



Lay-up of Vessels

MARCH 2012

*This chapter has been amended since the main revision (March 2012), most recently in April 2012.
See "Changes" on page 3.*

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FOREWORD

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Guidelines

Guidelines are publications which give information and advice on technical and formal matters related to the design, building, operating, maintenance and repair of vessels and other objects, as well as the services rendered by the Society in this connection. Aspects concerning classification may be included in the publication.

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CHANGES

General

This document supersedes Guidelines 22, April 2009.

Text affected by the main changes in this edition is highlighted in red colour. However, if the changes involve a whole chapter, section or sub-section, normally only the title will be in red colour.

Main changes March 2012

- Previous Sec.2 Disclaimer of Liability, has been removed and subsequent items have been renumbered.
- Sections 3.1 Hot Lay-up, and 3.2 Cold Lay-up, have been rewritten.
- A new Sec.8.9 Stability and other risks after lay-up, has been added.
- A new Sec.11 Declaration for Clean Lay-up, has been added.
- A new Sec.12 Certification of Lay-up Service Provider, has been added.
- A new Appendix B Summary of Vessel Type Lay-up Considerations, has been added and the following appendix has been renumbered.
- Appendix C Request for Declaration, now shows the certificate 32.410a which will be available in DNV's eForm system from the April 2012 release.
- The current lay-up and preservation practices as well as ship type specific measures for tankers, bulk carriers and container ships have been updated.
- The guideline is updated to be aligned with the changes of current DNV Rules for Classification of Ships.

Amendment April 2012

- In Appendix C the enclosed DNV Form was replaced with the correct version.

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1. Introduction

This Guideline is based on DNV's observations and accumulated experience in advising ship owners on laying-up vessels and represents a full revision of our recommended practices from the major lay-ups in the shipping industry during the 1970s and 1980s and is updated with a Declaration for Clean Lay-up.

The Guideline provides a systematic and cost effective approach for preparing the vessel for lay-up and maintaining it in a safe and cost effective condition during lay-up.

An overview of the various parties' involvement in laying-up of vessels is given in the start of the document in order to assist ship owners in evaluating the different scenarios of lay-ups.

If the vessel is laid-up in compliance with the recommendations given in sections 8 and 9, Det Norske Veritas AS may upon a successful verification, issue a Lay-up Declaration and Lay-up Preservation Declaration respectively stating compliance with said requirements. If the vessel is laid-up in compliance with the additional requirements given in section 11 and 12, a Declaration for Clean Lay-up may be issued.

Finally, some practical procedures for re-commissioning the vessel are given in Sec.10.

It should be noted that the guidance herein are not classification requirements. The recommendations given are of a general character. Maritime, national or local authorities and insurance companies may have individual requirements not covered by this document.

Furthermore, the specific requirements of equipment manufacturers may take precedence over the guidance presented.

2. DNV's Lay-up Services

DNV's services on lay-up are available individually or in the combination best suited for the actual situation:

- General advisory services on lay-up scenarios.
- Development of lay-up specification and procedures.
- Supervision of the lay-up process.
- Lay-up Declaration as requested by the various parties involved such as insurance and port authorities.
- Periodic inspection according to Lay-up Declaration.
- Supervision during re-commissioning.

3. Lay-up Condition

When vessels become idle, further operation is usually evaluated on a cost/benefit basis considering different technical and economic conditions. Key considerations for the choice of the lay-up condition are:

- estimated time in lay-up condition
- operational cost savings
- re-commissioning time and cost
- next intended destination after re-commissioning e.g. normal trade, repair yard or scrap yard
- age of vessel and recycling value.

A summary of relevant lay-up considerations for each condition listed below is given in Appendix A of this document.

3.1 Hot lay-up

In this lay-up condition, the machinery is kept in operation for the sake of fast re-commissioning, but measures may be taken to reduce various operational costs.

3.1.1 Hot lay-up with cargo

Vessels should normally be laid-up without cargo.

3.2 Cold lay-up

In cold lay-up condition the machinery is taken out of service and the vessel is kept "electrically dead" with the exception of emergency power.

This condition usually implies 3 weeks re-commissioning time or more depending on the level of preservation and maintenance during lay-up. The level of preservation is mainly decided based on the age and value of the vessel and the most likely re-commissioning scenario. Examples of scenarios are:

- vessel returns to normal trade
- vessel sails to repair yard

— vessel sails to scrap yard in ballast.

Minimum manning covering fire, leakage, moorings and security watches should be kept. The lay-up site is usually in a remote site and access is therefore limited. Power will be kept to minimum level to ensure emergency equipment and operation of windlass and mooring winch are operational. Usually, humidity is the challenge of cold lay-ups; hence, proper air dehumidifying is critical. If the vessel is intended to return to normal trade or repair yard, dry preservation is recommended and all preservation actions should be carefully documented, as the scope of re-commissioning required by the classification society will be dependent on the preservation.

3.2.1 Lay-up for over five years

Re-commissioning after long term lay-up periods over five years may be unpredictable and could take 3 months or more depending on maintenance and preservation applied. Extensive re-commissioning work should be anticipated.

4. Classification

Owner should notify DNV when the vessel is laid up or otherwise taken out of service for a period of more than 3 months. A written notification by e-mail will be sufficient for DNV to change the status of the vessel to “Laid Up”.

4.1 Surveys

During lay-up, vessels shall be subjected to annual survey. The extent of the annual survey will be reduced compared to main class annual survey, but shall cover watertight integrity, bilge system, fire hazard and equipment in use.

The following surveys apply for vessels laid up with DNV class:

- 1) Annual survey of laid-up vessel will be carried out at required intervals. Vessels manned during lay-up shall comply with class requirements regarding fire safety. The requirements may be limited to engine room areas and any high risk area in use, assuming vessels are laid up in ballast condition and that the cargo area is clean and gas free.
- 2) Prolonged survey intervals may be applied to vessels being laid-up directly after completion of construction.
- 3) Maintenance and preservation during the lay-up period is not a class requirement, but will affect the scope of the re-commissioning survey. If during the lay-up period the vessel has been preserved and maintained according to a program accepted by Det Norske Veritas, the scope of the re-commissioning survey will be specially considered. For maintenance and preservation see Sec.9.
- 4) There is no time limit for how long a vessel can be laid-up provided the required surveys as above are carried out.

