



SERVICE SPECIFICATION

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Naval technical assurance

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FOREWORD

DNV service specifications contain procedural requirements for obtaining and retaining certificates and other conformity statements to the objects, personnel, organisations and/or operations in question.

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CHANGES – CURRENT

This is a new document.

<i>Topic</i>	<i>Reference</i>	<i>Description</i>
Rebranding to DNV, cross-references	All	Some of the documents referred to may not yet have been rebranded. If so, please see the relevant DNV GL document.

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SECTION 1 GENERAL

1.1 Introduction

Naval vessels are capital intensive and complex equipment, subject to ever-changing demands due to shifts in threats and national interests. Public demand is also increasing for control and reduction of costs and control of the safety of the persons on board and of the impact of vessel operation on the environment.

At the same time, a navy often faces challenges when manning long development and manufacturing projects and maintaining and upgrading vessels. A further complication is that the markets for naval equipment are often not as deep and wide as those for commercial ship building.

To alleviate some of these challenges, navies are to an increasing degree applying some of the work processes applied to the merchant fleet, notably classification. The classification of merchant vessels has been developed over more than 150 years while it has been developed and applied to naval ships for the last 40 years.

DNV's services to all customers build on extensive experience and knowledge of naval vessels and classification and statutory services for the merchant fleet as regulated by SOLAS. However, there are some significant differences between the regulation of merchant vessels and of naval vessels. These differences are summarized in [Table 1-1](#).

Table 1-1 Regulation differences

<i>Merchant vessels</i>	<i>Naval vessels</i>
A merchant vessel is the subject of regulation by an independent administration by statute.	A naval vessel is not subject to regulation by an independent administration. Other arrangements apply - national legislation.
For merchant vessels there is one regulatory process - SOLAS	Each navy has its own convention.
An owner of a merchant vessel will build a vessel that is SOLAS compliant.	A navy will build the vessel they want based on national defence interest and requirements.
For a merchant vessel, the regulations assure a given property of the vessel - a level of material safety (implicitly).	For a navy, adequate control of process may alternatively be the objective - not to ensure a given property.
For an owner of a merchant vessel, the format and scope of the compliance documentation shall comply with SOLAS requirements.	A navy has other objectives with regard to the format and scope of compliance documentation.
For a merchant vessel, the application of class is mandatory (required by SOLAS).	For a naval vessel, the application of class is voluntary.

Classification, in the conventional sense, is an important contributor to the assurance process of naval vessels. However, as is evident from [Table 1-1](#), the assurance process often needs to be adapted to navy-specific needs and the environment within which they are operating. A navy must serve the security interest of its nation and therefore cannot always be the subject to a regime developed for merchant vessels. This calls for assurance processes that are more diversified and have a wider scope. Therefore, naval technical assurance is provided as an alternative and generic approach to the navy's own assurance process. Both naval technical assurance services and classification services from DNV are powerful tools for naval vessels that depend on the navy's own regulatory system and the nature of the vessel in question.

Apart from addressing technical needs, naval technical assurance has also been developed to support a wide range of regulatory approaches:

- national legislation prescribing clear safety objectives and/or regulatory systems

- detailed naval proprietary regulatory systems, in some cases combining this with a clear safety objective
- regulatory systems applying the ANEP-77 Naval Ship Code.

1.2 Objective

The objective of this document is to provide a flexible verification and certification process for naval vessels and serve as the basis for naval technical assurance services offered by DNV as an alternative to DNV classification services.

1.3 Scope

This document describes the naval technical assurance process for the concept stage, the newbuilding stage and the operational stage of a naval vessel. It includes establishing a standards plan and a verification process that:

- builds on and incorporates state-of-the-art assurance regimes and methods with a proven track record for material assurance and safety.
- gives external stakeholders confidence in the process.
- is efficient.

DNV naval technical assurance provides a flexible, modular-based approach, and is an alternative to DNV classification services.

Furthermore, this document describes the services DNV offers all naval technical assurance customers, providing a clear description of these services and the advantages they bring to all customer, see [4.2].

An essential part of the naval technical assurance process is the standards plan. The standards plan is defined as a list of standards ensuring the objectives of the project, see [1.6.2].

It is recognised that naval vessel have attributes that are outside of DNV's involvement, e.g. weapon and sensor systems.

1.4 Application

DNV naval technical assurance has been developed for, and may be applied to, naval vessels and vessels with similar modes of operation, e.g. vessels for coast guard duty, border control and police.

DNV naval technical assurance is not applicable to vessels to which the SOLAS convention applies and for which classification is required.

Naval technical assurance takes a wider perspective than classification alone in the services it offers for naval vessels through complementary advisory services, see [4.1].

1.5 References

When the standards plan includes, wholly or partly, references to DNV rules for classification by way of a DNV class notation string, DNV naval classification may be applied to control the assurance process with regard to the DNV class notation string. A DNV naval classification certificate may be issued when the assurance process has been fully based on DNV rules for classification. Refer to [DNV-RU-NAV Pt.1](#) for the description and control of DNV naval classification.

[Table 1-2](#) lists DNV references used in this document.

Table 1-2 DNV documents

<i>Document code</i>	<i>Title</i>
DNV-RU-NAV	DNV rules for classification: Naval vessels

Table 1-3 lists other references used in this document.

Table 1-3 Other documents

<i>Document code</i>	<i>Title</i>
ANEP '77 Rev.G	ALLIED NAVAL ENGINEERING PUBLICATION, NATO STANDARD ANEP-77 PART 2 "NAVAL SHIP CODE"

1.6 Definitions and abbreviations

1.6.1 Definition of verbal forms

The verbal forms defined in Table 1-4 are used in this document.

Table 1-4 Definition of verbal forms

<i>Term</i>	<i>Description</i>
shall	verbal form used to indicate requirements strictly to be followed in order to conform to the document
should	verbal form used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others
may	verbal form used to indicate a course of action permissible within the limits of the document

1.6.2 Definition of terms

The terms defined in Table 1-5 are used in this document.

