DAR 91
General Operating and Flight Rules

NZDF Airworthiness Authority
Headquarters New Zealand Defence Force
WELLINGTON

AUTHORITY ORDER

DAR 91 General Operating and Flight Rules

Issued by NZDF Airworthiness Authority

Authority

1. *DAR 91 General Operating and Flight Rules* is issued and promulgated under the authority of the NZDF AA to regulate and administer specified functions and activities within the NZDF.
2. Every order, rule, instruction and procedure contained in this publication is to be considered applicable to all whom it may concern and is to be complied with, even though it may appear, in part, addressed to a particular function or area of responsibility and accountability.
3. Failure to comply with this rule is an offence under s 38 or s 39(a) of the *Armed Forces Discipline Act 1971* depending on the circumstance, and is negligence as defined in the Civil Staff Code of Conduct.

Conflict

4. Nothing in this publication is to be construed as prevailing over any relevant Act of parliament or Regulations made under it, or Defence Force Orders issued and promulgated by the Chief of Defence Force or under their delegated authority.
5. Any conflict between the mandatory requirements stated in this publication and any other NZDF policy, order, rule or procedure issued within New Zealand should be reported through normal channels to the NZDF OAA without delay.

Signed on original

AVM Andrew Clark, Chief of Air Force

NZDF Airworthiness Authority, Headquarters New Zealand Defence Force Dated 21 January 2020

PRELIMINARY PROVISIONS

Purpose

1. NZDF aviation operations are conducted in accordance with limitations and instructions deemed necessary to ensure safety of flight. This system of operating rules provides a basis for training and operations that are consistent and authorised.

Releasability

2. This publication is available on the NZDF Intranet.

Standard of compliance

3. The information in this publication—
   a. aligns with the standard required by relevant New Zealand legislation and international standards; and
   b. uses the following terms to provide direction, instruction and suggested action—
      (1) **Is to, are to, must and must not.** The phrases 'is to', 'are to', 'must' and 'must not' are imperative and are used where an action or duty is imposed and *must* be performed. There is no alternative interpretation of these words and they are deemed mandatory requirements.
      (2) **May.** 'May' is permissive and is used where a power, permission, benefit or privilege given to a person may, or need not, be exercised; in these circumstances, action is discretionary.
      (3) **Shall.** 'Shall', when used in this publication, means 'must'.
      (4) **Should.** 'Should', when used in this publication, expresses the requirement of a higher authority but leaves some discretion to the recipient/addressee.
4. All members of the NZDF are required to comply with mandatory requirements set out in this publication. Where an alternative action that has been taken does not meet the standard required by the NZDF, this may result in disciplinary action for breach of this publication.

Commencement date

5. This publication is effective from the date of promulgation (Version 1.00) and any ensuing amendments to the publication.
6. A person submitting a proposed rule or amendment is to—
   a. send the proposed rule or amendment to the NZDF OAA;
   b. include the text or substance of the rule or amendment proposed or the rule that the petitioner seeks to have repealed;
   c. state which interested persons have contributed to the development of the draft rule or amendment; and
   d. include recommendation and supporting details for NZDF OAA consideration.
7. Every page shows the current amendment status of the publication in the header.
8. Revision bars identify only changes made at the current amendment status.

Approving Authority and Custodian

9. The Approving Authority for *DAR 91* is the NZDF OAA.

10. The Custodian for *DAR 91* is the NZDF OAA.

Meanings of terms

11. Abbreviations used in *DAR 91*, and not explained elsewhere, are defined in Annex A of these Preliminary Provisions.

Statement of equity and inclusion

12. The content and tone of *DAR 91* is non-discriminatory and non-prejudicial. Every effort has been made, so far as practicable, to ensure that there is no disproportionate impact on gender, ethnicity, age, diversity or disabilities unless the expression is relevant to the order, direction or instruction.

Authoritative version of *DAR 91*

13. The online copy of *DAR 91* is the authoritative version. Any printed copy or CD-ROM copy is deemed uncontrolled and is to be used for guidance only. Users should check the DAR online to ensure they are using the current release.

Annex A

Meanings of Terms

Term	Meaning
AC	advisory circular
ACD	air cargo delivery
ADRAC	Aviation Decompression Sickness Risk Assessment Computer
AFIC	Air Force Interoperability Council (Five Eyes)
AGL	above ground level
AIP	Aeronautical Information Publication
ALSE	aeronautical life support equipment
AMC	acceptable means of compliance
AMSL	above mean sea level
AMU	Aviation Medicine Unit
ATC	air traffic control
AvMED	aviation medicine
AvRM	aviation risk management
CAA	Civil Aviation Authority of New Zealand
CAM	Continuing Airworthiness Manager
CAMO	Continuing Airworthiness Maintenance Organisation
CAR	Civil Aviation Rule
CO	commanding officer
CRM	crew resource management
CRE	configuration, role and operating environment
DAR	Defence Aviation Rule
DCI	decompression illness
DFO	Defence Force Order
DG	dangerous goods
DLRO	Defence long range operations
DRA	Defence registered aircraft
EDTO	extended diversion time operations
FID	flight information documents
FMS	flying management system
FOD	foreign object damage
ft	feet
G	gravity
GFE	government furninshed equipment
GM	guidance material
GPS	global positioning system
HAOW	height above obstacles within
HSWA	*Health and Safety at Work Act 2015*
IATA	International Air Transport Association

Term	Meaning
ICA	Instructions for Continuing Airworthiness
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
KIAS	knots indicated airspeed
kts	knots
LFA	low flying area
LFR	low flying route
m	metres
MAA	military airworthiness authority
MAO	military air operator
MAOC	military air operator certificate
MEL	minimum equipment list
MRP	mission risk profile
MSD	minimum separation distance
NAA	national airworthiness authority
NDRA	non-Defence registered aircraft
NM	nautical miles
NSARS	non-standard aircraft restraint and seating
NZDF	New Zealand Defence Force
NZDF AA	New Zealand Defence Force Airworthiness Authority
NZDF MTC	New Zealand Defence Force Military Type Certificate
NZDF OAA	NZDF Operating Airworthiness Authority
OBOGS	on-board oxygen generation system
OEI	one engine inoperative
OIP	orders, instructions and procedures
OLS	obstacle limitation surfaces
OPS	operations
PANS	Procedures for Air Navigation Services
PED	portable electronic devices
PPE	personal protective equipment
PSD	point of safe diversion
PSR	point of safe return
RA	resolution advisory
RoA	rules of the air
SAR	search and rescue
SARPS	standards and recommended practices
SCBA	self-contained breathing apparatus
SFARP	so far as is reasonably practicable
SOIU	statement of operating intent and usage
SOP	standard operating procedure
TA	traffic advisory
TCAS	traffic collision avoidance system

Term	Meaning
TS S&S	Technical Support Safety and Surface
VFR	Visual Flight Rules
VIP	very important person

CONTENTS

GENERAL OPERATING AND FLIGHT RULES

END MATTER

DEFENCE AVIATION RULES

GENERAL OPERATING AND FLIGHT RULES

91.1 Rules of the air

The MAO is to ensure that the RoA as they apply to NZDF aviation as stipulated within NZDF OIP are harmonised with ICAO and national civil practice, wherever practicable, in order to ensure NZDF aviation interoperability with non-NZDF aviation activities, and NZDF's obligations under the HSWA.

AMC 91.1 – Rules of the air

GM 91.1 – Rules of the air

91.2 Conduct of flying operations

GM 91.2 – Conduct of flying operations

a. The MAO is to ensure NZDF aircraft are operated with adequate controls to ensure safety of flight.

b. Aircraft captains should operate NZDF aircraft—

(1) within the approved SOIU CRE parameters;

(2) in accordance with NZDF MTC and MAOC limitations;

(3) in accordance with CAA AIP, except as required by the NAA of the state of operation;

(4) as detailed in the aircraft flight manual;

(5) in accordance with applicable NZDF OIP; and

(6) at certified aerodromes, non-certified aerodromes and any other non-defined areas where it is safe to do so.

91.3 Aircraft captaincy

The aircraft captain is entirely responsible for the safety of the aircraft, its occupants and equipment, both in the air and on the ground until it is handed over to the appropriate authority after flight.

AMC 91.3 – Aircraft captaincy

GM 91.3 – Aircraft captaincy

91.4 Aircraft crewing

a. Aircraft captains are to ensure NZDF aircraft are crewed in accordance with minimum and normal crew compositions promulgated by the MAO.

GM 1 91.4 – Aircraft crewing

b. The MAO is to ensure aircrew operating NZDF aircraft are proficient and authorised in accordance with *DAR 61*.

c. The MAO is to ensure the operation of DRA by civilian aircrew is approved on the basis of—

(1) identification and attainment of prerequisite civil and military training, qualifications and competency;

(2) familiarity and adherence to applicable NZDF and type-related OIPs;

(3) identification and provision of flying clothing and ALSE necessary to crew the aircraft type; and

(4) approval is provided under the flight authorisation system.

GM 2 91.4 – Aircraft crewing

91.5 Portable electronic devices

GM 91.5 – Portable electronic devices

a. The MAO must ensure that portable electronic devices (PED) are only carried and used in accordance with approved OIP that includes the requirements for their carriage, stowage and operation by aircrew and passengers.

b. Personnel are to carry, stow and use PED in accordance with OIP issued by the MAO.

91.6 Use of flying clothing and aeronautical life support equipment

a. The MAO is to issue OIP covering the wearing and carriage of approved ALSE[1] and clothing by crew and passengers.

b. The MAO must establish an ALSE management system to enable the acquisition, integration and use of ALSE.

GM 1 91.6 – Aeronautical life support equipment

c. Prior to approving ALSE, the MAO must ensure—

(1) that the ALSE is certified.

GM 2 91.6 – Aeronautical life support equipment certification

(2) the ongoing use of ALSE is risk-managed under the MAO SMS, seeking subject matter expert (SME) advice to identify and manage ALSE hazards.

GM 3 91.6 – Aeronautical life support equipment risk management

(3) that maintainers and operators of ALSE are trained and their continued competence in its use can be demonstrated.

GM 4 91.6 – Aeronautical life support equipment use

(4) that OIP contain when ALSE is to be used/operated/carried.

GM 5 91.6 – Aeronautical life support equipment OIP

1 ALSE is any survival and life support equipment, including personal locator beacons, armoured life preserver, life saving vests, helmets, immersion suits, parachutes, cold weather clothing, dingy packs and life rafts.

91.7 Safety harnesses

The aircraft captain is to ensure all aircraft occupants are suitably restrained in all phases of flight.

AMC 91.7 – Safety harnesses

GM 91.7 – Safety harnesses

91.8 Provision and use of oxygen

a. The MAO is to establish an oxygen management system that ensures appropriate provision and use of oxygen on NZDF aircraft.

AMC 1 91.8 – Oxygen management system

GM 1 91.8 – Oxygen management system

b. The MAO is to ensure that flight crew who are occupants of flight crew seats on flight crew compartment duty use supplemental oxygen above 10 000 ft cabin altitude (CA).

AMC 2 91.8 – Flight crew oxygen requirements

GM 2 91.8 – Flight crew oxygen requirements

c. The MAO must ensure passengers (including parachutists) and crew not regulated under DAR *91.8b.* use supplemental oxygen whenever—

(1) flight is above 10 000 ft AMSL but not above 13 000 ft AMSL, and exceeds 30 minutes; or

(2) flight is above 13 000 ft AMSL.

AMC 3 91.8 – Supplemental oxygen requirements

GM 3 91.8 – Supplemental oxygen requirements

91.9 Use of role equipment and portable role equipment

The MAO is to ensure that aircraft role and portable role equipment is only carried and operated in accordance with approved OIP.

GM 91.9 – Use of role equipment and portable role equipment

91.10 Flight recorder and locating equipment

The MAO is to ensure NZDF aircraft are fitted with flight recorder and locating equipment appropriate to its military configuration, role and operating environment to—

a. locate aircraft and personnel in the event of an aircraft crash; and

b. provide data that can be downloaded, interpreted and analysed by approved personnel to assist in the prevention of further aviation safety occurrences.

AMC 91.10 – Flight recorder and locating equipment

GM 91.10 – Flight recorder and locating equipment

91.11 Carriage of personnel on NZDF aircraft

a. The MAO is to ensure a system is established that ensures the carriage of personnel in NZDF aircraft will not compromise suitability for flight.

AMC 1 91.11 – Carriage of personnel on NZDF aircraft

GM 1 91.11 – Carriage of personnel on NZDF aircraft

b. The MAO is to establish a system that ensures a requirement to carry personnel using NSARS is such that risk is eliminated or otherwise minimised, SFARP.

AMC 2 91.11 – Non-standard aircraft restraint and seating

GM 2 91.11 – Non-standard aircraft restraint and seating

c. The MAO is to ensure that records of personnel carried in NZDF aircraft are raised, maintained and preserved.

AMC 3 91.11 – Preservation of records

GM 3 91.11 – Passenger and flight crew manifest

91.12 Low flying

The MAO is to ensure low flying is specifically authorised and conducted in accordance with OIP authorised by the MAO.

AMC 91.12 – Low flying

GM 91.12 – Low flying

91.13 Display flying

The MAO is to ensure all display flying and practices are managed, organised and delivered in order to reduce the risk to life, SFARP.

AMC 91.13 – Display flying

GM 91.13 – Display flying

91.14 Formation flying

Aircraft captains are not to fly the aircraft in formation, except in an emergency, unless the aircraft captains have agreed to do so and have been authorised for the activity.

AMC 91.14 – Formation flying

GM 91.14 – Formation flying

91.15 Aerobatic flight

Aircraft captains are to only undertake aerobatic manoeuvres when authorised and in accordance with OIP issued by the MAO.

AMC 91.15 – Aerobatic flight

91.16 Air navigation

The MAO is to issue OIP in relation to air navigation that ensure—

a. fuel management requirements are specified;
b. mission planning software management and use are specified;
c. minimum safe altitude procedures are specified;
d. additional IFR and VFR operations to those detailed in FID are defined;
e. cold temperature altitude corrections are defined;
f. minimum navigation equipment requirements are specified; and
g. appropriate operational risk management processes are applied.

