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**AUSTRALIAN NAVAL CLASSIFICATION AUTHORITY
MANUAL (VOLUME 2)**

DIVISION 5: REMOTE AND AUTONOMOUS SYSTEMS

SECTION 4: LARGE UNCREWED SURFACE VESSELS

CHAPTER 06: FIRE SAFETY

PART 1: ANC RULES



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

A handwritten signature in black ink, appearing to read 'CN Dagg'.

CN Dagg, CSC
Assistant Secretary
Australian Naval Classification Authority
Department of Defence
CANBERRA ACT 2600
May 2024 Edition

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Division 5: Remote and Autonomous Systems, Section 4: Large Uncrewed Surface Vessels, Chapter 06: Fire Safety, Part 1: ANC Rules, May 2024 Edition

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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

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AMENDMENTS

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

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Division 5: Remote and Autonomous Systems (RAS) Rules

Section 4: Large Uncrewed Surface Vessel (L-USV)

Part 1: ANC Rules

Chapter 06: Fire Safety

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Australian Naval Classification Rules

Rule 0. Goal

- 0.1 For effective Fire Safety, the Large Uncrewed Surface Vessel (L-USV) Remote and Autonomous System (RAS) and its arrangements shall be designed, constructed, maintained, and operated in such a way that as far as is reasonably practicable, fire can be prevented, detected, contained, and extinguished whilst maintaining essential safety functions during and after the outbreak of a fire.

Note: Essential Safety Functions are defined in the Operating and Support Intent (OSI).

Rule 1. General

Functional Objective

- 1.1 The purpose of this Rule is to outline the principles and framework of Chapter 06 *Fire Safety* and its application.

Scope

- 1.2 Division 2 *Core Design Rules* Chapter 01 *General Requirements* applies to all chapters of the ANC Rules, as applicable to the design, and therefore in order to meet the Chapter 06 *Fire Safety* goal, the requirements of both this chapter and Division 2 *Core Design Rules* Chapter 01 *General Requirements* shall be met.
- 1.3 Division 3 *Ship Rules* Chapter 01 *Integrated Platform Survivability* goal applies to all Naval Vessels greater than 24m length overall that carry persons. Therefore, to meet the Chapter 06 *Fire Safety* goal, an L-USV that requires embarked persons shall meet the requirements of both this chapter and the requirements of Division 3 *Ship Rules* Chapter 01 *Integrated Platform Survivability* as applicable to the design.
- 1.3.1 The Rules listed in this Chapter are based on those in the corresponding Chapter within Division 3 *Ship Rules* and have been adapted for L-USV. When referring to Division 2 or 3, the following terms may be interchanged:
- 1.3.1.1 'Ship' as 'L-USV';
- 1.3.1.2 'Crew' or 'Operator' or 'Embarked Person' as 'End User';
- 1.3.1.3 'Primary, Main or Damage Control Station' as 'Remote Command Unit (RCU)';
- 1.3.1.4 'Bridge' or 'conning position' as RCU; and
- 1.3.1.5 'Signature Reduction' as 'Signature Management'.
- 1.4 The Fire Safety arrangements of the L-USV shall match its RAS Maturity Level to allow End Users to safely operate the L-USV to achieve missions listed in the OSI.
- 1.5 There is an interface with Chapter 10 *Dangerous Goods*. Chapter 06 *Fire Safety* contains the requirements for Fire Safety which apply to the carriage and use of Dangerous Goods (Class 1-9). Chapter 10 *Dangerous Goods* supplements Chapter 06 *Fire Safety* by providing additional requirements applicable to Class 1 Dangerous Goods.

- 1.6 The ANC Rules exclude training requirements. Chapter 06 *Fire Safety* assumes all End Users have an appropriate level of competence for the operation of the installed systems. Part 3 contains some guidance on typical training requirements.
- 1.6.1 Requirements for effective damage control to support recoverability are not included in this chapter, see Chapter 01 *Integrated Platform Survivability*.
- 1.6.2 The ANC Rules do not address the risk associated with ships using alternative fuels, such as hydrogen and compressed natural gas as fuel, or vehicles and small craft using such fuels.

Application

- 1.7 Alternatives to the requirements will be accepted provided that they have been demonstrated to be equivalent to meet the fire safety goal and functional objectives of this Chapter to the satisfaction of the ANC Authority.
- 1.8 Not used.
- 1.9 The function of the L- USV, as listed in the OSI, will determine the applicability of the Part 2 Solutions
- 1.10 For L-USV designed for combat operations, the Part 2 solutions to Chapter 01 *Integrated Platform Survivability* will advise on the appropriate Part 2 Solutions to this chapter and may require an enhancement of some of the Solutions in this chapter.

General Performance Requirements

- 1.11 The fire safety policies shall be defined which reflect the OSI for the L-USV and address the Functional Objectives of this Chapter.
- 1.12 In the event of any conflict in requirement between these Rules and any standards or documents referenced by these Rules, the more stringent specification shall take precedence.

Rule 2. Structural Integrity in Case of Fire

- 2.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 2 *Structural Integrity in Case of Fire*.

Rule 3. Risk of Ignition

- 3.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 3 *Risk of Ignition*.