Table 1-5 Definition of terms

<i>Term</i>	<i>Definition</i>
assurance	activity with the purpose of providing evidence of compliance with respect to a standard
acquisition process	process along the life cycle of a product/vessel, with dedicated activities and services
certification matrix	document specifying how the assurance process with regard to the standards plan shall be carried out, the responsibility for this activity and the compliance documentation
naval classification	service which comprises the development and maintenance of rules, and the verification of compliance with the rules throughout the vessel's life The extent of and methods for verifying compliance will be decided by the Society to establish reasonable assurance that the relevant rules are complied with.
class request	written request for classification by a contract partner, e.g. a newbuilding yard
class rules	independent standard that consist of all requirements, technical and procedural, adopted by DNV as the basis for classification
compliance documentation	generic term encompassing any type of documentation in which a statement is made about compliance with specified technical requirements: class certificate, certificate, statement of compliance, verification report, etc.

<i>Term</i>	<i>Definition</i>
concept stage	work to develop the standards plan ensuring fulfilment of the goals and objectives for the vessel
documentation requirements	specification of documentation necessary in order to confirm compliance with the standards plan
DNV naval technical assurance (NTA)	process for assuring that a naval vessel is built and maintained to standards specified by the navy and derived from objectives specified by the navy
IMO instruments	documents issued by the International Maritime Organization for the purpose of regulating vessels for which the international maritime conventions apply, e.g. SOLAS and MARPOL IMO instruments are used as standards for application in a standards plan.
materiel safety	all elements of the vessel's construction as a physical object with influence on the safe operation of the vessel
naval administration	generic term for the organizational unit(s) in the navy that are responsible for the regulatory system and the enforcement of these requirements
naval class certificate	certificate issued to naval vessels confirming compliance with DNV rules for classification
naval customer	counterpart of DNV for the implementation of naval technical assurance, which could be either the designer and/or newbuilding yard and/or navy and/or naval administration and/or arms procurement agency, etc.
naval technical assurance certificate	certificate issued to naval vessels with respect to standards other than DNV rules for classification
navy	nation's entire military organization for sea warfare and defence
newbuilding stage	stage ensuring and providing the evidence that the vessel as built complies with the requirements in the standards plan
operational stage	stage ensuring and providing evidence that the vessel is maintained in compliance with the requirements in the standards plan
plan approval	term used in DNV rules for classification for verification of documentation against specified requirements (e.g. rules): systematic and independent assessment of drawings, design documents or records by the Society to verify compliance with the rules or statutory requirements where authorized by a flag administration.
recognized organization	organization given a mandate to carry out specified activities for a naval administration
rules	DNV rules for classification
safety area	DNV default division in attributes of the vessel with relevance for materiel safety: <ul style="list-style-type: none"> — hull structure — buoyancy, stability and controllability — engineering systems — seamanship systems — fire safety — escape, evacuation and rescue — navigation — communication — dangerous goods.

<i>Term</i>	<i>Definition</i>
standard	generic term encompassing any document specifying technical requirements: navy proprietary standards, rules for classification, IMO instruments, ISO/IEC standards, NSC part 2 solutions, etc.
standards plan	suite of standards ensuring the achievement of the navy's objectives for the ship as regards its materiel state in all stages, see [4.3.6]
STANAG	STANAG is a NATO standardization document that specifies the agreement of member nations to implement a standard, in whole or in part, with or without reservation, in order to meet an interoperability requirement
SOLAS	International Convention for the Safety of Life at Sea Only applies to ships engaged on international voyages with exemptions for e.g. cargo ships of less than 500 tons gross tonnage or ships of war and troopships.
tailoring	process of adapting a standard to specific naval needs by means of equivalent solutions, other mitigating actions or risk reduction based on ALARP
translation process	process of translating the goals and objectives for the vessel into the prescriptive technical requirements according to which the vessel shall be designed and fabricated

1.6.3 Abbreviations

The abbreviations described in [Table 1-6](#) are used in this document.

Table 1-6 Abbreviations

<i>Abbreviation</i>	<i>Description</i>
ALARP	as low as reasonably practicable
ANEP	Allied Naval Engineering Publication
CADMID	the CADMID product life cycle model includes the following stages, each of which contribute to or detract from affordability, depending upon how they are handled: concept, assessment, demonstration, manufacture, in-service, disposal
COTS	commercially off the shelf
IMO	International Maritime Organization
NSC	Naval Ship Code, ANEP '77
SFARP	so far as reasonably practicable

SECTION 2 BACKGROUND FOR THE NAVAL TECHNICAL ASSURANCE (NTA)

2.1 Why DNV naval technical assurance?

DNV naval technical assurance provides a number of advantages for the navy and its stakeholders.

DNV naval technical assurance is a comprehensive, flexible and self-contained service. It encompasses the whole process, starting with the planning of the vessel, once the operational intent has been specified, throughout design and construction, and also offering coverage of the operational stage. It is generic and may, as such, be applied to all aspects of the materiel state of a naval vessel, whether this is relevant for materiel safety or for attributes of the vessel ensuring that operational intents are fulfilled.

For a naval customer, DNV offers a large degree of flexibility in the assurance process, from inception to end of service life. The process aims to ensure that everything with influence on the final performance of the vessel is addressed and that nothing is lost underway due to changes of responsibilities in different stages.

Utilizing the NTA process, a government may obtain assurance that public resources are used as intended and that a project delivers to specified requirements. NTA may also provide evidence that requirements for ensuring the health and safety aspects of a naval vessel as a workplace are adhered to. For all stakeholders in the newbuilding process, DNV naval technical assurance provides clear specifications and requirements for verification and certification that have a direct input to their own work processes.

A large degree of flexibility is required in an assurance process to adapt to different approaches and different stages in the process. DNV naval technical assurance provides this flexibility and thus gives navies and their stakeholders clear advantages.

DNV naval technical assurance is generic and can therefore interface with any system, thus providing the required flexibility.

2.2 Naval regulatory approaches

Naval customers apply different approaches to managing safety of their vessels. Key parameters are listed below and may be applied in different manners:

- The specification of explicit goals with regard to safety. An example is a reference to merchant shipping, i.e. it is required that a naval vessel in peacetime shall offer the same level of safety for the persons on board as offered by a merchant vessel. In some countries this is implemented in national legislation.
- The application of ALARP/SFARP, i.e. the risk shall be reduced to a level where further risk reduction would lead to cost (time, money, reduction of operational effect, etc.) that is disproportionate compared to the benefit in terms of risk.
- If and how operational effect takes precedence over safety in peacetime operation.
- Materiel safety controlled by application of a code, proprietary or public. (E.g. Naval Ship Code.)
- Application of a safety case approach.
- Proprietary regulations for the control of materiel safety.
- The use of class societies and class rules.

