



Queensland

# Transport Operations (Marine Safety—Designing and Building Commercial Ships and Fishing Ships) Standard 2006

Subordinate Legislation 2006 No. 17

made under the

*Transport Operations (Marine Safety) Act 1994*

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## **Part 1 Preliminary**

### **1 Short title**

This standard may be cited as the *Transport Operations (Marine Safety—Designing and Building Commercial Ships and Fishing Ships) Standard 2006*.

### **2 Commencement**

This standard commences on 1 March 2006.

### **3 Application of standard**

This standard applies to a ship that is a commercial ship or fishing ship.

### **4 Purpose of standard**

The purpose of this standard is to help people understand the general safety obligations imposed on them under part 4, division 1<sup>1</sup> of the Act.

## **Part 2 Interpretation**

### **5 Dictionary**

The dictionary in the schedule defines words used in this standard.

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<sup>1</sup> Part 4 (General safety obligations and standards), division 1 (General safety obligations) of the Act

## 6 Meaning of *relevant provision* of the USL code

- (1) For a commercial ship, a *relevant provision* of the USL code is a provision that—
  - (a) applies to a commercial vessel under the USL code of the same class as a commercial ship mentioned in schedule 2, part 1<sup>2</sup> of the regulation; and
  - (b) deals with a design matter.
- (2) For a fishing ship, a *relevant provision* of the USL code is a provision that—
  - (a) applies to a fishing vessel under the USL code of the same class as a fishing ship mentioned in schedule 2, part 2<sup>3</sup> of the regulation; and
  - (b) deals with a design matter.
- (3) Subsection (2)(a) applies whether or not the provision of the USL code refers to a commercial vessel or fishing vessel.

## 7 Meaning of *relevant provision* of the NSCV

- (1) For a commercial ship, a *relevant provision* of the NSCV is a provision that applies to a commercial vessel under the NSCV of the same class as a commercial ship mentioned in schedule 2, part 1 of the regulation and—
  - (a) sets out an outcome required by the NSCV for a design matter; or
  - (b) sets out a solution for an outcome mentioned in paragraph (a) and identifies it as a deemed to satisfy solution for the outcome.
- (2) For a fishing ship, a *relevant provision* of the NSCV is a provision that applies to a fishing vessel under the NSCV of the same class as a fishing ship mentioned in schedule 2, part 2 of the regulation and—

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2 Schedule 2 (Classes of ships), part 1 (Commercial ships) of the regulation

3 Schedule 2 (Classes of ships), part 2 (Fishing ships) of the regulation

- (a) sets out an outcome required by the NSCV for a design matter; or
  - (b) sets out a solution for an outcome mentioned in paragraph (a) and identifies it as a deemed to satisfy solution for the outcome.
- (3) Subsection (2)(a) applies whether or not the provision of the NSCV refers to a commercial vessel or fishing vessel.

## **8 Meaning of *relevant provision* of a rule**

A *relevant provision* of a rule means a provision of the rule that deals with a design matter.

# **Part 3 Designing relevant ships**

## **Division 1 Main purposes, and general provisions about required outcomes**

### **9 Main purposes of pt 3**

The main purposes of this part are—

- (a) to set out outcomes for designing relevant ships or parts of relevant ships; and
- (b) to provide ways to meet the outcomes.

### **10 Required outcomes**

- (1) A ship designer should design a relevant ship so the design meets the required outcomes for designing a relevant ship of that type.

- (2) A ship designer should design a part of a relevant ship so the design meets the required outcomes for designing a part of that type of a relevant ship.
- (3) The required outcomes are—
  - (a) the outcomes set out in division 2 for the design matters;  
or
  - (b) the relevant provisions of the NSCV that set out outcomes for design matters.

## 11 **Ways to meet required outcome**

- (1) A required outcome may be met—
  - (a) by applying prescriptive solutions (the *prescriptive approach*); or
  - (b) by applying performance based solutions (the *performance based approach*).
- (2) If a ship designer chooses the prescriptive approach to meet a particular required outcome, the outcome should be met only in this way.
- (3) If a ship designer chooses the performance based approach to meet a particular required outcome, the outcome should be met only in this way.
- (4) A ship designer may choose the performance based approach to meet a required outcome only if the ship designer verifies and documents, as set out in division 4, that the design of the relevant ship meets the outcome.
- (5) Regardless of the approach, the *Electrical Safety Act 2002* must be complied with as mentioned in section 34.

