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AUSTRALIAN NAVAL CLASSIFICATION AUTHORITY MANUAL (VOLUME 2)

DIVISION 3: SHIP RULES

CHAPTER 13: COMBAT 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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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

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Division 3: Ship Rules
Part 1: ANC Rules

Chapter 13: Combat Systems

Contents

Australian Naval Classification Rules

Rule 0. Goal

0.1 Combat Systems integration arrangements shall be designed, constructed and maintained for all foreseeable operating conditions to:

0.1.1 Provide a safe and effective means of controlling the connectivity, compatibility and interoperability of Combat Systems with equipment, services, and operational environment of the Naval Vessel; and

0.1.2 Provide a safe and effective means of supporting, controlling and maintaining the Combat System.

Rule 1. General

Functional Objective

1.1 The purpose of this Rule is to outline the principles and framework of Chapter 13 Combat Systems and its application.

Scope

1.2 The rules of this chapter apply to all Naval Vessels that operate with Combat Systems to support:

1.2.1 Peacetime Military Engagement;

1.2.2 Security;

1.2.3 Peace Support; and

1.2.4 Combat

1.3 The context of this chapter covers support to operations in all domains including surface, subsurface, air, cyber, and space.

1.4 Division 2, Chapter 01 General Requirements applies to all chapters of the ANC Rules, as applicable to the design, In order to meet the Chapter 13 Combat Systems goal, the requirements of both this chapter, and Chapter 01 General Requirements, shall be met.

1.5 Division 3, Chapter 01 Integrated Platform Survivability contains the overarching requirements for Survivability that apply to the Combat Systems.

1.6 The ANC Rules exclude training requirements. Chapter 13 Combat Systems assumes all embarked persons have an appropriate level of competence and experience for the operation and maintenance of the installed systems.

General Performance Requirements

1.7 The Operating and Support Intent (OSI) defines how Combat System capability is to be employed and sustained throughout the life of the Naval Vessel. The Naval Vessel OSI shall be used to define the scope of Combat Operations required for the Naval Vessel.

1.8 Common Combat Systems Requirements (CCSR) in Rule 2 are common elements of Combat Systems that apply in addition to all rules outlined in this chapter.

Rule 2. Common Combat Systems Requirements

Functional Objective

2.1 Combat Systems shall support the safe operation of the Naval Vessel.

Note: Division 2 Chapter 1 Rule 4 Systems Architecture supplements this rule with additional requirements.

2.2 Combat Systems shall operate safely under all roles and functions without compromising operational effectiveness.

Performance Requirements

Emitter Systems:

2.3 Combat Systems elements capable of emitting Electromagnetic Radiation (EMR) shall be designed, operated and maintained to control all Radiation Hazards (RADHAZ) to embarked persons, own ship, third parties, environment, Explosive Ordnance (EO), fuels, flammable atmospheres, and Safety Related equipment.

Note: Division 2 Chapter 1 Core Design Rules – Rule 2 Safety Management System, Rule 3 System Safety, and Rule 7 Hazardous Areas supplement this rule with additional requirements.

2.4 The Naval Vessel Operator (NVO) shall control the harmful effects of RADHAZ to the environment during the operation, maintenance and disposal of radioactive sources used onboard the Naval Vessel.

Note: All transmitters capable of radiating energy shall have an Emissions Control (EMCON) function.

Note: Chapter Division 2 Chapter 1 Rule 8 Emissions Security supplements this rule with additional requirements.

2.5 Compartments with Combat Systems and associated equipment shall allow embarked persons to safely remain within specified compartments during operation.

Note: Chapter 12 Habitability supplements this rule with additional requirements.

2.6 Embarked persons shall be able to locally monitor, operate, maintain and where appropriate repair Combat Systems as required by the OSI.

2.7 Risk of embarked persons being exposed to Hazardous Materials which form any part of Combat Systems shall be eliminated or reduced.

Note: Chapter Division 2 Chapter 1 General Requirements Rule 5, Materials, supplements this rule with additional requirements.

2.8 Combat Systems and sub-systems equipment shall have Mechanical Safety measures in place to control risk to embarked persons from mechanical output, movement, and kinetic hazards.

2.9 Equipment Monitoring and Protection systems shall be installed.

2.10 Combat Systems shall have the ability to manage and control Combat Systems elements for the safe conduct of incompatible operations.

2.11 The ability for Combat Systems shall enable alignment tasks, checks, adjustments and corrections to be performed.

Note: Chapter 2 Structures Rule 9, Military Features, supplements this rule with additional requirements.

2.12 System Availability shall be maximised during maintenance activities, or to recover from disruptions. In the event of failures or disruptions to primary components, Combat Systems shall have components available to take over functionality needed to maintain capability.

2.13 Single points of failure shall be eliminated from Combat Systems to ensure the availability of systems for operations and capabilities required by the OSI.