The choice of regulatory approach is solely the decision of the navy.

The selection of the regulatory approach will affect the complete life-cycle of the vessel, will have an impact on the concept, newbuilding and operational stages and is at the sole discretion of the navy.

SECTION 3 THE NAVAL CAPABILITY ACQUISITION PROCESS

3.1 General

The capability acquisition process supports the different acquisition phases in an appropriate way, with the aim of providing the navy, designers and shipyards with the desired and appropriate ship-type specific functional, performance and safety objectives for the envisaged naval vessel.

The naval technical assurance (NTA) is intended to be an integral part of such a capability acquisition process, taking a holistic approach, like the classification process, but with more flexibility to tailor the overall scope of work and standards to be applied.

One common method of structuring the acquisition process is the CADMID cycle, see [Figure 3-1](#):

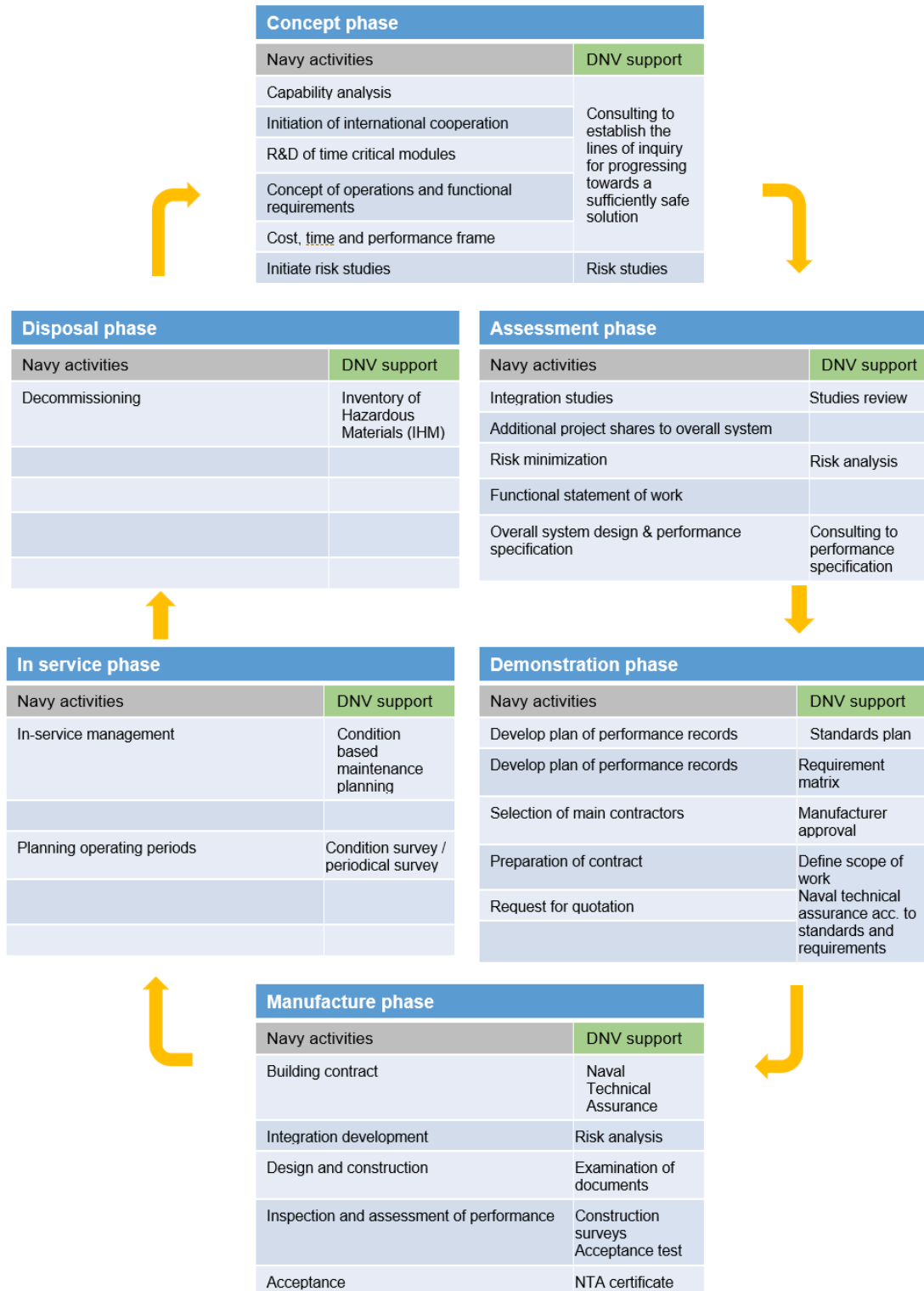


Figure 3-1 The CADMID life cycle

SECTION 4 DNV NAVAL TECHNICAL ASSURANCE

4.1 General

4.1.1 Introduction

The DNV naval technical assurance process stages are identified in [Figure 4-1](#) and [Figure 4-2](#).

First in the process, the goals and objectives, etc., shall be defined. These are determined based on national interests, national defence policy and national laws and regulations. This process may be outside naval technical assurance, but DNV may also provide services in this area.