91.17 Dropping or jettisoning of articles

Aircraft captains are not to drop or jettison articles from aircraft unless authorised.

AMC 91.17 – Dropping or jettisoning of articles

91.18 Handing over control in aircraft with dual controls

Aircraft captains are to ensure handing over or taking over control of aircraft fitted with dual controls is conducted formally.

AMC 91.18 – Handing over control in aircraft with dual controls

91.19 Refuelling aircraft – engines and/or rotors running

The MAO is to state in OIP how and when refuelling aircraft – engines and/or rotors running shall be permitted.

AMC 91.19 – Refuelling aircraft – engines and/or rotors running

91.20 Disabling traffic and terrain warning systems

The MAO is to state in OIP the circumstances when disabling traffic and terrain warning systems is permitted.

AMC 91.20 – Disabling traffic and terrain warning systems

GM 91.20 – Disabling traffic and terrain warning systems

91.21 Defence long range operations

The MAO is to ensure a DLRO management system is established.

AMC 91.21 – Defence long range operations

GM 91.21 – Defence long range operations

91.22 Air cargo delivery

a. The MAO is to ensure an operational document is established that details ACD procedures.

AMC 1 91.22 – Controls for an operational air cargo delivery document

GM 1 91.22 – Air cargo delivery suitability for flight

GM 2 91.22 – Air cargo delivery procedures

b. The MAO must approve any waiver for IATA-identified DG that are not configured and handled in accordance with IATA regulations unless the NZDF ACD document has authorised a different procedure.

AMC 2 91.22 – Orders, instructions and procedures for carriage of dangerous goods

GM 3 91.22 – Dangerous cargo

c. The aircraft captain must confirm that—

(1) aircraft weight and balance is within limits defined in approved OIP;

(2) the weight and balance limits will remain within those limits throughout the flight;

(3) all cargo is stowed and/or rigged in accordance with approved OIP;

(4) aircraft equipment is stowed in approved positions and secured; and

(5) any consignment of cargo classed as dangerous, restricted or classified goods have been managed in accordance with approved OIP.

91.23 Stabilised approaches

The MAO is to issue OIP to define and apply stabilised approach procedures, including criteria suitable for their operations, and for a mandatory go-around to be flown if they are not met and maintained.

GM 91.23 – Stabilised approaches

ACCEPTABLE MEANS OF COMPLIANCE AND GUIDANCE MATERIAL

This page signifies the end of the rules section of this DAR.

The following pages detail the associated acceptable means of compliance (AMC) and guidance material (GM), and should only be read in conjunction with their associated rule.

AMCs and GMs are best accessed by selecting the blue AMC and GM hyperlinks detailed within the paragraph of each rule.

AMC 91.1 – Rules of the air

RoA information sources that will ensure interoperability and compliance with the HSWA include—

(1) ICAO Annex 2 – *Rules of the Air*

(2) HSWA

(3) *Civil Aviation Act 1990*

(4) CAA CARs and associated ACs

Due Regard

In international airspace flying not conducted under ICAO flight procedures should only be carried out under due regard (operational prerogative of military aircraft). Due regard carries a personal responsibility on the part of the aircraft captain and/or handling pilot to maintain separation from other aircraft, vessels and objects (such as offshore platforms). In order to ensure an appropriate level of safety, flight under due regard should only be conducted subject to one or more of the following conditions—

(1) Aircraft should be operated in visual meteorological conditions.

(2) Aircraft may temporarily be operated in less than visual meteorological conditions, when required by operational needs, provided the residual risk has been reduced so far as reasonably practicable. All available resources and information within the mission context should be used to minimise risk before conducting such operations with due regard for all other aircraft. Any aircraft operations in reduced visibility should be of no greater extent or duration than required.

(3) Aircraft should be operated within radar surveillance and under positive control of a surface or airborne radar facility.

(4) Aircraft should be equipped with airborne radar and qualified operators sufficient to provide separation between themselves and other aircraft.

BACK TO RULE

GM 91.1- Rules of the air

a. The Chicago Convention, including associated amending protocols, is set out in the Schedules to the *Air Navigation Act 1920* and further implemented through the *Civil Aviation Act 1990* (the Act). Consistent with Article 3 of the Chicago Convention, s 3 of the Act states that 'except as otherwise expressly provided in this Act or any other Act, or in the regulations or rules concerned, nothing in this Act or in any regulations or rules made under this Act shall apply to the New Zealand Defence Force.'

b. The CAA is the agency responsible for implementing CARs, which are derived from the Act and other legislation.

c. The ICAO implements the requirements set by the Chicago Convention through the distribution of ICAO SARPS. ICAO publishes annexes to the Chicago Convention containing SARPS and PANS documents, which provide guidance and information facilitating the uniform application of the SARPS. ICAO annexes have a higher status than PANS documents, therefore NZDF RoA will normally only make mention of ICAO annexes when used for AMC.

d. A significant consideration is that the use of the term State Aircraft may not exempt all NZDF aviation from the Act because—

(1) civil aircraft operate in NZDF-controlled airspace and NZDF aircraft operate in civil-controlled airspace; NZDF, therefore, is well motivated to align with the Act to ensure interoperability between NZDF and civil aviation; and

(2) where practicable, NZDF RoA harmonisation with civil RoA can ensure NZDF aviation is conducted in a manner no less safe than civil aviation except when there is an operational need as defined in the HSWA.

Due Regard

Freedom of the high seas includes the right of aircraft of all nations to use the airspace over the high seas in accordance with the international Law of the Sea Conventions of 1958 and 1982, which state that the freedom of the high seas includes the right of military aircraft to use the airspace above those seas without the permission of the coastal states for overflight and related military operations.

The sovereignty of a nation state extends beyond its land area to the outer limit of its territorial seas. The airspace beyond the territorial sea is considered international airspace, where permission of the coastal state is not required for overflight and related military operations. Where, for reasons of military contingencies or other training, activities are over the high seas, the principles of due regard apply.

The purpose of this rule is to provide a level of safety that fulfils New Zealand's obligations under Article 3 of the Chicago Convention that states there must be 'due regard for the safety of navigation of civil aircraft' when flight is not being conducted under ICAO flight procedures. ICAO does not define or prescribe the conditions to achieve 'due regard', as this responsibility is left to individual states. However, the NZDF chooses to align its due regard policy with its partner military nations of the UK and US.

BACK TO RULE

GM 91.2 – Conduct of flying operations

Purpose

The purpose of this rule is to assure NZDF aircraft are operated with adequate controls to ensure safety of flight.

Overview

a. Flying operations are concerned with ensuring aircraft are operated—

(1) in approved roles;

(2) with correct mission equipment;

(3) by proficient and authorised individuals;

(4) according to approved procedures and instructions; and

(5) under a system of supervision and monitoring.

b. This is achieved in practical terms through a structure of three interconnected elements—

(1) competent flying organisation;

(2) approved operating standards and limitations; and

(3) proficient and authorised aircrew.

Flying organisations

a. The aviation community has learnt from experience that aircraft accidents are normally the result of a linked sequence of errors, omissions or failures, the prevention of any one of which would have broken the 'chain' and stopped the accident from occurring. The community has also learned that such chains of failure are unlikely to develop within structured organisations where activities are performed and supervised by appointed individuals in accordance with refined processes and instructions. The likelihood of accidents is further reduced where such organisations are subjected to ongoing (internal and external) assessments of their performance and compliance with prescribed requirements.

b. Flying organisations provide local guidance, training, supervision and monitoring of individual aircrew to ensure they are proficient and authorised to conduct specific flying operations. To support the performance of this role, NZDF flying organisations are required to establish and abide by local management practices, standards, orders and instructions regarding flying operations. They are also required to develop training and qualification requirements appropriate to the operations they conduct. Collectively, such administrative arrangements, or elements, form the organisation's FMS. *DAR 119.4* identifies the key elements of an FMS.

c. An FMS may be local in focus but, to allow organisations to safely operate with one another and to provide for the movement of personnel between them, there must be some consistency or commonality across organisations. For this reason, FMSs are subject to NZDF-wide requirements relating to operating standards and prerequisite training and qualification standards.

GM Continues

GM Continued

Operating standards and limitations

a. Operating rules establish boundaries for the conduct of flying operations. NZDF operating rules and limitations are the set of approved guidelines, instructions and restrictions within which aircraft are to be operated by personnel belonging to a flying organisation. Such criteria are derived from a collective wisdom that encompasses the engineering and operating field. Operating rules and limitations may be high-level and general in nature or specific to an aircraft type, operating locality, proficiency level, mission category or flying organisation. The common feature is that operating standards and limitations should all promote the attainment of a known level of safety for flying operations. They should also be consistent and not susceptible to mixed interpretations or subject to arbitrary alteration. Notwithstanding this, the nature of the considerations behind operating standards and limitations means that they are not always permanent; they may change as more becomes known about human behaviour and aircraft design, or as other factors come into play.

b. The NZDF flying operations concept operates on the principle of centralised control and decentralised execution (or mission command). This allows commanders the flexibility to exercise discretion and judgement in managing the safe operation of aviation systems they are familiar with in roles and environments they are accustomed to and approved for. There remains, though, a need for operating standards to be based on minimum and consistent criteria, so NZDF flying operations rules are intended to prescribe common minimum requirements that are then supported by more focused and tailored rules developed for individual flying organisations.

c. At the level of a flying organisation, standards and limitations, whether locally or externally developed, may take various forms (including flight manuals, orders, authoritative FID and rules governing crew training and currency, low flying, display flying, cargo carriage, the use of role equipment etc) Collectively, such documentation comes under the title of OIP, which are the subject of *DAR 119*. Other MAAs and NAAs may use the term ICA in lieu of OIP.

Aircrew qualification and authorisation

a. The safety of aviation systems depends upon them being designed, constructed, maintained and operated by personnel who are proficient and authorised to do so. The abilities of the end-user are key design considerations for any item of equipment, but this is a particularly important principle in aviation. Designers, however, still need to presume a certain level of proficiency in operators and this manifests itself in design parameters covering such matters as handling characteristics, cockpit and control layouts, and the coverage of automated systems. Defining and attaining these operator abilities is a prerequisite to achieving known minimum levels of operational safety and effectiveness.

b. To help meet operating safety and effectiveness minima, NZDF only permits aviation systems to be operated by proficient and authorised individuals who have been assessed as proficient and fit to operate a particular type of aviation system in specified roles. However, since NZDF aircraft may be operated in multiple roles (many of which may be unusually demanding) it may not be feasible for aircrew flying a particular type to be proficient in all of its intended roles. There may necessarily be a range of competencies required within a flying organisation. Furthermore, some roles that may be technically possible for an aircraft to perform may not be approved for a particular flying organisation because it is not practicable for its personnel to become and stay proficient in performing the roles.

GM Continues

GM Continued

c. Proficiency in the context of NZDF flying operations refers to the capacity of an individual to effectively and safely complete a task to a required standard of performance through the application of appropriate skills, knowledge and attitude. For aircrew, proficiency is achieved and recognised through a controlled and progressive process of training, accumulated experience and formal assessments.

d. Since proficiency is measured against a standard of performance, flying organisations must determine what these standards are. Certain competencies are regarded as essential for the safe operation of all aircraft, so these are set under NZDF-wide arrangements or articulated through common principles. For example, NZDF has common principles relating to minimum levels of training and proficiency required to safely operate aircraft in general.

e. There are also minimum training and qualification requirements stipulated for medical fitness and general aviation operations, such as basic flying training, CRM, AvRM and aviation safety. Flying organisations are responsible for establishing local requirements that relate more particularly to the organisation's operating environment, roles and aviation systems. Proficiency requirements must be sufficient in scope and detail to provide a suitable degree of confidence that a known level of safety can be achieved in flying operations when aviation systems are operated by personnel with prescribed qualifications and levels of experience and proficiency.

f. NZDF flying operations requirements regarding proficiency levels and the management of local proficiency assurance regimes are prescribed in *DAR 61*.

Operation of non-Defence registered aircraft

a. Where NZDF personnel operate NDRA, the principles that underpin the NZDF concept of flying operations remain relevant. Operating safety depends upon the aircraft being flown in accordance with approved standards and limitations by qualified, proficient and authorised individuals working within an effective flying organisation.

b. As with operations involving NZDF aircraft, commanders will need to make determinations about criteria that must be satisfied in order to obtain a desired level of safety in the operation of NDRA. Conformance to applicable civil aviation requirements covering crew proficiency, and operating standards and limitations is mandatory in making such determinations, but additional criteria may need to be developed under some circumstances. Moreover, although NDRA may be operated under arrangements that incorporate a level of oversight by a civil flying organisation, NZDF flying organisations will nonetheless need to supplement civil requirements with their own to ensure that NZDF personnel continue to receive suitable guidance, supervision and monitoring. The nature of such supplementation will depend upon the situation and the associated degree of risk.

Aerodromes

a. It is the responsibility of the MAO to determine which aerodromes are safe and suitable for the operation of their aircraft. The suitability of an aerodrome depends on aircraft capabilities, the declared features of the aerodrome and the activity being carried out.

GM Continues

GM Continued

b. Certified aerodromes operated under the oversight of a recognised NAA or MAA have systems in place to ensure the ongoing safety of the aerodrome. Defence aerodromes are regulated under *DAR 139*. NAA/MAA systems include design and maintenance standards, operational controls and reporting mechanisms to ensure that published data remains valid. Operations at these aerodromes, therefore, have a lower level of risk than those at non-certified aerodromes.

c. Non-certified aerodromes may still meet the physical and operational characteristics as those of certified aerodromes but may have less oversight and assurance by an NAA or MAA, due to potentially less stringent inspection and maintenance regimes.

d. Aircraft can be operated from a non-defined area. Non-defined areas are not considered aerodromes but may be utilised subject to MAO-approved procedures.

e. The MAO should consider a system to assess, control and manage the risk of operating at aerodromes other than those that are certified. The MAO is expected to use professional judgement in determining whether an aerodrome meets the requirements for safe operation of their aircraft in the absence of formal certification.

