



Queensland

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

Explanatory Notes for SL 2006 No. 17

made under the

Transport Operations (Marine Safety) Act 1994

1 General Outline

The *Transport Operations (Marine Safety – Designing and Building Commercial Ships and Fishing Ships) Standard 2006* sets out a process by which Maritime Safety Queensland (MSQ) establishes the criteria to be applied by ship designers and ship builders in the designing and building of commercial ships and fishing ships referred to in the standard as "*relevant ships*".

2 Short Title

The short title of the proposed standard is the *Transport Operations (Marine Safety – Designing and Building Commercial Ships and Fishing Ships) Standard 2006*.

3 Authorising Law

The power to make the proposed standard, and the required procedure, is set out in part 4 division 2 of the *Transport Operations (Marine Safety) Act*

1994. A standard may provide for any matter about which a regulation may be made, and a regulation may be made about marine safety and issues affecting marine safety.

4 Policy Objectives

The objective of establishing standards as provided for in the Act is to ensure that ships are designed and built in a way that maintains safety, but gives ship designers and ship builders the opportunity to devise programs of design or building that best suit their circumstances and the circumstances of their clients, and reduce the need for day-to-day oversight.

It is in the interests of the marine industry, the general public, and the accredited ship designers and ship builders themselves, that the requirements should be based on fair, relevant, and publicly accessible criteria.

The policy objective envisaged in making the standard is to continue to provide such criteria in a standard while providing a more contemporary standard for the designing and building of ships that achieves an appropriate balance between safety and costs.

5 How Standard will achieve the Policy Objectives

The operative parts of the proposed standard prescribe that a ship designer or ship builder must design and build ships in a way that achieves the required outcomes for safety regardless of whether a prescriptive or performance based approach is adopted.

6 Alternative ways of achieving Policy Objectives

The policy objective of providing fair, relevant, and publicly accessible criteria for the design and building of ships could be achieved by amending the regulation to embody the requirements, but there seems little justification for the regulatory amendment this would require. The preferred option is to make the proposed standard as a stand-alone reference point for ship design and building.

7 Consistency of the Standard with the Policy Objectives of the Authorising Law

The proposed standard is consistent with the overall objectives outlined in section (3) (1) of the Act and contributes to the provision of a system that achieves an appropriate balance between:

- regulating the maritime industry to ensure maritime safety; and
- enabling the effectiveness and efficiency of the Queensland maritime industry to be further developed.

8 Consistency with Other Legislation

The proposed standard is part of a broader framework of state and federal maritime safety law. Consistency with Commonwealth maritime legislation and the legislative provisions of the other Australian states and territories is being achieved through the coordinated development and adoption of uniform national marine safety legislation.

9 Benefits and Costs of Standard

The primary benefit of the proposed standard will be to continue to provide an accessible and flexible guide to ship designing and building standards for accredited persons under the Act, and for other sectors of the marine industry who apply for Design Approval Certificates or Certificates of Survey from MSQ.

The standard contributes to the move towards uniform national standards by allowing ship designers to meet the required outcomes of the National Standard for Commercial Vessels, and clarifies the procedures for verifying and documenting performance based solutions for required outcomes.

Notes on Sections

Part 1 Preliminary

Short title

Section 1 - sets out the short title of the Standard

Commencement

Section 2 - provides for the Standard to commence on 1 March 2006

Application of standard

Section 3 - states that the standard applies to a commercial ship or fishing ship.

Purpose of standard

Section 4 – states that the purpose of the standard is to help people understand the general safety obligations imposed on them under part 4, division 1 of the Act.

Part 2 Interpretation

Dictionary

Section 5 – refers to the dictionary defining certain words located in the schedule to the standard.

Meaning of *relevant provision of the USL code*

Section 6 – identifies the provisions of the Uniform Shipping Laws (USL) code with which a ship designer should comply when using the USL code

in applying a prescriptive approach to meeting a required outcome as set out in part 3 division 2 of the standard.