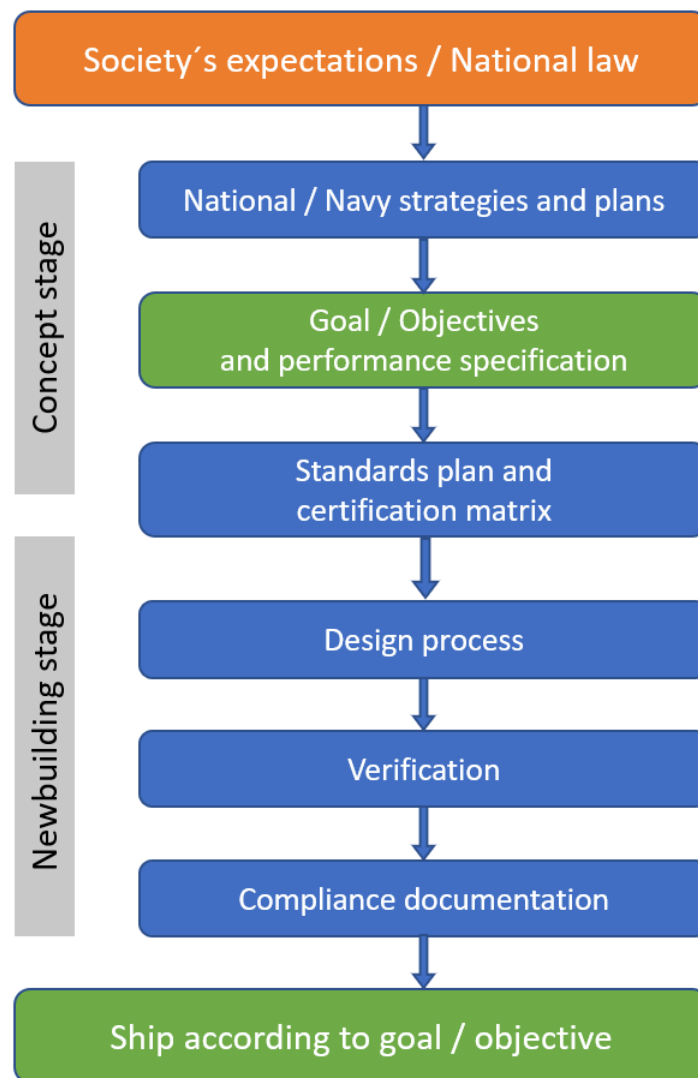


Figure 4-1 Naval technical assurance process - concept and newbuilding stages

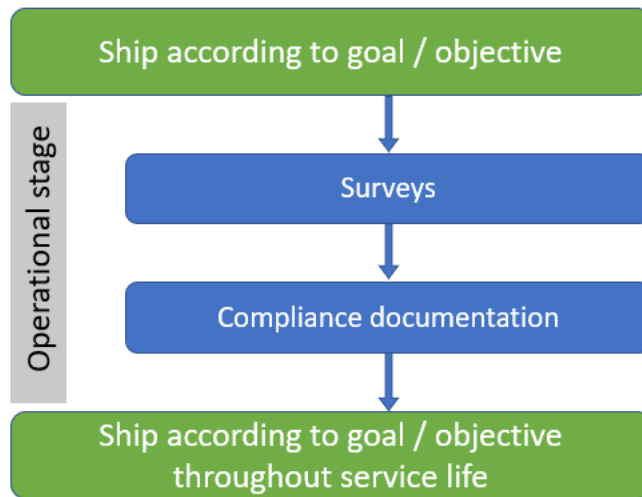


Figure 4-2 Naval technical assurance process - operational stage

4.1.2 Utilization of NTA

Due to the different nature of the three stages, different service offerings may be applied. For example, the verification process applied during the newbuilding stage is not yet required during the concept stage, which requires a definition of functional and safety objectives together with applicable standards.

The primary reason for the differentiation between these stages is that it provides flexibility. A customer may wish to involve DNV in one or two of the stages. An example is a vessel that is already in operation, but which was not built under the supervision of a 2nd or 3rd party. It may be of interest to the navy to bring the vessel in the operational stage under such an assurance process.

The scope and execution of the stages are described in [4.3] and in [4.4].

DNV's contribution can be in any configuration of the three stages.

4.2 DNV naval technical assurance service offering

4.2.1 Introduction

DNV may contribute to the technical assurance process in several ways:

- by providing benchmarks in the form of technical standards (e.g. DNV rules and other standards)
- by providing verification for the control of the assurance process
- by providing classification according to DNV rules.

Although naval vessels differ from merchant vessels in many aspects, there are also similarities. E.g. several of the requirements for naval peacetime operations are similar to those for merchant ships:

- the 'Float' and 'Move' of the naval demand for 'Float', 'Move' and 'Fight'
- the vessel shall be a safe place to be
- the vessel shall be environmentally friendly.

These similarities make it possible to apply classification processes and class rules to naval vessels. These were also recognized when the ANEP-77 Naval Ship Code was developed. The processes for controlling the materiel safety are similar. There are very many opportunities for applying standardized solutions.

DNV's assurance process is the subject of continuing development with respect to quality, efficiency and, importantly, the creation of a user-friendly interface with yards, owners, flag administrations and navies. This interface provides a detailed overview of the progress and status of the assurance process during the newbuilding stage for both the yard and owner and during operational stage for the owner.

4.2.2 Contractual relationship between involved parties

For technical assurance, DNV shall cooperate with and provide the results of the assurance activities to a counterparty designated by the customer.

DNV's technical assurance involvement shall be governed by a specific contractual agreement which determines the relationship between the naval customer and DNV and stipulates the rules and standards to be used, the exact assurance scope and the deliverables in the form of certificates, verification statements or statements of compliance. The contractual agreement may be different in the concept, newbuilding and operational stages.

4.2.3 DNV's scope

DNV's default approach is to apply safety areas for dividing the vessel into property and systems that can be dealt with separately. These safety areas may follow the arrangement in ANEP-77 Naval Ship Code:

- hull structure
- buoyancy, stability and controllability
- engineering systems
- seamanship systems
- fire safety
- escape, evacuation and rescue
- navigation
- communication
- dangerous goods.

DNV's technical scope may cover all of these safety areas or parts of them in a combination specified by the navy. For regulatory systems with other arrangements, the same principle applies, it is the navy that decides on DNV's scope of involvement.

The scope of DNV's naval technical assurance may also cover areas and topics beyond the listed and typical safety areas.

In some regulatory systems, the term 'recognized organization' is used.

4.2.4 DNV rules for classification - benchmarks

The DNV rules have been developed based on more than 150 years of experience from merchant shipping and more than 40 years of cooperation with navies in different countries. The rules provide technical standards for design and construction within all key areas relevant for the material safety of practically any type of ship, whether merchant or naval.

These rules provide relevant benchmarks for the design and equipment of naval vessels, for communicating the navy's objective with regard to safety, and for use in the technical assurance process. A benchmark serves as a Yardstick that other technical solutions may be measured against, Whether standards other than class rules, such as navy proprietary standards, or solutions based on risk analyses.

4.3 The concept stage

4.3.1 Objective and scope

The objective of the concept stage is to develop a performance specification for the vessel that meets the specified goals and objectives, Figure 4-3. The goals, objectives and performance specification form the basis for the design and system definition as shown in the figure, and shall be detailed enough for the purpose of detailing procurement and fabrication requirements.