BACK TO RULE

AMC 91.3 – Aircraft captaincy

Eligibility

An individual assigned as aircraft captain for each flight should be—

(1) qualified for appointment on the aircraft type as an aircraft captain as determined by the commander of the operating unit; or

(2) a qualified pilot undergoing an approved conversion training course on the aircraft type; or

(3) a trainee pilot undergoing an approved pilot training course.

Authority of aircraft captain

Within the bounds of s 40 of the *Armed Forces Discipline Act 1971*, all other legal orders and the scope of the flight authorisation, the authorised aircraft captain has total responsibility for the safe and effective operation of an aircraft. The aircraft captain therefore has authority over all persons on board, irrespective of rank, for the period of operation of the aircraft.

Flying instructors

In any aircraft in which dual controls are fitted and instruction is being given, the instructor should be designated as aircraft captain and have authority, irrespective of rank, over the student or pilot to whom instruction is being given in all matters concerning the operation of the aircraft. Where the instructor is non-pilot aircrew, the pilot should be designated captain.

Duties and responsibilities of aircraft captain

Pre-flight

The aircraft captain should ensure—

(1) the crew is properly constituted and all members are proficient, current and capable of performing their duties during flight;

(2) the crew meet the medical requirements for flight;

(3) the crew have received sufficient pre-flight detail by way of tasking information, authorisation guidance, meteorological information, mission briefing or syllabus description;

(4) all crew members are—

(a) properly clothed and equipped for their tasks;

(b) current for all safety and survival drills appropriate to aircraft type;

(c) proficient in the use of the escape and survival equipment carried; and

(d) are familiar with all emergency procedures;

(5) all necessary flight and fuel planning has been carried out and that, when required, a flight plan has been filed with the ATC authorities;

(6) the appropriate AIP or other national flight planning documents relevant to the area in which they intend to operate are used;

(7) the necessary publications to enable the safe operation of the aircraft are carried on board the aircraft;

AMC Continues

AMC Continued

(8) an adequate pre-flight briefing for any crew members is conducted;

(9) passengers, if carried, have been briefed on—

(a) the authority of the aircraft captain;

(b) precautions to be taken when boarding and leaving the aircraft;

(c) crash positions and emergency procedures;

(d) the correct use of the aircraft oxygen, escape and survival equipment carried; and

(e) loose equipment to be properly stowed.

(10) the aircraft role and portable role equipment are serviceable, and the aircraft is duly released by maintenance and accepted for flight; and

(11) the requirements for all OIP relating to the aircraft and its operations are observed and obeyed until the aircraft is handed to the appropriate authority after flight.

In-flight

An aircraft captain is responsible for the effective operation of the aircraft in meeting the assigned task. In particular, the captain should—

(1) ensure the flight is conducted in accordance with the flight authorisation;

(2) deal with occurrences/emergencies outside the scope of the flight authorisation in accordance with the aircraft flight manual and applicable OIP;

(3) use all the resources at their disposal to ensure the safe recovery of their aircraft, crew members and passengers; and

(4) contact the authorising officer for advice, and guidance when necessary to deviate from the flight authorisation given, as soon as circumstances allow.

Post-flight

The aircraft captain should—

(1) conduct a post-flight crew debrief;

(2) notify the authorising officer of any unusual occurrences or deviations from the flight authorisation; and

(3) comply with post-flight documentary requirements.

Aircraft marshalling

While taxiing an aircraft under the guidance of a marshaller, the aircraft captain retains overall responsibility for its safe operation. The aircraft captain should follow the marshaller's directions except where the aircraft captain considers that, in so doing, the safety or effective operation of the aircraft would be compromised. The aircraft captain should stop the aircraft immediately if, while receiving marshalling directions, sight of, or confidence in, the marshaller is lost.

AMC Continues

AMC Continued

Aircraft serviceability and flight safety

The aircraft captain is responsible for ensuring that the aircraft serviceability state, as indicated by the form RNZAF700 and associated documentation, is adequate for the safe conduct of the flight.

In-flight occurrences

Occurrences outside the scope of the flight authorisation should be handled in accordance with the flight manual and applicable OIP if possible. Where that guidance is insufficient or inappropriate, aircraft captains should exercise their best judgement and use all the resources at their disposal to ensure the safe recovery of their aircraft, crew and passengers. As soon as circumstances allow, the authorising officer should be contacted for advice, or informed, when a captain finds it necessary to deviate from the flight authorisation given. During normal peacetime operations, captains should give overriding consideration to flight safety during any deviation from flight authorisation.

Passenger and cargo requirements

The aircraft captain is responsible for all aspects associated with the carriage of passengers and cargo, appropriate NZDF-specific OIP and other approved publications relevant to the carriage of passengers and cargo.

In-flight transfer of captaincy

a. The in-flight transfer of aircraft captaincy is an undesirable practice that should be avoided if possible. However, where the in-flight transfer of aircraft captaincy becomes necessary for the successful completion of a task, the authorising officer should—

(1) clearly indicate to both pilots the point in the flight that aircraft captaincy transfer should occur; and

(2) record the transfer details in appropriate documentation.

b. To make sure there is no uncertainty concerning who is acting as aircraft captain at various stages of the flight or task, all pilots involved should—

(1) advise all crew members on intended aircraft captaincy transfer arrangements during the pre-flight briefing;

(2) conduct a formal 'hand-over/take-over' of the aircraft captaincy; and

(3) advise all crew members when the aircraft captaincy transfer is actually completed.

Orders, instructions and procedures

The MAO should issue OIP in relation to aircraft captaincy that identify—

(1) the responsibilities of aircraft captains;

(2) the authority of the aircraft captain in all circumstances relating to flying operations;

(3) the responsibilities of the aircraft captain in relation to cargo and passengers;

(4) consideration for flight authorisation regarding firearms and ammunition carried on NZDF aircraft by crew members, the authorised degree of weapon readiness and method of carriage; and

AMC Continues

AMC Continued

(5) the circumstances and requirements under which an in-flight transfer of captaincy may occur, including a mechanism to record the transfer in the appropriate documentation.

BACK TO RULE

GM 91.3 – Aircraft captaincy

The aircraft captain is in the unique position of being the only person on the aircraft who must be aware of all the factors and operational constraints affecting their particular flight. The aircraft captain is assigned command of the aircraft and is legally responsible for the safe and effective operation of the aircraft in performing its mission. Being accountable for the safety of the aircraft and its crew and passengers while underway, the captain has authority over all persons on board, regardless of their rank.

BACK TO RULE

GM 1 91.4 – Aircraft crewing

Purpose

a. The purpose of this rule is to assure that aircraft are suitably crewed to deal with normal operation and foreseeable emergencies so as to not compromise suitability for flight. Aircrew crew composition (normal and minimum) should be identified for the different tasks or missions an aviation system may perform as stipulated in relevant OIP.

b. To maintain the operating airworthiness integrity of NZDF flying activities, aircraft operating within the NZDF airworthiness framework must be crewed by an appropriate number of crew meeting specified proficiency and currency requirements and who have been authorised to conduct the SOIU-approved role.

Aviation safety occurrences

All crew members have a responsibility to clearly advise the aircraft captain of any circumstance that may compromise the safety of a flight. Where the captain does not properly report a flight safety compromise or breach, it is incumbent on the other crew members to ensure that the authorising officer and a flight safety officer are informed.

Defence members crewing non-Defence aircraft

Defence aircrew may fly on duty as crew in aircraft operating outside of the scope of the NZDF airworthiness framework provided the flight will further their Service knowledge and experience and that any preconditions imposed by the operating authority are satisfied.

BACK TO RULE

GM 2 91.4 – Aircraft crewing

Civilian aircrew medical fitness is to be in accordance with *DAR 67*.

BACK TO RULE

GM 91.5 – Portable electronic devices

Purpose

a. The purpose of this rule is to ensure that electronic equipment that is not part of the aircraft configuration and is carried aboard an aircraft does not introduce hazards including—

(1) electromagnetic interference;

(2) overloaded electrical systems;

(3) electrical fumes;

(4) battery fires; or

(5) physical interference with the safe operation of the aircraft.

b. In the context of this rule PED includes—

(1) personal electronic devices such as laptop computers, tablets and game consoles;

(2) personal communication devices such as mobile telephones; or

(3) medical or monitoring equipment such as heart pacemakers, hearing aids and blood glucose monitors.

c. PED may be used without any physical/electrical connection to the aircraft, or may be powered through aircraft power outlets such as 240/115V GPO or USB.

d. In order to create the approved OIP, the MAO should seek engineering advice through the CAMO.

BACK TO RULE

GM 1–5 91.6 – Aeronautical equipment

GM 1 91.6 – Aeronautical life support equipment

a. **Rule Purpose**. The purpose of this rule is to ensure that ALSE is safely managed. An MAO should gain reasonable knowledge of ALSE hazards to ensure that ALSE is safe in the defined operational context. Use of ALSE on an aircraft without due consideration of the elements in this rule may jeopardise aviation safety or post-crash survivability.

b. **Scope of ALSE management system**. The scope of the MAO's ALSE management system comprises all ALSE, including that subset of ALSE managed as part of an aircraft's type design. This ALSE subset is considered during an aircraft's initial type certification. Subsequent changes, additions or deletions are considered through Supplemental Type Certification or as either major/minor changes to the type design.

c. **MAO evaluations**. The MAO should conduct evaluations of ALSE application, integration and hazards associated with their applicable platform.

GM 2 91.6 – Aeronautical life support equipment certification

a. In this context, the term 'certified' has two meanings—

(1) For ALSE considered to be part of an aircraft's type design, certification refers to the outcome of the *DAR 21* processes associated with type certification, supplemental type certification and major/minor changes. The MAO may approve the use of the ALSE based on these certifications. Before approval of any ALSE, the MAO should assess the adequacy of the integration between certified and non-certified ALSE by seeking SME advice.

(2) For ALSE that is not part of an aircraft's type design, certification refers to a process in which the MAO ensures that the ALSE complies with the relevant design requirements. Although some ALSE is not considered part of an aircraft's type design, it may still adversely impact broader aviation safety matters.

GM 3 91.6 – Aeronautical life support equipment risk management

a. ALSE-related hazards and their resultant risks should be considered in conjunction with all other risks within the MAO's SMS.

b. The ability to eliminate or otherwise minimise ALSE risks SFARP does not remain static throughout the ALSE operational lifecycle. The MAO ALSE management system should enable investigation of ALSE technology improvements to ensure ALSE-related hazards continue to be eliminated or minimised SFARP.

c. **ALSE SME advice**. The CAM (Ohakea) is the NZDF centre of expertise for ALSE and will provide authoritative airworthiness advice regarding ALSE. TS S&S can provide advice on ALSE, eg earplugs or helmets, current capability and review ALSE requests. TS S&S can also provide information on the various airworthiness issues associated with the use of ALSE.

GM 4 91.6 – Aeronautical life support equipment use

a. **ALSE training**. Aircrew and maintenance training, and their currency requirements, need to be defined.

GM Continues

GM Continued

GM 5 91.6 – Aeronautical life support equipment OIP

a. **ALSE OIP**. ALSE carried on Defence registered aircraft should have associated OIP to govern use, operation and carriage. Refer to *DAR 119* rule 119.9.

BACK TO RULE

AMC 91.7 – Safety harnesses

a. Unless specifically authorised by the aircraft captains, crew should wear the appropriate restraint harness, secured to a suitable anchorage point, at all times, except when attached to a winch cable or, when required to move about within the cabin (eg flight stewards). Aircraft captains should only allow crew safety harnesses to be unfastened in flight when necessary to complete authorised tasks. However, the pilot controlling the aircraft should be securely strapped into their seat at all times.

b. For take-off and landing, crew should be seated and restrained using a seat harness. Specific circumstances where seat harness restraint for take-off and landing is not appropriate should be detailed by the MAO in OIP.

c. Passengers and troops should be strapped in and seated at all times using standard seating and restraints when the aircraft is moving except when authorised by the aircraft captain. Refer to *AMC 2 91.11* Non-standard aircraft restraint and seating criteria for any deviations from this rule.

d. The aircraft captain should take the following into account when allowing passengers and troops to unstrap or move about the aircraft—

(1) the security of cabin doors and hatches;

(2) the availability of dispatcher harnesses, or equivalent restraint;

(3) connection to a serviceable intercom system;

(4) essential mission or mission training requirements;

(5) poor weather, especially anticipated turbulence; and

(6) the ability of crew members to manage emergencies.

BACK TO RULE

GM 91.7 – Safety harnesses

Dispatcher harnesses, while preventing the wearer from inadvertent exit from the aircraft, do not provide the same degree of restraint or protection as seat harnesses. The time spent solely restrained in a dispatcher harness or attached to a winch cable must be kept to a minimum consistent with the safe completion of the task.

BACK TO RULE

AMC 1 91.8 – Oxygen management system

Controls

The oxygen management system controls should include the following—

(1) Direction on determination of appropriate supplemental oxygen supply duration periods and system design as they relate to flight crew, other crew and passengers.

(2) Direction that aircraft ejection seat occupants are provided a correctly fitted oxygen mask and that maximum use of the oxygen mask is achieved to the extent practicable during flight.

(3) A suitable supplemental oxygen dispensing system within easy reach of the personnel carried onboard the aircraft.

(4) Methods for calculating supplementary oxygen requirements. Calculations may consider aircraft performance characteristics with regard to emergency requirements as a balance to total quantities of oxygen carried.

(5) Oxygen training requirements, unless covered under other OIP.

(6) Pre-flight briefing requirements by a suitably qualified person that may include appropriate briefings and demonstrations in the use of the oxygen system.

(7) For pressurised aircraft, give directions that ensure enhanced emergency response for the pre-fitment of oxygen masks. Examples include—

(a) **Above 25 000 ft AMSL**. At least one pilot is seated at the flight controls using an oxygen mask, unless the aircraft is fitted with a quick donning mask system for each pilot. Aircraft fitted with a quick donning mask system must provide a warning of a depressurisation that would necessitate the masks to be donned. **Flexibility provision**. For legacy fleets (eg C-130(H)NZ and P-3K2), the requirements of a quick donning oxygen system (as defined in *AMC 2 91.8*) above 25 000 ft AMSL and below 45 000 ft AMSL may be waived by the MAO provided the intent of prompt oxygen delivery to the seated pilot can still be achieved. The MAO should seek AMU advice in order to exercise this flexibility provision.

