Australian Government

Defence

AUSTRALIAN NAVAL CLASSIFICATION AUTHORITY MANUAL (VOLUME 2)

DIVISION 3: SHIP RULES

CHAPTER 11: AVIATION SYSTEMS

PART 1: ANC RULES

This document is issued for use by Defence and Defence Industry personnel and is effective forthwith.

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Department of Defence
CANBERRA ACT 2600
May 2024 Edition

ANCA Manual (Volume 2)

Division 3: Ship Rules, Chapter 11: Aviation Systems, Part 1: ANC Rules, May 2024 Edition

Developer:

Australian Naval Classification Authority

1 https://www.legislation.gov.au/Series/C1968A00063

2 https://www.legislation.gov.au/Series/C2004A04868

3 https://www.legislation.gov.au/Series/C2004A03712

4 http://drnet/AssociateSecretary/security/policy/Pages/dspf.aspx

AUSTRALIAN NAVAL CLASSIFICATION RULES

First issued	May 2024
Reissue date	N/A
Issued by	CN Dagg, CSC, AS ANCA
Document management	This volume will be reviewed periodically from the date of issue, but sooner if necessitated by business requirements, and to ensure it continues to meet the intent of Defence policy.
Availability	The latest version of this volume is only available from the Defence Australia website. Its currency cannot be guaranteed if sourced from other locations. It is available for public release.
Policy domain	Defence Seaworthiness
Accountable Officer	Australian Naval Classification Authority
Publication Owner	Defence Seaworthiness Authority (DSwA)
Policy contact	anca.communications@defence.gov.au
Structure	see Contents[5]
Cancellation	N/A
Definitions	Definitions that apply to this volume are located in the Division 1, Part 1 Annex A.

[5] https://www.defence.gov.au/business-industry/industry-governance/australian-naval-classification-authority/australian-naval-classification-rules

AMENDMENTS

Proposals for amendments to the ANCA Manual (Volume 2) may be sent to:

Australian Naval Classification Authority
Mail to: anca.correspondence@defence.gov.au

EDITIONS

Edition	Edition	Amendment type	Effective
May 2024	Original issue		May 2024

Division 3: Ship Rules
Part 1: ANC Rules

Chapter 11: Aviation Systems

Contents

Australian Naval Classification Rules

Rule 0. Goal

0.1 The arrangement for aviation systems shall be designed, constructed and maintained for all Foreseeable Operating Conditions to:

0.1.1 Provide a safe and effective operating platform for manned and unmanned air systems; and

0.1.2 Provide an effective means of controlling and maintaining air operations.

Rule 1. System Capability

Functional Objective

1.1 The purpose of this Rule is to outline the principles and framework of Division 3 Chapter 11 *Aviation Systems* and its application.

Scope

1.2 The Rules of this chapter apply to all ships that operate manned air systems.

1.3 The application of this chapter to unmanned air systems is dependent on its size and subject to consultation with ANCA.

1.4 Division 2 Chapter 01 *General Requirements* and Division 3 Chapter 01 *Integrated Platform Survivability* applies to all chapters of the ANC Rules, as applicable to the design, and therefore in order to meet the Chapter 11 goal, the requirements of both this chapter, Chapter 01 and Division 2 Chapter 01 *General Requirements* shall be met.

1.5 The ANC Rules exclude training requirements. Chapter 11 *Aviation Systems* assumes all embarked persons have an appropriate level of competence for the operation of the installed systems.

Note: In addition to the rules specified in this chapter, the ship must also comply with the shipborne heliport certification requirements of DASA given in the *Defence Airworthiness Safety Design Requirements Manual* (DASDRM) Section 6 Chapter 4 *Defence Shipborne Heliports*.

Rule 2. Communication Systems

Functional Objective

2.1 The ship shall provide systems to enable direct communication with an air system and internal communication systems to support air operations.

Note: This Rule applies to communications systems and are additional to the requirements of Chapter 08 *Safety Communications*, which should be read in conjunction with this chapter.

Performance Requirements

2.2 To enable the ship to communicate securely and directly with the air system at each air system launch/recovery position, the ship shall provide a communications system between the air system and defined positions on the ship.