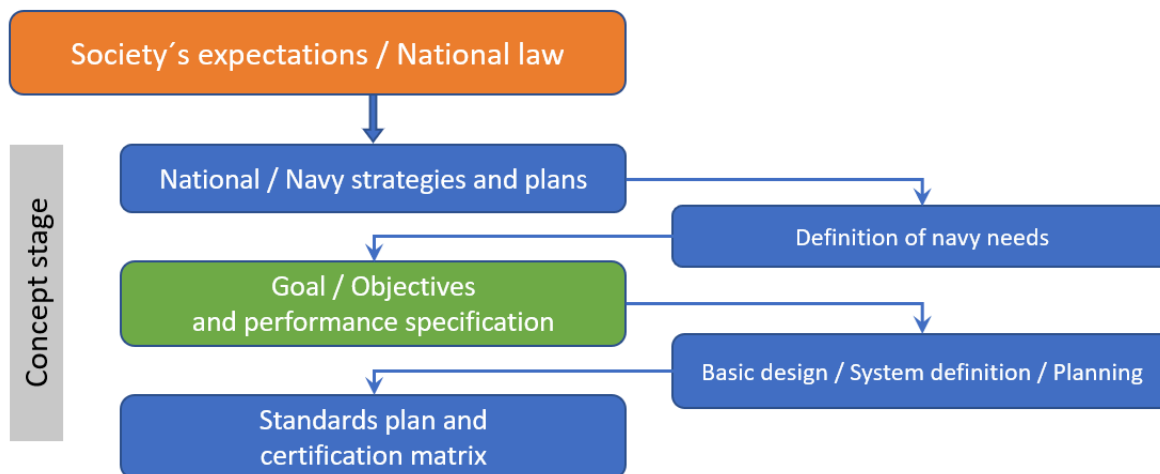


Figure 4-3 The concept stage

The development of a naval vessel concept shall cover all aspects of significance for fulfilling the operational intent and the materiel safety. DNV's involvement in this stage may cover materiel safety alone or also other attributes of the vessel.

4.3.2 Formulation of the vessel's goals and objectives

The goals and objectives of the vessel are normally outside of DNV's contribution. However, the understanding of these has a large influence on how the naval technical assurance process is carried out. It is therefore imperative that full understanding is established between the naval customer and DNV on this matter.

It is often clarifying to differentiate between goals/objectives with regard to materiel safety in peace time and goals/objectives with regard to the operational effect of the vessel in peacetime and when under hostile threat. An important reason for this is that additional standards apply when the operational effect shall be assured.

As regards the materiel safety of the ship, the corresponding goal or objective may be formulated in two different ways:

- As a specification of an outcome. I.e. a given level of safety presented to the persons on board. For example, some navies and/or national legislation specify that a naval vessel shall provide a level of safety in line with what is offered in merchant shipping when not exposed to an external threat.
- As a control of process. The navy shall have processes and controls in place that ensure that all key areas relevant for the materiel safety of the ship are considered and evaluated while ensuring the objectives with regard to operational intent. The ALARP principle is a possible approach for evaluation in this context.

This can be achieved without the outcome being specified. DNV uses a combination of both ways in the technical assurance.

4.3.3 Development of the standards plan

4.3.3.1 General

The goals and objectives are translated into the standards plan in the translation process. For this purpose, it is advantageous to divide the ship and its equipment and systems into groups that can be dealt with separately. DNV's default approach is to address this using the safety areas, which may follow the arrangement in ANEP-77 Naval Ship Code, see [4.2.3] and additional areas added by the naval customer.

However, the way in which this division is done can vary between the particular regulatory systems and different nomenclature can be used: disciplines, safety areas, compliance obligations, etc.

There are two key deliverables from the concept stage:

- The standards plan.
- The certification matrix.

These two deliverables need to be accepted by the naval administration.

4.3.3.2 The translation process

The translation process is a cascading process from a set of goals/objectives for each safety area of the vessel to the standards plan, [Figure 4-4](#). Prescriptive technical solutions supporting the objectives for each safety area shall be specified for inclusion in the standards plan.



Figure 4-4 Translation process

The standards plan shall include the following:

- The specification of applicable standards.
- The links between the requirements in the standards to corresponding requirements in the navy’s regulatory system.
- Justification of how the requirements in the goals/objectives and or regulatory requirements are fulfilled.

The standards plan shall be agreed by the naval administration.

The standards plan may consist of any type of technical documentation specifying technical requirements supporting the goals/objectives:

- navy proprietary standards
- DNV class rules (see [1.5])
- IMO instruments
- STANAG
- ISO standards
- IEC standards
- outcome of risk analysis
- other standards.

A necessary and important part of the translation process is to create the link between the objective and the technical solutions for the particular safety area they support. The justification for the choice of technical solution shall be documented so that it can be confirmed and evidence provided that all objectives have been met.

As mentioned in [4.3.2] the purpose of DNV naval technical assurance is to control the outcome or the process.

The translation process is also controlled and significantly influenced by the following factors:

- The navy's regulatory system. The regulatory system may specify how the process of specifying the standards plan shall be carried out and what evidence of justification confirming compliance shall be provided. Alternatively, DNV can suggest a process acceptable to the navy.
- Whether risks are known or unknown. Where risks are known, existing controls may be used, for example existing standards like class rules, navy proprietary standards, IMO instruments, etc. When risks are not fully known it may be necessary to carry out risk analysis, based on which adequate controls are specified. For example, there may be features of the vessel or of its operation that are not adequately covered by existing controls. In such cases a formal safety assessment may be carried out.

Normally the translation process will be a mixture of both approaches. A significant number of the risks are known, but there will normally always be some risks that need further investigation.

4.3.3.3 Tailoring

The most efficient option in the translation process is the re-use of existing risk controls, i.e. already available standards. This has the advantage that the solutions are based on well-known and proven technology for which ample operational experience is already available.

However, it is possible that a selected standard may not be suitable to the full extent, especially with respect to vessel operation under a naval regime. Tailoring is applied to adapt the existing solutions accordingly. Such a process includes developing technical solutions that can be demonstrated to be equivalent to the specified standard or developing other actions to compensate for the increased risk, for example modifications of operational procedures, frequently referred to as mitigation. For such cases dedicated risk analyses may be applied.

4.3.4 Development of the certification matrix

The second key deliverable from the concept stage is the certification matrix. The purpose of the certification matrix is to control the execution of the activities providing evidence of compliance. The certification matrix is the direct result of and follow-up to the standards plan. The certification matrix specifies:

- how verification with regard to the standards plan shall be carried out (verification of technical documents, test, sea trial, etc.)
- by which organization
- the compliance documentation.