Rule 4. Fire Growth Potential

- 4.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 4 *Fire Growth Potential* as amended in Table 1.1 below:

Table 1.1: Division 3 Chapter 06 Rule 4 Amendments

Rule Number	Amendment
4.2.1	Means of control for the air supply to a space or group of spaces shall be operable from the RCU if required by the OSI.

Rule Number	Amendment
4.2.2	Means of control for flammable liquids in a space or group of spaces shall be operable from the RCU if required by the OSI.

Rule 5. Smoke Generation and Toxicity

- 5.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 5 *Smoke Generation and Toxicity* as amended in Table 1.2 below:

Table 1.2: Division 3 Chapter 06 Rule 5 Amendments

Rule Number	Amendment
5.1	The hazard to the environment from smoke and toxic products generated during a fire from spaces that contain the fire or adjacent to the fire shall be reduced.
5.2.5.2	Not used.

Rule 6. Control of Smoke Spread

- 6.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 6 *Control of Smoke Spread* as amended in Table 1.3 below:

Table 1.3: Division 3 Chapter 06 Rule 6 Amendments

Rule Number	Amendment
6.2	If required by the OSI, the RCU shall be provided with a means for controlling the spread of smoke on the L-USV.
6.2.1	Not used.
6.2.2	Not used.
6.2.3	Not used.
6.2.6	Not used.
6.3	Not used.

Rule 7. Detection and Alarm

- 7.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 7 *Detection and Alarm* as amended in Table 1.4 below:

Table 1.4: Division 3 Chapter 06 Rule 7 Amendments

Rule Number	Amendment
7.2	An effective means of detecting and locating fires and alerting the End User at the RCU shall be provided.
7.4	Not used.

Rule 8. Containment of Fire

- 8.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 8 *Containment of Fire*.

Rule 9. Fire Fighting

- 9.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 9 *Fire Fighting* as amended in Table 1.5 below:

Table 1.5: Division 3 Chapter 06 Rule 9 Amendments

Rule Number	Amendment
9.3	Fixed fire-extinguishing systems shall be installed, having due regard to the risk of ignition, fire growth potential and operational importance of the protected spaces.
9.4	Not used.
9.6	Automatic activation of fire-fighting systems should have due regard for the function of the space, and or equipment protected.
9.7	Controls for fire-fighting systems shall be operable from the RCU.
9.10	If required by the OSI, the RCU shall be provided with the means of purging spaces with a gaseous fire-fighting system.
9.11	If required by the OSI, means of redundancy shall be provided to mitigate the failure of fixed fire-fighting systems.

Rule 10. Not Used

Rule 11. Not Used

Rule 12. Provision of Operational Information

- 12.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 12 *Provision of Operational Information*.

Rule 13. Special Requirements for Carriage of Dangerous Goods

- 13.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 13 *Special Requirements for Carriage of Dangerous Goods* as amended in Table 1.6 below:

Table 1.6: Division 3 Chapter 06 Rule 13 Amendments

Rule Number	Amendment
13.2.7	Not used.

Rule 14. Carriage of Low Flash Point Fuels

- 14.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 14 *Carriage of Low Flash Point Fuels* as amended in Table 1.7 below:

Table 1.7: Division 3 Chapter 06 Rule 14 Amendments

Rule Number	Amendment
14.2	Small quantities of low flash point fuel shall be stored in independent containers or tanks and shall be readily jettisonable overboard upon initiation from by the End User located at the RCU.

Rule 15. Special Requirements for Vehicle, Well dock, RO-RO spaces and Small craft bays

- 15.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* 06 Rule 15 *Special Requirements for Vehicle, Well dock, RO-RO spaces and Small craft bays*.

Rule 16. Special Requirements for Aircraft Facilities

- 16.1 The L-USV shall comply with Division 3 *Ship Rules* Chapter 06 *Fire Safety* Rule 16 *Special Requirements for Aircraft Facilities*.

Rule 17. Remote Monitoring

Functional Objective

- 17.1 The L-USV shall have Remote Monitoring capabilities to ensure Fire Safety.

Scope

- 17.2 This rule is applicable for L-USV with a Remote Monitoring level of RM1 or greater.

Performance Requirements

- 17.3 L-USV with a Remote Monitoring level of RM1 shall be able to remotely Monitor the status of the fire detection and suppression system.
- 17.4 L-USV with a Remote Monitoring level of RM2 or greater shall be able to remotely monitor the status and state of the fire system.

Rule 18. Remote Control

Functional Objective

- 18.1 The L-USV shall have Remote Control capabilities to ensure Fire Safety.

Scope

- 18.2 This rule is applicable for L-USV with a Remote-Control level of RC3 or greater.

Performance Requirements

- 18.3 L-USV with a Remote-Control level of RC3 or greater shall be capable of remotely interacting with the fire system monitoring and suppression systems SFARP to achieve the OSI.

Rule 19. Autonomy

Functional Objective

- 19.1 The L-USV shall have autonomy control and decision-making capabilities to ensure Fire Safety.

Scope

- 19.2 This rule is applicable for L-USV with an Autonomy level of A1 or greater.

Performance Requirements

- 19.3 L-USV with an Autonomy level of A1 or greater shall be able to autonomously activate the fire system as per the OSI.