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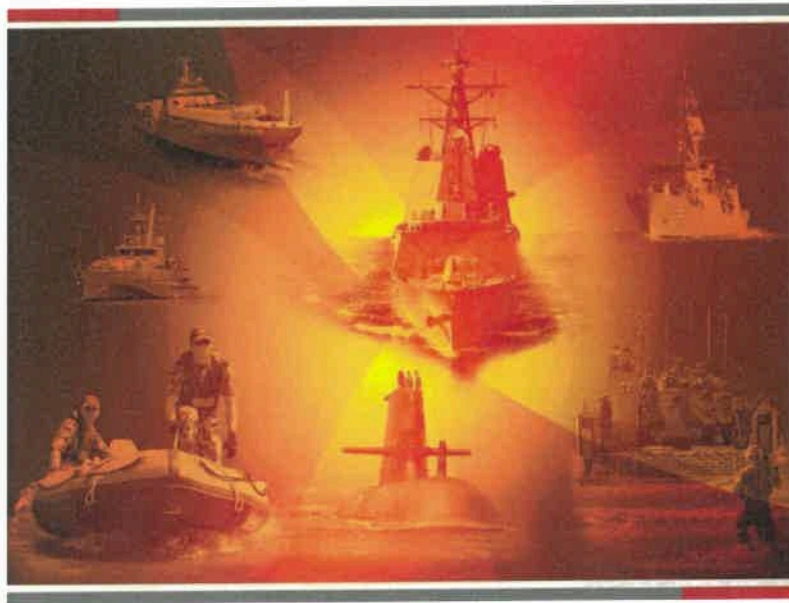
**Australian Government**  
**Defence**

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

**DIVISION 3: SHIP RULES**

**CHAPTER 01: INTEGRATED PLATFORM SURVIVABILITY**

**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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**ANCA Manual (Volume 2)**

Division 3: Ship Rules, Chapter 01: Integrated Platform Survivability, Part 1: ANC Rules, May 2024 Edition

**Developer:**

Australian Naval Classification Authority

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<sup>1</sup> <https://www.legislation.gov.au/Series/C1968A00063>

<sup>2</sup> <https://www.legislation.gov.au/Series/C2004A04868>

<sup>3</sup> <https://www.legislation.gov.au/Series/C2004A03712>

<sup>4</sup> <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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## **EDITIONS**

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Division 3: Ship Rules  
Part 1: ANC Rules

# Chapter 01: Integrated Platform Survivability

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**Australian Naval Classification Rules****Rule 0. Goals**

- 0.1 Ships exposed to extreme threat conditions shall be designed, constructed and maintained to achieve a level of survivability aligned with the Operating and Support Intent (OSI) that optimises Susceptibility, Vulnerability and Recoverability to maintain post damage capability for all credible threats 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 01 *Integrated Platform Survivability* and its application.

**Scope**

- 1.2 The scope of this Chapter is to describe the Goals, Functional Objectives and Performance Requirements of the ship's ability to maintain a level of Post Damage Capability and provide safe protection of embarked persons at sea, against all credible threats and damage scenarios in all Foreseeable Operating Conditions.
- 1.3 The minimum survivability level is provided by the International Convention for the Safety of Life at Sea (SOLAS). However, this alone does not provide a sufficient level of survivability and may not be applicable to the context, for Post Damage Capability and safe protection of embarked persons, for the majority of ship operations in peacetime, constabulary and combat operations.
- 1.4 Chapter 01 *Integrated Platform Survivability* provides additional requirements to all Chapters of the ANC Rules Division 3, as applicable by the Integrated Platform Survivability (IPS) level. Therefore, in order to meet Chapter 01 goals, the requirements of this Chapter shall be met when designing and verifying other Division 3 Chapters, to the extent necessary to meet the OSI.

**Application**

- 1.5 The ship design shall meet the ship's survivability in accordance with the OSI, to:
- 1.5.1 Retain Post Damage Capability for both combat and platform systems from credible threats; and
- 1.5.2 Provide safe protection of embarked persons throughout a credible damage incident.
- 1.6 The survivability controls shall be designed for each area of the survivability domains as follows:
- 1.6.1 Susceptibility: The tactical and post detection capability shall be ensured by understanding the threat capabilities and applying susceptibility controls:
- 1.6.1.1 Signature Reduction;
- 1.6.1.2 Threat Detection;
- 1.6.1.3 Countermeasures;

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Note: For threat detection, countermeasure systems, decoys, and their associated systems requirements, refer to Chapter 13 *Combat Systems*.