An example of a certification matrix is shown in [Table 4-3](#).

4.3.5 Responsibilities

The standards plan and certification matrix will be agreed and thus eventually owned by the naval administration.

However, the drafting of the standards plan and certification matrix can be carried out by parties other than the naval administration. For example, the responsibility for the work may be part of the yard's delivery or pre-project services.

DNV can provide assistance in the process, for example facilitation of work processes and advice. DNV offers drafting of the standards plan and a certification matrix as a separate service.

4.3.6 Standards plan / certification matrix - examples

4.3.6.1 Examples - standards plan

As an example, the following standards plan is specified, based on DNV class notations:

- Class notations: **+1A Corvette Naval HELDK(S,H,F) RAS**
- IMO Instrument: Cargo Ship Safety Construction

The standards plan can support materiel safety on different levels of detail. [Table 4-1](#) demonstrates compliance at a high level, where the standards are specified in a consolidated form for each safety area. The table shows the links between the specified standards and the safety areas for which the standards are the chosen solution. Each class notation refers to a specific part of the DNV rules.

Table 4-1 Example - high level standards plan

<i>Safety area</i>	<i>Class notation</i>	<i>Other standards</i>
Structure	1A Corvette Naval	
	HELDK(S,H,F)	
Buoyancy, stability and controllability	1A Corvette Naval	ICLL Navy stability standard
Engineering systems	1A Corvette Naval	
Seamanship systems	1A Corvette Naval	SOLAS Cargo Ship Safety Construction
	HELDK(S,H,F)	SOLAS Cargo Ship Safety Equipment
	RAS	
Fire safety	1A Corvette Naval	SOLAS Cargo Ship Safety Construction
	HELDK(S,H,F)	
Escape, evacuation and rescue	1A Corvette Naval	SOLAS Cargo Ship Safety Equipment
Communications	-----	SOLAS Cargo Ship Safety Radio
Navigation	-----	SOLAS Cargo Ship Safety Equipment
Dangerous goods	1A Corvette Naval	-----

However, depending on regulatory system specification, a more detailed level may be required. See [Table 4-2](#). This table is based on the ANEP-77 Naval Ship Code. The table identifies the link between the specified standards and the NSC performance requirements stated in NSC Chapter VI Fire Safety.

Table 4-2 Example - detailed level

<i>NSC Chapter VI Performance Requirement</i>	<i>Standards plan reference: DNV-RU-SHIP July 2019</i>	<i>Standards plan reference: IMO instruments or other standards</i>
Fire Safety		The solutions specified in NSC Part 2 Chapter VI shall apply.

<i>NSC Chapter VI Performance Requirement</i>	<i>Standards plan reference: DNV-RU-SHIP July 2019</i>	<i>Standards plan reference: IMO instruments or other standards</i>
7.6 Fixed fire detection and fire alarm system installations are to be demonstrated in accordance with a recognized standard and shall be tested periodically in accordance with a recognized procedure	Pt.5 Ch.13 Sec.10 [10] (refers to SOLAS).	SOLAS Reg. II-2/7.
Regulation 8 Containment of Fire		
Performance Requirements		
8.2 The ship shall be subdivided by thermal and structural boundaries or equivalent	Pt.5 Ch.13 Sec.10 [1.1] (refers to SOLAS).	SOLAS Reg. II-2/9.1.1 & /9.2.1.
8.2.1 Fire containment at boundaries shall have due regard to the fire risk of the space, function of the space, and function of adjacent spaces	Pt.5 Ch.13 Sec.10 [1.1] (refers to SOLAS) Pt.5 Ch.13 Sec.10 [6.1].	SOLAS Reg. II-2/9.1.1 & /9.2.1.
8.2.3 Active and/or passive containment arrangements may be provided	Pt.5 Ch.13 Sec.10 [10] (refers to SOLAS).	SOLAS Reg. II-2/9.
8.3 Fire boundaries, openings and penetrations shall be demonstrated in accordance with a recognized standard	Pt.5 Ch.13 Sec.10 [1.1] (refers to SOLAS).	SOLAS Reg. II-2/3.2.5, /3.4.4, /3.33, /9.3.1, /9.4.2.1 > FTP Code.
Regulation 9 Fire Fighting		
9.2 For all foreseeable fire hazards there shall be defined effective and proportionate means of extinguishing each such fire	Pt.5 Ch.13 Sec.10 [11], [12], [13], [14] (refers to SOLAS).	SOLAS Reg. II-2/10.4/9.7.5/10.3710.5.
NSC Chapter III Performance Requirement		
Intact and damage stability criteria		American Navy Rules Design Data Sheet 079 (DDS 079). German Navy Rules BauVorschrift (BV 1030). English Navy Rules, Naval Engineering Standard (NES 109).
Other performance requirements		
Shipborne helicopter harpoon/Grid securing system		STANAG 1276.
For the required level and measurement of coefficient of friction on flight decks		STANAG 1278.

<i>NSC Chapter VI Performance Requirement</i>	<i>Standards plan reference: DNV-RU-SHIP July 2019</i>	<i>Standards plan reference: IMO instruments or other standards</i>
Specification for sectional cold rooms and refrigerated storage cabinets		BS 2501:1992. BS 2501:1979.

4.3.6.2 Example - certification matrix

An example of entries in the certification matrix is shown in [Table 4-3](#).

Table 4-3 Example - certification matrix

<i>Item</i>	<i>Description</i>	<i>Standard</i>	<i>Assessment method</i>	<i>Compliance documentation</i>	<i>Responsible</i>
Xx	Diesel engine for emergency generator	DNV-RU-SHIP Pt.4 Ch.3	Type approval FAT Shipboard test	TA certificate Test report Class certificate	DNV Manufacturer DNV
Xx	Hull structure	DNV-RU-SHIP Pt.3 Ch.1 - DNV-RU-SHIP Pt.3 Ch.11	Verification/plan approval	SoC/class certificate	DNV
Xx	Rudder stock	DNV-RU-SHIP Pt.3 Ch.14	Verification/plan approval	SoC/class certificate	DNV

The matrix specifies for each item the standard that applies, the method of assessment (verification, testing, etc.), the type of compliance documentation that shall be issued and the organization responsible for the assessment.