Note: The launch/recovery position includes those positions required for transfer, VERTREP and HIFR Operations in addition to the launch/ recovery of manned/unmanned air system(s). The defined positions are those designed as air operations command and control positions.

2.3 A ship to air system two-way radio communications system shall enable communication with air systems as follows:

2.3.1 For manned air systems:

2.3.1.1 Two-way verbal communication; and

2.3.1.2 Two-way data exchange as required by the Operating and Support Intent (OSI).

2.3.2 For un-manned air systems:

2.3.2.1 Two-way data exchange.

2.4 The ship should be capable of recording and retaining air system communications.

2.5 An Air System Operating Area Communications System shall be provided to enable personnel to communicate regarding deck movements/operations. This system shall be available at defined positions within the ship.

2.6 For emergency Sea-Air Radio-communications, the requirements of Chapter 08 *Safety Communications* Rule 10 *Sea-Air Radio-communications* shall be met.

Rule 3. Ship External Lighting

Functional Objective

3.1 The ships external lighting shall not adversely affect air system operations.

Performance Requirements

3.2 Where the Ship's external lighting could adversely affect the safe operation of an air system, this Rule is applicable.

3.3 All Ship's external lighting shall be positioned and controlled so as not to adversely affect air system operations.

3.4 Where Night Vision Devices (NVD) are utilised, all Ship's external lighting and light reflective panels which may interfere with those devices shall be compatible.

Note: The Ship's external lighting and light reflective panels shall be compatible with the air system(s) NVDs.

3.5 Where required by the OSI, the Ship shall be able to conduct flight operations at night.

Rule 4. Visual Surveillance

Functional Objective

4.1 The Ship shall provide visual means to safely monitor all air systems while onboard.

Performance Requirements

4.2 The Ship shall be designed to monitor Air Systems Launch and Recovery Area operations and utility operations from required positions as determined by the OSI.

4.3 Where the required positions have identified blind spots of the air systems launch and recovery area, an alternate means of monitoring shall be provided.

4.4 The OSI may require an installed system to monitor Air Systems Launch & Recovery Area, comprising some of the following features:

4.4.1 Day and night capable;

4.4.2 Have a recording capability;

4.4.3 Controllable from the required positions;

4.4.4 Include zoom, pan and tilt facilities; and

4.4.5 Be connected to uninterruptible power supply.

4.5 Aviation Control Station bulkheads and windows overlooking the Flight Deck shall have a sufficient level of protection for the purpose of protecting occupants and to support incident response, in the event of a crash on deck.

Note: Ballistic protection shall comply with requirements in Chapter 01 *Integrated Platform Survivability* Rule 9 *Ballistic Protection*.

Rule 5. Firefighting

Functional Objective

5.1 Suppression, containment and quick extinction of aviation fires shall be effective within the area of origin.

Note: This Rule applies to firefighting systems and are additional to the requirements of Chapter 06 *Fire Safety* and Chapter 10 *Dangerous Goods*, which should be read in conjunction with this chapter.

Performance Requirements

5.2 The firefighting extinguishing system shall be appropriate for the flight deck size, the air system, its fuel load, inclusive of any dangerous goods.

5.3 Firefighting and rescue equipment shall be provided in the vicinity of the Aviation Stowage Area.

5.4 Sufficient extinguishing media shall be held on the ship for sustained fire-fighting and/or multiple incidents.

5.5 Firefighting system(s) shall be designed to apply firefighting control measures within an appropriate timeframe.

5.6 Firefighting system(s) shall have sufficient capacity to sustain continued operation to prevent ignition of any dangerous goods.

5.7 All points of the Landing, VERTREP, HIFR and hangar areas shall have redundancy in firefighting control measures appropriate for the air system(s) to be operated.

5.8 The flight deck material shall withstand the effects of a prolonged aviation fuel fire and maintain its integrity to prevent the fire from spreading to compartments beneath the deck.

Rule 6. Role Equipment and Stowage

Functional Objective

6.1 Aviation specific Role Equipment shall be provisioned, maintained and safely stowed in order to provide support for all aviation activities.