## Division 2                      Design matters and required outcomes for the design matters

### 12      Stress

- (1) The calculated stress in a machinery component or structural member of a relevant ship should be not more than the maximum permissible stress value.
- (2) For subsection (1), the maximum permissible stress value is calculated by applying an adequate safety factor to the minimum guaranteed mechanical properties of the material used in the component or member.
- (3) In this section—  
*structural member*, of a relevant ship, includes a frame, shell and other component forming part of the ship's structure.

### 13      Components

The components of a relevant ship contributing to the structural strength of the ship should resist deformation from possible water pressure generated by the static and dynamic forces of the sea in anticipated weather conditions in the intended operational area for the ship.

### 14      Structure

The structure of a relevant ship should—

- (a) resist deformation from—
  - (i) impulse forces generated by engines and propellers; and
  - (ii) operation in anticipated weather conditions in the intended operational area for the ship; and
- (b) withstand structural failure from operation in anticipated weather conditions in the intended operational area for the ship.



## **15 Machinery**

The machinery of a relevant ship should—

- (a) be adequate for its intended purpose; and
- (b) be of adequate strength and endurance to operate reliably in anticipated weather conditions in the intended operational area for the ship.

## **16 Vision and access components**

The vision and access components fitted to a relevant ship should be of adequate strength to stop water entering the ship through the components in anticipated weather conditions in the intended operational area for the ship.

## **17 Protection from injury and comfort**

The structure and accommodation of a relevant ship should provide protection from injury and reasonable comfort to each person on board in anticipated weather conditions in the intended operational area for the ship.

## **18 Fire protection**

- (1) The design of a relevant ship should provide for protection from fire hazards having regard to the following—
  - (a) the accessibility and ease of operation, in case of fire, of the ship's main controls and safety systems;
  - (b) the design of machinery should minimise risk of fire from a malfunction of the machinery;
  - (c) the division of passenger accommodation areas in a way that, in case of fire, the occupants of a compartment can escape to an alternative compartment or safe area;
  - (d) the subdivision of the ship by fire-resistant boundaries;
  - (e) the restricted use of combustible materials, and materials generating smoke and toxic gases in a fire;

- (f) the continuous detection of fire and its containment and extinguishment in the space of origin;
- (g) the immediate availability of, and access to, fire extinguishing appliances;
- (h) the protection, in case of fire, of the means of escape from a fire.

(2) In this section—

***main controls*** include controls for propulsion and steering systems.

***safety systems*** include fire detection systems and fire control systems.

*Examples of safety systems—*

smoke detectors, fire extinguishing systems

## 19 **Steering system**

The steering system of a relevant ship should—

- (a) be appropriate to steer the ship in anticipated weather conditions; and
- (b) include another way of steering the ship if the main steering system fails.

## 20 **Bilge pumping system**

The bilge pumping system of a relevant ship should—

- (a) be capable of removing from the ship an accumulation of water affecting the ship's safe operation; and
- (b) enable stability of the ship to be achieved or maintained under reasonable conditions of list and trim.

## 21 **Buoyancy and stability**

- (1) The form and structure of a relevant ship should provide an adequate reserve of intact buoyancy and stability in anticipated loading conditions to prevent the ship from

capsizing in anticipated weather conditions in the intended operational area for the ship.

- (2) The form and structure of a relevant ship that is a class 1 commercial ship should provide an adequate reserve of intact buoyancy and stability in anticipated loading conditions necessary to maintain the safety of passengers and crew in anticipated weather conditions in the intended operational area for the ship.

## **22 Subdivision**

The form and structure of a class 1 commercial ship should provide an adequate reserve of intact stability in anticipated weather conditions in the intended operational area for the ship if the ship is damaged to the extent that any single compartment is open to the sea.

## **Division 3 Prescriptive approach**

### **23 Application of div 3**

This division applies if a ship designer chooses the prescriptive approach as the way to meet a required outcome.

