL, including remarks, for each OLA is in Reference D. Detail on operations from the HSF is located on the HMAS *Stirling* Resident Units webpage. The HSF Manger shall be contacted prior to any activity requiring EO, to confirm procedures and status of the facility to accommodate EO operations – Duty mobile 0448 719 837. Note – the visiting unit is responsible for the accounting and condition of EO.

Other Aerodromes/Airfields

19. Guidance relating to other Defence sites with an aviation capability is detailed in the relevant FIHA AD2 Supplement at Reference E. All Defence and non-Defence sites and airfields that have a licence to provide support for EO can be found in the applicable ELL in Reference D. Reference F provides considerations relating to specific airfields. Aircrew should contact airfield operations/managers if clarification of local procedures is required when carrying stores classified as dangerous good or EO.

ATC Requirements

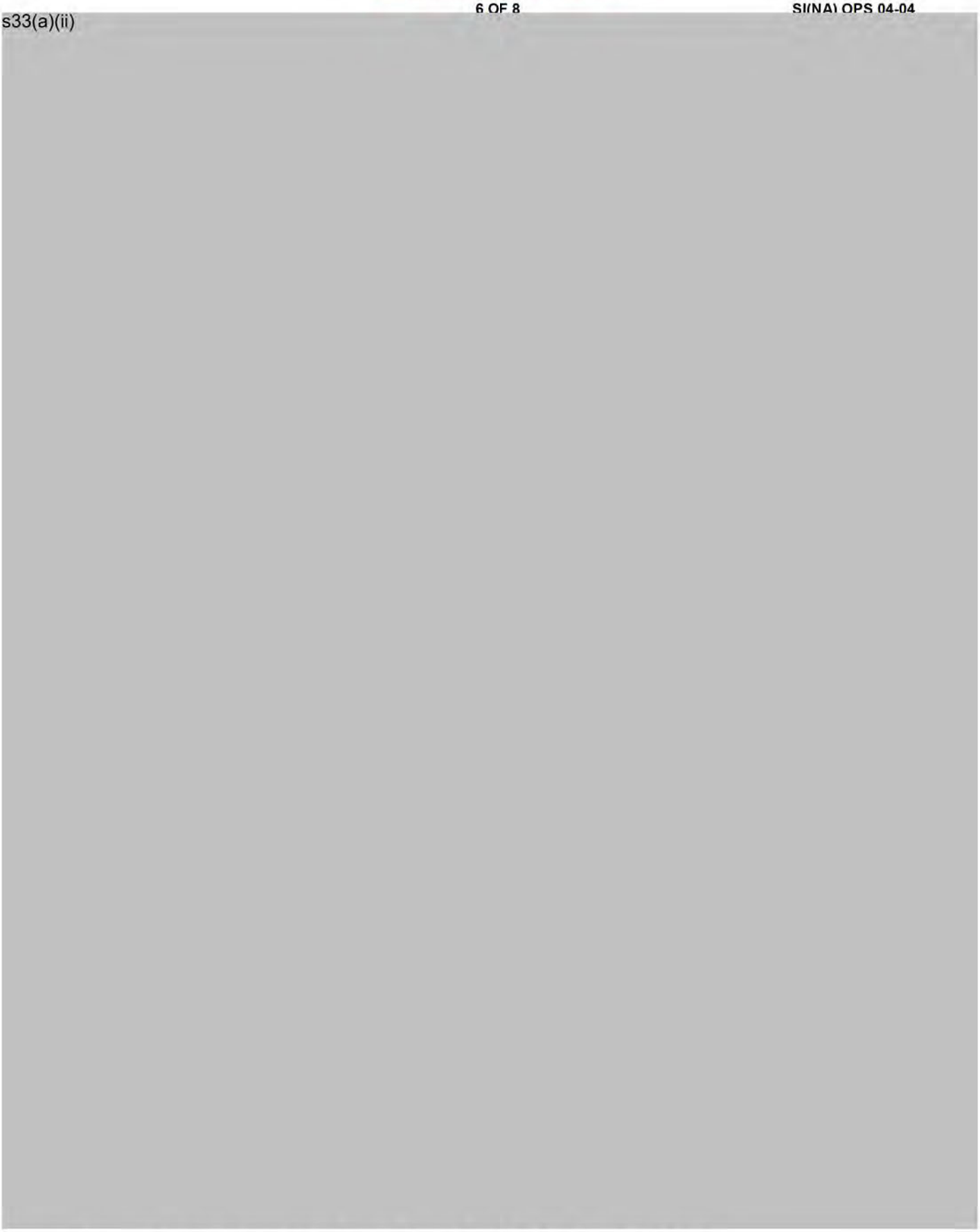
20. Aircraft Captains shall notify ATC of any dangerous cargo or explosive weapons stores being carried when requesting taxi and landing instructions, unless the information has been previously advised, as per Reference E (FIHA).