As fishing vessels are a type of commercial vessel under the USL code, while fishing ships and commercial ships are distinct types of ship under the *Transport Operations (Marine Safety) Regulation 2004*, subsection 6(3) makes it clear that a reference in the USL code to a commercial vessel may sometimes include a fishing ship under the regulation.

Meaning of *relevant provision of the NSCV*

Section 7 – identifies the provisions of the National Standard for Commercial Vessels (NSCV) which set out required outcomes that may be used as an alternative to the required outcomes set out in the standard; and identifies the provisions of the NSCV with which a ship designer should comply when applying a prescriptive approach to meeting an NSCV required outcome.

Meaning of *relevant provision of a rule*

Section 8 – identifies the provisions of rules set by classification societies with which a ship designer should comply when using rules in applying a prescriptive approach to meeting a required outcome as set out in part 3 division 2 of the standard.

Part 3 Designing relevant ships

Division 1 Main purposes, and general provisions about required outcomes

Main purposes of pt 3

Section 9 – states the purposes of the part are to set out the required outcomes for designing a relevant ship and to provide ways to meet the outcomes.

Required outcomes

Section 10 – provides that a ship designer should design a relevant ship or part of a relevant ship to meet the outcomes required by part 3 division 2 of the standard or the outcomes required by the NSCV.

Ways to meet required outcome

Section 11 – sets out the two approaches to meeting required outcomes. A required outcome may be met by applying either prescriptive solutions (the prescriptive approach) or performance based solutions (the performance based approach). If the ship designer chooses the prescriptive approach to meet a particular required outcome, the outcome should be met only in this way. If a performance based approach is taken to meet a particular required outcome, the outcome should be met only in this way.

If a performance based approach is chosen to meet a required outcome the ship designer must verify and document that the design of the relevant ship meets the outcome, as set out in part 3 division 4 of the standard.

Regardless of the approach chosen, the provisions of the *Electrical Safety Act 2002* must be complied with.

Division 2 Design matters and required outcomes for the design matters

Stress

Section 12 – deals with stress (the design matter) and provides that the required outcome for this design matter is that calculated stress in a machinery component or structural member should not be more than the maximum permissible stress value. This is calculated by applying an adequate safety factor to the minimum guaranteed mechanical properties of the material used in the component or member. A *structural member* of a relevant ship is defined in the section as the frame, shell, or other component of the structure of the ship.

Components

Section 13 – deals with components and provides that the required outcome for this design matter is that 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.

Structure

Section 14 – deals with structure and provides that the required outcome for this design matter is that the structure of the relevant ship should resist deformation from either impulse forces generated by engines and propellers or operation in anticipated weather conditions in the ship's intended operational area; and the structure should withstand structural failure from operation in anticipated weather conditions in the ship's intended operational area.

Machinery

Section 15 – deals with machinery and provides that the required outcome for this design matter is that the machinery of a relevant ship should be adequate for its intended purpose and be of adequate strength and endurance to operate reliably in anticipated weather conditions in the intended operational area for the ship.

Vision and access components

Section 16 – deals with vision and access components and provides that the required outcome for these design matters is that 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.

Protection from injury and comfort

Section 17 – deals with protection from injury and comfort and provides that the required outcome for these design matters is that 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.

Fire protection

Section 18 – deals with fire protection and provides that the required outcome for this design matter is that the design of a relevant ship should provide for protection from fire hazards having regard to –

- the accessibility and ease of operation, in case of fire, of the ship's main controls (such as steering and propulsion) and safety systems (such as fire detection and fire control systems);
- the design of machinery should minimise the risk of fire from a malfunction of the machinery;
- the division of passenger accommodation areas in a way that, in the case of fire, the occupants of a compartment can escape to an alternative compartment or safe area;
- subdivision of the ship by fire-resistant boundaries;
- restricted use of combustible materials, and materials generating smoke and toxic gases in a fire;
- the continuous detection of fire and its containment and extinguishment in the space of origin;
- immediate availability of, and access to, fire extinguishing appliances;
- protection in case of fire, of the means of escape from a fire.