### **24 Prescriptive solutions for meeting required outcomes under div 2 for design matter**

- (1) The ship designer may meet a required outcome under division 2 for a design matter by complying with—
  - (a) 1 of the prescriptive solutions mentioned in the schedule, definition *prescriptive solution*, paragraph (a), (b) or (c); or
  - (b) a combination of 2 or more of the prescriptive solutions mentioned in the schedule, definition *prescriptive solution*, paragraphs (a), (b) and (c).

- (2) However, for designing a part of a relevant ship, the ship designer may meet a required outcome under division 2 for a design matter only by complying with subsection (1)(a).

## **25 Prescriptive solutions for meeting required outcomes under NSCV**

The ship designer may meet a required outcome under the relevant provisions of the NSCV for a design matter, as mentioned in section 10(3)(b), by applying a solution stated in the NSCV for the outcome and identified in it as a deemed to satisfy solution.

## **Division 4 Performance based approach**

### **26 Application of div 4**

This division applies if a ship designer chooses the performance based approach as the way to meet a required outcome.

### **27 Verifying performance based solutions**

A ship designer should verify a performance based solution meets a required outcome with evidence that the use of a design, material or form of construction—

- (a) is at least equivalent to a prescriptive solution; or
- (b) otherwise meets the outcome.

### **28 Methods of verifying performance based solutions**

A ship designer should use at least 1 of the following methods to verify a performance based solution meets a required outcome—

- (a) calculation;
- (b) testing;

- (c) risk analysis;
- (d) expert opinion.

## **29 Calculation**

Calculating design loads for a ship for the intended operational area for the ship should—

- (a) take into account foreseeable static and dynamic forces that may be induced by the sea, weather, motion and stowed or wheeled cargo; and
- (b) include structural calculations that demonstrate the adequacy of the structural design to meet the design loads.

## **30 Testing**

Testing should—

- (a) take into account foreseeable static and dynamic forces that may be induced by the sea, weather, motion and stowed or wheeled cargo; and
- (b) demonstrate the structure of a ship is adequate and suitable for the design of the ship for the intended operational area for the ship.

## **31 Risk analysis**

Risk analysis should demonstrate the application of an appropriate risk management process, including—

- (a) hazard identification; and
- (b) risk assessment; and
- (c) measures to eliminate the risk or control the risk to an acceptable level.

*Examples of an appropriate risk management process—*

- AS/NZS 4360

- NSCV, part B, annex B and annex C
- a safety case

## **32 Documenting methods of verifying performance based solutions**

- (1) Documents detailing the methods of verifying a performance based solution meets a required outcome should include—
  - (a) detailed information demonstrating the performance based solution—
    - (i) is at least equivalent to a prescriptive solution; or
    - (ii) otherwise meets the outcome; and
  - (b) a statement that the performance based solution meets the outcome.
- (2) For subsection (1)(a), information includes the following—
  - (a) information about the outcome to be met by the performance based solution;
  - (b) if the information is information for subsection (1)(a)(i)—information about the prescriptive solution;  
*Example of information for paragraph (b)—*  
NSCV, part B, annex D
  - (c) the methods used to verify the performance based solution meets the outcome;
  - (d) information under section 33 about the methods used to verify the performance based solution meets the outcome;
  - (e) a certificate or other document verifying a performance based solution meets an industry standard;  
*Example of an industry standard—*  
AS/NZS 4360
  - (f) a certificate or other document issued by—
    - (i) a classification society; or

- (ii) an entity verifying a performance based solution meets an industry standard;
- (g) other information the ship designer relied on to verify a performance based solution meets the outcome.