4.2 Re-commissioning

4.2.1 General

Re-commissioning survey of laid-up vessel will depend upon several factors such as time in lay-up, maintenance and preservative measures taken during lay-up, survey status at the time of re-commissioning, the reason for re-commissioning, the type and age of vessel.

4.2.2 Vessels laid-up for up to 12 months

Such vessels are considered as having traded continuously by Det Norske Veritas, i.e. being preserved like under normal operating conditions. In such case only overdue surveys shall be carried out during re-commissioning. For vessels not preserved, a sighting survey may be required.

4.2.3 Vessels laid-up for more than 12 months

Ships which have been out of commission, e.g. laid up, for a period of at least 12 months, shall be surveyed and tested before re-entering service. The extent of the surveys and tests will be considered in each case depending upon:

- the time the ship has been out of commission
- the maintenance and preservative measures taken during lay-up
- the extent of surveys carried out during the time out of commission.

As a minimum, a sea trial for function testing of the machinery installation shall be carried out.

All overdue surveys shall be completed prior to re-entering service.

No maintenance or preservation is required, but if carried out, the scope of the re-commissioning survey will be specially considered.

The scope of the re-commissioning survey may be increased if deemed necessary by the attending surveyor (e.g. in case of longer lay-up periods with no preservation or maintenance).

5. ISM and ISPS

5.1 ISM

If the vessel has been laid up more than 6 months the SMC becomes invalid. An interim verification audit will be required upon re-commissioning, with the vessel being treated as a new vessel to the company. Upon successful completion of the verification, an interim SMC will be issued.

If the lay-up period is less than 6 months, but periodical audit window has expired during lay-up, the certificate will be considered invalid. The vessel will then be required to undergo interim verification upon re-commissioning.

If the vessel has been laid up less than 6 months and the periodical audit window has not expired the certificate will still be valid.

If the Flag State Administration has issued any instructions in this respect, they will override these requirements.

5.2 ISPS

If the vessel has been laid up more than 6 months the ISSC becomes invalid. An interim verification audit will be required upon re-commissioning, with the vessel being treated as a new vessel to the company. Re-approval of SSP may be required. Upon successful completion of the verification, an interim ISSC will be issued.

If the lay-up period is less than 6 months, but periodical audit window has expired during lay-up, the certificate will be considered invalid. The vessel will then be required to undergo interim verification upon re-commissioning.

If the vessel has been laid up less than 6 months and the periodical audit window has not expired the certificate will still be valid.

If the Flag State Administration has issued any instructions in this respect, they will override these requirements.

6. Insurance

Relevant hull and machinery underwriter and P&I club should be consulted for guidance prior to removal of the vessel from service.

P&I club rules for protection and indemnity cover will vary, but the owner may, upon negotiation, apply for lay-up return for certain idling period provided the vessel is declared safely laid up. I.e. the vessel has been taken out of commercial operation and has been subjected to the recommendation of this Guideline or its equivalent.

If the vessel is laid-up for an extended period of time, most P&I clubs will reserve the right to inspect the condition of the vessel on re-commissioning.

Most port authorities will require a letter from local P&I club representatives to confirm that the laid-up vessel is covered for port risks, e.g. oil pollution, wreck removal, salvage costs, etc.

7. Flag State and Port Authorities

7.1 General

Owner should notify flag state when the vessel is laid up or otherwise taken out of service for a prolonged period of unemployment. Most flag states require an official notification with date and location of lay-up, so that the status of lay-up can be registered.

Flag state requirements for lay-up vary from notification only to more detailed documentation of the lay-up condition. For example, Hong Kong flag requires a copy of a lay-up survey report with the purpose of confirming that the quality of the vessel is maintained during the lay-up period. Another example is Liberian

flag which requires vessel operators to submit a lay-up plan including lay-up procedures, proposed manning level, emergency response, etc. for short term lay-up.

It is therefore important to consult the relevant flag state and check relevant flag requirements prior to entering lay-up.

7.2 Safe manning

While the Safe Manning Certificate sets the criteria for safe manning at all times for vessels in operations, there are no requirements which require minimum manning levels while vessels are within port limits, alongside or safely at anchor.

For hot lay-up, flag states may authorize the vessel to have reduced crews depending on the requirements of the local port authorities. Since requirements vary from port to port, it is recommended to forward a lay-up plan for evaluation and authorisation including:

- lay-up procedures
- proposed manning level
- emergency response (fire, collisions, pollution, hurricanes, floods, etc.)
- navigation watches (if at anchor)
- security plan
- completing class surveys and audits
- procedures for re-commissioning.

The following example given by the Liberian flag state requires such a lay-up plan:

“At anchor or moored and required to get underway in an emergency, or when directed by the port authorities; the vessel should have the following navigation crew:

1 master, 1 mate, 1 Abs, 2 OS

The following engineering crew if E0 certified:

One Chief Engineer or Second Engineer

Two engine ratings, 1 of which will be an oiler”.

For example, a vessel hot laid up, safely moored alongside, may be allowed by the port authorities to reduce the crew to watch and minimum engineering crew only. In such a case DNV will issue a Condition of Authorities (CA) stating that the safe manning must be re-instated before leaving port.

Safe manning is a flag state responsibility, but as a general guideline the following may be considered sufficient for hot lay-up where the vessel may be required to get underway in an emergency, or when required by port authorities:

- 1 master, 1 deck officer, 3 deck crew
- 1 chief engineer, 2 engineering crew
- sufficient crew to maintain all safety functions, i.e. explosion prevention, etc.

For cold lay-ups the vessel should have at least fire, leakage, mooring and security watch. It is recommended that the owner seeks guidance from the vessel's flag state, insurer and local port authorities to agree the final manning levels onboard during cold lay-up.

8. Safety

8.1 Lay-up Declaration

Upon request Det Norske Veritas AS may issue a Lay-up Declaration as may be required by third parties involved in a lay-up situation such as underwriters, owners or charterers, and maritime, national or local authorities. The declaration will have no bearing on a vessel's class with DNV or any other classification society. See Appendix C, Request for Lay-up Declaration.

A Lay-up Declaration may be issued based on the following overall requirements:

- the vessel is safely moored with periodical mooring watch, and emergency operation of mooring winches available at short notice
- navigation lights, fire and bilge alarms are in operation
- fire extinguishing and bilge systems are operable on short notice by competent personnel
- safety arrangements for personnel on board, if any, are in place.