(b) **Above 45 000 ft AMSL**. At least one pilot will use an oxygen mask that is properly fitted and supplying oxygen at all times.

(8) Advice relating to high altitude management procedures for levels above 21 000 ft CA that reduces the risk of DCI. *AMC 2 91.8* provides examples.

High altitude exposure management

a. In the absence of other DCI risk factors, the risk of DCI is considered very low at or below 21 000 ft CA without the need for 100% oxygen or flight restrictions.

b. When an on-board oxygen generation system (OBOGS) is used, the maximum oxygen concentration output achieved by the OBOGS is sufficient when this AMC refers to 100% oxygen.

c. **Unplanned flight above 21 000 ft CA**. 100% oxygen should be applied and time spent above that level should be kept to a minimum.

AMC Continues

AMC Continued

d. Controls for aircrew and passengers (including parachutists) that may reduce the risk of DCI for planned flight above 21 000 ft CA include—

(1) **Pre-oxygenation.** Twenty minutes of pre-oxygenation with 100% oxygen completed before ascending above 21 000 ft CA. Pre-oxygenation is to commence at an altitude where the oxygen system is delivering 100% oxygen (the altitude will vary dependent on the OBOGS) and continued during the climb. If the oxygen system is unable to deliver 100% oxygen prior to flight above 21 000ft CA, breathing oxygen system should be selected. A single inadvertent brief break in pre-oxygenation of less than or equal to 60 seconds does not require recommencement of the pre-oxygenation time.

(2) **100% oxygen**. Use of 100% oxygen during flight until final descent below 10 000ft CA.

(3) **Time at altitude**. After pre-oxygenation, time limits above 21 000 ft CA are applied as specified in Table 1. The time above 21 000 ft CA is based on the highest cabin altitude reached during the sortie.

Pilots should descend to or below 10 000 ft CA before the Table 1 time limit is reached. Any breach of Table 1 time limits requires an aviation medical officer assessment before conducting further flight and requires appropriate safety reporting.

(4) **Time between re-exposures within a sortie**. Time spent at or below 10 000 ft CA resets the allowable duration above 21 000 ft CA at a one-for-one rate. For example, when aircrew spend 60 minutes at 23 000 ft CA and descend to 10 000 ft CA or below for 60 minutes, they regain 60 minutes of exposure time and may operate at 23 000 ft CA for a further 120 minutes (allowable at Table 1) before having to descend again. Use of 100% oxygen when resetting for exposure within a sortie, including below 10 000 ft CA, is required.

(5) **Subsequent sorties**. Following flight above 21 000 ft CA, within the Table 1 time limits, crew or passengers may only conduct subsequent sorties providing CA exposure does not exceed 21 000 ft CA again within the next 24 hour period.

(6) Aircraft equipped with irregular oxygen systems that prevent the use of 100% oxygen for pre-oxygenation, or other aspects of exposure to high altitude requirements, should have alternative Aviation Medicine Unit-(AMU) endorsed DCI risk reduction procedures published in type specific OIP that provide an equivalent level of DCI protection.

(7) The exposure limits at Table 1 are established using the Aviation Decompression Sickness Risk Assessment Computer (ADRAC). These limits do not eliminate the risk of DCI; a residual DCI risk of approximately 5-15% for a person engaged in mild physical activity remains.

Table 1 – Altitude exposure time limits

Time (minutes)	Cabin altitude (ft)
45	24 001–25 000
70	23 001–24 000
120	22 001–23 000
200	21 001–22 000

AMC Continues

AMC Continued

Very high altitude exposure management

a. Planned flight at altitudes above 25 000 ft CA may not be conducted without MAO approval as this incurs a significantly increased risk of DCI.

b. MAO may not approve planned flight above 25 000 ft CA unless AMU has provided written advice and special operational reasons exist, which inform a risk assessment. AMU advice must be sought before operating above 25 000 ft CA.

c. When an OBOGS is used, the maximum oxygen concentration output achieved by the OBOGS is sufficient when this AMC refers to 100% oxygen.

d. AMU advice will consider controls for aircrew and passengers (including parachutists) that may reduce the risk of DCI for planned flight above 25 000 ft CA to 38 000 ft CA, which may include—

(1) **Pre-oxygenation**. Sixty minutes of pre-oxygenation with 100% oxygen completed before ascending above 21 000 ft CA. Pre-oxygenation is to commence at an altitude where the oxygen system is delivering 100% oxygen (the altitude will vary dependent on the OBOGS) and continued during the climb. If the oxygen system is unable to deliver 100% oxygen before flight above 21 000ft CA, breathing oxygen system should be selected. A single inadvertent brief break in pre-oxygenation of less than or equal to 60 seconds does not require recommencement of the pre-oxygenation time.

(2) **100% oxygen**. Use of 100% oxygen during flight until final descent below 10 000ft CA.

(3) **Time at altitude**. After pre-oxygenation, time limits above 25 000 ft CA are applied as specified in Table 2. The time above 25 000 ft CA is based on the highest cabin altitude reached during the sortie. Pilots should descend to or below 10 000 ft CA before the Table 2 time limit is reached. Any breach of Table 2 limits requires an AMO assessment before conducting further flight and appropriate safety reporting.

(4) **Subsequent sorties**. Following flight above 25 000 ft CA, within the Table 2 time limits, crew or passengers may only conduct subsequent sorties providing CA exposure does not exceed 21 000 ft CA again within the next 24 hour period.

(5) AMU advice will consider the ADRAC.

(6) The exposure limits at Table 2 are established using the ADRAC. These limits do not eliminate the risk of DCI; a residual DCI risk of approximately 2–6% at 25 001–30 000 ft and 3–16% at 30 001–38 000 ft for a person engaged in mild physical activity remains.

Table 2 – Above 25 000 ft CA time limits

Time (minutes)	Cabin altitude (ft)
30	25 001–30 000
20	30 001–38 000

BACK TO RULE

AMC 2 91.8 – Flight crew oxygen requirements

Oxygen management system controls should include—

(1) supplemental oxygen supply that is sufficient to ensure availability for the flight crew for the planned time above 10 000 ft CA or, if unplanned, 15 minutes as a minimum period to allow descent to 10 000 ft CA;

(2) pre-flight calculations that account for the anticipated flight profiles above 10 000 ft CA, planned depressurisation aspects and potential emergency descent profiles required to descend the aircraft to 10 000 ft CA; and

(3) access to supplemental oxygen for flight crew that includes—

(a) individual oxygen dispensing units that are connected to the oxygen supply terminal, can be readily and visually checked for the flow and quantity of available oxygen, and are available for immediate use;

(b) a quick donning mask that can be placed on the face with one hand from the ready position within five seconds, properly secured, sealed and supplying oxygen (Aviation Medicine Unit (AMU) written advice is required if time periods will exceed five seconds);

(c) a pressure-demand type mask. Use of a diluter-demand pressure breathing regulator design is not mandatory;

(d) an ability to access the aircraft communications system simultaneously with the use of oxygen; and

(e) a portable oxygen system and sufficient supply hose, or spare oxygen outlets and masks to ensure immediate availability of oxygen for flight crew members who are required to move around in the aircraft to perform essential flight crew duties. For example: a loadmaster who must oversee a parachute extraction mission and the aircraft is depressurised above 10 000 ft CA.

DAR 91.8 BACK TO RULE

AMC 1 91.8 BACK TO RULE

AMC 3 91.8 – Supplemental oxygen requirements

a. Oxygen supply durations, means of supply and other considerations should be provided under DAR *91.8*. NZDF aircraft are not always constructed to civil design standards; however, use of any recognised NAA standard for the provision of oxygen, or a hybrid of more than one such standard that may achieve the required outcome, may be used provided technical endorsement and approval has been obtained by the CAMO.

b. If not considered as part of the initial NZDF type certification, and depending on the complexity of the design, the introduction of a new passenger supplemental oxygen system could be undertaken as—

(1) a change to the NZDF MTC;

(2) a supplemental NZDF MTC;

(3) a modification; or

(4) approved role equipment (refer to DAR *91.9* for guidance on role equipment.)

BACK TO RULE

GM 1 91.8 – Oxygen management system

Purpose

a. The purpose of this rule is to assure suitability of supplemental oxygen systems for use on NZDF aircraft.

b. For NZDF aircraft that are not NZDF registered, unless agreement exists with CAA that assigns oversight responsibility of the aircraft operation to NZDF, or the aircraft is not deemed a State aircraft, the MAO may rely upon the oxygen management provisions required by CAA.

c. The regulatory outcome required is not intended to replace formal AvMED training requirements. In developing the oxygen management system, decompression illness (DCI) references should be balanced by limiting oxygen management system to general prevention measures, leaving the more detailed awareness and procedures to be prescribed by AvMED regulation outcomes.

BACK TO RULE

GM 2 91.8 – Flight crew oxygen requirements

Purpose

a. The purpose of this rule is to ensure that reduced levels of oxygen do not introduce performance deficiencies that could compromise safety of flight. The rule does not consider mission capability beyond airworthiness aspects and specifically addresses only the flight crew who are holding primary control of aircraft flight systems. If deemed necessary, the MAO may also apply this rule to those flight crew members who are deemed to be actively conducting essential flight crew duties. In this manner, the Authority does not impose potentially unneeded aircraft design features.

b. The rule does not discriminate between pressurised or non-pressurised aircraft, as a cabin altitude above 10 000 ft CA presents the same hazards and requires the same controls.

Flexibility Provision

If required for operational reasons, the MAO may approve flight above 10 000 ft CA where the aircraft is not equipped with an adequate supplemental oxygen system.

BACK TO RULE

GM 3 91.8 – Supplemental oxygen requirements

Purpose

a. The purpose of this rule is to ensure that reduced levels of oxygen do not introduce physiological harm to passengers and crew.

b. The rule does not discriminate between pressurised or non-pressurised aircraft as a cabin altitude above 10 000 ft CA presents the same hazards and requires the same controls.

c. This rule does not consider safety procedures and equipment for mission essential passengers who are intending to egress an aircraft above 10 000 ft CA, such as parachute operations. Should mission essential personnel be equipped with mission commander-authorised self-contained breathing apparatus (SCBA) for use upon egress of the aircraft, the SCBA may also be used as the onboard aircraft support system for those personnel.

BACK TO RULE

GM 91.9 – Use of role equipment and portable role equipment

Purpose

a. The purpose of this rule is to ensure adequate controls for, and oversight of, aircraft role equipment and portable role equipment. In essence any equipment that is to be used as role equipment during flight must be approved for that use. Most aircraft will have a range of operating parameters and technical specifications which govern, or constrain, the design and use of role equipment.

b. Normally, role equipment approval would be given for a specific item part number. However, for some types of generic role equipment, where variation between items is so minor that it does not warrant assessing each item individually, MAO approval may be given for a range of items, such as 'electronic flight bag' tablets, hand held GPS or Special Forces field radios.

c. In order to provide role equipment approval, the MAO should seek engineering advice through its CAMO. For the purposes of determining technical input to the approval process, role equipment is divided into the following categories—

(1) **Certified**. The 'certified' category includes all role equipment that forms part of the certified aircraft design and thus is subject to *DAR 21* requirements. Examples would include external fuel tanks, missile launchers and certified tablet/camera mounting hardware. This category requires no additional technical inputs to the MAO's role equipment approvals. Technical consideration of this category of role equipment, including the development and approval of any required Instructions for Continuing Airworthiness, is provided through either the aircraft's initial type certification program, or approval of in-service design changes. Where new or modified role equipment is proposed for use on DRA, the CAMO should seek MTCH advice regarding whether the equipment should be managed under the 'Certified' category; or

(2) **Specific Approval**. Equipment in the 'specific approval' category does not affect certified aircraft design. This equipment usually has a low level of integration into the aircraft or no integration. The equipment in this category would comprise role equipment—

(a) that has been anchored to the aircraft, via a means that does not need to be certified under *DAR 21* (eg a medical oxygen bottle strapped to a stanchion);

(b) that has been anchored via a certified means, but the equipment itself is not certified (eg an 'electronic flight bag' tablet or a camera);

(c) electronically/electrically connected to the aircraft via an existing certified interface (eg aeromedical equipment using aircraft power); or

(d) unconnected (either electronically/electrically or physically) to the aircraft (eg non-aircraft non-integrated radios to be used in flight), noting that this equipment differs from portable electronic equipment which is approved via DAR 91.5).

Note: Specific Approval' role equipment is not synonymous with 'specific equipment' per *DAR 21* and is therefore not subject to DAR 21 Subpart K Parts and Appliances requirements. 'Specific Approval' role equipment is approved under the provisions of DAR 91.9, not under DAR 21.

d. The MAO should seek advice through its CAMO on the degree of engineering rigour necessary to inform any role equipment approvals. Where required, the CAMO should undertake a technical evaluation of 'specific approval' role equipment for potential impact on aircraft safe flight or capability. The

CAMO should provide a recommendation as to the embodiment and use of the equipment, including the implementation of operation, installation and maintenance instructions, and support associated with the equipment.

e. Regardless of the role equipment category, risks associated with carriage and use must be eliminated or otherwise minimised so far as is reasonably practicable (SFARP). Robust technical evaluation of the role equipment supports the Risk Management Authority in making this determination.

f. The MAO should ensure that approval for any role equipment, its application criteria and limitations are promulgated in appropriate OIP.

BACK TO RULE

AMC 91.10 – Flight recorder and locating equipment

Flight with unserviceable flight recorder or locating equipment

A system should be established for the approval of flight for aircraft with unserviceable flight recorder or locating equipment components. When assessing an approval, the nature, risk and urgency of the mission should be considered. All approvals should be recorded.

Intentional disabling of flight recorder equipment

In the event of an aircraft operation where, following an aviation safety occurrence or diversion, unauthorised recovery of flight recorder data could significantly damage national security, the MAO may direct that a component(s) of flight recorders be disabled for the duration of the particular mission, or that part of the mission pertaining to national security.

