Inspections, Surveys and Certificates

TrainMoS II

Mr Georgios Vavourakis
Contents

• Framework of Surveys and Certificates
• Class Surveys and Certificates
• Statutory Surveys and Certificates
• On-board surveys
• Other Types of Surveys
Framework of Surveys and Certificates

• Reasons and Aims for Surveys
• Instruments to verify compliance
• Summary
Reasons and Aims for Surveys

- quality of the ship
- quality of the cargo hold
- safety of crew
- seaworthiness
- life extension planning
- corrosion trend analysis
- repair and maintenance requirements
- insurance
- sale and purchase
- working conditions
- after repair
- convention requirements (law, rules, regulations, …)
- design and structural details
- problem areas
- future inspection requirements
- Agreements
- …
Instruments to verify Compliance

<table>
<thead>
<tr>
<th>Plan approval</th>
<th>Survey</th>
<th>Audit</th>
<th>Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval</td>
<td>Certificate</td>
<td></td>
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<tr>
<td>Example:</td>
<td>Example:</td>
<td>Example:</td>
<td>Example:</td>
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<tr>
<td>- Ship Security Plan (ISPS)</td>
<td>- Safety Construction Cert. (SOLAS II-1)</td>
<td>- Document of Compliance (ISM)</td>
<td>- International Ship Security Certificate (ISPS)</td>
</tr>
<tr>
<td>- Shipboard Oil Pollution Emergency Plan (MARPOL)</td>
<td>- Safety Equipment Cert. (SOLAS III, V)</td>
<td>- Safety Management Certificate (ISM)</td>
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<tr>
<td>- Plan Approval for New buildings</td>
<td>- Class Certificate</td>
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Summary

- **Surveys**
  - **Classification**
    - Depends on Classification Rules
    - Class Certificate
  - **Statutory**
    - Depends on Laws and Regulations
    - Statutory Certificates
  - **Others**
    - Depends on Contracts and Agreements
    - Reports

Source: DNV-GL
Class Surveys and Certificates

• Basics of Classification
• Surveys and Certificates
  • New-buildings
  • Ships in Operation
  • Special Procedures
The Classification Process: Rules

Ships are designed, constructed and maintained to meet the requirements of:

- Classification Rules
- IMO Conventions
- Relevant National Regulations
- Relevant Standards (ISO, DIN, etc.)
Basics

Classification Rules - What is Classification?

Classification regards
• hull
• machinery / electrical installation and
• cargo refrigerating installation (if any)
Sample of Character of Class
Sample of Character of Class & Class Notations (hull)

100  A5  Container Ship

Built under supervision according to Class Rules
Hull complies 100% with Class Rules
Interval at class to be renewed in years
Ship type

Sample of Character of Class
& Class Notations (hull)
Sample of Character of Class & Class Notations (machinery)

MC

AUT

Built under supervision according to Class Rules

Machinery installation in compliance with Class Rules, components and material certified

Machinery spaces equipped for unattended 24h operation
Sample of Character of Class

Emma Mærsk
General Arrangement

Energy Efficiency in Shipping and Clean Air in Port Cities

**Hull** 100 A5 E, IW, SOLAS II-2 Reg. 19, Container ship

**Machinery** MC AUT
Sample of Class Notations (additional)

- **E**: Ice strengthening
- **SOLAS II-2, Reg.19**: Carriage of dangerous cargo
- **COLL**: Strengthening for collisions
- **IW**: In-water survey
- **BWM**: Ballast Water Management
- **NAV-O**: Bridge design for 1 man watch keeping, while operating in ocean areas
Sources to draw up Class Rules

Class Rules are in a constant state of evolution and development, reflecting:

- **Technical Development**
- **Experience**
- **Research**
- **IACS Unified Requirements**
- **IMO Conventions / Resolutions**
- **International Standards**
- **National Requirements**

Source: DNV-GL
Ship Life-cycle and Class Surveys

**Ship in Service:**
- Classification
- Safety surveys

**Newbuilding:**
- Supervision
- Plan approval

<table>
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<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25 Years</th>
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<td>0</td>
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0 = Delivery
General Procedure for the Classification of New-buildings

Shipowner (Client) → Building Contract → Shipyard

Shipyard → Application for Classification → Drawing → Approval

Classification Society

Subsuppliers

Test Certificates

Industry

Test of Components

Supplies of Component → Orders → Shipyard

Survey of Newbuilding Construction → Shipowner (Client)