Recommendations on how to achieve this are given in the following. It is recognised that there may be alternative ways to achieve equivalent safety of a laid-up vessel, but in order to qualify for a Lay-up Declaration

from DNV, the above overall requirements shall be met, and the following recommendations followed or met by actions resulting in an equivalent safety level.

A summary of relevant lay-up considerations for different vessel types is given in Appendix B of this document.

8.1.1 Initial survey

If the vessel meets the requirements laid down in this Guideline, a Lay-up Declaration valid for a period of maximum 6 months may be issued.

8.1.2 Re-surveys:

Consequent Lay-up Declarations may be issued for a period of maximum 12 months.

8.1.3 Scope of work

The lay-up declaration is based upon an evaluation of:

- seabed characteristics
- environmental conditions including weather and current statistics
- mooring arrangement
- structural strength of moorings and mooring fastening devices
- ballasting and stability
- the planned manning or watch-keeping personnel
- safety aspects
- fire protection, detection and extinguishing
- precautions against flooding
- communication equipment
- navigation lights
- lifesaving equipment
- power availability
- emergency contingency plan
- anti-pollution measures
- security arrangements.

The vessel and the items above will be inspected by DNV before issuing of initial and subsequent Lay-up Declarations.

8.1.4 Documents to be submitted

The following plans and other documents should be submitted for evaluation:

- general arrangement plan (if not in DNV class)
- ballasting and draught for the vessel in the proposed lay-up condition.
- area chart with indication of vessel location
- expected statistical weather conditions
- chart showing depth curves and bottom soil conditions
- proposed position and heading of vessel
- mooring arrangement:
 - number of anchors and length of chain cables to be used
 - proposed mooring pattern
 - chart indicating bollard position, bollard capacity and individual distances between bollards ashore if applicable.
- planned manning and watch-keeping
- emergency contingency plan
- anti pollution measures
- security arrangements and procedures.

8.2 Lay-up site

The lay-up site should be well sheltered from heavy wind, strong current and swell. The site should not be in tropical cyclone areas, unless sufficient tug assistance will be readily available, and there is a well-established weather forecast service for the area.

The seabed characteristics should be such as to provide adequate anchor holding power if anchors shall be used. A diving report confirming the seabed condition may be required.

The seabed should be free from obstructions, wreckage or other projecting objects. The site should not be exposed to significant amounts of moving ice.

The water depth on the site should give sufficient clearance between seabed and vessel's keel, including the

lay-up initial position as well as the area in which the vessel or block of vessels may be moving due to environmental forces.

When shore moorings are used, mooring bollards of sufficient strength should be placed in such positions that proper lead of moorings is obtained. Suitable distance from vessel's stern to shore bollards should be between 50 m and 150 m, varying with size of vessels.

Sufficient shore bollard strength should be available.

Sideways clearance in the laid-up initial position to shore or any seabed obstacles should be at least 60% of the distance between stern and shore bollards. If vessels are laid in block alternate bow to stern, with anchors in opposite directions, sideways clearance should be at least 30% of the anchor cable deployed.

The minimum distance between separately laid-up vessels or block of vessels should be 50 m.

The acceptable total number of vessels to be laid-up in one block should be considered. The total tonnage in a block of vessels should be considered against possible restrictions from any national or local authorities, or from underwriters involved.

8.3 Mooring arrangements

The mooring arrangement shall be able to maintain a safe mooring of the vessel, or block of vessels. Vessels in lay-up position should be able to withstand wind loads from wind velocity up to normally 30 m/s, acting 90° and 45° to the vessel's centreline, without getting vertical forces on anchors, or unacceptable loads on shore moorings. In closed harbours, and for vessels berthed quayside, lesser wind loads may be used if based on documented weather statistics.

The effect of current speed and directions should be considered. Normally, current of 2 knots should be used for evaluation.

When the anchors are used, full length of chain cables should be deployed, and the length of chain cables deployed should be approximately seven times the depth of the water as a minimum. Chain cables should be laid in a straight line, parallel with the vessel's centreline with the vessel in the initial position. After pre-tension of chain cable, the angle between the water surface and the chain cables should be approximately 65°.

The anchor windlass with braking system and anchor chain stopper should be checked.

The number and size of moorings should be considered. A mooring line or bundle of moorings should not be stressed to more than 50% of the breaking load. Wire moorings are generally preferred, synthetic fibre ropes may be considered for short lay-up periods. Age, wear and corrosion of mooring lines should be considered for each single line.

When vessels are laid-up berthed to a quay, an adequate number of head/stern lines, breasts and springs should be set. Special care should be taken to minimize loss of restraint capacity due to vertical inclination of mooring lines.

When vessels are laid-up in a block alternate bow to stern, vessels should be of approximately the same size, and of even numbers in the block.

When a vessel is laid-up on sway with one anchor deployed, the other bow anchor should be lowered to the water surface and be ready for dropping. Provisions should be made for periodically clearing the chain of twists.

When a vessel is laid-up with bow anchors deployed and stern moorings to shore bollards, all moorings ashore should preferably be concentrated in one bundle. Two bundles may be acceptable, in which maximum possible parallelism between the bundles should be obtained. All moorings should be tensioned in order to obtain even stress. All moorings should be of same property.

The capacity of the vessel's chocks, bollards and possible winch brakes should be considered.

When vessels are laid-up in a block with shore moorings, the bundles of moorings should be kept parallel to obtain even stress in the mooring lines. Bundles of mooring lines from the outer vessels in a block should be less tensioned than moorings from inner vessels, in order to obtain even loads during sideways movements of the block.

Moorings between vessels in a block should be kept tightened. At least 8 lines consisting of breast and springs should be set between each vessel in a block.

Heavy fendering should be used between each vessel in a block, positioned at different levels, preferably secured with chain cable.

All moorings in use should be well protected against corrosion and chafing.

8.4 Ballasting

The vessel should be ballasted in order to reduce exposure to wind forces, normally 30% to 50% of the loaded draught. The final ballast distribution should be documented.

Consideration should be given to:

- depth of water at the lay-up site
- wind and current forces
- the stability and strength of the vessel
- slack ballast tanks should be avoided.