Steering system

Section 19 – deals with the steering system and provides that the required outcome for this design matter is that the steering system of a relevant ship should be appropriate to steer the ship in anticipated weather conditions and should include another way of steering the ship if the main system fails.

Bilge pumping system

Section 20 – deals with the bilge pumping system and provides that the required outcome for this design matter is that that the bilge pumping

system should be capable of removing an accumulation of water from the ship to maintain safe operation and ensure stability of the ship is achieved or maintained under reasonable conditions of list or trim.

Buoyancy and stability

Section 21 – deals with buoyancy and stability and provides that the required outcome for this design matter is that 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; and
- if the relevant ship is a class 1 commercial ship, 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.

Subdivision

Section 22 – deals with subdivision and provides that the required outcome for this design matter is that the form and structure of a relevant ship that is a class 1 commercial ship that has been damaged to the extent that any single compartment of the ship is open to the sea should provide an adequate reserve of intact stability in anticipated weather conditions in the intended operational area for the ship.

Division 3 Prescriptive approach

Application of div 3

Section 23 – states that the division applies if the ship designer chooses the prescriptive approach as the way to meet a required outcome.

Prescriptive solutions for meeting required outcomes under div 2 for design matter

Section 24 – provides that a ship designer may meet a required outcome under division 2 for designing a relevant ship by complying with 1 of the prescriptive solutions or a combination of 2 or more of the prescriptive solutions that are mentioned in the stated paragraphs of the schedule definition of *prescriptive solution*. This means complying with –

- the relevant provisions of the USL code; or
- the relevant provisions of the NSCV that set out deemed to satisfy solutions; or
- the relevant provisions of a rule; or
- a combination of 2 or more of these prescriptive solutions.

However, a combination of prescriptive solutions may not be used for designing a part of a ship.

Prescriptive solutions for meeting required outcomes under NSCV

Section 25 – provides that a ship designer may meet a required outcome under the NSCV for designing a relevant ship or part of a relevant ship by complying with the relevant provisions of the NSCV that set out deemed to satisfy solutions.

Division 4 Performance based approach

Application of div 4

Section 26 – states that the division applies if a ship designer chooses the performance based approach as the way to meet a required outcome.

Verifying performance based solutions

Section 27 – requires a ship designer using a performance based solution to verify that it meets a required outcome with evidence that the use of a design, material or form of construction is at least equivalent to a prescriptive solution, or otherwise meets the outcome.

Methods of verifying performance based solutions

Section 28 – sets out the methods for verifying that a performance based solution meets a required outcome. A ship designer should use at least one of the following –

- calculation;
- testing;
- risk analysis;
- expert opinion

Calculation

Section 29 – provides that calculating design loads for a ship for the intended operational area for the ship should take into account foreseeable static and dynamic forces that may be induced by the sea, weather, motion and stowed or wheeled cargo and include structural calculations that demonstrate the adequacy of the structural design to meet the design loads.

Testing

Section 30 – provides that testing should take into account foreseeable static and dynamic forces that may be induced by the sea, weather, motion and stowed or wheeled cargo and demonstrate the structure of a ship is adequate and suitable for the design of the ship for the intended operational area for the ship.

Risk analysis

Section 31 – provides that risk analysis should demonstrate the application of an appropriate risk management process which includes hazard identification, risk assessment, and the measures to eliminate the risk or control it to an acceptable level. Appropriate risk management processes may follow Australian Standard AS/NZS 4360, or NSCV part B, annex B and annex C, of the application of an appropriate safety case.

Documenting methods of verifying performance based solutions

Section 32 – requires that documents detailing the methods of verifying that performance based solutions meet required outcomes should include

- detailed information demonstrating that the performance based solution is at least equivalent to a prescriptive solution, or how it otherwise meets the outcome; and
- a statement that the performance based solution meets the outcome.