Certificates of Class → National Statutory Certificates

Source: DNV-GL
Newbuilding Procedure

1. Plan Approval
2. Certification
3. Survey at Yard
4. Keel-laying
5. Delivery
6. Contract

Source: DNV-GL
Newbuilding Procedure

Plan Approval
verify design for compliance of
- Material
- Hull, equipment, outfitting
- Main machinery components and systems
- Electrical systems
- Instrumentation and automation systems
- Life saving appliances
with

Certification
verify relevant materials and components like
are designed and manufactured in compliance with
- Class Rules
- International and national regulations
- Recognized standards
and supplied to the yard with certificate
Newbuilding Surveys

- Initial Hull Survey
  - Prior to commencement of inspections
  - Supervision during construction
- Initial Machinery Survey
New-building Initial Hull Survey – Prior to Commencement of Inspections

• Investigation whether
  • Yard is provided with suitable equipment and facilities
  • The yard has sufficiently qualified personnel
  • All approvals for welding are available
  • ...

• Obtaining information
  • on the Yards Quality Management
  • ...

• Examination
  • which Rules, regulations, guidelines are to be applied
  • whether all drawings and particulars for the supervision are available
Full term Class Certificates
Surveys for Ships in Operation

• **Periodical Surveys**
  • Annual Survey
  • Intermediate Survey
  • Class Renewal Survey
  • Bottom Survey
  • Boiler Survey
  • Tailshaft Survey

• **Non periodical Surveys**
  • Damage and Repair Survey
  • Voyage Repairs
  • Conversion Surveys
  • Extraordinary Surveys

• **Special cases**
  • Change of Class
  • Condition Assessment Program
Periodical Surveys for the Maintenance of Class:

- Annual Class Survey
- Intermediate Class Survey
- Class Renewal Survey
- Bottom Survey
- Boiler Survey
- Tailshaft Survey
Surveys for Class Renewal

1. Issuing of Class Certificate
2. Annual Survey
3. Intermediate Survey
4. Annual Survey
5. Endorsement of existing Certificate

Flowchart:
- If Intermediate Survey carried out on 2nd Anniversary Date?
  - Yes: Annual Survey
  - No: Annual Survey, then Endorsement of existing Certificate

Time windows:
- 1st Year: 3 months (max. allowed time windows - month -)
- 2nd Year: +3 months
- 3rd Year: +6 months
- 4th Year: +3 months
- 5th Year: +3 months

Source: DNV-GL
Annual Class Survey

- Loadline items
- Hull items
- Machinery and electrical items
- Firefighting equipment

- Oil tanker additional items (Deck foam and inert gas systems; steering gear; hull, machinery and equipment)
- Chemical tanker additional items (Steering gear, structure, equipment, fittings, arrangements, and materials)
- Gas carrier additional items (Steering gear, structure, equipment, fittings, arrangements, and materials)
Intermediate Class Survey

Annual Survey plus the following items:

• Ballast tanks and cargo spaces
• Oil tanker additional items (Piping systems and cargo tanks and electrical circuits in dangerous zones)
• Chemical tanker additional items (Steering gear, structure, equipment, fittings, arrangements, and materials)
• Gas carrier additional items (Steering gear, structure, equipment, fittings, arrangements, and materials)
Class Renewal Surveys

- Class Renewal
- Partial Class Renewal
- Continuous Class Renewal
Class Renewal

• detailed inspection of hull and machinery together with its installations and equipment for the purpose of assigning the ship to a new period of class

• the survey becomes due on expiry of the regular period of class

• the scope of the survey depends on the age and type of the ship

• the scope may be extended if this is considered necessary by the surveyor in view of his findings
Non-periodical Surveys

- Damage and repair survey
- Voyage Repairs
- Conversion Surveys
- Extraordinary Surveys
Damage Survey

It is the purpose of the damage survey to

• Determine the nature, location and extent of the damage

• Determine the necessary repairs with a view to the unrestricted conformation of class

or

• to determine the temporary repairs and/or other measures/conditions necessary to enable the ship to proceed to the repair harbour
Damage of side shell of Ro/Pax ship
Damage Survey – Example Loss of Anchor

If no spare anchor is available and/or if the remaining chain link cable is not adequate for anchoring, the following condition of class could be made:

“Class confirmed until …. on condition that main engine is to be kept stand-by whilst vessel at anchor. The assistance of sufficiently strong tug during estuary trading has to be applied for, if deemed necessary by the master”
Damage Survey - Consequence of Fire
Conveyance Certificate