Erasure of flight recorder data

Flight recorder data should only be erased where possible in the following circumstances—

(1) in accordance with the previous paragraph *Intentional disabling of flight recorder equipment*;

(2) under an MAO system of approval, when any component of a flight recorder/system containing a memory module is removed from an aircraft before routine maintenance action not requiring data analysis; and

(3) when otherwise authorised by the MAO.

Quarantine and release of flight recorder equipment

a. In the event of an aviation safety occurrence requiring investigation, flight recorder equipment from all aircraft involved should be quarantined and access to the data managed in accordance with *AFGO*.

b. The process of quarantining equipment should ensure that flight recorder information is not erased or corrupted.

c. The Authority provides guidance for flight recorder quarantining after an aviation safety occurrence.

Flight recorder data download, interpretation, analysis and management of data

Refer to *AFGO*.

BACK TO RULE

GM 91.10 – Flight recorder and locating equipment

Purpose

a. The purpose of this rule is to ensure—

(1) that in the event of an aircraft crash—

(a) aircraft and/or occupants are located in a timely manner to increase their chances of survival. Locating equipment includes an emergency locating transmitter; and

(b) accident site hazards are controlled in a timely manner.

(2) flight and voice recorded information is downloaded, interpreted and analysed by approved personnel in a timely manner in support of a safety investigation to aid in the prevention of a future aviation safety occurrence.

b. The primary purpose of flight recorders is to record parametric aircraft flight data and the aural environment of the cockpit, including communication to and from the aircraft and between the flight crew members for aviation safety occurrence investigative purposes. Flight recorders may include—

(1) flight data recorder;

(2) cockpit voice recorder;

(3) voice flight data recorder; and

(4) underwater locator device.

BACK TO RULE

AMC 1 91.11 – Carriage of personnel on NZDF aircraft

While aircraft configuration and mission requirements will vary, the system controls should—

(1) Address the hazards that are present when personnel are carried on NZDF aircraft.

(2) Vary depending on whether the person is classified as mission crew or passenger, noting mission crew may not have the equivalent training as flight crew regarding aircraft operations.

(3) Where appropriate, consider and use requirements that exist to support carriage of personnel in civil-registered aircraft. For example, a civil-registered aircraft used to transport troops will already be under CAA oversight, alleviating the need for NZDF to produce additional controls and/or minimising any additional treatments that may be desired.

System controls

System controls supporting development of a carriage of personnel control system may include—

Approval authorities

A system that delegates decisions to carry personnel on NZDF aircraft using approved restraints and seating to relevant command appointments. Approval authorities should be able to—

(1) determine the classification of personnel;

(2) approve the carriage of personnel; and

(3) if required, assess documentation that supports judgement of an individual's fitness for flight and the suitability of the aircraft for carriage of such personnel.

Safety assessments

Consideration of safety risks apply equally regarding personnel carriage on operations or during training. Similarly, when engaged on operations, in addition to the aircraft captain, the operational commander should be jointly responsible for eliminating or otherwise minimising the safety risk to personnel, SFARP.

Dedicated seats or crew stations

Personnel should only be carried in dedicated seats or crew stations in accordance with the aircraft NZDF MTC and MAO-approved OIP. Considerations include—

(1) passenger capacity and seating configurations;

(2) any passenger capacity limitations due to restricted access to emergency exits by cargo or role equipment; and

(3) requirement for the use of seatbelts, harnesses and aircraft fittings and equipment.

AMC Continues

AMC Continued

Classification of personnel

Personnel are classified as crew or passengers, from which risk levels should be determined. Classifying personnel travelling in NZDF aircraft with precision ensures that the requirement for an individual's presence onboard an aircraft is balanced against the hazards of the aviation activity. For example, the treatment of risk for a mission essential passenger may be different to that of passenger, as one must fly while the other need not.

Classifying subcategories of passengers

When not classified as mission essential, passenger subcategories can improve awareness of increased risks regarding carriage of a particular passenger type in a crew station or in a specific aircraft type. For example, opportunity travel, VIP, NZDF personnel, foreign Defence personnel, Government employees, external service providers, other non-NZDF personnel.

Restricting non-NZDF personnel from acting as crew

Non-NZDF personnel should not be permitted to fly as crew on NZDF aircraft without approval from an appropriate authority.

Training mission crew and mission essential passengers

Identifying and training personnel who travel frequently on NZDF aircraft may be considered a way of managing increased risk exposure.

Restrictions regarding flights of a hazardous nature

Unless classified as crew or a mission essential passenger, personnel should be not be authorised for carriage on flights of a hazardous nature. Hazardous flights may include test flights, low level operations, operational missions, certain types of dangerous cargo carriage and display flying.

Restrictions regarding flight crew stations

Before approving carriage of passengers in flight crew stations, where the presence of the passenger could compromise flight safety, consideration should be given to—

(1) the potential for passengers to access aircraft systems or equipment that may jeopardise the aircraft safety; and

(2) the possibility of interference with essential crew functions.

Pre-flight briefings

NZDF has a duty of care for the carriage of passengers who may be unaware of basic aircraft safety requirements. Personnel should be briefed on aspects relating to passenger safety by an authorised person, normally a crew member. At a minimum, all personnel should be instructed on how to use restraint and seating systems and how to operate relevant safety systems, such as emergency oxygen masks. Consideration should be given to comfort breaks, repositioning within the aircraft during flight and other reasons a person may be required to move within an aircraft during flight time. Additionally, an authorised person should brief passengers seated in crew stations on—

(1) flight profiles and sequence of events, especially those sequences that may cause concern;

AMC Continues

AMC Continued

(2) emergency procedures;

(3) any controls or switches that the passenger may be asked to operate; and

(4) securing or stowage of loose items.

Personnel are fit to fly

This particularly applies to aircraft where individuals could be exposed to higher physiological stresses than transport aircraft or rotary wing aircraft. Medical checks should be considered on advice of a medical subject matter expert.

Use of aeronautical life support equipment and/or personal protective equipment

Use of such ALSE and PPE includes training in its use before flight.

Minimum levels of qualification

Minimum flight crew composition and qualification requirements should be specified that support the safe carriage of passengers.

Restricting the carriage of loose articles

Requirements for carriage, stowing and restricted items should be defined to ensure FOD hazards are minimised.

Personnel supervision requirement

Ratio of supervising flight crew to passengers is defined, particularly with respect to cabin crew versus passengers on those flights dedicated to passenger transport activities. While CAA standards provide an AMC for this ratio, mission requirements may dictate differing ratios from civil practice.

Requirements for the carriage of infants, sick or injured personnel, and handicapped personnel

Any increased requirement for supervising crew members, or competent passengers, to assist in the evacuation of personnel with limited mobility should be considered.

Compliance examples

Examples of a management system supporting the carriage of personnel in NZDF aircraft may include—

Example 1

For transport aircraft types with dedicated passenger seats that operate in a CRE substantially similar to an equivalent civil aircraft type, may choose to implement appropriate controls from civil aviation that may include—

(1) delegated approval authorities for crew and passengers;

(2) passenger capacity, ratio of supervising crew and crew qualifications are consistent with civil standards for operation of a similar aircraft type;

(3) verbal passenger briefs and briefing cards meet an acceptable civil standard consistent with a similar aircraft type;

AMC Continues

AMC Continued

(4) provisions for the carriage of loose articles onboard the aircraft meet an acceptable civil standard consistent with a similar aircraft type;

(5) special provisions for carriage of infants, sick or injured persons, and handicapped persons meet civil standards consistent with a similar aircraft type;

(6) the quantity and type of available survival equipment meets an acceptable civil standard consistent with a similar aircraft type;

(7) minimum requirements for passenger medical fitness for flight are defined; and

(8) any other controls necessary to manage specific hazards identified.

Example 2

For aircraft types with dedicated passenger seats, but operating in a specific military configuration and/or role that does not lend itself to drawing from civil aviation controls, may choose to implement appropriate controls that include—

(1) delegated approval authorities for crew and passengers;

(2) the passenger capacity and seating configurations are defined;

(3) requirements for numbers and type of supervising crew are defined, including crew qualifications and currency requirements;

(4) passenger briefing requirements are defined, as applicable to the role or mission;

(5) requirement for the use of seatbelts, harnesses, and aircraft fittings and equipment are identified;

(6) requirements for stowage of loose articles and passenger related cargo are identified;

(7) survival equipment appropriate to the task or mission is carried;

(8) requirements for the carriage of sick or injured personnel are defined;

(9) any passenger capacity limitations due to restricted access to emergency exits by cargo or role equipment are identified;

(10) minimum requirements for passenger medical fitness for flight are defined; and

(11) requirements for the use of PPE appropriate to the task or mission are defined.

BACK TO RULE

AMC 2 91.11 – Non-standard aircraft restraint and seating criteria

Use of NSARS should only occur where alternate methods of mission execution present greater safety risk. NSARS requirements are based on criteria that may include—

(1) the required configuration of the aircraft provides insufficient seating for the number of mission essential passengers;

(2) the required configuration of the mission essential passenger's equipment being carried restricts use of the approved restraint and seating system;

(3) one or more passengers are required to perform a mission essential function that cannot be achieved if limited to the approved restraint and seating system; and

(4) the mission requires personnel in excess of the aircraft's maximum approved seating. This may involve the removal of some or all seats in order to load mission essential passengers and their personal equipment up to the maximum lift carrying capacity of the aircraft.

Non-standard aircraft restraint and seating criteria management system controls

The NSARS management system should define controls that may include—

Approval authorities

The MAO may agree with commanders on who should approve NSARS activity; however, the approval of NSARS activities remains a joint responsibility as follows—

(1) The commander of the passenger being carried should authorise activities associated with the reduced level of safety provided. Where an operational commander is not readily apparent, is unavailable or will not have sufficient knowledge of the NSARS risks, the decision to approve an NSARS activity should fall to the chain of command under which the aircraft is operated, which includes the aircraft captain. For example, for a passenger being winched from a ship by a helicopter, the aircraft captain may be better placed to authorise the activity on behalf of the passenger than the ship's captain.

(2) The MAO retains responsibility for the safety during the NSARS activity and the safety of passengers when carried in approved restraint and seating systems. The MAO approval is executed through the existing FMS via the command chain, flight authorisation (for planned NSARS activities) and ultimately the aircraft captain.

Activity identification

The MAO should identify and establish a comprehensive list of defined NSARS activities supported by the FMS. The MAO may, where appropriate, approve specific NSARS activities for each delegated aircraft type. Examples might include parachuting, rappelling, helicopter casting, diver drop insertions and winching.

AMC Continues

AMC Continued

Risk management

DAR 100 details the risk management process. NSARS risk management should focus on the likelihood that death or injury to mission essential passengers or crew in the event of violent aircraft motion, heavy landing or aircraft crash may be increased when using NSARS. So that the commander considering approval of an NSARS activity can do so with certainty, the system should provide precise guidelines as to the risk authorisation thresholds at each command level of authority. Should such advice already exist in other OIP a direction to that OIP is sufficient.

Compliance Example

An aircraft type with dedicated passenger seats, but operating in a specific military configuration and/or role that requires the use of NSARS, may choose to implement appropriate controls that include—

(1) delegated NSARS approval authorities for both crew and passengers, including risk authorisation thresholds;

(2) specifying responsibilities of aircraft captains for both planned and unplanned NSARS activities;

(3) requirement for the use of NSARS is identified;

(4) maintaining an approved list of NSARS activities for the type, which should include the NSARS passenger capacity, configuration and a supporting mission risk profile;

(5) requirements for numbers and type of supervising crew are defined, including crew qualifications;

(6) passenger briefing requirements are defined, as applicable to the role or mission;

(7) requirements for stowage of loose articles and passenger-related cargo are identified;

(8) survival equipment appropriate to the task or mission is carried;

(9) requirements for the carriage of sick or injured personnel are defined;

(10) any passenger capacity limitations due to restricted access to emergency exits by cargo or role equipment are identified;

(11) minimum requirements for passenger medical fitness for flight are defined;

(12) requirements for the use of PPE appropriate to the task or mission are defined; and

(13) any other controls necessary to manage specific hazards are identified.

DAR 91.11 BACK TO RULE

AMC 91.7 BACK TO RULE

AMC 3 91.11 – Preservation of records

An AMC to preserve records is adherence to the *Archives Act 1957*.

BACK TO RULE

GM 1 91.11 – Carriage of personnel in NZDF aircraft

Purpose

The intent of this rule is to assure that carriage of personnel on NZDF aircraft using approved aircraft restraints and seating systems is conducted appropriately, with emphasis on eliminating or otherwise minimising risk, SFARP, regarding loss of life or injury to personnel carried on the aircraft.

Exemption

This rule does not apply to crew, who are managed under other approved OIP, such as the aircraft flight manual.

Equipment inclusion

Carriage of personnel includes any required equipment a person must use or control to achieve an assigned mission outcome. For example, parachutes or dive equipment. Such equipment is restrained by the owning person, with direction and assistance of a relevant crew member as may be appropriate. Equipment handed over to crew to restrain is treated as cargo and not managed under this rule.

BACK TO RULE

GM 2 91.11 – Non-standard aircraft restraint and seating

Purpose

a. The intent of this rule is to assure that when use of NSARS may be required, the aviation activity is authorised and conducted such that risk is eliminated or otherwise minimised, SFARP.

b. Personnel should be secured in certified aircraft restraint and seating systems whenever possible; however, NZDF will have operational requirements that may require use of NSARS systems. Previously such a scenario was referred to as contingency loading; however, this term is no longer used as it implies use of NSARS is an unplanned activity, which is not always the case. An example of an unplanned activity, whether an emergency situation or a contingency operation, might be a flood or fire evacuation of more passengers than an aircraft has certified seating for in order to save lives with little or no planning notice. Such activity is not regulated under *DAR 91*; rather, such activities would be better managed under primacy of command.

Operational needs

a. The rule recognises that use of NSARS systems are required in some training in order to meet specific training and/or readiness objectives. This training should be limited to that which is necessary to meet specific training objectives and not become the norm.

b. Where carriage of personnel using NSARS is considered necessary to achieve mission objectives, the NSARS management system is intended to eliminate or otherwise minimise risk, SFARP, to ensure that NZDF complies as best it can and certainly within the spirit and intent of the HSWA.