### **33 Information about methods used to verify required outcome**

For section 32(2)(d), information includes the following—

- (a) if the method used to verify the performance based solution meets the outcome is calculation—
  - (i) the calculations and results of the calculations; and
  - (ii) how the results of the calculations demonstrate the performance based solution meets the outcome;
- (b) if the method used to verify the performance based solution meets the outcome is testing—
  - (i) the testing procedure and results of the testing; and
  - (ii) how the results demonstrate the performance based solution meets the outcome;
- (c) if the method used to verify the performance based solution meets the outcome is risk analysis—
  - (i) the risk management process, including—
    - (A) hazard identification; and
    - (B) risk assessment; and
    - (C) measures to eliminate the risk or control the risk to an acceptable level; and
  - (ii) the results of the risk analysis; and
  - (iii) how the results demonstrate the performance based solution meets the outcome;
- (d) if the method used to verify the performance based solution meets the outcome is an expert opinion—
  - (i) the training, study or experience on which the expert's specialised knowledge is based; and

- (ii) a statement about whether the performance based solution meets the outcome; and
- (iii) if the performance based solution meets the outcome—a statement about how the performance based solution meets the outcome; and
- (iv) the extent to which the expert opinion was relied on.

## **Division 5                      Compliance with Electrical Safety Act 2002 regardless of approach**

### **34            Electrical equipment and electrical installations**

- (1) When designing a relevant ship, a ship designer should ensure all electrical equipment and electrical installations on the ship are designed in compliance with the *Electrical Safety Act 2002*.
- (2) In this section—  
*electrical equipment* see the *Electrical Safety Act 2002*, section 14.<sup>4</sup>  
*electrical installation* see the *Electrical Safety Act 2002*, section 15.<sup>5</sup>

## **Part 4                              Building relevant ships**

### **35            Electrical work**

- (1) When building a relevant ship, a ship builder should ensure electrical work on the ship is performed in compliance with the *Electrical Safety Act 2002*.

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4    *Electrical Safety Act 2002*, section 14 (Meaning of *electrical equipment*)

5    *Electrical Safety Act 2002*, section 15 (Meaning of *electrical installation*)



(2) In this section—

*electrical work* see the *Electrical Safety Act 2002*, section 18.<sup>6</sup>

### **36 Employees of ship builders**

(1) When building a relevant ship, a ship builder should ensure the builder's employees are appropriately qualified to do, and sufficiently trained in, work involved in building the ship.

(2) Without limiting subsection (1), welders working on aluminium ships should have the qualifications stated in AS/NZS 1665:2004.<sup>7</sup>

### **37 Hull identification number (HIN)**

(1) When building a relevant ship, a ship builder should provide a HIN as a means of identifying the ship.

(2) In this section—

*HIN* means a hull identification number.

### **38 Ship building facilities and practice**

(1) A ship builder should build a relevant ship with equipment, and in premises, appropriate for the ship being built.

(2) Without limiting subsection (1)—

(a) if a relevant ship is built from aluminium—a ship builder should build the ship in premises conforming with AS 4132.2-1993;<sup>8</sup> or

(b) if a relevant ship is built from fibre reinforced plastic—a ship builder should build the ship in premises conforming with AS 4132.3-1993.<sup>9</sup>

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6 *Electrical Safety Act 2002*, section 18 (Meaning of *electrical work*)

7 AS/NZS 1665:2004 (Welding of aluminium structures)

8 AS 4132.2-1993 (Boat and ship design and construction - Aluminium construction)

9 AS 4132.3-1993 (Boat and ship design and construction - Fibre-reinforced plastics construction)

### **39 Design and specifications**

A ship builder should build a relevant ship in accordance with the design of, and specifications for, the ship.

### **40 Identified hazards or risks**

- (1) This section applies if, when building a relevant ship, a ship builder identifies a hazard or risk arising from the design of the ship that may affect the health or safety of a person.
- (2) The ship builder should—
  - (a) consult the ship designer to ensure the ship designer assesses the hazard or risk; and
  - (b) after the consultation, take necessary measures to eliminate or control the hazard or risk.

## **Part 5 Repeal and references to former standards**

### **41 Repeal**

The Transport Operations (Marine Safety—Designing and Building Commercial Ships and Fishing Ships) Interim Standard (No. 2) 2005 SL No. 180 is repealed.