- After respective survey, a Conveyance Certificate may be issued for a severely damaged ship enabling it to undertake the journey to the repair harbour subject to special conditions.
- Such conditions may stipulate increased freeboard, appropriate weather restrictions, assistance from tug, etc...
Special Procedures – CAP - Survey

CAP = Condition Assessment Program

• inspection of a vessel to determine its technical condition
• According to a specified rating system
CAP- Survey

• CAP Surveys are not a classification requirement
• Required by major oil companies
• Tankers that are 15 years of age and older require a CAP (Condition Assessment Program) certificate
• the CAP program can be effectively applied to any size, type or age of commercial ship.
A CAP survey covers:

- hull structure assessment
- machinery assessment
- cargo systems assessment.
- Combining Class CAP survey with the vessel’s structural survey provides minimal disruption to the operational schedule.
Ratings are computed for each of the program assessments, ranging from 1 (high) to 4 (low).
Special Procedures – Change of Class
Statutory Surveys and Certificates

• Relationship Class – Statutory Surveys
• Legal Background
• Survey Types and Intervals
Relation Class - Statutory

**Classification**
Rules for Classification & Construction passed by Classification Society

**Statutory**
IMO Conventions, Codes, Resolutions as far as ratified by the flag state
Additional National Requirements

**Internal Rules**
- passed by Class
- executed by Class

**External Rules**
- passed by Flag State
- executed by Flag State or Class (on its behalf, if authorized by Administration)

Source: DNV-GL
Relation Class - Statutory

Classification

Authorize

Construction Rules

Consult

Surveys, Certificates

Consult

Unified requirements recommendations etc

Authorize

IACS

Administration

Consult

Conventions, Codes, Resolutions

IMO

Source: DNV-GL
Legal Background

Statutory Regulations - What means “statutory”?  
• requirements by national (flag) administration  
• international regulations are ratified by national administrations  
• class may conduct surveys only on behalf of the flag administration
Legal Background

Conventions, Codes and Resolutions
Legal Background

- SOLAS
- MARPOL
- Load Line
- Tonnage Conv.
- IBC Code
- IGC Code
- HSC Code
Periodical Surveys for the Maintenance of International Certificates:

- Load Line Surveys
- Safety Construction Surveys
- Safety Equipment Surveys
- Safety Radio Surveys
- MARPOL Surveys
Special Cases

- Enhanced Survey Programme (ESP)
- Condition Assessment Scheme (CAS)
ESP – Enhanced Survey Programme

- Who
  - Surveyor
- Background (legal)
  - more detailed hull survey for oil tankers, chemical tankers, bulk carriers
  - Res A744(18)
- IACS Guidelines
ESP – Enhanced Survey Programme

• **Aim**
  • survey items are more detailed than on periodical survey only

• **Consequences**
  • detailed survey of hull structure within the cargo tank / hold length
  • ballast tanks
  • cargo and ballast piping systems
  • pump rooms, cofferdams, etc
Condition Assessment Scheme (CAS)

In April 2001, MEPC 46 approved to accelerate the phasing-out of single hull oil tankers (entered into force in September 2002)

• phase-out began 2003;

• last single hull oil tanker of 5,000 tons deadweight and above but less than the tonnage specified for Category 1 and 2 tankers will be phased out by 2015 and hence will not be allowed to enter ports of EU member states;

• A Condition Assessment Scheme (CAS) will have to be applied to all Category 1 vessels continuing to trade after 2005 and all Category 2 vessels after 2010 in order to ensure permanent good maintenance. (Res. MEPC 94(46) Condition Assessment Scheme, amended by Res. MEPC 99(48) and Res. MEPC 112(50))
Condition Assessment Scheme (CAS)

- The Scope includes the hull structure in way of
  - cargo tanks
  - pump rooms,
  - Cofferdams
  - Pipe tunnels
  - Void spaces

- After a successfully completed Survey a Statement of compliance will be issued by the Flag State Administration with a validity of 5 years
On-board Surveys

• Authorization
• In service
  • Preparation of a Survey
  • Conducting
  • Reporting (follow-up)
  • Certification
Authorization of Classification Society

- Classification Societies (IACS) are authorized to carry out statutory functions by most of the Flag States.
- These authorizations include attendance to matters stipulated by the most important conventions concerning ship safety and marine environmental protection, which are supplemented to a varying degree by national safety regulations.
Involved parties

• **IACS Quality Committee**
  The governing body of QSCS. Responsible for Quality policy development and oversight of the Scheme to ensure Quality System Certification Scheme (QSCS) remains effective and fit for purpose. The QC shall consist of one voting representative per Member CS.