8.5 Power availability

Dependent upon the lay-up site and possibilities for tug assistance, availability of propulsion machinery may be required. It is, however, generally assumed that in normal lay-up condition there will be no immediate need for propulsive power.

Power for operation of navigation lights, fire and bilge alarms, and fire extinguishing and bilge systems shall be available. This may be arranged by the use of a portable diesel generator set mounted on deck. Emergency power sources to be kept ready for operation and tested regularly.

Adequate power for operation of windlasses and mooring winches should be available. If steam-driven, the anchor windlass and any necessary mooring winches should be fitted with emergency air connections, and sufficient air capacity should be available for their operation. If electric, an emergency source of power should be available for their operation.

8.6 Safety precautions

8.6.1 Manning

Qualified personnel shall be available in order to maintain full-time fire, leakage, moorings and security watch of the vessel, and shall be capable of operating the related equipment.

8.6.2 Protection against explosions and fire

Fire sources should be removed or minimized as far as practical. All decks, accommodation and machinery spaces should be cleaned and all flammable or combustible materials should be removed or properly stored. Bilges should be kept dry and clean.

All cargo tanks, pump rooms, cofferdams and pipelines should be clean and gas concentration of hydro-carbons shall not exceed 0.40 of the lower flammable limit (LFL).

A valid Gas-free Certificate, if required by maritime, local or national regulation should be posted on board.

Inerted tanks may be accepted. O₂-content in inerted tanks should be below 5% by volume when going into Lay-up. During lay-up, O₂-content should be kept below 8% by volume. If vessels are laid up in areas where frost may be expected, water locks for inerted systems should be filled with anti-freeze coolant.

Gas concentration, or O₂ content if inerted, should be measured regularly. Special attention should be paid to gas concentration with increase of temperature. Results should be recorded in the Log Book.

If inert gas is not available, CO₂ may be used, e.g. for slop tanks.

Hot work should be carried out only with a valid hot work certificate and appropriate safety precautions in place.

Valves or cocks to oil tanks in machinery spaces should be closed and drip trays should be cleaned. If machinery or boilers should be kept in operation during lay-up for power supply or heating, quick-closing devices for fuel oil valves should be checked.

Wire gauze in air pipes to fuel tanks and spark arresters in exhaust pipes to be in proper condition.

Any temporary installations like space heaters, driers or heaters for electrical equipment, stores etc. should be specially considered with respect to fire hazard.

All fire dampers in ventilators are either to be closed or clearly marked and kept easily closable.

Fire doors and watertight doors should be closed.

Flash Point on all residual and distillate fuels kept on board during lay up should be determined to confirm compliance with the prevailing SOLAS regulation of minimum 60°C. Analysis results based on samples taken during bunker deliveries, if available, should be sufficient.

As for other oil tanks hot work should only be carried out with a valid hot work certificate and appropriate precautions in place. Although fuel oil Flash Point is above 60°C over time, depending amongst other on

climate/temperature, flammable gases may accumulate in the head spaces of the fuel oil tanks.

8.6.3 Fire detection and fire fighting arrangement

The fire alarm system shall be kept in normal operation during lay-up. It should be arranged in such a way that it is capable of alerting the crew or watch personnel.

The vessel's normal fire fighting equipment should be available and maintained with special attention to:

- Fixed fire fighting installations should be kept ready for operation and checked regularly in case the vessel is manned during the lay-up.
- Fire mains should be ready for use. Power supply to be available for operating the fire pumps. These should be checked and run regularly.
- Emergency fire pumps must be ready for use and to be checked and run regularly.
- International shore connection must be available and clearly marked.

8.6.4 Precautions against flooding

A double barrier towards flooding should be maintained for all overboard connections. Inspection hatches, etc. of equipment located below the waterline should be kept closed if connected to the seawater system.

All overboard valves not in use and all sea inlet valves not in use (except for cooling of prime mover for emergency electric power generation and fire pumps) should be closed.

Water level in ballast tanks, pump rooms and bilges should be checked regularly. Level and bilge alarms shall be kept in normal operation.

Bilge lines to holds, pump rooms, cofferdams and engine room to be kept ready for use. Sufficient electric power should be available for the bilge pump.

All pipes liable to be damaged by frost should be drained or otherwise protected.

Temporary bilge alarms should be arranged for in the engine room, if not already fitted.

8.6.5 Communication

Reliable means of 24 hours communication should be available for immediate contact for local assistance or rescue facilities.

Two separate means of communication should be provided.

8.6.6 Navigation lights and fog signalling system

Anchor lights, and if necessary, additional position markings, e.g. lights marking the bow and stern, should be well maintained. Supplemental deck lighting should be used if the vessel is laid up near shipping lanes.

Fog signalling system should be kept readily available.

8.6.7 Lifesaving equipment

Lifesaving equipment and distress signals appropriate for the lay-up site and the total complement on board should be kept available. Periodical servicing of life-raft should be carried out as per normal requirement.

8.6.8 Emergency contingency plan

An emergency contingency plan should be available.

8.7 Anti-pollution measures

Depending on the lay-up mode, bilge water and water accumulated on deck should be pumped into slop tanks or similar as far as applicable. On tankers the cargo tanks should be cleaned and dirty residues disposed of at a reception facility.

8.8 Security

Means to prevent unauthorized access to the vessel should be established. Doors and openings should be kept locked, bearing in mind emergency escape possibilities for the persons onboard.

Regular watch-keeping routines, reflecting the security situation at the lay-up site should be established. Procedures for periodical testing of the Ship Security Alert System (SSAS) should be established.

8.9 Stability and other risks after lay-up

The following represents a hazard to the crew and the vessel and should be assessed prior to departure from lay-up in rough weather:

- **Stability:**

- Vessels with a low metacentric height (GM) will be more exposed to longer periods of roll which increases the risk of a ship capsizing
- Certain vessels with a large metacentric height (GM) while being laid up (e.g. container vessels) will be more exposed to waves with shorter periods. This might cause resonance and excessive roll.
- Course Keeping: Reduction in maneuverability when in ballast
- Longitudinal strength: Excessive bending moments when in ballast.

9. Preservation

9.1 Lay-up Preservation Declaration

Upon request, DNV may issue a Lay-up Preservation Declaration confirming that a vessel has been laid-up in accordance with either of the standards below:

Preserved: Preservative measures and maintenance according to 9.3 or similar.