2.14 Combat Systems shall have redundant systems to allow configuration and reconfiguration to satisfy the range of operational requirements as specified in the OSI.

Note: This rule supplements redundancy requirements in Division 2 Chapter 1 – General Requirements, Rule 6 – Zoning, Separation and Redundancy with additional requirements.

2.15 Combat Systems interactions shall be identified to ensure integration is achieved in accordance with OSI requirements.

2.16 Combat Systems shall include simulation or other training capability where required by the OSI.

2.17 The Naval Vessels Defence Information Environment (DIE) shall enable management of and access to safety-related information

2.18 Information and Communications Technology (ICT) Systems shall be able to operate safely over a wide range of operational and environmental conditions as specified by the OSI.

Note: Chapter 04 Engineering Systems supplements this rule with additional Electrical Fittings requirements.

Rule 3. Command & Control and Tactical Awareness

Functional Objective

3.1 Command & Control (C2) and Tactical Awareness (TA) shall support decision making, coordination and control as specified by the OSI.

3.2 C2 and TA shall be established, monitored and maintained in order to exchange data with cooperating units for coordination and interoperability

3.3 C2 capability shall enable tactical control of activities in all Warfare Areas (Anti surface, undersea and anti-air) as specified by the OSI.

Performance Requirements

3.4 The C2 System shall provide the Naval Vessel with the ability to coordinate compilation of the tactical picture, and execution of operational command orders (including Effector activation and sensor control).

3.5 The C2 System shall provide Situational Awareness (SA), and Indications and Warnings (IW).

3.6 The C2 System shall have the ability to automatically, continuously, and simultaneously:

3.6.1 Record;

3.6.2 Monitor;

3.6.3 Display; and

3.6.4 Process data.

3.7 The C2 System shall have the ability to exchange data with Combat Systems Elements, peripherals, and systems external to Combat Systems as required by the OSI.

3.8 TA Systems shall enable and support C2.

Note: Navigation systems with military specific features shall comply with requirements of Chapter 09: Navigation.

3.9 Tactical Information Exchange (TIE) shall enable and support C2 and SA.

3.10 Combat Systems states and modes shall control risk to embarked persons, own ship, third parties, marine life, and surrounding environment.

Note: Division 2 Chapter 1 Core Design Rules – Rule 2 Safety Management System, Rule 3 System Safety, and Rule 7 Hazardous Areas supplement this rule with additional requirements.

Rule 4. Sensors, Detectors and Tracking Systems

Functional Objective

4.1 Sensors, Detectors and Tracking Systems shall be included in Combat Systems to support SA and TA and any other capability as specified by the OSI.

4.2 Sensors, Detectors and Tracking Systems used for the Detection, Recognition, Classification, Identification, and Localisation as well as Mapping shall be capable of being safely maintained and operated under system Operating Conditions as specified by the OSI.

Performance Requirements

4.3 Sensors, Detectors and Tracking Systems shall eliminate or minimise risk to embarked persons, own ship, third parties, marine life, and the surrounding environment.

4.4 Sensors, Detectors and Tracking Systems shall enable and support C2.

Rule 5. Underwater Systems

Functional Objective

5.1 Underwater Sensor Systems shall be included in Combat Systems to support SA, TA, and any other capability as specified by the OSI.

5.2 Sonar used for the Detection, Classification, and Localisation (DCL) as well as Mapping shall be capable of being safely maintained and operated under foreseeable system Operating Conditions as specified by the OSI.

Performance Requirements

5.3 Underwater Systems shall eliminate or minimise risk to embarked persons, own ship, third parties, marine life, and the surrounding environment.

5.4 Combat Systems shall include a means of underwater communications.

Note: Chapter 14 Environmental Protection supplements this rule with additional requirements.

5.5 Underwater Systems shall be incorporated into Combat Systems to support SA and TA and any other capability, as specified by the OSI.

5.6 Underwater systems shall operate safely under all Foreseeable Operating Conditions as specified by the OSI.

Rule 6. Above Water Sensor Systems

Functional Objective

6.1 Above Water Sensor Systems shall be incorporated into Combat Systems to support SA and TA and shall operate safely under all Foreseeable Operating Conditions, as specified by the OSI.

6.2 Above Water Sensor Systems used for the Detection, Classification, and Localisation (DCL) as well as Mapping shall be capable of being safely maintained and operated under foreseeable system Operating Conditions as specified by the OSI.

Performance Requirements

6.3 There shall be features to ensure activation of Above Water Sensor Systems does not adversely affect embarked persons, and the surrounding environment.

6.4 Naval Vessel shall be fitted with Primary and Secondary Surveillance Radars as specified by the OSI.

6.5 Above Water Sensor Systems shall eliminate or minimise risk to embarked persons, own ship, and third parties

Note: Chapter 01 General Requirements, Rule 7 Hazardous Areas supplements this rule with additional requirements in relation to RADHAZ emission safety requirements.