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- 1.6.2 Vulnerability: The post damage capability and safe protection of embarked persons shall be ensured by understanding the damage extent from the defined threats and applying vulnerability controls for:
- 1.6.2.1 Zoning, Separation and Redundancy;
  - 1.6.2.2 Shock Hardening;
  - 1.6.2.3 Blast Hardening;
  - 1.6.2.4 Ballistic Protection;
- 1.6.3 Recoverability: The recovered capability shall be ensured by understanding the damage extent from the defined credible threats and applying recoverability controls:
- 1.6.3.1 Incident Management;
  - 1.6.3.2 Fire Control;
  - 1.6.3.3 Flood Control;
  - 1.6.3.4 Hazardous Substance Control;
  - 1.6.3.5 Chemical, Biological, Radiological and Nuclear Defence; and
  - 1.6.3.6 Preservation of Life.

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Note: For Fire Control requirements, refer to Chapter 06 *Fire Safety*.

Note: For Hazardous substance Control requirements, refer to Division 2 Chapter 01 *General Requirement Rule 7 Hazardous Areas*.

Note: For Preservation of Life requirements, refer to Chapter 07 *Escape, Evacuation and Rescue*.

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## Rule 2. Post Damage Capability

### Functional Objective

- 2.1 In case of damage, the capability of essential safety functions and other defined services shall be maintained and/or recovered to a defined level to meet the OSI.
- 2.2 Ships shall be designed against internal and external physical threats in non-combat and combat operating environment through its survivability capabilities to meet the OSI.

### Performance Requirements

- 2.3 The credible threats, both non-combat and combat, both external and internal, the ship may encounter while meeting its OSI shall be identified and defined.
- 2.4 The Post Damage Capability expected of the ship shall meet the OSI, if any of the defined credible threats are realised.
- 2.5 Sufficient systems shall be provided following a damage incident to support safe abandonment when required.
- 2.6 Post Damage Capability shall be provided to the extent required by the OSI to enable embarked persons to remain on board in the event of an incident.

- 2.7 Where defined in the OSI, Post Damage Capability shall provide for the following functions following a defined damage type and extent:
- 2.7.1 Safety systems to support situational awareness and facilitate safe navigation and external communications;
  - 2.7.2 Safety Systems to contain the current damage and manage further incidents;
  - 2.7.3 Systems and arrangements to enable movement of people to safe locations and to support orderly evacuation and abandonment of the ship if the condition degrades and if there are further incidents;
  - 2.7.4 Structural strength having due regard of the post damage environmental conditions specified;
  - 2.7.5 Stability and Controllability appropriate for safe navigation;
  - 2.7.6 Propulsion to allow the ship to move to a safe haven within a suitable time based on the environmental conditions specified;
  - 2.7.7 Habitability systems and supplies to maintain support to life; and
  - 2.7.8 Maintain conditions for dangerous goods and embarked equipment such that they remain in a safe state.
- 2.8 A Damage Control Centre (DCC) shall be provided to ensure adequate management of the damage event and adequate operation, control, and monitoring of the remaining functions post damage.
- 2.9 Embarked persons shall be provided with suitable operator information for operation in the damaged state.

### Rule 3. Signature Reduction

#### Functional Objective

- 3.1 The ship shall be designed to reduce and maintain signatures to avoid detection by threats and their operators as specified in the OSI.

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Note: The ship design may consider signatures that include, but are not limited to those caused by Underwater Radiated Noise, Magnetic, Electromagnetic, Radar Cross Section, Heat, Airborne Noise and Visual.

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#### Performance Requirements

- 3.2 The ship's signatures shall be designed to minimise the likelihood of detection from threat operators.
- 3.3 The ship's signatures shall be designed to minimise the likelihood of detection from credible combat threats.
- 3.4 The ship's signatures shall be designed to enable effective operation of countermeasures.
- 3.5 All signature reduction systems shall be design, constructed and maintained to achieve overall effectiveness, as specified in the OSI.



**Rule 4. Zoning, Separation and Redundancy****Functional Objective**

- 4.1 The ship zoning shall be subdivided to reduce its vulnerability and maximise its recoverability from damage resulting from defined credible threats.
- 4.2 Ships critical systems and equipment shall be provided with redundancy systems that are separated sufficiently for autonomous zones of the ship to meet the OSI.

**Performance Requirements**

- 4.3 Sub-divided zones shall be aligned to watertight, fire, smoke, damage control, and citadel zones required by Chapter 03 *Buoyancy and Stability* and Chapter 06 *Fire Safety*.
- 4.4 The zoning, separation and redundancy of vital systems shall be determined from the level of Post Damage Capability required and protection of embarked persons.
- 4.5 The ship's electrical distribution systems shall be designed to isolate electrical power in any damaged zone.
- 4.6 At each sub-division bulkhead and/or deck, the ship shall include through structure connectors or openings to enable recoverability in any damaged zone without compromising the water, fire and smoke tight integrity of the zone boundary.
- 4.7 The ship shall be designed and equipped to enable the formation of control boundaries.
- 4.8 The ship shall be fitted with a damage control state marking system in every ship zone.