4.4 The newbuilding and operational stages

4.4.1 Objective and scope

The objective of the technical assurance in the newbuilding stage is to generate the evidence based on the completed technical assurance process according to the standards plan and certification matrix, see [\[4.4.2\]](#).

The objective of the technical assurance in the operational stage is to generate validation that the requirements defined in the standards plan are complied with throughout the service life of the vessel, see [\[4.4.3\]](#).

Once the concept stage has been completed and the standards plan and certification matrix have been specified, the ship concept is ready to be realized in the newbuilding stage and commissioned for the operational stage. The newbuilding and operational stages are described in [Figure 4-5](#) and [Figure 4-6](#).

In these stages, DNV's experience of and facilities for classification will be drawn upon and applied, as far as possible, applicable and relevant. The advantages of this approach are:

- DNV's long experience and knowledge base can be fully deployed
- cost savings are achieved by applying established procedures and infrastructure
- quality assurance is improved when using well-known work processes.

The contractual arrangement will be based on the arrangement applied for classification, including DNV's general terms and conditions. The parties' responsibilities will follow the same set up as for classification.

The deliverable will be a DNV naval technical assurance certificate. If a DNV class certificate is required by the customer, the DNV classification process shall be followed.

4.4.2 The newbuilding stage

4.4.2.1 General

The objective of the technical assurance in the design and/or newbuilding stage is to verify and document that the requirements defined in the standards plan are complied with. This stage may cover verification of technical documentation as well as the fabrication process and construction surveys of the vessel.

The process for the newbuilding stage is shown in Figure 4-5.

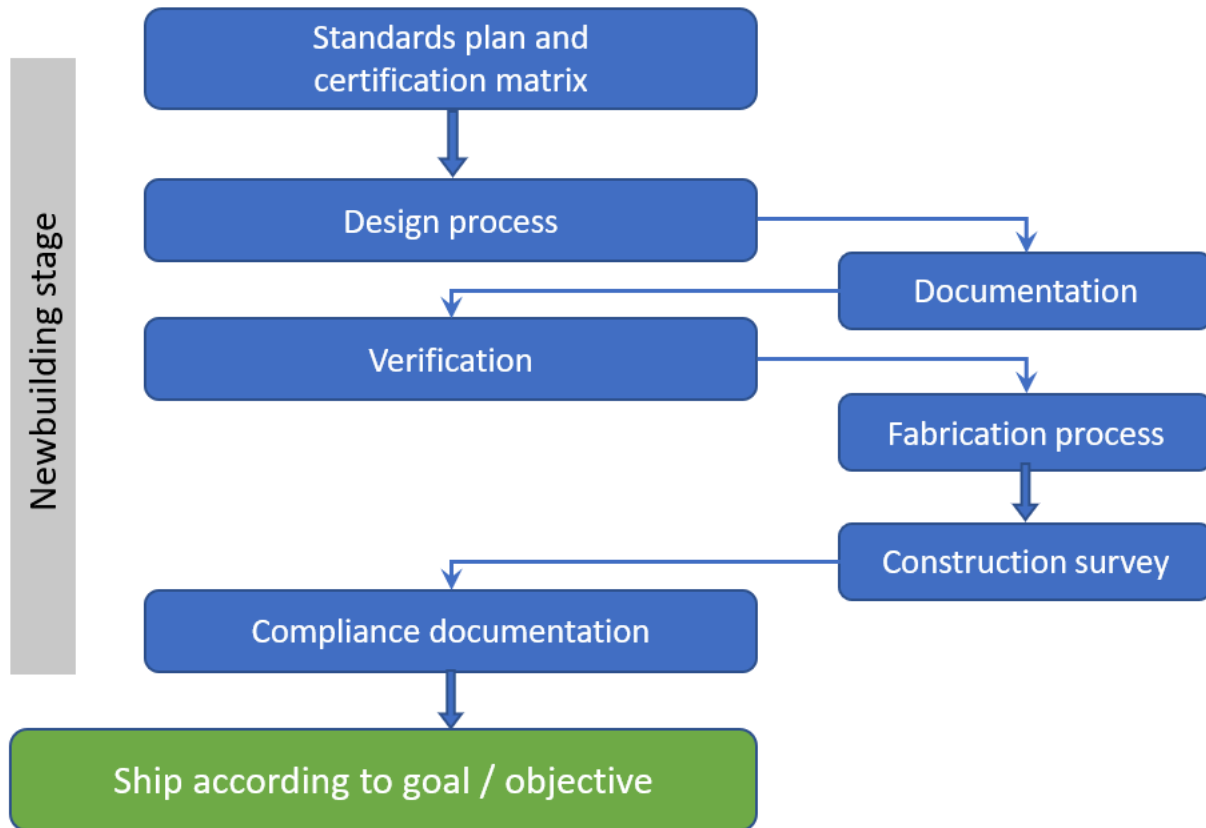


Figure 4-5 The newbuilding stage

4.4.2.2 Input to the newbuilding stage

For the execution of the newbuilding stage, the following handovers from the concept stage are required:

- the standards plan
- confirmation of acceptance of the standards plan by the naval administration
- the certification matrix.

4.4.2.3 Verification of technical documentation

The assurance process consists of the following generic steps:

- specification of documentation requirements
- submission of technical documentation
- assessment of technical documentation
- survey of fabrication, witnessing, testing

- issuing of compliance documentation.

These items are described in short in the following sections.

4.4.2.4 Documentation requirements

The documentation requirements are a specification of all the documentation that shall be submitted for verification in accordance with the standards plan.

Documentation requirements as specified in the DNV rules for classification may be used as a basis. If the rules are used as a basis, this list shall be modified to cover the complete content of the standards plan.

4.4.2.5 Verification of documentation

The technical documentation is verified with regard to compliance with the relevant parts of the standards plan.

The verification process is similar to the plan approval process for DNV classification. Therefore, DNV will follow the same procedures as for classification, while addressing the complete standards plan.

4.4.2.6 Surveys and witnessing

When a vessel is built under the supervision of DNV, DNV will verify:

- that the construction and scantlings comply with the requirements in the applicable standards and the assessed documentation
- that material is in agreement with the applicable standards
- that the materials, components and systems have been certified in accordance with the certification matrix
- that the fabrication is carried out in compliance with the applicable standards
- that satisfactory tests are carried out to the extent and in the manner prescribed by the certification matrix.

These surveys can be carried out by DNV personnel or by the naval customer's own or appointed personnel as per agreement between the customer and DNV.