BACK TO RULE

GM 3 91.11 – Passenger and flight crew manifest

Purpose

a. The intent of this rule is to assure that manifests, once raised and recorded, are not destroyed prematurely. Manifests can be invaluable assistance to accident investigations, and health and safety matters.

b. Lack of a formalised process for raising and preserving a manifest should not be used as a means to stop an operational outcome, as long as the data can be made available at a future date. For example, a passenger who may require a change of flight at short notice, but the passenger manifest has been closed. Rather than not allowing the passenger on the flight, a temporary means may be used to record the passenger details and the manifest be amended when possible. If a passenger record system is not available, the crew manifest system may also be used to capture the passenger data.

Exemption

Regulatory compliance requires the ability to understand an operation before start of the aviation activity. Scenarios may exist where the operational commander or aircraft captain may not be able to formally document passengers in order to comply with this rule. For example, emergency evacuation of personnel from a dangerous environment where planning is unable to properly identify passenger names and numbers in advance. In such cases, the operational commander and/or the aircraft captain should make decisions regarding safe passenger carriage. If possible, the crew may notify operations staff en route to the intended landing point, or post-landing, of the manifest requirement so that arrangements to create a record post-flight.

BACK TO RULE

AMC 91.12 – Low flying

Definition of low flying

Low flying is defined, in accordance with CAR 91, as flight inside 1000 ft AGL or any obstacle that is within a horizontal radius of 600 m from the point immediately below the aircraft over built-up areas, and 500 ft AGL or any obstacle, person, vehicle, vessel or structure that is within a horizontal radius of 150 m from a point immediately below the aircraft elsewhere, except when—

(1) conducting an approach or departure;

(2) on an overshoot from an approach to land, circling approach or published missed approach procedure following an instrument approach;

(3) during hover operations, or while hover or air taxiing within the confines of an aerodrome in a helicopter;

(4) conducting a reconnaissance circuit in a helicopter; and

(5) otherwise stated in *DAR 91*.

Orders, instructions and procedures

The MAO should issue OIP for low flying including—

(1) LFA;

(2) routes;

(3) avoidance areas (eg prohibited, sensitive, ski fields, avalanche prone, and built up areas);

(4) minimum heights;

(5) separation requirements;

(6) weather;

(7) limitations of each aircraft type; and

(8) use of any specialised equipment (such as terrain-following radar, ground proximity warning systems, vision enhancing equipment).

Low flying minimum separation heights

a. The MAO should define low flying minimum separation heights and distances for aircraft types by day and night (aided and unaided), within the following areas—

(1) promulgated LFA and surveyed LFR;

(2) unsurveyed LFR;

(3) low flying over water;

(4) conduct of flight at low altitude;

(5) display flying; and

(6) built-up areas.

b. The following MSD apply during peacetime low flying operations—

Promulgated low flying areas

Operations within a promulgated LFA may be authorised to a height not below 150 ft MSD for fixed wing aircraft. Rotary wing aircraft may conduct nap of the earth flying.

AMC Continues

AMC Continued

Unsurveyed low flying areas

Operations over land that are conducted over unsurveyed routes or areas, or for which the surveys are not current, may be authorised to a height not below 250 ft MSD for fixed wing aircraft and not below 100 ft MSD for rotary wing aircraft.

Low flying over water

(a) By day, fixed wing aircraft fitted with serviceable and operating ground proximity devices (eg radar altimeters) and operating over water may be authorised to fly not below 200 ft MSD. Aircraft operating over water by day without radar altimeters should not be authorised below 250 ft MSD unless specifically approved (eg convert operations).

(b) By day, rotary wing aircraft fitted with serviceable and operating ground proximity devices (eg radar altimeters) and operating over water may be authorised to fly not below 50 ft MSD.

(c) The MAO may consider lower day over water limits if specifically required for Maintenance Check Flight (MCF) activities.

(d) By night, the MAO should determine if higher heights are suitable and publish the night minima heights in OIP.

Built-up areas

Aircraft are not to be authorised for flight below 1000 ft HAOW 600 m of a built-up area without MAO approval unless—

(1) conducting an approach or departure;

(2) on an overshoot from an approach to land, circling approach or published missed approach procedure following an instrument approach;

(3) during hover operations, or while hover or air taxiing within the confines of an aerodrome in a helicopter;

(4) conducting a reconnaissance circuit in a helicopter; and

(5) otherwise stated in *DAR 91*.

Promulgated low flying areas

a. The MAO should nominate suitable appointments for the management of low flying issues. These appointments should promulgate approved LFA. Areas selected for promulgation as LFA should be—

(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; and

(4) as clear as possible from aerodrome OLS.

b. Where a promulgated LFA infringes the PANS OPS and aerodrome OLS, the nominated appointment should promulgate and implement local procedures that ensure positive separation is maintained between aircraft operating in the LFA and aircraft conducting instrument approaches, including practice instrument approaches.

AMC Continues

AMC Continued

Low flying routes

CO of flying units are responsible for approving LFR outside promulgated LFAs. LFRs should be planned to avoid aerodromes and other known landing areas. Routes should also be planned to avoid sensitive and noise nuisance areas.

Low flying charts

a. The MAO should maintain master reference charts for—

(1) promulgated local LFAs; and

(2) promulgated LFR.

b. The charts should be kept current and made available to all base and transient aircrews in either electronic or paper form. COs of local flying units should be responsible for ensuring that master copies of these reference charts are maintained and displayed at an appropriate place within the unit.

c. The reference charts should display the following information—

(1) approved LFA and weapons ranges;

(2) all known obstacles within 5 NM of the LFA or LFR;

(3) areas of major air activity, including conflicting instrument approaches;

(4) areas to avoid; and

(5) noise sensitive areas.

Low flying routes and low flying areas survey

The purpose of surveying a LFA or LFR is to safely pinpoint and record the location of overhead wires and other obstructions that present a significant hazard to aircraft operating at low altitude in the vicinity. Consequently, the MAO should promulgate a maximum period between surveys. If an LFA/LFR has not been surveyed within that period, it should be regarded as unsurveyed. Depending on the frequency of use of the area or route and the likelihood of hazard variation, the MAO should exercise their judgement on the possible need for additional surveys and the timing of surveys before use of the area or route.

Conduct of surveys

(a) Personnel responsible for conducting surveys of intended LFA and LFR should ensure that—

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

(2) the crews employed and aircraft used are suitable for the task and authorised in accordance with the appropriate OIP;

(3) the crews 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 (ie low flying); and

(4) on completion of the survey, the aircraft captain should submit a report to the appropriate commander detailing the nature and location of all located hazards, together with an indication of the captain's confidence in the validity of the report. CAA should be notified of any significant changes or new data uncovered on the survey that conflicts with information published in AIP.

AMC Continues

AMC Continued

(b) After the survey has been completed, the following details should be recorded on the appropriate master hazard chart—

(1) the survey date and required date of resurvey;

(2) hazardous obstructions, in particular, wires;

(3) instrument approach paths; and

(4) the minimum height and lateral separation to which the area or route has been cleared.

Obstructions

CARs prescribe obstruction height limitations.

Conduct of flight at low altitude

a. When operating at low altitude, aircrew should carry, in their aircraft, charts indicating applicable hazards as shown on the appropriate master maps. As part of their pre-flight preparation, aircrew should validate these low flying charts against master charts held at the unit.

b. While low flying, aircrew should—

(1) observe the authorised minimum height for the flight unless weather or an emergency dictates otherwise;

(2) be cognisant of their aircraft's performance and capability, and exercise vigilance to avoid ground and air hazards;

(3) avoid known terminal air traffic areas;

(4) avoid built-up or closely settled areas;

(5) avoid operating mines, quarries or other industrial centres; and

(6) avoid, as far as practicable, farmhouses, livestock and known sensitive areas.

c. If flight below the authorised height is necessary for any reason, the aircraft captain should report the details to the authorising officer as soon as practicable after landing.

BACK TO RULE

GM 91.12 – Low flying

Purpose

a. The purpose of this rule is to ensure the safe management of low flying activities.

b. This rule does not apply to NDRA being operated by NZDF aircrew; such operations are to be in accordance with the relevant civil air rules and regulations.

BACK TO RULE

AMC 91.13 – Display flying

Categories of display flying

In the context of this rule, display flying is any flying activity performed to exhibit or show an aircraft or related training and practice. There are three categories of display flying—

(1) **Handling demonstration**. Manoeuvre(s), including aerobatics, flown to a set routine or schedule in order to display the handling characteristics of an aircraft;

(2) **Role demonstration**. Operating an aircraft in accordance with OIP in approved roles to demonstrate the unit capabilities; and

Note: The difference between a role demonstration and handling demonstration can quickly blur. Anytime a role demonstration is designed to include multiple roles connected together with linking manoeuvres consideration should be given to treating it as a handling demonstration — particularly if the role demonstration also involves the public or other third party participants.

(3) **Fly-pasts**. Overflight of a predetermined point in order to mark an event.

Spectator line management

A spectator line will normally be provided by an event organiser for aviation events. Depending on the event's nature, the event organiser may not fully understand the implications of aircraft display flying from a safety point of view. There may be times when the spectator line (or similar) needs to be determined by planning staff and the aircraft captain due to the nature of the event, such as a car race. In this circumstance, the aircraft captain and event organiser should work together to determine the position of all potential spectators, personnel and structures at the time of the display. Locations of spectators and structures may also change over the course of the event. This may warrant a site assessment and/or airborne recce before the display.

Spectator line infringement

There may be circumstances requiring some people to be closer to the aircraft than the designated spectator line. In such cases, the aircraft captain should ensure the event organiser has provided a safety briefing to the exposed people so that appropriate precautions may be taken. For example, helicopter downwash may require display signs to be firmly fastened or removed before the display. Assumptions should not be made that the same level of controls such as site preparation, FOD awareness to that of military-controlled environments will be in place. If the aircraft captain is unsure such a safety briefing has occurred, the spectator line measurements should be modified to include those people and objects who would have been outside the spectator line.

Display flying sequences

Display flying sequences may not take place over the spectator enclosure, except for ingress and egress for their displays, without specific MAO approval.

Safe distance from spectators and structures

a. Rotor downwash effect will vary with channelling/funnelling objects (such as buildings, concrete barriers etc), which must be accounted for by the aircraft captain during display planning and execution (assessing the risk of rotor downwash). This may require the minimum distance to be based on the channelling/funnelling object.

AMC Continues

AMC Continued

b. Rotor downwash effect area is influenced by ambient wind. The separation distance should be increased downwind by an additional 20 m per 10 kts of wind.

Speed limitation

Aircraft should not exceed—

(1) Mach 0.90 or 600 KIAS, whichever is least, so as to avoid accidental generation of a sonic disturbance during manoeuvres; aircraft flying at or approaching this limit should reduce speed further before initiating any manoeuvre to avoid in inadvertent sonic disturbances; and

(2) 300 KIAS, or operate at high power settings, when approaching the display area from the rear of the crowd.

Display flying weather minima

a. Pilots should maintain clear of cloud and a visibility suitable for the display at all times to ensure suitability for flight will not be compromised. This ensures that aircraft remain in a position to provide visual separation with other display aircraft, terrain, structures and to aid in the maintenance of situational awareness throughout.

b. The flight authorisation officer and aircraft captain should establish minimum weather in advance based on the complexity and location of the display. Where practicable, the event planner should be included in the planned weather determinations.

Display flying limitations and approval

Display flying limitations and approval controls include—

(1) identification of approval authorities for display flying that include aerobatics or opposition manoeuvres;

(2) any additional limitation that is deemed necessary to further restrict aircraft display flying operations; and

(3) high-level approval, administrative and indemnity insurance aspects of display flying as determined by the MAO.

Flight conduct

In addition to *DAR 119.6*, flight authorisation and conduct should include—

Display director

The MAO should appoint a qualified display director for CAA-approved aviation events and for other complex and/or multi aircraft displays. The display director is to coordinate all flying displays and fly-pasts.

Communications

To aid in situational awareness, display aircraft should have continuous communication with the event organiser or similar (such as unit personnel at the event) during the display.

Aviation risk management

Where the display sequence is not fully covered in existing mission risk profiles, further risk management is to be completed to ensure that all known risks are minimised, SFARP.

AMC Continues

AMC Continued

Public awareness

Ensure that there is a mechanism to provide public awareness of upcoming display flying and fly-pasts where required. This is to ensure the safety of the public who may not be aware of the event and to reduce the potential for adverse publicity.

Display sequence

The display sequence is to be discussed with the flight authorisation officer in accordance with *DAR 119*, paying particular attention to and specifying in detail each authorised manoeuvre. Any changes to a display sequence are to be approved by the flight authorisation officer, thoroughly briefed and practised before being incorporated into a display.

Briefings

A comprehensive crew briefing is to be given before any practice or display flight. The briefing is to cover all OIP and sequences relevant to the flight, paying particular attention to—

(1) noise-sensitive areas that are to be avoided;

(2) the location and height of obstacles in and near the area of operations, including channelling/funnelling objects;

(3) the location of the spectator line, spectators and the applicable display axis (orientation of display); and

(4) the specific limitations on aircraft operations detailed in this DAR, such as—

(a) height minimums (refer to tables *1*, *2* and *3*);

(b) manoeuvring and operating limitations (speed, 'G', roll rates, aircraft systems etc);

(c) distance from spectator line (refer to tables *1*, *2*, *3* and *4*);

(d) weather minima and considerations;

(e) contingency procedures;

(f) risk management plan/mission risk profile constraints;

(g) ground special effects (such as pyrotechnics, smoke etc); and

(h) other expected airborne traffic.

Formation display flying

a. Specific limitations and restrictions for formation display flying are—

(1) opposition manoeuvres involving vectors towards the crowd are prohibited except as specifically authorised by the MAO;

(2) new manoeuvres or sequences may not—

(a) be practised without MAO approval; or

(b) be performed in public without MAO approval.

b. The MAO should promulgate the minimum qualifications of pilots selected for formation aerobatic teams.