International Operations

21. The RAN has no standing Status of Force Agreements (SOFA) for operations in another country's territorial waters. Any operation involving carriage of EO needs to be coordinated with local authorities through the Defence/Naval Attaché (DA/NA). This coordination process is generally managed through the Ship's Maritime Logistics Officer (MLO) with Flight Commander (FLTCDR) assistance through to the CTG/CTF or MAROPs. Crews need to be cognisant of what diplomatic clearances have been obtained prior to flight with EO in territorial waters.

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b. **Impacts Within The Range Danger Area Safety Trace (RDAST)**

(1) suspend firing and establish the cause of abnormal release,

(2) approve recommencement of firing for inadvertent releases only, provided there is no detriment to safety,

(3) report the incident to the FLTAUTHO/FLTCDR and CO.

c. **Impacts Outside of RDAST but Within The Surface Danger Area (SDA)/Defence Practice Area (DPA).**

(1) terminate the range activity and confirm details of the abnormal release ,

(2) report the incident IAW range standing orders,

(3) report the incident to the FLTAUTHO/FLTCDR and CO.

d. **Impact Outside of DPA**

(1) terminate the range activity and confirm details of the abnormal release,

(2) report the incident details to Range Control, Unit, and the local police, as required,

(3) report the incident to the FLTAUTHO/ FLTCDR and CO:

(a) **Ashore**: If required, the CO/HQFAA is to ensure that a legal officer, local police, other appropriate authorities along with the owner/occupier of the property involved are informed of the situation and are given advice on what to do/not to do. Seek advice from Joint Explosive Ordnance Support (JEOS).

(b) **Embarked**: CO/FLTCDR notify CTG/CTF/MAROPS of incident via OPREP (FIE-P or FIE-S as appropriate). COMFAA notified of incident IAW Reference K.

34. If following a normal release, any significant weapon fragment or associated debris is discovered to fall outside of the RDA Trace or the authorised weapon safety template, the use of the RDA Trace and weapon safety template must be immediately suspended.

35. When serious personal injury or property damage occurs following the abnormal release of any type of aircraft store, or when negligence seems probable, notify and report IAW Joint and Service Defence Instructions for Incident Management and Reportable incidents (for RAN related incidents use the Fleet Legal Incident Recording and Reporting webpage.

Post Abnormal Release administrative actions

36. Any malfunctioning equipment/aircraft shall be quarantined and placed unserviceable. Maintenance activities will be carried out IAW local procedures. Crews are to raise an Aviation Safety Report (ASR) in Sentinel.s33(a)(ii) Investigations and post investigation activities will be carried out as required by relevant authority depending on severity of incident.

37. All EO incidents, that may include an accident, near miss, malfunction or defect, shall be reported in accordance with Reference A. This will involve the submission of an EO016 – *Explosive Ordnance Incident Report* form. Firing units are to record as a minimum the location, tactical profile, description of occurrence, environmental conditions, target used and probable cause.