- The vessel with machinery and equipment is properly preserved.

Dry preserved: Preservative measures and maintenance according to 9.4 or similar.

- The vessel with machinery and equipment is properly preserved in a de-humidified atmosphere.

Recommendations on how to achieve this are given in the following. It is recognised that there may be alternative ways to achieve equivalent preservation of a laid-up vessel, but in order to qualify for a Lay-up Preservation Declaration from DNV the above overall requirements shall be met, and the following recommendations followed or met by actions resulting in an equivalent preservation level.

Proposed methods of preservation as well as a maintenance programme should be submitted before the initial survey. Re-surveys shall take place 6 months after the initial survey, and thereafter annually.

9.2 General

9.2.1 Equivalent solutions

The following recommendations are based on DNV's experience with preservation of laid-up vessels, but it is recognised that there may be other ways to achieve good preservation. It is encouraged to seek manufacturer's recommendations for preservation of specific equipment and machinery. Such recommendations are in general to replace recommendations given in this Guideline.

9.2.2 Lay-up plan

A lay-up plan outlining the preservation and maintenance routines during the lay-up period should be available.

9.2.3 Lay-up log

All preservation actions should be logged. The log should include required actions at re-commissioning for each item.

Preservation and maintenance actions taken during the lay-up period should be logged, and may form a basis for reduced scope of the re-commissioning survey.

A log of equipment and spares removed from the vessel should be kept.

9.2.4 Lay-up environment

Preservation measures should in general reflect the environmental conditions at the lay-up site. If laid-up in a location that may be subject to sub-zero temperatures, measures to prevent damages due to freezing should be taken. Any mentioning of freezing in this Guideline applies to vessels laid-up in such locations only.

9.3 Preservation

9.3.1 Hull

9.3.1.1 General

All drain pipes and scuppers should be kept clear and open. Decks should be kept clean, and loose and foreign items removed or properly secured. Any corrosive products should be properly sealed and safely stored.

Hatches and doors should be closed weathertight. Possible open cargo tank hatches should be protected with tarpaulins. Skylight should be closed and preferably covered with tarpaulins.

Except for necessary ventilation to each compartment, ventilators, air pipes and similar should be closed.

All sidelights, windows and deadlights, where fitted, should be closed.

Dependent upon the machinery condition the funnel openings should be covered weathertight.

9.3.1.2 Underwater parts

The vessel's external coating systems should be in good condition prior to lay-up. If not, additional protection with either sacrificial anodes or an impressed current system is recommended used. For lay-up periods > 12 months, cathodic protection is recommended irrespective of coating condition.

For vessels not protected by sacrificial anodes or an impressed current system, stainless steel propellers should be protected against corrosion by a sacrificial anode fitted to the boss.

Impressed current systems, if fitted, should be maintained in an operational mode suitable for the lay-up situation, and controlled at regular intervals. The operational mode should be such as to avoid over-heating of anchor chains and mooring cables. A suitable criterion for cathodic protection may be 0.80 V vs. Ag/AgCl/Seawater reference electrode.

A logbook should be kept. If sacrificial anodes or impressed current systems are fitted, proper electrical earthing of propeller and rudder should be ascertained. Where two or more vessels are moored together, and where one or more of these vessels have cathodic protection as described above, the vessels' hulls should be electrically connected to each other.

All valves to or from the sea should be wired or locked closed, except those required for use during lay-up in connection with fire extinguishing, pumping out or watch personnel service. In order to prevent excessive fouling and choking, the sea suction openings (except for fire pumps) should be covered over and/or protected with a slow-acting biocide or cathodic protection specially designed for sea water inlets.

9.3.1.3 Hull above waterline

All paint should be in a proper condition and necessary touch-up carried out prior to lay-up or issue of declaration. Special attention should be given to the area just above the waterline.

9.3.1.4 Tanks and holds

Chain lockers should be dry.

Ballast tanks should be kept either full, or completely empty and dry.

Ballast tanks and cargo tanks kept full should be protected by anodes, unless protected by coating in a GOOD condition. For lay-up periods > 12 months, cathodic protection is recommended irrespective of coating condition.

The design of sacrificial anodes should be dimensioned for a realistic percentage of coating imperfections. Arrangement and age of possible existing anodes should be considered, and additional anodes fitted as found necessary.

Impressed current system or magnesium anodes shall not be used in tanks. Empty cargo tanks and cofferdams may be filled with dry inert gas. The dryness of the gas should be controlled and kept on a safe level with regard to corrosion. It is recommended that oil with no, or very low sulphur content is used for inert gas production.

A suitable inhibitor may be applied in sludge tanks, dirty bilge tanks, etc. if these are not kept clean and dry.

Adding of inhibitor is also recommended for bunker oil tanks for heavy oil if not kept completely full or empty. An inhibitor which does not cause harm to boilers or machinery should be used.

Other tanks should be kept either completely full, or empty and dry.

Due consideration should be given to preventing freezing of tanks.

9.3.1.5 Deck piping

In addition to protective measures against corrosion, deck and accommodation pipelines should be protected against freezing if relevant.

Cargo oil pipes, deck steam pipes, Butterworth lines, heating coils, exhaust, water and air pipes and ballast lines for dry cargo vessels should be well drained, preferably blown through with dry air or dry inert gas and left with drains open.

If not subjected to freezing, above-mentioned pipes may alternatively be filled with inhibited water. It is recommended that cargo oil lines first be flushed clean.

Fire lines and bilge lines should be drained and dried, but should be completely boxed up again and ready for service.

Sea valves for these systems should be easily operable and marked, or left open. Spindles on all valves should be well greased.

9.3.1.6 Deck machinery

Deck machinery should be carefully oiled and protected with grease.

For reciprocating machinery, non-contaminating corrosion protection should be applied to cylinders and slide valves after draining carefully. Windlass and important mooring winches should after above treatment be kept ready for operation.

Deck machinery should be turned at regular intervals.

9.3.1.7 Blocks, running gear and fittings

Wires and blocks for cargo gears not intended for use during lay-up period, should be dismantled and stored in a dry place or be left in place well-greased.

All deck fittings such as hinges, rollers, valves, valve spindle boxes etc, should be well protected by grease or protective oil.

