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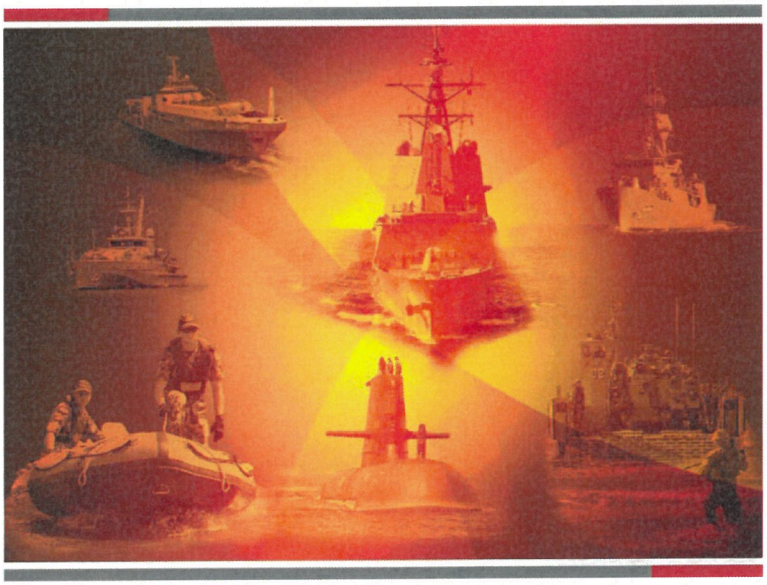
DIVISION 5: REMOTE AND AUTONOMOUS SYSTEMS

SECTION 4: LARGE UNCREWED SURFACE VESSELS

CHAPTER 05: SEAMANSHIP SYSTEMS

PART 1: ANC RULES



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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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[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 5: Remote and Autonomous Systems (RAS) Rules
Section 4: Large Uncrewed Surface Vessel (L-USV)
Part 1: ANC Rules

Chapter 05: Seamanship Systems

Contents

Australian Naval Classification Rules

Rule 0. Goal

0.1 The Seamanship Systems shall be designed, constructed, operated and maintained to:

0.1.1 Operate in a predictable manner with a level of integrity commensurate with operational requirements.

0.1.2 Ensure the watertight integrity of the hull and meet the requirements of Chapter 03 *Buoyancy and Stability*.

0.1.3 Enable the independent operating of Seamanship Systems with an Essential Safety Functions, and, where specified, Mission Critical Functions in all foreseeable operating conditions.

Rule 1. General

Functional Objective

1.1 The purpose of this Rule is to outline the principles and framework of Chapter 05 *Seamanship Systems* and its application.

Scope

1.2 Division 2 *Core Design Rules* Chapter 01 *General Requirements* and Chapter 01 *Integrated Platform Survivability* apply to all chapters of the ANC Rules and therefore in order to meet the Chapter 05 *Seamanship Systems* goal, the requirements of both this chapter, Chapter 01 01 *Integrated Platform Survivability* 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 05 *Seamanship Systems* 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 Seamanship systems 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 Operating and Support Intent OSI.

1.5 The ANC Rules exclude training requirements. Chapter 05 *Seamanship Systems* 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.

General Performance Requirements

1.6 The availability of Seamanship Systems associated with Essential Safety Functions and, where specified, Mission Critical Functions shall be sustained or restored by means of:

1.6.1 Reliability, especially of any single points of failure; and

1.6.2 Redundancy, to minimise single points of failure.

1.7 Means shall be provided to ensure isolation of equipment and systems to allow maintenance to take place safely.

1.8 A robust maintenance and inspection schedule to support equipment used in upper deck operations shall be provided.

Rule 2. Not Used

Rule 3. Provision of Operational Information

3.1 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 3 *Provision of Operational Information* as amended in Table 1.1 below:

Table 1.1: Division 3 Chapter 05 Rule 3 Amendments

Rule Number	Amendment
3.3	Information and instructions shall define safe operating limits.

Rule 4. Not Used

Rule 5. Not Used

Rule 6. Not Used

Rule 7. Not Used

Rule 8. Mooring

8.1 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 8 *Mooring* as amended in Table 1.2 below:

Table 1.2: Division 3 Chapter 05 Rule 8 Amendments

Rule Number	Amendment
8.2.2	Not used.
8.4	Where winches or other vessel mooring systems are provided to tension the mooring lines or systems, the controls shall be in a position such that the operation of the winch may be visually monitored in real-time by the End User located at the RCU.
8.7	Not used.
8.9	Not used.

Rule 9. Anchoring

9.1 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 9 *Anchoring* as amended in Table 1.3 below:

Table 1.3: Division 3 Chapter 05 Rule 9 Amendments

Rule Number	Amendment
9.3	L-USV shall have the ability to allow the controlled deployment of the anchor using a power source independent of the ship's main power. This is to include an indication of the length of anchor chain deployed.
9.4	L-USV shall have the ability to lock the anchor in the position desired by the End User using a power source independent of the ship's main power.
9.5	L-USV shall have the ability to abandon the anchor that is controlled by a power source independent of the ship's main power.
9.8	Not used.