• **IACS Advisory Committee**
  The AVC shall consist of between six and ten independent members from governmental and nongovernmental organisations in the maritime industry. It provides independent industry perspective and advice for the further development and improvement of the policies and operation of QSCS.

• **Accredited Certification Bodies (ACBs)**
  Independent, professional auditing organisations comply with ISO/IEC 17021 standard by an Accreditation Body who is signatory to the International Accreditation Forum (IAF).

• **IACS Quality Secretary**
  The QS is an officer of the Permanent Secretariat. The main purpose of this function is to promote the effective operation of the QSCS, ensuring the continued robustness, consistency and integrity of the scheme, with a uniformly high quality standard within IACS, supported by IACS Operational Centre (OC).

• **IACS Council**
  The most senior body of IACS has overall responsibility for strategy and high level policies concerning the Scheme. Not involved in management, implementation or certification matters.
IACS QSCS features

- Auditors training
- Audit of process & survey’s object
- ACB assessment and improvement
- IACS End User Workshop
- Internal audits

A classification society with staff 1500 and with 50 branches worldwide, conducts every year about 80 internal audits and 20 Vertical Contract Audits (VCA’s)
IACS QSCS vs. RO Code

**RO Code, Part 1 GENERAL, item 4 DELEGATION OF AUTHORITY:**

4.1 A flag State **may delegate authority to an organization** recognized as complying with the provisions of this Code to perform, on its behalf, statutory certification and services under mandatory IMO instruments and its national legislation.

**RO Code, Part 2 RECOGNITION AND AUTHORIZATION REQUIREMENTS FOR ORGANIZATIONS, item 8 AUTHORIZATION OF RECOGNIZED ORGANIZATIONS:**

8.1 Under the provisions of regulation I/6 of SOLAS 1974, article 13 of LL 66, regulation 6 of MARPOL Annex I and regulation 8 of MARPOL Annex II and article 6 of TONNAGE 69, a flag State **may authorize an RO** to act on its behalf in statutory certification and services and determination of tonnages only to ships entitled to fly its flag as required by these conventions. Such authorizations shall not require ROs to perform actions that impinge on the rights of another flag State.

**RO Code, Part 3 OVERSIGHT OF RECOGNIZED ORGANIZATIONS, item 6 PRINCIPLES OF AUDITING:**

6.1 The flag State should be satisfied that the RO has an **effective quality management system** in place. The flag State may rely upon the **audits carried out by an accredited certification body** or equivalent organizations.
Annual QSCS Audits

• Head Office
• One Controlling Office (if any)
• One Plan Approval (PA) centre, ensuring geographic coverage over a three year period and to the full extent of PA activities
• Vertical Contract Audits (VCAs) dependent on fleet size covering (minimum of 6 per year):
  • ships in service
  • new construction
  • ISM/ISPS
  • material and equipment certification
• Audits of additional survey locations according to IAF:MD5
Preparing a Survey

• Survey for a vessel in service can only be successful if the ship, the master and the crew are prepared.
Preparing a Survey

• The Surveyor will start to collect impressions from even before the time he takes his first step onto the gangway and will continue to do so until he takes the last step off the gangway.
Plan & Prepare

- planning ship’s schedule
- ensure suitable location
- request surveyor in a timely manner
- discuss surveys with surveyor in advance
- know scope of survey
- enough time for survey
- ensure crew may demonstrate operations if required
- plan before carrying out repairs
- advise class / discuss repair plan with class
- provide adequately certified spares
Preparing

- Documentation ready
- Ensure machinery and spaces are prepared (e.g. cooled down, mountings open)
- Tanks open
Conducting Surveys

The survey methods depend on the scope of the intended survey.

Possible survey methods are:

• the Visual overall inspection
• the Visual close up examination
• an Audit of the maintenance history
• Witness testing,
  • function test,
  • tightness test
Conducting Surveys

During the inspection

• Make sure that the surveyor is accompanied around the vessel during the inspection by either the Master or a senior officer
Preparation for an In-Water Surveys

- Information Diver Company
- Ensure recognition
- Clarify permission (port authority)
- Check visibility (ask diver or Class Inspection office)
- Availability of IW-documentation and instructions (approved copy)
- Measuring tools for propeller shaft and rudder (filler etc.)
- Availability of tools and equipment (cover for sea-chests, etc.)
In-Water Surveys (with notation IW)

- For vessels maintaining the class notation IW
- Substitute for every second bottom survey in dry dock except class renewal
- Only with approved diver companies
Ballast Water Tank Survey