**Rule 5. Shock Hardening****Functional Objective**

- 5.1 The ship and its equipment shall be shock hardened against defined threats to the extent necessary to meet the OSI.

**Performance Requirements**

- 5.2 The severity of the shock loading to be used throughout the design and qualification process for the ship structure and its equipment shall be determined from the threats and stand-off assumptions in the OSI.
- 5.3 Shock and whipping loads on the hull's structure, appendages, and fittings are to be included in the hull structural design and calculations required by Chapter 02 *Structure*.
- 5.4 All equipment, systems and structure shall be shock qualified to post-damage capability required by the OSI, to include one or more of the following outcomes:
  - 5.4.1 To remain functional and safe after the maximum shock design level for the ship;
  - 5.4.2 To remain intact at the maximum shock design level for the ship; and
  - 5.4.3 To remain safe at the maximum shock design level for the ship.

**Rule 6. Blast Hardening****Functional Objective**

- 6.1 The ship and its equipment shall be blast hardened against defined threats according to the OSI.

**Performance Requirements**

- 6.2 The ship shall be blast hardened to resist internal and/or external blasts, to the extent necessary to meet the OSI.
- 6.3 The position and design of equipment mountings on blast affected surfaces shall minimise the peak accelerations incurred during a defined blast.
- 6.4 The ship's structure and fittings shall be designed to withstand blast damage sufficient to retain the post damage capabilities and personnel protection required by the OSI.

**Rule 7. Ballistic Protection****Functional Objective**

- 7.1 The ship shall be fitted with ballistic protection systems to retain capability and safe protection of embarked persons against the defined ballistic threats to the extent necessary to meet the OSI.

**Performance Requirements**

- 7.2 Ballistic protection systems designed to defeat projectile and fragment ballistic threats shall provide the required level of ballistic protection as specified in the OSI.
- 7.3 No evidence of the presence of ballistic protection systems shall be visible from outside the ship with the exception, if necessary, of protected stations and transparent armour.
- 7.4 Ballistic protection shall be installed in a way that does not compromise the ballistic performance of the armour.
- 7.5 The ballistic protection system shall be designed, manufactured, and maintained to retain its qualified ballistic protection level in all the environmental conditions in all Foreseeable Operating Conditions.
- 7.6 Ballistic protection systems shall consider the ballistic threat from realistic firing positions, the target to be protected, all layers of material in between firing position and target, and the ship's motions.
- 7.7 There shall be no localised areas of ballistic underperformance or ballistic leakage over the designated area.
- 7.8 Ballistic protection shall be located around capabilities and volumes that are deemed to be vital to the post damage capability of the ship.
- 7.9 Protected stations shall provide personnel with ballistic protection to crouch behind or stand behind against defined ballistic threats originating outboard from the ship.

**Rule 8. Incident Management****Functional Objective**

- 8.1 The ship shall be fitted with systems to maximise recoverability in the event of internal and external damage.
- 8.2 The ship shall be fitted with systems that provide the ability to be aware, manage and enable recovery of the damage situation in the event of damage resulting from internal and external threats.

**Performance Requirements**

- 8.3 The ship shall have an Incident Management System (IMS) to record command and control damage scenarios.
- 8.4 The IMS shall communicate or integrate with the ship's Integrated Control System (ICS) as specified by Chapter 04 Rule 31 *Integrated Control System*.
- 8.5 The IMS shall include systems that provide or assists with situational awareness.
- 8.6 The ship shall provide battle damage repair stations and command and control centres throughout the ship.
- 8.7 The ship systems shall be designed to operate in a number of modes, as required, including:
- 8.7.1 Automatic according to sensors and control systems;
  - 8.7.2 Remote manual operation from designated control stations;
  - 8.7.3 Local manual operation near the location of the system; and
  - 8.7.4 Battle override to operate outside of normal or safe working conditions.
- 8.8 The ship shall be designed and equipped to facilitate entry to the point of damage, isolations, connections and/or structural components.
- 8.9 The ship shall provide tools and equipment to reinstate or repair damaged elements to an acceptable condition.

**Rule 9. Flood Control****Functional Objective**

- 9.1 The ship shall be fitted with systems to:
- 9.1.1 Remove the accumulation of liquids as result of controlled and uncontrolled discharge from internal and external systems, through external openings above the waterline and floodwater leakage through an internal watertight boundary; and
  - 9.1.2 Control and remove liquids from compartments.
- 9.2 The ship is to be provided with a means of alerting control stations to the presence of flooding that may affect the essential safety or capability functions of the vessel.
- 9.3 The ship is to be provided with a means to prevent the hazardous accumulation of liquids on deck and in spaces within the watertight boundary.