The information referred to includes –

- information about the outcome to be met
- information about any prescriptive solution to which the performance based solution is equivalent
- the methods used to verify that the performance based solution meets the outcome
- the information required under section 33 about the methods used to verify the performance based solution
- a certificate or other document verifying that the performance based solution meets an industry standard
- a certificate or other document issued by an entity (such as a classification society) verifying that the performance based solution meets an industry standard
- other information the ship designer relied upon to verify that the performance based solution meets the outcome.

Information about methods used to verify required outcome

Section 33 – requires, for the purposes of section 32, the following information about the method used to verify a performance based solution:

- for calculations: the calculations and the results of the calculations including how the results of the calculations demonstrate that the performance based solution meets the outcome
- for testing: the testing procedure and the results of the testing and how those results demonstrate that the performance based solution meets the outcome

- for risk analysis: the risk management process (including hazard identification, risk assessment, and measures to eliminate the risk or control it to an acceptable level), the results of the risk analysis, and how the results demonstrate that the performance based solution meets the outcome
- for expert opinion: the training, study or experience on which the expert's specialised knowledge is based, a statement about whether the performance based solution meets the outcome, and how it meets the outcome, and the extent to which the expert opinion was relied on.

Division 5 Compliance with Electrical Safety Act 2002 regardless of approach

Electrical equipment and electrical installations

Section 34 – states that when designing a relevant ship, a ship designer should ensure that all electrical equipment and electrical installations are designed in compliance with the *Electrical Safety Act 2002*.

Part 4 Building relevant ships

Electrical work

Section 35 – states that 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*.

Employees of ship builders

Section 36 – provides that when building a relevant ship, a ship builder should ensure that the builder's employees are appropriately qualified to do, and sufficiently trained in, work involved in building the ship. Welders working on aluminium ships should have the qualifications stated in AS/NZS 1665:2004, the Australian Standard which deals with welding of aluminium structures.

Hull identification number (HIN)

Section 37 – provides that when building a relevant ship, the ship builder should provide a hull identification number (HIN) as a means of identifying the ship.

Ship building facilities and practice

Section 38 – provides that a ship builder should build a relevant ship with equipment, and in premises, appropriate for the ship being built. If the relevant ship is built of aluminium the premises should conform to Australian Standard AS4132.2-1993. If the ship is built from fibre reinforced plastic the premises should conform to Australian Standard AS4132.3-1993.

Design and specifications

Section 39 – provides that a ship builder should build a ship in accordance with the design of, and specifications for, the ship.

Identified hazards or risks

Section 40 – 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. The ship builder should consult the designer to ensure the hazard or risk is assessed, and then take any necessary measures to control or eliminate the hazard or risk.

Part 5 Repeal and references to former standards

Repeal

Section 41 – repeals the *Transport Operations (Marine Safety – Designing and building Commercial Ships and Fishing Ships) Interim Standard (No.2) 2005 SL No. 180*.

References to former standards

Section 42 – states that a reference in any document or instrument to any of the following standards, may, if the context permits, to be taken to be a reference to the standard –

- *The Transport Operations (Marine Safety – Designing and Building Commercial and Fishing Ships) Standard 1998*
- *The Transport Operations (Marine Safety – Designing and Building Commercial Ships and Fishing Ships) Interim Standard 2005*
- *The Transport Operations (Marine Safety – Designing and Building Commercial Ships and Fishing Ships) Interim Standard (No.2) 2005*

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

Standard amended in pt 6

Section 43 – states that this part amends the *Transport Operations (Marine Safety – Hire and Drive Ships) Standard 2000*.

Amendment of schedule (Dictionary)

Section 44 – amends references to the regulation in the schedule, dictionary of that standard.

Schedule Dictionary

The schedule contains the definitions of terms and phrases used consistently throughout the standard.

ENDNOTES

- 1 Laid before the Legislative Assembly on . . .
- 2 The administering agency is the Department of Transport.