Recovery procedures for Hung Store/Misfire

38. Recovery procedures for a Hung Store/Misfire store is detailed in Reference B (local procedures) and in Reference L (embarked operations). For other airfields, the relevant Aerodrome Supplement at Reference E shall be consulted. If transiting with EO, Aircraft Captains and FLTAUTHOs must consider contingencies in the event of an emergency landing with EO. Aircraft

Captains are to consult their local Ordnance Safety Officer (OSO) prior to an ordnance/weapon exercise activity to ensure local procedures are adhered to.

39. **Safe Route to Base.** When the aircraft captain has to return or divert to a Base, following an irregular release or negative release/hung store, the safe route to Base is a route where the aircraft can avoid flight over populated areas whilst restricting manoeuvring and endeavouring to avoid flight in turbulent or Instrument Meteorological Conditions. A safe route to base must be planned and communicated during pre-flight briefing prior to a sortie carrying releasable stores.

EMBARKED CONSIDERATIONS

40. All stores and pyrotechnic considerations whilst embarked are IAW ANP3300 (Reference L). Part 2, Section 3, Chapter 7 provides specific guidance on aircraft EO and pyrotechnics, and specific details relating to EO will be found in the ship class specific chapters. Guidance on responsibilities, management, and storage and handling of EO whilst embarked is detailed in the *Naval Armament Systems* publication (Reference M). Overall management of embarked EO is the responsibility of the Ship's EO Safety Officer (SEOSO).

41. The Flight's POATV is appointed as the Flight Special User Person (SUP) for EO whilst a Flight is embarked. The Flight SUP will liaise with ship EO key personnel as required for management of aviation EO and maintains overall safety responsibility for Aviation EO after it is issued from the particular magazine. The POATV will be the primary POC when considering to conduct any type of operation involving EO. Further guidance can be sought from the MH-60R EO Cell in Nowra via Email: s47E(d)

42. The Flight Operations Officer (FLOPSO) is responsible for ordering required EO stores (in consultation with POATV) through the Explosives Accountability Officer (EAO). Stores will be ordered in line with what is listed on the Ship's EO Warrant, therefore the FLOPSO/POATV should ensure the EO Warrant is up to date in order to receive correct amounts and type of each store.

43. Emergency procedures are to be IAW the *Emergency Considerations* section of this document. The primary reference for the interaction with the Ship following an EO emergency is detailed in Reference L (Part 2, Section 3, Chapter 8). A major consideration prior to conducting EO operations in the embarked environment is the potential need for EO disposal (EOD). The person qualified for EOD whilst embarked is the Clearance Diver posted to the ship. The POATV is responsible for ensuring an ability for EOD is available during EO operations.

Policy Sponsor: SO1 OPAW
Content Officer: SO2 OPAW

2-224 LOW FLYING

DASR.ORO.50(a), DASR.SPA.20

2-224.1 Definitions

a. Low Flying (LF) – defined in FIHA (and CASR) as flight below 500 ft AGL.

b. Terrain Flight (TF) – an Army specific subset of LF, defined as flight below 200 ft AGL.

2-224.2 Low Flying

a. In accordance with this SI, Army aircraft **are** authorised to LF, not below 200 ft AGL, outside of urban/built up areas, when required by tasking, traffic management and/or environmental conditions at Aircraft Captain (AC) discretion.

b. The prevalence of RPS (UAV) and other civil airspace users operating below 500 ft has increased the risk of LF in civil airspace. Accordingly, Army aircraft should minimise operations below 500 ft AGL outside approved Terrain Flight Areas (TFAs) where there is no operational/training imperative for LF.

2-224.3 Terrain Flight

a. Army aircraft **may be** authorised to conduct Terrain Flight (TF) within approved areas or routes approved by the Operating Unit CO.