AMC Continues

AMC Continued

Table 1 – Minimum Separation for Handling Display

	Vertical (ft)			Horizontal (m) from spectator line			
	Fixed wing		Rotary	Fixed wing			Rotary
	Single engine	Multi engine		Low energy[1]	100–250 kts	250 kts +	
Single aircraft low pass	100	100	50	75	150	220	150
Single aircraft turning	100	300	50	150	220	220	220
Single aircraft aerobatics	500[2]	500	N/A	150	220	220	N/A
Formation low pass	300	300	50	75	150	220	150
Formation turning	300	500	50	150	220	220	220
Formation aerobatics	500	500	N/A	150	220	220	N/A

1. The Tiger Moth meets the criteria set for low energy aircraft.

2. When aerobatics are started at 500 ft, the wings are to be in a level attitude and the pitch is not to exceed 30 degrees nose up until through 500 ft MSD.

Table 2 – Minimum Separation for Aircraft Role Demonstration

	Vertical (ft)			Horizontal (m) from spectator line			
	Fixed wing		Rotary	Fixed wing			Rotary
	Single engine	Multi engine		Low energy	100–250 kts	250 kts +	
Single aircraft low pass	100	100	50	75	150	220	150
Single aircraft turning	300	300	50	150	220	220	220
Formation low pass	300	300	50	75	150	220	150
Formation turning	300	500	50	150	220	220	220

Table 3 – Minimum Separation for Fly-past

	Vertical (ft)			Horizontal (m) from spectator line			
	Fixed wing		Rotary	Fixed wing			Rotary
	Single engine	Multi engine		Low energy	100–250 kts	250 kts +	
Single aircraft	300	300	300	N/A	N/A	N/A	N/A
Formation	300	500	300	N/A	N/A	N/A	N/A

Table 4 – Minimum Designated Spectator Line Clearances for Take-off and Landing

	Centre line	Runway edge
<100 kts	60 m	10 m
>100 kts	75 m	10 m

AMC Continues

AMC Continued

Objects released during display flying or fly-pasts

The following controls may ensure safe release of objects during display flying—

(1) Specific MAO approvals are required.

(2) The object to be released has technical and operational clearance for release from the participating aircraft.

(3) The release of objects is included in the risk management for the display.

(4) All safety distance requirements are observed.

Orders, instructions and procedures

The MAO should issue OIP in relation to display flying that ensure—

(1) an approval process is defined for event participation;

(2) aircrew eligibility, selection criteria, proficiency requirements and approval processes are defined;

(3) flight authorisation procedures are defined;

(4) training and work up schedules are specified;

(5) SOPs are produced covering all display manoeuvres;

(6) the requirements for a display director are defined; and

(7) appropriate AvRM processes are applied.

Aviation event organisers

Aviation event organisers should use CAA AC 91-1 *Aviation Events* as the standard for organising an aviation event.

BACK TO RULE

GM 91.13 – Display flying

Approval to participate in an aviation event or conduct a display flight does not absolve those involved in the flight authorisation process from ensuring risks are eliminated, SFARP or, if elimination is not practicable, minimised, SFARP. It should not be assumed that the event organiser understands the risks associated with a particular aircraft or display sequence. Risk ownership belongs to the NZDF flight authorisation officer and the aircraft captain/formation lead.

Purpose

a. Throughout any type of display flying, the safety of spectators and other personnel is paramount. The purpose of this rule is to ensure that display flying is conducted without damage to the aircraft involved, at an appropriate position from spectators and structures to ensure first, second or third party risk is mitigated from hazards or exposure to hazards including—

(1) rotor/jet downwash or jet blast;

(2) a mishandled sequence;

(3) an aircraft malfunction;

(4) high-speed aerodynamics;

(5) hazardous materials carried by aircraft;

(6) electricity pylons;

(7) displaying and non-displaying aircraft;

(8) human factor influences;

(9) sources of visual confusion;

(10) major and minor roads;

(11) public footpaths and rights of way;

(12) potential areas of congregation of secondary spectators;

(13) occupied properties; and

(14) display location topography.

b. Without specific approval from the approving authority, NZDF aircraft may not engage in any display flying or practice display flying over any city, town or densely inhabited area. In most cases, this will preclude display flying, but not fly-pasts, over any regatta, race meeting or similar event. The adequacy of a display venue is to be considered in all cases and specifically addressed in any application submitted to the approving authority as appropriate for approval to conduct display flying. Particular attention should be given to the availability of clear areas appropriate to the likely consequences of airborne emergencies.

c. Helicopter display flying may involve operations conducted in the avoid area of the height velocity diagram. Helicopter display flying must be planned and conducted in a manner that does not expose spectators to the consequences of a loss of power while operating in the avoid area of the height velocity diagram.

BACK TO RULE

AMC 91.14 – Formation flying

The NZDF MAO is to issue OIP in relation to formation flying that ensure—

(1) the minimum distances between aircraft in formation are specified;

(2) the numbers of aircraft permitted are specified;

(3) procedures for formation flying in controlled airspace are specified;

(4) weather minima are specified;

(5) occasions when formation flying is authorised between dissimilar types or when non-NZDF aircraft are involved;

(6) aircrew eligibility and proficiency requirements are specified;

(7) flight authorisation procedures are defined;

(8) briefing requirements are specified;

(9) SOPs are produced covering all formation flying; and

(10) appropriate AvRM processes are applied.

BACK TO RULE

GM 91.14 – Formation flying

Formation flying means more than one aircraft that—

(1) navigate and report as a single aircraft; and

(2) are no more than 1 NM laterally and within 100 ft vertically from the formation leader.

BACK TO RULE

AMC 91.15 – Aerobatic flight

a. Aerobatic flight means—

(1) an intentional manoeuvre in which the aircraft is in sustained inverted flight or is rolled from upright to inverted or from inverted to upright position; or

(2) manoeuvres such as rolls, loops, spins, upward vertical flight culminating in a stall turn, hammerhead or whip stall, or a combination of such manoeuvres.

b. Aerobatics should not be carried out—

(1) when they are likely to endanger other aircraft;

(2) in formation, except when specifically authorised;

(3) over built up areas or congested areas;

(4) at night, in cloud or in conditions where recovery is likely to take place in cloud;

(5) within controlled airspace, except with the permission of the appropriate air traffic control authority; or

(6) below 3000 ft AGL or above sea level unless specifically authorised.

Orders, instructions and procedures

The MAO should issue OIP in relation to aerobatic flight that ensure—

(1) minimum safe distances for aerobatic flight are specified;

(2) aircrew eligibility and proficiency requirements are specified;

(3) flight authorisation procedures are defined;

(4) SOPs are produced covering all aerobatic flight manoeuvres; and

(5) appropriate AvRM processes are applied.

BACK TO RULE

AMC 91.17 – Dropping or jettisoning of articles

The aircraft captain should only permit dropping or jettisoning of articles when authorised—

a. for training;

b. for operational or trials purposes; or

c. when the safety of the aircraft is otherwise seriously endangered.

BACK TO RULE

AMC 91.18 – Handing over control in aircraft with dual controls

a. When it is necessary to hand over control of an aircraft fitted with dual controls, a formal instruction to take control and to accept control should be made. In some cases (eg during instruction) it is necessary to take control in the first instance; this should also be formally declared and accepted. Formal statements of 'I have control' and 'You have control' should be made and acknowledged as appropriate.

b. The MAO should produce OIP detailing actions in the event that verbal communication becomes impossible (eg intercom failure or suspected incapacitation).

BACK TO RULE

AMC 91.19 – Refuelling aircraft – engines and/or rotors running

a. To refuel aircraft with engines and/or rotors running, the aircraft should be cleared in the release to service, type certificate or SOIU.

b. Engines and/or rotors running refuelling should be carried out in accordance with the aircraft-specific procedure, sponsored and published in the technical publications.

c. OIP should consider the following, as a minimum—

(1) Fire cover.

(2) Guarding of flying controls.

(3) Training and authorisation requirements for all personnel involved, including vehicle drivers.

(4) Safety procedures and hazard management, for example earthing and safe distances.

BACK TO RULE

AMC 91.20 – Disabling traffic and terrain warning systems

a. For the purpose of this rule, traffic and terrain warning systems include—

(1) terrain awareness and warning system;

(2) enhanced ground proximity warning system, excluding configuration warnings;

(3) ground proximity warning system, excluding configuration warnings;

(4) TCAS; and

(5) radar altimeter.

b. In order to achieve safe military air operations, there will be occasions when it is acceptable to disable certain functionality; however, the expectation is that traffic and terrain warning systems will be used for all operations that fall within the equipment specifications unless exempt by this rule.

c. When operating within, or entering a controlled aerodrome traffic circuit, pilots should operate TCAS on TA mode. This is to avoid unnecessary RA manoeuvres against controlled air traffic operating by reference to visual, composite visual, vertical or runway separation standards that are not considered by a TCAS.

BACK TO RULE

GM 91.20 – Disabling traffic and terrain warning systems

a. This rule outlines the generic use of traffic and terrain warning systems, the policy and processes to enable the aircraft captain to disable functionality during type-specific operations.

b. Traffic and terrain warning systems assist crew members in the early detection of conflicting traffic and approaching terrain. Some traffic and terrain warning systems installed in NZDF aircraft are not designed for military operations and when used outside their design specifications can generate nuisance alerts that create a distraction and may cause, rather than prevent, an accident.

BACK TO RULE

AMC 91.21 – Defence long range operations

Defence long range operations risk assessment considerations

General assessment: aircraft role and flight profiles

(a) Aircraft role, eg tactical and strategic transport, SAR, intelligence surveillance and reconnaissance, battle space management/command and control and VIP transport.

(b) Benign or challenging environments.

(c) Carriage of passengers and crew.

(d) Carriage of cargo/DG.

General assessment: Defence long range operations area of operations and/or air route

(a) Threshold time for diversion.

(b) The maximum diversion time.

(c) Diversion profile and speed schedule.

(d) Adequate aerodromes to which an aircraft can divert, approach and land within the maximum diversion time.

(e) Effective communication for all sections of the route.

(f) Time limited aircraft system performance.

General assessment: capacity to undertake Defence long range operations

(a) Aircraft type certification status for EDTO.

(b) Sufficiency of supporting information, eg aircraft performance data and systems, pre- and in-flight information and systems monitoring, and appropriate OIP.

(c) Compliance with relevant civil regulatory requirements.

(d) Ground support and facilities.

(e) Communications over the planned route and altitudes (including diversions), reliable two-way voice and/or data link communications under expected conditions.

Defence long range operations risk assessment areas for consideration (not limited to): flight crew training and proficiency

Check programme and experience regarding—

(1) routes and aerodromes to be used;

(2) fuel planning to be used to the PSD, and from the PSD to the diversion aerodrome (ie critical fuel scenario);

(3) navigation methods to be used;

(4) diversion profiles from the PSD, eg long range cruise, normal cruise, obstacle clearance, depressurised, engine failure depressurised;

(5) diversion procedures;

(6) evaluation of probable propulsion and system failures;

(7) criteria for significant system(s) failure;

AMC Continues

AMC Continued

(8) performance including a total loss of thrust in one engine (twin engine aircraft);

(9) total loss of normal generated electrical power;

(10) diversion, approach and landing on standby power, if applicable;

(11) emergency training relevant to particular types of flight operation and cargo; and

(12) any other condition considered likely to impact airworthiness, crew workload or performance risk.

Maintenance

(a) Procedures to verify the status of the aircraft and significant systems;

(b) Procedures to maximise system reliability through maintenance action (eg maintenance to safety critical systems performed by different personnel or with additional supervision); and

(c) Any additional maintenance deemed necessary to support higher system reliability required for DRLO operations. This includes (but is not limited to) oil consumption monitoring, failures/incident reporting, monitoring programs and parts control for DLRO-significant systems.

Adequate diversion aerodrome (for the expected time of use)

(a) Adequate diversion aerodromes authorities (approval to use, contact procedures);

(b) Defined procedures for obtaining overflight and landing authorisation;

(c) Visual and non-visual aids for the anticipated types of approaches and operating minima are available at diversions;

(d) Physical requirements for the approved aircraft weight range (length, manoeuvring area size, strength and lighting);

(e) At least one approved instrument approach procedure that permits the conduct of an instrument approach to the expected runway while complying with applicable minima;

(f) Known status and availability of navigation aids, air traffic control, lighting, rescue fire services and meteorological forecasts;

(g) Required level of technical assistance and ground handling (fuel, food etc);

(h) Required ability to receive and accommodate the planned complement of passengers, crew and cargo, or a recovery plan in place to ensure the protection and well-being of passengers and crew until they are transported to another location;

(i) The accuracy and completeness of ground support and any passenger recovery plans;

(j) Meet other requirements applicable to the flight (eg DG handling, ground security, International Traffic in Arms Regulations compliance);

(k) **Aircraft equipment**. Minimum equipment list and appropriate redundancy for systems that have a fundamental influence on flight safety, ie significant systems, including (but not limited to)—

(1) electrical;

(2) hydraulic;

AMC Continues

AMC Continued

(3) pneumatic;

(4) fuel;

(5) auxiliary power unit oil consumption;

(6) flight instruments;

(7) flight controls;

(8) navigation and communication equipment;

(9) pressurisation;

(10) fire suppression;

(11) anti-ice/de-ice; and

(12) emergency equipment.

Fuel planning

(a) In-flight management.

(b) Aircraft configuration/contingencies (including consideration of OEI performance and OEI cruise speed), impact of flaps not retracting and/or asymmetry, ramp/door not closing and/or propeller malfunctions.

(c) Critical fuel reserves.

(d) Critical fuel scenario.

(e) Effect of icing.

(f) PSD/point of safe return/equal time point.

Environmental

(a) Communications (en route and on ground).

(b) Fuel freeze.

(c) Aircraft cooling/de-icing.

(d) Crew/passenger training and survival considerations.

(e) Passenger recovery plan.

(f) Operation of ground equipment.

Weather information

(a) Weather information system can be relied upon to forecast terminal and provide en route weather forecasts with a reasonable degree of accuracy and reliability.