Note: Role Equipment in this rule also includes Aviation Support Equipment.

Performance Requirements

6.2 All Role Equipment as required to facilitate air system(s) operations as detailed within the OSI shall be supported.

6.3 An area for the maintenance and safe stowage of aviation role equipment shall be provided.

Rule 7. Aviation System Storage Area

Functional Objective

7.1 An Aviation System Storage Area shall provide safe stowage of the Aviation Air System and allow maintenance to be undertaken.

Note: The application of this Rule is for Naval Vessels that have an Aviation System Stowage Area and in accordance with the OSI defined Class/Level. This Rule should be read in conjunction with Chapter 06 *Fire Safety*, Chapter 07 *Escape, Evacuation and Rescue,* Chapter 10 *Dangerous Goods* and Rule 8 *Flight Deck* of this Chapter.

Performance Requirements

7.2 A facility shall be provided to allow stowage of the air system as defined in the OSI.

7.3 The Aviation System Storage Area shall be designed in accordance with the requirements in Chapter 10 *Dangerous Goods* Rule 6 *Stowage and Handling*.

7.4 A facility shall be provided to enable the necessary levels of maintenance and servicing to be carried out, including weapon prep and stowage, as defined in the OSI.

7.5 The Aviation System Storage Area shall be capable of accepting the static and moving weights of the air system detailed in the OSI.

7.6 The Aviation System Storage Area deck shall conform to the requirements of the flight deck, without the consideration of landing and take-off criteria.

7.7 If the Aviation System Storage Area is fitted with doors it shall comprise the following features as defined in the OSI:

7.7.1 If power operated, it shall also be able to operate manually;

7.7.2 Capable of withstanding the forces generated by the rotor downwash;

7.7.3 Capable of being opened and closed in wind speeds, without distortion at all opening positions; and

7.7.4 Capable of withstanding ‘green sea’ conditions.

7.8 An area for safe transit and shelter of personnel shall be provided.

7.9 The Aviation System Storage Area shall be provided with suitable lighting to carry out air system(s) maintenance and servicing.

7.10 The Aviation System Storage Area shall provide heating and ventilation to provide suitable working conditions with respect to dry bulb temperatures.

Rule 8. Flight Deck

Functional Objective

8.1 A flight deck shall be provided from which the air system(s) are safely launched, recovered, manoeuvred and stored.

Performance Requirements

8.2 The flight deck shall provide the following functions for all air system(s) as defined in the OSI:

8.2.1 Launch;

8.2.2 Recovery;

8.2.3 Secure air system and associated aviation equipment to the flight deck;

8.2.4 Manoeuvre air system and associated aviation equipment;

8.2.5 Storage of air system and associated aviation equipment;

8.2.6 Forward maintenance activities;

8.2.7 Ground replenishments;

8.2.8 Vertical replenishments;

8.2.9 Loading/unloading of weapons; and

8.2.10 Transfer of passengers.

8.3 The flight deck shall provide an area of safe working conditions.

8.4 There shall be a clear approach from the directions specified in the air system operating specification(s).

8.5 The minimum dimensions of the flight deck shall be calculated, based upon the scatter and the flying maintenance activities to be performed for the air system(s) detailed in the OSI.

8.6 All flight decks shall have markings to facilitate operation of the air system(s) as detailed in the OSI.

8.7 The flight deck shall be prepared and coated to meet the requirements of the air system(s). Any markings shall conform to the flight deck coating criteria.

8.8 Flight deck strength at each operating spot and movement area shall be such that it will meet the dynamic effects, including dynamic response, limits of the air system(s) and air system(s) tie down requirements as specified in the OSI.

8.9 Flight deck protrusions and fittings shall be kept to a minimum.

8.10 Flight deck drainage shall be provided to prevent accumulation of fluids and prevent fluids entering the Aviation System Storage Area from the flight deck. The flight deck shall comply with the rules in Chapters 03 *Buoyancy and Stability* and Chapter 06 *Fire Safety*.