9.3.1.8 Accommodation

Accommodation including navigating bridge and radio room should be protected against corrosion and other deterioration by means of a suitable system, e.g. by a dehumidified atmosphere having a relative humidity below 60%.

9.3.2 Engine and boiler rooms

The temperature in engine and boiler rooms should be maintained about 3°C above the outside temperature and never below 0°C.

Regarding general conditions of cleanliness, detection of fire and flooding, reference is made to section 9 of this Guideline.

9.3.3 Machinery

9.3.3.1 General

Prior to lay-up or issue of a declaration, all machinery should be established to be in normal good condition.

System lubrication oil for main systems should be thoroughly purified, and oil from each system should be analysed for water and alkalinity as well as acidity.

All lubricating oil ventilating pipes should terminate inside the machinery space, but above the freeboard deck level for double bottom tanks.

Engines should be clean and it is advised to run all combustion engines on water free diesel oil prior to lay-up.

Movable parts, like valve spindles, links, hinges etc. should be well greased. Other vulnerable metallic parts directly exposed to atmosphere should be covered by protective oil.

Rotating machinery, including electric motors and generators, should be turned at regular intervals. After turning, it should be checked that the shafts have changed positions.

Lubricating oil pumps should be run. Lubricating oil priming should be carried out before turning. It is recommended to jack up the crankshaft of engines to facilitate good lubrication prior to turning.

All air intakes and exhaust openings should be covered over. Supply and exhaust openings for necessary emergency diesel generator or fire pump engines should be arranged for immediate or automatic opening.

Purifiers should be run before and after turning of machinery.

Draining of water from tanks should be done regularly where possible.

9.3.3.2 Reciprocating machinery

Cylinder liners and pistons should be protected by means of inhibitors or non-contaminating oil.

Lubricators should be hand turned at regular intervals.

Crank cases should be regularly inspected to ensure absence of condensate or corrosion.

9.3.3.3 Turbine machinery and reduction gears

Turbine and gear housings should be dried out by dehumidified air and arrangements should be made to maintain dryness

(RH < 50%). Alternatively special protective oil may be applied.

Regular inspections should be carried out to ensure absence of condensate or corrosion.

Governing oil pumps should be run regularly and different parts moved.

9.3.3.4 Stern tube

For water-lubricated stern tubes, gland packing should be sufficiently tightened to prevent water leakage.

For oil-lubricated stern tubes, upper header tank should be used, and prior to lay-up it should be confirmed that the stern tube is free from water.

For stern tubes with forced oil circulation, pumps should be run at regular intervals.

When turning, larger stern tube bearings may sustain damage. It is therefore advised to limit the slow-turning to for instance a few (3-4) revolutions, and not do this operation for hours. For large vessels, long shafting and heavy propeller, it is recommended to have shaft arrangement plan analysed in order to make a plan for turning during lay-up.

9.3.3.5 Seawater system

All parts of the seawater systems not in use should be emptied, and pipes and heat exchangers flushed through with fresh water and completely dried out. For heat exchangers a thorough cleaning should be done to remove all growth and deposits.

Both heat exchangers and pipe system should after cleaning and drying be kept open to the dehumidified atmosphere. Regular blow through by dehumidified air should be done.

All sea suction and discharge valves not in use should be closed and secured. Spindles and turning gear should be protected by grease or protective oil.

Vessel side valves should be moved at regular intervals. This implies that means of closing the system should be arranged inside the vessel side valves.

9.3.3.6 Fresh water systems

Cooling water systems on engines may be left filled up with chemically treated water (in order to prevent corrosion as well as settlements) with head to expansion tank.

9.3.3.7 Starting air system

Starting air receivers may be kept fully charged or empty, clean, dry and open. At least one auxiliary starting air bottle is, however, should be kept fully charged to maintain auxiliary engines ready for start.

Charged air receivers as well as air piping should be drained at regular intervals.

9.3.3.8 Refrigerating plant

In addition to preservative measures given for relevant type of machinery used, refrigerant and brine systems should normally be kept tight and sealed. Filters, oil separators etc. should be cleaned.

9.3.3.9 Hydraulic systems

Hydraulic systems and governing oil systems should be completely full and care taken to ventilate air and drain all water out of the system. Movable parts should be well greased or protected with corrosion protective oil.

9.3.3.10 Steering gear

See precautions listed for hydraulic systems and electrical equipment.

Steering gear should be tested at regular intervals and rudder operated from hard over to hard over.

9.3.3.11 Fuel oil system

Provided practicable bunker tanks containing residual and marine diesel oil (black oils) should be emptied and cleaned prior to lay up, or during the initial stages of lay up to.

Fuel oil separators and filters should be emptied and cleaned.

Fuel oil lines containing residual fuel oils should be emptied. Preferably all engines and systems should be flushed with marine gas oil prior to shutting down.

If residual and marine diesel oils shall be kept on board, these fuels shall be analysed to establish the quality, with regards to water, sediments and abrasive particles. These contaminants will settle out over time and pose a potential damage risk to vital engine components during re-commissioning.

If possible, fuels kept on board during lay-up should be circulated at regular intervals to prevent settling of contaminants, while representative samples should be taken and analysed.

Special attention to be paid to the potential development of microbiological activity in distillate fuels during lay-up. Microbes in distillate fuels as well as in lubes and hydraulic systems may cause filter blockages and corrosion to tanks, pipes and equipment. There may be an increased risk of microbes developing in tanks and systems of idling or laid up vessels due to settling out of water, hence such samples should, where practicable, be taken from the oil/water interface area.

Draining of free water from fuel oil tanks, where practicable, should be carried out at regular intervals. This would also preempt the development of microbes.

9.3.4 Boilers and steam system

9.3.4.1 Fire side

The whole fire side, including economisers and air heaters, should be thoroughly cleaned prior to lay-up to remove all accumulation of deposits. Special attention should be given to super heaters.

Following the cleaning, the boiler should be fired with Diesel oil to dry out insulation and brickwork and left open.

If wet conservation method is employed for water/steam side, precautions should be taken to prevent sweating accumulating in insulation.

9.3.4.2 Water/steam side

Either dry or wet lay-up condition may be used. In both cases the boiler should first be carefully drained.

Dry lay-up condition means that the boiler is protected by a dry atmosphere.

Wet lay-up condition means that the boiler is filled with and protected by inhibited water.