4.4.3 The operational stage

4.4.3.1 Objective of the operational stage

The operational stage starts when the newbuilding stage ends.

The objective of the technical assurance in the operational stage is to generate the evidence based on which it can be concluded that the requirements defined in the standards plan are complied with throughout the service life of the vessel.

The process for the operational stage is shown in [Figure 4-6](#).

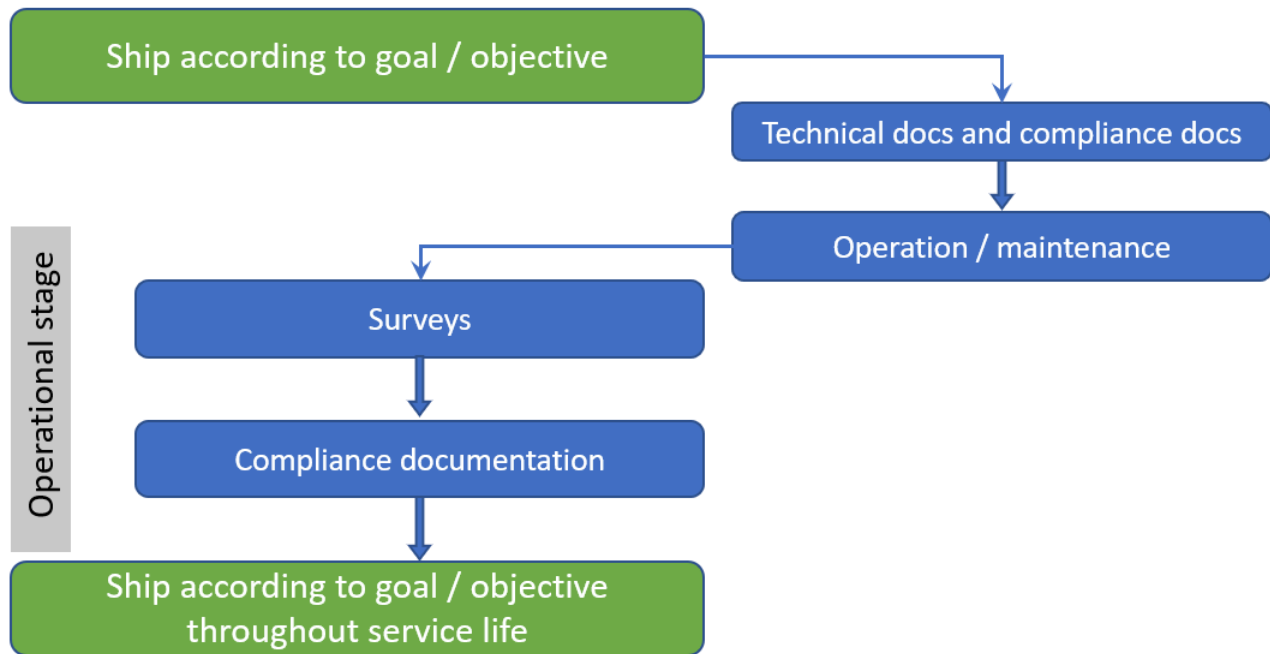


Figure 4-6 Operational stage

4.4.3.2 Input to the operational stage

The following documentation is required input for the operational stage:

- standards plan
- confirmation of acceptance of the standards plan by the naval administration (when not already agreed for the newbuilding stage)
- specification of survey regime, intervals, scope, etc.
- the vessel's compliance documentation.

4.4.3.3 Assurance process

The vessel is subject to a regime of regular surveys with the purpose to confirm that the vessel is maintained to the standard specified in the standards plan. These surveys can be carried out by DNV personnel or by the navy's own or appointed personnel as per agreement between the naval customer and DNV.

A survey may consist of a combination of visual inspections, audits, measurements, functional testing, non-destructive testing and a review of maintenance and other relevant records.

The assessment process is similar to the fleet in service process for DNV classification. Therefore, DNV will follow the same procedures as for DNV classification, while addressing the complete standards plan.

4.4.3.4 Modifications - upgrades

Modification and upgrade processes resemble the newbuilding of a vessel in that the modifications/upgrades are engineered and then manufactured. The division into a concept stage and newbuilding stage is therefore applicable in this situation and the same processes as described above can be applied.

In the operational stage it is also necessary to consider possible changes to the operation of the vessel. This may necessitate modifications to the standards plan and the generation of updated compliance documentation based on relevant verification.

4.4.3.5 Information on vessel status

Via 'My services' on Veracity, DNV offers easy access to vessel status and survey reports to the naval customer. This provides the naval customer with complete and instantly updated information about the condition of the vessel.

4.4.3.6 Compliance documentation

Compliance in the operational phase is documented by the re-issuance of the DNV naval technical assurance certificate, see [Sec.5](#).

SECTION 5 COMPLIANCE DOCUMENTATION

5.1 Naval technical assurance certificate

5.1.1 General

The naval technical assurance certificate can be issued when the assurance process has been carried out and is based on a standards plan and certification matrix.

The certificate can be combined with a scheduled survey regime as per the customer's priorities.

The naval technical assurance process may be initiated if the class certificate shall no longer be continued or if a vessel is no longer in compliance with DNV class rules. The naval technical assurance certificate documents compliance with the associated standards plan.

5.1.2 Validity

The naval technical assurance certificate may, when combined with follow-up in the operational phase, be assigned a period of validity. The period of validity is subject to agreement between the naval customer and DNV.

5.2 Statement of compliance

DNV may issue a statement of compliance with other standards in the standards plan when the assurance process has been successfully carried out, for example documenting compliance with IMO instruments and national regulations.

CHANGES – HISTORIC

There are currently no historical changes for this document.

About DNV

DNV is the independent expert in risk management and assurance, operating in more than 100 countries. Through its broad experience and deep expertise DNV advances safety and sustainable performance, sets industry benchmarks, and inspires and invents solutions.

Whether assessing a new ship design, optimizing the performance of a wind farm, analyzing sensor data from a gas pipeline or certifying a food company's supply chain, DNV enables its customers and their stakeholders to make critical decisions with confidence.

Driven by its purpose, to safeguard life, property, and the environment, DNV helps tackle the challenges and global transformations facing its customers and the world today and is a trusted voice for many of the world's most successful and forward-thinking companies.

WHEN TRUST MATTERS