Note: Fluids should also be prevented from entering internal compartments from the Flight Deck.

8.11 Access to the flight deck shall be via controllable recognized routes and the requirements in Chapter 07 *Escape, Evacuation and Rescue* Rule 16 *Escape Routes and Escape Exits*.

8.12 An area for weapon/explosive routing, preparation and stowage shall be provided on the flight deck in accordance with the requirements in Chapter 10 *Dangerous Goods* Rule 6 *Stowage and Handling*.

8.13 There shall be a system to safely move the air system(s) between the flight deck and aviation system storage area.

8.14 The Ship shall secure air system(s) such that neither the aircraft nor the ship suffer damage.

8.15 The Ship shall be fitted with earthing points and an earthing pole provided for electrostatic discharge.

8.16 Protection of crew from falling overboard shall be provided along all boundaries of the flight deck.

8.17 The flight deck and normal aircraft hover positions over the flight deck should minimise interaction with the ship's exhaust gases.

8.18 The lighting system shall convey the status of the Flight Deck through a combination of lights, symbols and/or flashing.

8.19 The ship shall provide appropriate lighting to facilitate personnel to prepare and secure the air system(s) before and after air operations.

Rule 9. Landing Aids

Functional Objective

9.1 Landing aids shall be provided to enable the safe recovery of approaching air system(s).

Performance Requirements

9.2 In accordance with the OSI, air system landing aids are to be:

9.2.1 Compatible with all ships systems; and

9.2.2 Operated and displayed at the required Ship positions.

9.3 Own Ship motion data shall be provided at the required ship positions in accordance with the OSI.

9.4 Local meteorological conditions shall be provided to assist safe recovery of approaching air system(s) which may include:

9.4.1 Local temperature;

9.4.2 Atmospheric pressure;

9.4.3 Wind speed; and

9.4.4 Wind direction.

9.5 A visual means of communicating marshalling signals shall be provided.

9.6 The Ship shall be fitted with a Landing Aid System to support the safe conduct of aviation operations at night, where required by the OSI.

Rule 10. Aviation Services

Functional Objective

10.1 Aviation services shall be provided to support air system operations and all aviation related maintenance activities.

Note: This Rule should be read in conjunction with Chapter 04 *Engineering Systems* and Chapter 06 *Fire Safety*.

Performance Requirements

10.2 The level of services required shall be defined within the OSI, these may include:

10.2.1 Fresh water for the cleaning of the air system and its components;

10.2.2 Support for appropriate means of engine compressor washing;

10.2.3 An air system handling arrangement to meet the air system operating requirements;

10.2.4 Mobile handling equipment for the safe handling of aviation related equipment;

10.2.5 An air system power supply shall be provided to fulfil the starting and servicing requirements of the air system(s);

10.2.6 Gaseous services for air system maintenance and air systems associated Ground Support Equipment;

10.2.7 An aviation refuel/defuel system capable of supplying specified flow rates and pressures with an efficient means of removing suspended matter and undissolved water before fuel reaches the air system. Additionally, all ship aviation refuel/defuel components shall meet the OSI requirements and shall incorporate an independent earth bonding capability;

Note: This capability includes both high and low flash point fuels.

10.2.8 Helicopter in Flight Refuelling (HIFR) facility; and

10.2.9 Appropriate means for hydraulic servicing requirements of the air systems(s).

10.3 Integration of air system information and management with ship systems shall be provided in accordance with the OSI.

Note: The Air Information and Management System includes those systems required for air system(s) mission support and operational planning.

10.4 The ship shall provide stowage for aviation servicing fluids.

10.5 Power to support the air system(s) shall be available at each starting and servicing position.

10.6 The ship shall provide facilities to store bulk aviation fuel.

10.7 A fuel emergency shut off shall be provided at the required positions as determined by the OSI.

10.8 The Ship fuelling facilities' shall meet the requirements of Chapter 04 *Engineering Systems* and Chapter 06 *Fire Safety*.