(b) Weather information will remain valid for estimated time of arrival (within defined buffer periods).

Delayed dispatch considerations

If delayed for more than one hour, the ability to monitor weather forecasts and aerodrome status at the nominated en route diversions to ensure that they stay within the specified planning minima requirements until dispatch.

Diversion decision making

(a) Procedures, policy and guidance for in-flight monitoring and decisions regarding any significant changes in conditions at diversions.

AMC Continues

AMC Continued

(b) Aerodrome facility information.

(c) Other appropriate planning data.

Orders, instructions and procedures

DLRO OIP should include—

(1) the threshold diversion flight time beyond which an operation is considered as a DLRO, for each aircraft type;

(2) OEI and any other critical operating speed to be used for the calculation of the threshold time for each aircraft type;

(3) depressurisation profiles (speed, altitude and engine configuration);

(4) limitations for each aircraft type;

(5) use of any specialised equipment for each aircraft type;

(6) diversion time;

(7) diversion speed; and

(8) special equipment requirements.

Review of Defence long range operations

A review of compliance against DLRO approvals should be conducted in the following circumstances—

(1) Changes to the aircraft configuration role and environment.

(2) Changes to type design.

(3) Significant safety incidents/issues.

(4) Issues with DLRO-significant system reliability.

(5) Continued validity and effectiveness of OIP and aircrew training.

BACK TO RULE

GM 91.21 – Defence long range operations

Purpose

The purpose of this rule is to ensure that additional safety controls to treat the risks of flight operations with an extended flight time to an adequate diversion aerodrome are considered.

Applicability

DLRO applies to fixed wing, multi-engine turbine aircraft (includes turbo propeller), operated by the NZDF, that may carry personnel on long range flights. The approved aircraft SOIU forms the basis for applicability and the MAO is responsible for determining which aircraft should be managed under DLRO.

Introduction

a. The DLRO system supports standing risk assessments and approvals for aircraft, based on the CRE, to develop technical and/or operational mitigation strategies. These standing assessments and approvals are valid until a change occurs to the approved CRE or as directed by the MAO.

b. The premise behind the DLRO management strategy is that NZDF aviation risks associated with the conduct of long range flights are identified and treated. NZDF should consider the various civil practices as potential DLRO risk mitigating strategies where reasonably practicable; however, DLRO management strategy should be flexible and tailored to the NZDF context. The end state is the identification, documentation and treatment of risk, with any residual risk being reduced, SFARP, and retained by the appropriate risk management authority.

c. NZDF is not bound by civil regulation, nor would it be advantageous for NZDF to mandate a strict compliance with civil regulation pertaining to long range operations, also known as EDTO. Implementation of civil regulation may result in unnecessary costs to NZDF, potential operational constraints and a potentially false sense of improved safety. However, there are risks associated with long range flights conducted by NZDF that can be controlled through appropriate risk management.

d. DLRO is an extension of the extant FMS and, therefore, various recommended mitigation strategies are expected to be in place. As such, DLRO should be treated as 'business as usual' in the context of NZDF operations and any approvals should be simple, at the lowest level practicable and integrated into extant risk management systems.

Risk management

The aim of DLRO is to eliminate or otherwise minimise risks, SFARP, to aircraft occupants in the event of an in-flight emergency, and to ensure the delivery of capability and achievement of the mission. This is done through the identification of the DLRO area of operations and the management of DLRO-significant events. Analysis is focused towards the risk domains and processes provided within *DAR 100*. In identifying any risks associated with the conduct of long range flights, it is important to establish the applicability to aircraft types and the risk context.

GM Continues

GM Continued

Establish the context

For DLRO, this is achieved through review of the following—

(1) **The approved aircraft SOIU—**

(a) This includes an assessment of the approved roles/flight profiles and environment that involve exposure to long range flights and flights that involve significant flight time from adequate aerodromes. Such roles include tactical and strategic transport, VIP transport, SAR, intelligence surveillance reconnaissance and command and control.

(b) The assessment of the SOIU includes—

(i) an understanding of the operating environment, either benign or challenging;

(ii) any hazards associated with the carriage of cargo/ DG; and

(iii) the exposure of risk to aircraft occupants.

(c) Consideration should also be given to whether aircraft occupants are aware of any risks, for example civil passengers versus military passengers/crew.

(2) **The capabilities, design features and certification basis of the applicable aircraft that includes DLRO significant systems—**

(a) This includes compliance to contemporary design requirements, including—

(i) the Airworthiness Authority-prescribed design requirements;

(ii) NAA/MAA certification of the same or similar type for EDTO;

(iii) impacts of military modifications to civil derivative aircraft;

(iv) critical system performance;

(v) the capacity of the aircraft to conduct long range operations; and

(vi) original equipment manufacturer ICA.

(b) The conduct of operations and the supporting FMS that includes all relevant OIP.

Risk identification

Once the context is clearly established, any hazards and associated risks should be identified. Identification of the hazards should consider impacts to the mission, equipment, personnel and the environment. Once the hazards are identified, the risks are determined, considering the three AvRM risk dimensions: safety impact on personnel, impact on aircraft and impact on flight crew.

Analyse risks

The risks are analysed in terms of likelihood and an assessment of the most credible consequence for each risk dimension. Any existing controls are considered; including analysis of extant OIP and mitigating strategies that should be conducted for aircraft in service.

GM Continues

GM Continued

Identify reasonable measures

(a) Controls and mitigating strategies are identified to eliminate or otherwise minimise risk, SFARP. This step can establish whether a system of mitigating strategies is required under DLRO, or whether only specific risks need to be addressed.

(b) When selecting controls or mitigating strategies to treat risk, an assessment must be made as to whether the strategy is reasonably practicable and the cost of implementation does not outweigh the benefit or unnecessarily constrain capability or the conduct of the mission. Risk mitigation strategies are designed to preclude an in-flight emergency and, should any emergencies occur, to protect occupants and capability as follows—

Preclude

Measures to preclude an in-flight emergency are largely technically based. Strategies include—

(1) aircraft that are designed, configured and certified in accordance with NAA EDTO requirements and are supported by an associated type certificate;

(2) specific maintenance procedures and training;

(3) specific aircraft parts control procedures;

(4) specific condition monitoring programs and on-board health and usage monitoring systems;

(5) critical system reliability requirements;

(6) the capture and analysis of critical system data across fleets;

(7) the use of a long range operation MEL; and

(8) the implementation of approved aircraft operating limitations.

Protect

Measures to protect in the event of an in-flight emergency are largely operationally based. Strategies include—

(1) specific flight planning and time-limited system planning;

(2) access to specific aircraft performance data for all viable aircraft configurations and contingencies;

(3) the conduct of specific aircrew and operational staff training and currency;

(4) the implementation of procedures in OIP;

(5) use of constant communication, flight-following and ‘real time’ operational planning facilities;

(6) assessment of alternate aerodrome facilities to cater for diversions; and

(7) aircrew fatigue and CRM.

Review

(a) The documentation of a risk assessment process forms the basis for a DLRO approval for the respective aircraft type. The MAO is responsible for conducting DLRO risk assessments.

GM Continues

GM Continued

(b) The MAO determines—

(1) the applicability of DLRO;

(2) how risks are managed;

(3) the control strategies to be used; and

(4) the documentation and issue of approvals.

(c) The basis for an approval and the associated documentation should include—

(1) a standing risk assessment that contains MAO-endorsed operational; and

(2) technical assessments supported, if required, by Authority advice.

(d) The standing risk assessment is valid until a change occurs to the approved aircraft CRE.

(e) DLRO threshold times and maximum diversion times are predetermined and should be reflected in OIP. An appropriate threshold time ensures maximum flexibility and capability while duly considering safety. A threshold time is based on worst case contingencies, which have been analysed, reviewed and treated under a risk assessment.

(f) The maximum diversion time should factor a suitable allowance for holding, approach and landing. The maximum diversion time should be assessed and nominated by the respective MAO and it must be greater than the nominated threshold time.

(g) The MAO may approve DLRO threshold times based on considerations that include—

(1) risk assessment based on a judgement of aircraft design, configuration and performance;

(2) technical advice regarding technical and design considerations, including advice from the relevant initial airworthiness (military design) organisation;

(3) nominated threshold time for an aircraft type, based on a system safety analysis that considers the most limiting aircraft system (including the most time limited system) and related system effects;

(4) the nature of operations; and

(5) the personnel exposed to the risks.

(h) Threshold times and maximum diversion time determinations may be managed as follows—

(1) at or less than the approved DLRO threshold time use extant procedures as documented in OIP;

(2) at or above (greater than) the approved DLRO threshold time as detailed in this regulation; and

(3) aircraft-specific limitations and type-certified data.

(i) Once the risks and associated treatments have been determined, MRPs document aircraft and operation-specific risks and mitigation strategies.

GM Continues

GM Continued

(j) OIP that support the predetermined threshold times and risk management strategies. This includes provision of DLRO-specific operational manuals, standing instructions, ICA, maintenance/logistic manuals and adequate aerodrome information. Information contained in OIP should address any DLRO-specific operating limitations, component life limits, minimum equipment list, specific maintenance/inspection requirements and any specific aircraft CRE considerations. Where able, consideration should be given to adopting only one management framework that is interchangeable. References to compliance with NAA EDTO approvals should not be documented in OIP, and NAA requirements should not be referred to as 'related OIP'.

(k) Where MAO decisions may be influenced by technical considerations, including airworthiness design requirements, the interface should be described in the DLRO management system.

(l) Where previously assessed/approved DLRO limits are expected to be exceeded, such as an immediate operational requirement, a specific or 'one off' risk assessment/approval should be conducted. This one off assessment should consider all aspects and should be documented in the same manner as a standing risk assessment/approval, noting that such approvals may involve an operational imperative and may be subject to time constraints for development and approval. It is expected that a 'one off' assessment/approval is time limited and subject to review as required.

BACK TO RULE

AMC 1 91.22 – Controls for an operational air cargo delivery document

ACD operational controls include—

(1) *ICAO Annex 18 – Safe Transport of Dangerous Goods by Air*;

(2) IATA *Dangerous Goods Regulations Manual*;

(3) *CAR Part 92 – Carriage of Dangerous Goods*; and

(4) accepted NZDF doctrine, which includes foreign Service doctrine accepted for use by NZDF.

BACK TO RULE

AMC 2 91.22 – Orders, instructions and procedures for carriage of dangerous goods

a. OIP in relation to DG issued under this rule should include—

(1) assurances that exemptions for carriage of DG issued to meet an operational requirement will not compromise suitability for flight; and

(2) DG training requirements, including currency/refresher training for DG qualifications.

b. Identification of requirements for the carriage of—

(1) approved munitions, including riot control agents;

(2) individual weapons by aircrew in hostile or remote area;

(3) dangerous/restricted articles by passengers, including private firearms, animals, plants and fruit; and

(4) military police/force protection working dogs.

BACK TO RULE

GM 1 91.22 – Air cargo delivery suitability for flight

ACD can compromise suitability for flight by affecting the aircraft's flight profile or physical integrity should the cargo be incorrectly loaded into the aircraft in a manner that does not ensure correct configuration, placement and restraint.

BACK TO RULE

GM 2 91.22 – Air cargo delivery procedures

Purpose

a. The purpose of this rule is to ensure that ACD procedures are appropriately documented.

b. Aircraft movement services provide a multitude of services, one of which is ACD. The rule only applies to ACD aspects that involve the loading of air cargo, whatever it may be, including, but not limited to—

(1) passengers;

(2) freight;

(3) paratroopers;

(4) animals and explosive ordnance materials; and

(5) the unloading of the air cargo, either on the ground or while in the air.

c. ACD includes—

(1) payload composition;

(2) configuration, which includes weight and balance;

(3) placement; and

(4) restraint within, or attached to, aircraft platforms.

BACK TO RULE

GM 3 91.22 – Dangerous cargo

Purpose

a. The purpose of this rule is to assure that DG are appropriately configured and handled.

b. While IATA is a comprehensive document, it may not always accommodate the needs of Defence activity. In such cases, specialised Defence requirements should be contained within the NZDF ACD document.

BACK TO RULE

GM 91.23 – Stabilised approaches

Purpose

a. Runway excursions remain a common issue within the broader aviation industry and unstable approaches can contribute significantly towards them. It is therefore important to not only adopt a 'stabilised approach concept' but also record when unstable approaches occur for subsequent data analysis and safety improvement in accordance with DAR 12.

b. It is not possible to develop a standardised set of parameters and define a stabilised approach across all fleets because of the differences in aircraft types, aircraft OEM operating philosophies and/or operational training needs of specific flying units. Therefore, it is up to the MAO to determine, develop and apply stabilised approach criteria to individual fleets. The following generic criteria from IATA[1] should be considered when developing fleet specific stabilised approach criteria—

(1) The aim is to achieve and maintain constant flight path conditions for the approach phase of the flight with whatever the target flight characteristics are for the point immediately prior to the commencement of the landing flare. These should be the same flight characteristics required to be met at an earlier point during the approach, and maintained thereafter.

(2) Therefore, a stabilised approach concept is characterised by maintaining a stable speed, descent rate, attitude, aircraft configuration, displacement relative to the approach path with power/thrust settings appropriate for the flight conditions until the commencement of the landing flare.

Note: While the stabilised approach concept primarily draws from fixed wing aircraft operations the core intent, that of achieving and maintaining a portion of safe and predictable flight path control for the purposes of assuring a safe landing (on any surface), should also be considered for rotary aircraft operations.

BACK TO RULE

1 'Unstable Approaches: Risk Mitigation Policies, Procedures & Best Practices', IATA, 2016, 2nd Edition.

END MATTER

Record of Change

Amendment Number	Commencement Date	Reference	Details of Change	Approving Authority
Version 1.00	01 APR 2020	CMMS WO 70113927	Initial issue	NZDF OAA
Version 1.01	04 MAR 2021	CMMS WO 70122021	Inserted and substituted text as per *DAR 91 Version 1.01 Changes*	NZDF OAA
Version 1.02	29 APRIL 2021	CMMS WO 70123251	Inserted and substituted text as per *Dar 91 Version 1.02 Changes*	NZDF OAA