- 9.4 The ship is to be provided with a means to remove routine accumulation of liquids from within the watertight boundary.
- 9.5 The ship is to be provided with a means to remove flood water from spaces within the watertight boundary.

#### Flooding Detection

- 9.6 The ship shall be fitted with a system to provide indication to a main control station, and other control stations or locally, as required by the Naval Administration, of discharges from internal systems and ingress due to loss of hull integrity that would have a detrimental effect on stability and essential safety functions or mission critical functions.
- 9.7 The system is also to provide information on the impact and degradation of essential safety functions.

#### Drainage

- 9.8 Adequate provision shall be made for the drainage of enclosed spaces, capable of operation in all foreseeable conditions.
- 9.9 All exposed decks shall be free draining.

#### Bilge

- 9.10 A system capable of routinely removing liquid from bilges as a result of minor system leakage, cleaning or maintenance procedures shall be provided.

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Note: Minor system leakage is considered to be leakages from system joints at a rate that does not affect system performance or alternatively minor weather ingress or the collection of condensation.

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- 9.11 The system shall have a capacity to remove the maximum level of liquid in the bilge in an appropriate time, to maintain an empty bilge.
- 9.12 The system shall prevent the discharge of oil or contaminated water to sea in normal operation.

#### Emergency Bilge

- 9.13 A system capable of removing the accumulation of flood water shall be provided. The system shall be sized on the greatest of the following scenarios:
- 9.13.1 Discharge of firefighting systems;
- 9.13.2 Largest foreseeable hull system failure;
- 9.13.3 Largest foreseeable internal system failure;
- 9.13.4 Leakage in an internal boundary retaining flood water; and
- 9.13.5 A minimum capacity as defined by the OSI.
- 9.14 The Emergency Bilge pumping system shall be capable of operation under all foreseeable operating conditions.
- 9.15 The system is to be rapidly operable from the Primary Control Station, all Damage Control Stations and a local dry location.
- 9.16 Indication of system operation shall be available at all control positions.

- 9.17 Redundancy shall be provided in each machinery space, located to provide suitable separation whilst being capable of operation in all foreseeable conditions.
- 9.18 The system shall facilitate indication of Emergency Bilge system performance.
- 9.19 A supplementary portable Emergency Bilge capacity is to be provided.
- 9.20 The ship's watertight boundaries considerations for damage scenarios shall supplement zoning requirements in Rule 4 *Zoning, Separation and Redundancy* to control and minimise flooding.
- 9.21 Controlled flooding capability shall be provided for underwater side protective systems, floodable voids, peak tanks and trim tanks.
- 9.22 The ship's ballast system shall be designed to enable rapid ballast or de-ballast of bulk fluid tanks to maintain stability during credible damage scenarios.

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Note: Refer to Chapter 03 *Buoyancy and Stability* for stability requirements

Note: Refer to Chapter 04 *Engineering Systems* for piping and pumping systems.

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## Rule 10. Chemical, Biological, Radiological and Nuclear Defence

### Functional Objective

- 10.1 The ship and its equipment shall be capable of surviving and operating in a Chemical, Biological, Radiological and Nuclear (CBRN) environment and provide defence against CBRN threats to the extent necessary as specified in the OSI.

### Performance Requirements

- 10.2 CBRN situational awareness shall be provided through an automatic detection system that can perform the following:
- 10.2.1 Sense CBRN agents and contaminants both external and internal to the ship;
- 10.2.2 Monitor CBRN agents and contaminants residual levels following a CBRN incident; and
- 10.2.3 Provide identification of the CBRN agent or contaminant.
- 10.3 The ships exposed surfaces and equipment shall be designed to prevent accumulation of contaminants and allow for ease of decontamination.
- 10.4 Collective Protection (COLPRO) shall be provided as a citadel to enclose part of the ship to isolate all personnel from external CBRN threats while retaining a level of ship's operating capability.
- 10.5 COLPRO shall include space to conduct self-aid for embarked person who were exposed to CBRN agents and have suffered CBRN contamination.
- 10.6 Measures shall be in place to prevent any potential CBRN threat from entering the citadel.
- 10.7 Cleansing Stations shall be provided for immediate decontamination of embarked persons at the entry point to the citadel.
- 10.8 The ship shall be designed with systems for the removal of CBRN agents and contamination.
- 10.9 The ship shall provide stowage internal and external of the ship's citadel for all relevant CBRN Individual Protective Equipment (IPE) and portable CBRN related equipment.

- 10.10 The ship shall be designed with consideration for operating equipment external to the citadel with CBRN IPE.
- 10.11 After being exposed to CBRN contaminants, the ship shall have the ability to undergo decontamination without the need for operator intervention.