Towing

9.2 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 10 *Towing* as amended in Table 1.4 below:

Table 1.4: Division 3 Chapter 05 Rule 10 Amendments

Rule Number	Amendment
10.5.1	Not used.
10.5.2	When the design limit is exceeded, the system fails in such a way that the remaining elements of the system do not damage the structure of the L-USV.
10.10	Not used.

Rule 10. Replenishment at Sea

10.1 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 11 *Replenishment at Sea* as amended in Table 1.5 below:

Table 1.5: Division 3 Chapter 05 Rule 11 Amendments

Rule Number	Amendment
11.4	Effective means of communication, complying with the requirements of Chapter 08 *Safety Communications* shall be provided between:
11.4.1	The conning position of other vessel involved in the Replenishment at Sea evolution and the End User conning the L-USV who is located at the RCU.
11.4.2	The Replenishment at Sea station position of other vessel involved in the Replenishment at Sea evolution and the End User operating the Replenishment at Sea station of the L-USV who is located at the RCU.
11.4.3	At the RCU, the End User controlling the L-USV and the End User operating the Replenishment at Sea station.
11.4.4	Not used.
11.6	Not used.
11.14	Replenishment systems of the L-USV shall minimise the risks imposed on the Replenishment at Sea operators of the other vessel involved in the evolution.

Rule 11. Boat operations

11.1 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 12 *Boat operations* as amended in Table 1.6 below:

Table 1.6: Division 3 Chapter 05 Rule 12 Amendments

Rule Number	Amendment
12.3	The End Users of the L-USV who are controlling the launch and recovery of the boat shall be able to visually observe both the boat and any associated equipment at all times.
12.4	Not used.
12.5	Not used.
12.6.1	At the RCU, the End User conning the L-USV and the End User launching or recovering the boat.
12.6.2	Not used.
12.6.3	Not used.
12.7	Means of transferring equipment into and out of boats shall be provided if required by the OSI.

Rule 12. Not Used

Rule 13. Diving Operations

13.1 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 14 *Diving Operations* as amended in Table 1.7 below:

Table 1.7: Division 3 Chapter 05 Rule 14 Amendments

Rule Number	Amendment
14.2	Not used.
14.3	Not used.
14.3.1	Not used.
14.4	The L-USV shall be provided with means to inhibit the movement and/or transmission of underwater fittings, sensors and machinery which may present a hazard to diving operations.
14.6	Not used.
14.7	Not used.
14.8	Not used.
14.8.1	Not used.
14.8.2	Not used.
14.8.3	Not used.

Rule 14. Lifting and Hoisting Appliances

14.1 The L-USV shall comply with Division 3 *Ship Systems* Chapter 05 *Seamanship Systems* Rule 15 *Lifting and Hoisting Appliances* as amended in Table 1.8 below:

Table 1.8: Division 3 Chapter 05 Rule 15 Amendments

Rule Number	Amendment
15.4	The operational instructions of each item of lifting equipment shall be defined for its assembly, use and maintenance and be present at the RCU.
15.5	The lifting appliance shall remain under control during all modes of operation. Failsafe logic shall be included for RM, RC & A connection failure.
15.6	Operation of lifting appliances shall minimise the risk to the lifting equipment and the platform during lifting operations.
15.8	As far as reasonably practicable, the location of visual monitoring equipment shall be such that the load may be visually monitored in real time by the End User at the RCU.
15.10	Not used.
15.11	Not used.

Rule 15. Remote Monitoring

Functional Objective

15.1 The L-USV shall have Remote Monitoring capabilities to ensure sufficient Seamanship Systems to achieve the OSI requirements.

Scope

15.2 This rule is applicable for L-USV with a Remote Monitoring level of RM3 or greater.

Performance Requirements

15.3 L-USV systems with a Remote Monitoring level of RM3 or greater shall be capable of Remotely Monitoring seamanship systems as per the OSI.

Rule 16. Remote Control

Functional Objective

16.1 The L-USV shall have Remote Control capabilities to ensure effective Seamanship Systems to achieve OSI requirements.

Scope

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

Performance Requirements

16.3 L-USV systems with a Remote Control level of RC3 shall be capable of remotely interacting or controlling seamanship systems as per the OSI.

Rule 17. Autonomy

Functional Objective

17.1 The L-USV shall have autonomy control and decision-making capabilities to ensure effective Seamanship Systems to achieve OSI requirements.

Scope

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

Performance Requirements

17.3 L-USV systems with an Autonomy level of A1 or greater shall be capable of autonomously utilising seamanship systems as per the OSI.