10.9 Fuel Sampling points and analysis equipment shall be provided.

Rule 11. Aviation Compartments

Functional Objective

11.1 Aviation compartments shall be provided to enable air system maintenance and aviation operations to take place.

Performance Requirements

11.2 Air system maintenance, co-ordination and equipment repair areas shall be provided to fully support embarked aviation in accordance with the OSI.

11.3 Air operations and co-ordination areas shall be provided to fully support all aviation operations in accordance with the OSI.

11.4 An area for weapon/explosive routing, preparation and stowage shall be provided in accordance with the requirements in Chapter 10 *Dangerous Goods* Rule 6 *Stowage and Handling*.

11.5 Air System Control Station(s) (ASCS) shall be provided to monitor flight operations to and from the Flight Deck.

11.6 Access to the ASCS shall be via controllable recognized routes and the requirements in Chapter 07 *Escape, Evacuation and Rescue* Rule 16 *Escape Routes and Escape Exits*.

Rule 12. Electromagnetic Hazards

Functional Objective

12.1 The Ship's Electromagnetic emissions shall not adversely affect personnel's health and safety or the Ship operations.

Note: This Rule applies to all Electromagnetic Hazards and are additional to the requirements of Division 2 Chapter 01 *General Requirements*, Chapter 08 *Safety Communications* and Chapter 10 *Dangerous Goods* which should be read in conjunction with this chapter.

Performance Requirements

12.2 The hazards associated with ship aviation related electromagnetic emissions shall be assessed to ensure that personnel's health and safety or the Ship's operation are not adversely affected.

12.3 The Ship's electromagnetic emissions shall be compatible with those of the air systems to be operated as defined within the Ship's OSI.

Rule 13. Aviation Incident Response

Functional Objective

13.1 Aviation Incident Response equipment shall be provisioned, maintained and stowed to support the conduct of emergency rescue operations.

Performance Requirements

13.2 An aircraft crash alarm shall be installed.

13.3 An appropriate number of crash kits shall be available at the flight deck for the conduct of emergency rescue operations from aircraft which have crashed.

13.4 The ship shall provide a crash rescue boat to be used for the conduct of emergency rescue operations.

13.5 The ship shall be equipped with a Search and Rescue Direction Finding set capable for giving homing indication from the standard aircrew search and rescue equipment beacon.

Rule 14. Vertical Replenishment and Transfer

Functional Objective

14.1 Ships shall be capable, where required by the OSI, of transferring stores, explosive ordnances or personnel by air.

Performance Requirements

14.2 Arrangements for replenishment by air shall be suitable for transfer/evacuation operations where defined by the OSI, using internal and/or under slung loads. Where applicable the following conditions shall be met:

14.2.1 The replenishing area shall be safe and accessible;

14.2.2 The replenishing area shall be clear of obstructions which may impede the transfer operation;

14.2.3 A suitable means for the earthing of persons and cargo shall be available;

14.2.4 The replenishing area shall be clearly marked and visible from the air; and

14.2.5 The replenishing area shall be equipped for prevention of man overboard.

14.3 Where transfer by air is (with the exception of emergency casualty evacuation by winch) provided for in the OSI the ship shall be provided with Ship and Air System(s) Limits for those transfers and the associated equipment to assess those limits.

14.4 Where Ship and Air System(s) Operating Limits apply the ship shall be provided with a clear and unambiguous method of indicating to the aircraft when those limits permit safe operation.

14.5 Where routine Air System(s) transfer operations are contained within the OSI the ship shall be provided with facilities to mitigate the impact on the ship of aviation accidents.

14.6 Where routine Air System(s) transfer operations are contained within the OSI the dedicated transfer area shall be designed so as to mitigate the impact on the ship of aviation accidents.

14.7 Effective means of communications, complying with the requirements of Chapter 08 *Safety Communications*, are to be provided between the conning position, the replenishment area and the air system(s).

14.8 The requirements of Chapter 02 *Structures* are applicable for local structural loads.

14.9 The requirements of Chapter 03 *Buoyancy and Stability* are applicable for sea keeping, stability and manoeuvrability.

14.10 The requirements of Chapter 07 *Escape, Evacuation and Rescue* are applicable for CASEVAC operations.