### **42 References to former standards**

- (1) In a document or instrument, a reference to the following standards may, if the context permits, be taken to be a reference to this standard—
  - *Transport Operations (Marine Safety—Designing and Building Commercial and Fishing Ships) Standard 1998*
  - *Transport Operations (Marine Safety—Designing and Building Commercial Ships and Fishing Ships) Interim Standard 2005*

- *Transport Operations (Marine Safety—Designing and Building Commercial Ships and Fishing Ships) Interim Standard (No. 2) 2005.*
- (2) Subsection (1) does not limit the application of the *Acts Interpretation Act 1954*, section 14H.<sup>10</sup>

## Part 6 **Amendment of Transport Operations (Marine Safety—Hire and Drive Ships) Standard 2000**

### 43 **Standard amended in pt 6**

This part amends the *Transport Operations (Marine Safety—Hire and Drive Ships) Standard 2000*.

### 44 **Amendment of schedule (Dictionary)**

- (1) Schedule, definitions *commercial ship* and *positive flotation*, ‘schedule 11’—  
*omit, insert—*  
‘schedule 15’.
- (2) Schedule, definition *Marine Safety Regulation*, ‘1999’—  
*omit, insert—*  
‘2004’.

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<sup>10</sup> *Acts Interpretation Act 1954*, section 14H (References taken to be included in reference to law)

## Schedule Dictionary

### section 5

***class 1 commercial ship*** means a commercial ship that is a class 1 passenger ship under the USL code.

***classification society*** see schedule 15<sup>11</sup> of the regulation.

***commercial ship*** see schedule 15 of the regulation.

***design matter*** means a matter that is the subject of, and is dealt with in, sections 12 to 22 but does not include the outcome stated in the relevant section for the matter.

***expert opinion*** means an opinion requiring specialised knowledge based on training, study or experience.

***fishing ship*** see schedule 15 of the regulation.

***machinery*** includes propulsion and associated systems.

***NSCV*** means the National Standard for Commercial Vessels endorsed by the Australian Transport Council and published by the National Marine Safety Committee.<sup>12</sup>

***part of a relevant ship*** means the hull, superstructure, load line, electrical systems or machinery of a relevant ship.

***performance based approach*** see section 11(1)(b).

***performance based solution*** means a solution that—

- (a) meets a required outcome in a way at least equivalent to, but different from, a prescriptive solution; and
- (b) is verified to meet the outcome.

***prescriptive approach*** see section 11(1)(a).

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11 Schedule 15 (Dictionary) of the regulation

12 A copy of the NSCV is available from the National Marine Safety Committee, PO Box 1773, Rozelle NSW 2039, or from its website at <[www.nmsc.gov.au](http://www.nmsc.gov.au)>.

### Schedule (continued)

***prescriptive solution*** means a solution for a required outcome that complies with—

- (a) the relevant provisions of the USL code; or
- (b) the relevant provisions of the NSCV mentioned in section 7(1)(b) or (2)(b); or
- (c) the relevant provisions of a rule; or
- (d) a combination of 2 or more of the prescriptive solutions mentioned in paragraphs (a) to (c).

***regulation*** means the *Transport Operations (Marine Safety) Regulation 2004*.

***relevant provision***—

- (a) of a rule, see section 8; or
- (b) of the NSCV, see section 7; or
- (c) of the USL code, see section 6.

***relevant ship*** means a commercial ship or fishing ship.

***required outcome*** means either of the following in relation to designing a relevant ship or part of a relevant ship—

- (a) an outcome stated in part 3, division 2 for a design matter;
- (b) an outcome required by the NSCV for a design matter.

***rule*** includes a non-statutory code, regulation or standard issued by a classification society or other entity that specifies rules for ships.

***ship builder*** means a person who builds a relevant ship or part of a relevant ship.

### Schedule (continued)

***ship designer*** means a person who designs a relevant ship or part of a relevant ship.

***USL code*** see schedule 15 of the regulation.<sup>13</sup>

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### ENDNOTES

- 1 Made by the general manager on 11 January 2006.
- 2 Approved by the Governor in Council on 23 February 2006.
- 3 Notified in the gazette on 24 February 2006.
- 4 Laid before the Legislative Assembly on . . .
- 5 The administering agency is the Department of Transport.

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<sup>13</sup> A copy of the USL code is available from the National Marine Safety Committee, PO Box 1773, Rozelle NSW 2039, or from its website at <[www.nmsc.gov.au](http://www.nmsc.gov.au)>.