If the wet method is applied, the following should be carried out:

- The boiler is re-filled with inhibited water. Manufacturers should be consulted regarding water treatment.
- The boiler is fired (heated) and air vented to atmosphere.
- A temporary circulation of boiler water is arranged, circulation should be continuous, and the boiler left open to atmosphere with head for ventilation.
- Alternatively, the boiler may be kept slightly pressurized after careful removal of all air.
- Boiler water should be controlled at regular intervals.

If dry method is applied, either of the following should be carried out to obtain dryness:

- Blanking off and evacuating to a vacuum giving desired dryness.
- Blanking off and pressurizing with dry air or inert gas, then blow down after stabilization time. This procedure should be repeated until desired dryness.
- Blanking off and charging with trays of drying agent, which should be frequently changed or reactivated until desired dryness is obtained.

Upon completion of the drying process, the following alternatives may be applied:

- The boiler is slightly pressurized with inert gas (Nitrogen) with dew point below 0°C.
- The boiler is charged with trays of desiccant and sealed. Drying agent should be changed or reactivated at regular intervals.
- The boiler may also be left open for slight air circulation with a heat source inside the upper part of the boiler.
- Dehumidified air is circulated in the boiler.

9.3.4.3 Steam system

For the main steam systems, with high pressure steam pipes and feed water pipes, feed water heaters and de-aerator, the same methods as described for boilers are recommended.

Other steam lines and exhaust lines should be well drained and dried and ventilated with dehumidified air.

9.3.5 Electrical installation

9.3.5.1 General

Electrical equipment should be protected against moisture absorption in insulation material and damage to rotating parts due to corrosion.

9.3.5.2 Insulation

All electrical equipment should be maintained with a temperature some degrees above surrounding atmosphere or in a dehumidified atmosphere (RH < 50%). Prior to lay-up or issue of declaration, insulation resistance should be confirmed acceptably high. If necessary, cleaning of insulation to improve resistance should be carried out.

Built-in heating elements in generators and motors should be in use.

Equipment not initially fitted with heaters should periodically be put into service, so that it is heated until moisture is removed. Insulation resistance should be confirmed each time.

9.3.5.3 *Generators and motors*

Brushes should be lifted from slip rings and commutators.

Turning should be carried out at regular intervals.

9.3.5.4 *Storage batteries*

Automatically regulated trickle charging systems for storage batteries should be kept in operation.

Batteries without automatic charging system should be recharged monthly. Liquid level should be checked for all batteries.

Special precautions may be required in very cold weather.

Battery manufacturer's recommendations should be consulted.

9.3.5.5 *Electronic equipment and computers*

Manufacturer's recommendations should be followed.

It is advisable to maintain a dehumidified atmosphere on the navigation bridge, in control rooms and all other rooms containing computers and electronic equipment. The relative humidity should be controlled at regular intervals.

Subject to manufacturer's recommendations it may be advisable to keep equipment under constant voltage, or to put it into service at regular intervals both for additional moisture removal and to recondition components.

9.3.6 Instrumentation and automation

9.3.6.1 *General*

Uniform guide lines for instrumentation and automation equipment cannot be given, but general considerations are given below. Manufacturer's recommendations should be consulted.

9.3.6.2 *Electric and electronic equipment*

Precautions should be taken to prevent damage from moisture.

In addition to counter measures given in 9.3.5, it may be advisable to leave some types of instrumentation equipment with voltage on, (e.g. smaller transformers and rectifiers).

Instrumentation equipment placed in open machinery spaces should be cleaned prior to lay-up. Movable parts should be run over the full operation range; thereafter they should be protected with oil or grease according to Manufacturer's instructions.

9.3.6.3 *Pneumatic equipment*

Whole piping system should be thoroughly blown through, and all drains left open. Alternatively, the system may be in operation. Components, such as controllers and transmitters with delicately built mechanisms, e.g. flapper nozzle systems, should be cleaned and covered with protective covers.

Regular controls should be carried out if the system is in operation.

9.3.6.4 *Hydraulic systems*

Section 9.3.3.9 applies.

9.4 Dry preservation

9.4.1 General

All provisions under section 9.3 apply, except that the temperature in the engine room and other spaces need not be kept above the ambient temperature, but not below 0°C.

Spaces, equipment and machinery should be protected by the use of a dehumidified atmosphere with a relative humidity below 50%. A safe method for keeping this atmosphere under control with regard to humidity should be established, and arrangements should be made to maintain the relative humidity below the given limit.

Cooling water should be drained from machinery.

Dry lay-up of boilers and steam system to be applied.

9.4.2 Hull

9.4.2.1 *Ballast tanks*

Ballast tanks in use shall have efficient corrosion protection with coating in a GOOD condition throughout.

For ballast tanks not in use, a dehumidified atmosphere should be secured, and the tanks sealed off.

9.4.2.2 *Cargo tanks, pump rooms, etc.*

For cargo tanks and holds not in use for ballast purposes, for pump rooms, cofferdams and pipe tunnels, a dehumidified atmosphere should be secured, and the tanks/rooms sealed off.

9.4.2.3 *Deck piping*

Cargo oil pipes, deck steam pipes, Butterworth lines, heating coils, exhaust, water and air pipes and ballast lines not in use should be cleaned, well drained, and kept protected by a dehumidified atmosphere.

9.4.2.4 *Deck machinery*

Deck machinery which is not needed for instant operation should be protected by a dehumidified atmosphere.

9.4.2.5 *Accommodation*

Accommodation, including navigating bridge and radio room, should be protected by a dehumidified atmosphere.

Parts of the accommodation in use may be held at a comfortable atmosphere with moderate relative humidity.

9.4.2.6 *Engine- and boiler rooms*

Engine and boiler rooms should be protected by the use of a dehumidified atmosphere.

Air supply to the engine room for possible working of combustion engines should be arranged in such a way that the dryness of the atmosphere is not influenced.

9.4.3 Machinery

9.4.3.1 *Reciprocating machinery*

Crank case should be protected by the use of a dehumidified atmosphere.

9.4.3.2 *Turbine machinery and reduction gears*

Turbine and gear housings should be protected by the use of a dehumidified atmosphere.

9.4.3.3 *Fresh water systems*

Cooling water systems on engines not in use should be emptied and dried.

Care should be taken to remove all water from cooling spaces, and thorough ventilation with dehumidified air is required.