Rule 7. Armament Systems

Functional Objective

7.1 The placement and configuration of Armament Systems, including countermeasure launchers, shall be designed to maximise operational effectiveness of the Naval Vessel where required by the OSI.

7.2 Armament Systems shall have the means to create the intended effect on a specified target and shall operate safely under all Foreseeable Operating Conditions where required by the OSI.

Note: Chapter 10 Dangerous Goods supplements this rule with additional EO Storage and Handling, and RADHAZ requirements.

Performance Requirements

7.3 Armament Systems shall be treated as a Safety Significant system.

7.4 Armament System Design shall minimise risks to the safety of embarked persons, and environment.

7.5 Armament System Design shall minimise risks to Naval Vessel survivability and operational capability.

7.6 Armament Systems utilising hydraulic or pneumatic components shall include safety features to prevent danger to embarked persons within a space where stored energy components are located and may move.

7.7 Armament Systems shall provide Alerts, Warnings, and Indicators to the operator of the system safety states and modes.

7.8 Armament Systems EO storage arrangements shall incorporate features to minimise risk to embarked persons and protect EO from damage.

7.9 EO containing liquid propulsion fuels such as OTTO fuel II or jet fuel, shall be provided with a dedicated stowage.

7.10 Armament Systems that launch EO with separation stages shall ensure the safety of the Naval Vessel from all components including discarded or ejected components.

7.11 Armament System shall prevent loading of a round into an already occupied chamber or incorrect ammunition configuration into the system

7.12 Controls shall be implemented ensuring embarked persons are safe from blast and efflux of armament systems.

7.13 Effectors shall be fitted with a handling system/method to enable safe loading and unloading.

Rule 8. Embarked Mission Systems

Functional Objective

8.1 Embarked systems, including any attached payload, ancillary, portable or handheld equipment, and subsystems which integrate or interact with Combat Systems shall be safe to operate and not degrade Combat Systems functions under all Foreseeable Operating Conditions.

Performance Requirements

8.2 Embarked systems and subsystems shall have hazards controlled as part of the installation and integration with the Naval Vessel.

Note: Division 2 Chapter 1 Core Design Rules – Rule 2 Safety Management System, Rule 3 System Safety, and Rule 7 Hazardous Areas supplement this rule with additional requirements.

8.3 Embarked system shall not expose embarked persons to hazards caused by interference or interaction with systems or equipment on board any Naval Vessel or embarked persons they are operating from.

Entertainment and Personal Communications Services:

8.4 Entertainment and Communications systems and equipment shall not present a safety or environmental hazard in their own right or by interfering with the safety of existing equipment.

8.5 Installation, configuration and storage of all Entertainment and Personal Communications equipment shall minimise the risk of missile, fire and suction hazards.

8.6 Entertainment and Communications systems shall not present a hazard to the environment from hazardous materials or hazardous chemicals.

Embarked Communications Equipment, including Sea Safety Communications:

8.7 All temporary sea safety communication equipment carried on board shall comply with the requirements of this chapter while embarked.

8.8 Temporary embarked communication equipment carried on board shall not affect the functionality of all Naval Vessel systems.

Note: Division 2 Chapter 2 Cyberworthiness supplements this rule with additional requirements

Note: Division 2 Chapter 3 Software Systems supplements this rule with additional requirements

Note: Chapter 08 Safety Communications supplements this rule with additional requirements.

Rule 9. Internal Communication Systems

Functional Objective

9.1 All Internal Communications Systems and Equipment shall maximise operation capability and minimise risk to safety under all Foreseeable Operating Conditions as specified by the OSI.

9.2 A CCTV System shall monitor, store, and playback real time video of safety critical areas and operations as specified by the OSI;

Performance Requirements

9.3 Intercom System shall be installed according to OSI requirements.

9.4 Sound Powered Voice systems shall be installed according to OSI requirements.

9.5 Ship's Phone System shall be installed shall be installed according to OSI requirements.

9.6 Communications Management System shall be installed according to OSI requirements

9.7 Flight Deck Communications System shall provide wireless and wired communication coverage to ensure the safety of embarked persons and environment as specified by the OSI.

Note: Chapter 11 Aviation Systems supplements this rule with additional requirements.

9.8 Voice Recording System shall provide the ability to monitor, record, store, and transfer with metadata, all necessary voice circuits and voice communications, in safety critical areas as specified by the OSI.

9.9 Ship's Time System shall allow for synchronised time indication to operational areas as specified by the OSI.

Note: Chapter 07 Escape, Evacuation, and Rescue supplements this rule with additional requirements.

Note: Chapter 08 Safety Communications supplements this rule with additional requirements.