- Ventilation
- Access
- Gas concentration
- Cleanliness
- Illumination
- Security Equipment
- Personnel / Company whilst getting into the tank
- Communication (VHF)
- Safety Equipment (Breathing apparatus)
Critical items

- Maintenance Safety Equipment
- Fire Fighting / Fire Flaps
- Hatch Covers
- Air / Sounding Pipes
Survey Report

Report No.: TUR-11-1219 rev 1

DET NORSKE VERITAS

SURVEY REPORT

This is to verify that the undersigned surveyor to Det Norske Veritas Oy/AB did attend at the request of Steelfaster Finland Oy, Mynämäki, Finland, in order to inspect the following item:

LFS water tank and water control module

Manufactured by: Steelfaster Finland Oy, Mynämäki, Finland
Serial No.: 6610
Ordered by: Bike Ocean Solutions Pte Ltd, Singapore
Order no.: PO1-1005
Intended for: 
Ref.no.: 
Date of inspection: 
Marking: TUR-11-1219

Scope of work: Witness of pressure test and visual inspection of the product

Design approval: Pending

Findings: The product was manufactured according to the drawing no. 001 dated and was visually inspected with satisfactory result. The hydraulic pressure test was carried out by water with a test pressure of 75 bar with satisfactory result. Electrical installation was visually inspected and found to comply with general Rules Pt 4 Ch 8

Material certificates: Material certificates were verified and found to comply with Rule requirements.

Welding/NDT-testing: Welding of pipe joints was carried out by qualified welder using approved welding procedures and consumables. RT inspection of butt weld joint of pipes was carried out by Inspecta Oy, Finland with satisfactory results; inspection report dated

Conclusion: Piping diagram and electrical documentation to be submitted for approval. Function test onboard to be witnessed by DNV Surveyor.

For Det Norske Veritas OY/AB
Place: Mynämäki, Finland
Date: 
Surveyor:

Pekka Toja

DETNORSKE VERITAS, VIKINGHAVEN 1, N-4022 OSLO, NORWAY, TEL: INT +47 97 97 00 00, TELEFAX: +47 97 97 97 11
FAX No.: 40574 Issue: July 99
Afterwards

If the ship has passed the survey successful:

• Certificate will be endorsed (annual/intermediate)
• Extension of certificates
• New certificate will be issued (renewal)
Other Types of Surveys

• Flag State Inspection
• Port State Control
• Vetting Inspection
• Sale and purchase
• Inspection of the Ship
Flag State Inspection

- Surveys carried out by nominated inspectors of the flag (i.e. no Class Surveyor)
- Check of technical and operational requirements
- Reporting to flag states
Port State Control (PSC)

Who

• each coastal country / port state

Background (Legal)

• Resolution A 787(19), Resolution A 822(21), Memorandum of understanding

• USCG also checks national regulations

Aims

• check for compliance with international convention regulations

Report / Consequences

• PSC report, handed over to the master
Port State Control (PSC)

Scope of Inspection
- general inspection – impression of ship
- more detailed inspection – clear grounds
- expanded inspection
- Concentrated inspection campaign (CIC)

Detention
- PSCO decides by his professional judgement

Deficiencies
- technical / operational / in the documentation
Vetting Inspection

Who

• Surveyors, Inspectors

Background (legal)

• contracts, agreements
• on behalf of owners or potential charterers
• SIRE > oil tankers, follows OCIMF inspection criteria
  • SIRE = Ship Inspect. Report Exchange
  • OCIMF = Oil Companies Int. Marine Forum
  • questionnaire: VPQ and VIQ
• CDI > chemical and gas carriers, follows CEFIC standard
  • CDI = Chemical Distribution Institute
  • CEFIC = Council of Europe Federation of Chem. Industry
Vetting Inspection

Aim

- risk assessment survey

Consequences

- Pro forma inspection reports available
- upon completion of survey
  - SIRE/C31 database uploaded with inspection results
  - results available to users of CDI/SIRE system
- evaluation of inspection report allows interested parties assessment:
  - does specific ship comply with own standards
  - is it suitable for being chartered
  - is it suitable to load/discharge at own terminal
Sale and Purchase

Who

• Inspectors, Surveyors

Background

• agreement between owners and buyers about time and type of survey

Aims

• decision making for purchase and costs

Consequence

• contract for sale and purchase – or not
Inspection of the Ship

Who

- Superintendents of the company

Background (Legal)

- internal rules, agreements, quality system

Aims

- e.g. maintenance planning, preparation for repair

Report / Consequences

- e.g. internal report, repair
Thank you!

Any questions?