2-224.4 Terrain Flight Areas/Low Flying Routes

a. All military training areas are approved Terrain Flight Areas (TFAs[1]) subject to meeting the requirements of this instruction. TFAs should be:

1. For the purposes of this SI, Low Flying Area and Terrain Flight Area are synonymous.

1. Surveyed to identify and locate all hazardous obstructions.
2. Where possible, clear of promulgated instrument approaches.
3. As clear as possible of hazardous obstructions.
4. As clear as possible from aerodrome Obstacle Limitation Surfaces.

b. Low Flying Routes (LFR) should be planned to avoid aerodromes (CTAFs) or the CTR boundary (controlled aerodromes) by 3 nm, and avoid sensitive and noise nuisance areas.

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c. The details of all approved TFA and LFR must be detailed in Unit SI and must include:

1. Boundaries of each area or route
2. Lowest authorised altitude for the particular area or route
3. Separation requirements
4. Limitations by aircraft type (low level/contour/NOE)
5. Use of specialised equipment (ie FLIR, laser)
6. 'Avoid' areas
7. Frequency of hazard inspections.

d. When flight is to be conducted in a TFA of another Unit or Service, the appropriate Unit's Standing Instructions (or equivalent), Master Hazard Map and Vertical Obstacle (VO) database must be adhered to. Liaison with the sponsor Unit of the TFA must occur prior to flying operations.

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2-224.6 Requirements

a. When TF is authorised, the following requirements apply:

1. The crew member responsible for navigation must navigate using a map showing the boundaries of the TFA, applicable avoid areas and the location of both natural and man-made hazards as depicted on the Master Hazard Map.
2. The crew is to refer to other sources of Vertical Obstruction (VO) data such as the Hazard and Noise Database (HAND) during planning for TF.

b. When a flight is to be conducted below 50 ft AHO in a TFA that is known to contain man-made hazards the aircraft must be flown by:

1. Two pilots qualified on type with access to flight controls.
2. A QFI and a trainee undergoing training or assessment.

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2-224.8 Hazard and Noise Database

a. In accordance with paragraph 2-224.6 (a)(2), HAND VO data can be accessed via PFPS and opened as a Manual CHUM file from the following locations:

1. MPA Files\Australia\Hand\HAND-Powerlines.mch
2. MPA Files\Australia\Hand\HAND-Towers.mch

2-224.9 LF/TF Over Urban/Built Up Areas

a. Prior to the conduct of a LF/TF training activity in urban/built up areas within Australia the following must occur:

1. All activities shall include Public Relations/noise management plans.
2. The requirements of paragraph 2-224.4 (a) must be met by the conduct of a route reconnaissance by day, within 30 days of the task, and detailed in either mission orders or Unit SIs. Whilst this may not be practicable during a named operation or an operational response, all reasonably practicable steps must be taken to determine hazardous obstacles within an Area of Operations.

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b. Flight below 1000 ft AGL in urban/built up areas is approved in accordance with Table 2-224.9(1).

TABLE 2-224.9(1) URBAN FLIGHT BELOW 1000 FT AGL APPROVAL MATRIX

	Condition/Task	Approving Authority	
		Raise, Train & Sustain Activity	Named Operation/ Operational Response
1.	Following ATC direction	N/A	N/A
2.	Planned activities below 1000 ft, including tasks, individual/crew training, or reconnaissance (whether force assigned as part of an operation or not).	COMD 16 AVN BDE COMDT AAVNTC S3 16 AVN BDE	JTF COMD not below 1 Star or as delegated by COMD 16 AVN BDE
3.	Operation not below 500 ft AHO for traffic separation in high density traffic environments.	CO after completion of RMP	CO after completion of RMP
4.	Terrain Flight: 1. During the execution of an approved operational response 2. During formal individual training in accordance with an approved TMP/LMP (ie SOQC) 3. During collective training necessary to meet SO CAPD requirements or for the conduct of MRE/MST.	COMD 16 AVN BDE S3 16 AVN BDE CO OC REGT STDO	CO OC

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