9.4.3.4 *Starting air system*

Starting air receivers should be kept empty, clean, dry and open to the dehumidified atmosphere in the engine room.

At least one auxiliary starting air bottle should be kept fully charged to maintain auxiliary engines ready for start. It should be confirmed prior to lay-up that drains are clear. Air piping should be drained and dried out.

9.4.4 Boilers and steam system

9.4.4.1 *Fire side*

Arrangements should be made to circulate dehumidified air through the boiler and maintain a dehumidified atmosphere.

9.4.4.2 *Water/steam side*

Dry lay-up condition should be used.

After careful draining, drying should be executed by circulating dehumidified air through the boiler and the steam system.

9.4.4.3 *Steam system*

The whole steam system should be preserved by means of dehumidified air. An arrangement combined with the boiler should be established.

9.4.5 Electrical installation

9.4.5.1 *General*

Local arrangements with dehumidified atmosphere should be established for components such as switchboards, starter boxes, instrumentation units etc.

Regular control of relative humidity on components as well as regular change/reactivation of possible drying agents should be carried out.

9.4.6 Instrumentation and automation control room

Control room in engine room and other rooms containing sensitive electronic equipment should be protected by the use of a dehumidified atmosphere.

10. Re-commissioning

10.1 General

In general both the length of the lay-up and the preservation and maintenance carried out during the lay-up have great impact on the required extent of re-commissioning work. Therefore, all preservation actions should be logged during lay-up. The log should include required actions at re-commissioning for each item in order to enable an orderly re-commissioning process.

Classification requirements regarding re-commissioning are outlined in 4.2 of this Guideline and may be more extensive than what is outlined in 10.2 below.

The following steps should be taken by the owner upon re-commissioning of a vessel:

- Notify local port authorities in the lay-up area.
- Notify the classification society and check which class requirements have to be fulfilled prior to leaving the lay-up site.
- Ensure that the Safety Equipment Certificate and all other statutory certificates are valid.
- Re-commission the vessel, using vessel's crew or other competent personnel (preferably with guidance and attendance of local class surveyor).

10.2 Practical procedures

All temporary arrangements or installations in connection with the lay-up should be removed, such as temporary drying, heating and ventilation systems as well as locking of valves or temporary anode installations.

Necessary consideration should be given to protective oils or inhibitors applied; that they are either removed or that it is confirmed that they will not have harmful effects if remaining in the systems.

10.2.1 Hull

If the vessel has been laid-up for more than 12 months the submerged hull should be checked by a diver. The sea chests should either be confirmed free from excessive marine fouling, or such fouling should be removed.

Anchoring and mooring equipment should be checked and operated.

10.2.2 Cargo tanks

Temporary anodes should be removed.

Tanks which have been filled with water ballast containing corrosion inhibitor should be emptied and cleaned in accordance with manufacturer's instructions.

All tanks should be well ventilated and proved gas-free.

Heating coils should be blown through by steam or air.

All other tank equipment should be checked and verified to remain efficient.

10.2.3 Safety equipment

All equipment should be checked to the satisfaction of relevant authorities.

Particular attention should be given to emergency and fire fighting systems.

10.2.4 Machinery

Samples of lube oil should be submitted for full analysis.

All systems should be checked for completeness and sufficient operation.

Representative samples of all fuel oils kept on board during lay up (residual and distillates) should be taken and thoroughly analysed prior to use in diesel engines.

Depending on lay-up location (climate) representative samples of residual fuels may not be possible until steam is available to heat up the fuels.

10.2.5 Boilers

All burners should be dismantled and cleaned. Fuel oil should be circulated through the oil burning system.

All safety measures and emergency shut-off should be tested.

Care should be taken to proceed slowly when raising steam production.

10.2.6 Main engines

If rust-prevented oil has been used, this should be removed in accordance with supplier's recommendations.

Cooling water for pistons and jackets should be circulated and checked for leakage.

A complete survey of one cylinder unit with gear as well as two main bearings should be carried out to check condition of contact surfaces.

Fuel valves should be cleaned and adjusted and the fuel system checked for leakage.

Checking of crankshaft deflection should be considered.

10.2.7 Electrical equipment

All circuits should be checked for insulation resistance to earth.

All electrical cables and equipment should be examined.

Overload trips of all generator breakers should be checked for satisfactory operation.

10.2.8 Navigation

All navigation equipment should be verified to be in good order.

All required charts and publications should be up to date.

10.2.9 Spare parts

Spare parts removed from the vessel during the lay-up period should be replenished.

10.2.10 Testing

Testing should include at least the following equipment:

- main engine safety alarms
- engine should be run ahead and astern by engine room and bridge controls, including testing of shut-down and slow-down functions
- auxiliary engines with connected automation equipment
- all pumping, pneumatic and hydraulic systems
- all alarms covering ME, auxiliaries with steering gear
- remote operation of fuel oil and lube oil, pumps and valves
- cargo and ballast pumps
- bilge pumping systems
- all communication systems
- steering gear, including emergency operation
- all deck machinery and equipment
- all navigation and sounding lights and signals.

10.2.11 Antifouling coating system

All vessels will experience fouling during lay-up. The extent of the fouling is dependent on time, location and duration among other factors. Hence there can be a need to clean the hull prior to re-commissioning the vessel.

It is advisable to contact the coating supplier for the best cleaning procedure.

The most common in-water cleaning methods are rotating brushes or flushing. Brushing is mainly used on conventional antifouling coatings and hard coatings. Rotating brushes can damage and remove some of the antifouling coating. Depending on the local environmental legislation, one may be required to get a permit to carry out this kind of work as coating fragments are released to the environment.

Foul release coatings are typically less resistant to mechanical damage; hence they are not suitable for brushing. For foul release coatings the most suitable cleaning method seems to be flushing.

It is not unlikely that during the lay-up and in particular during the cleaning operation, the coating is damaged to such an extent that re-application of antifouling coating in the dry-dock will be necessary.

11. Declaration for Clean Lay-Up

11.1 General

Upon request, DNV may issue a Clean Lay-up Declaration confirming that a vessel has been laid-up in accordance with requirements of 11.1.1 to 11.1.4.

11.1.1 Emergency Preparedness

The vessel shall have shore based assistance (e.g. Emergency Response Service) maintained during the laid-up period. The shore based assistance shall ensure a quick response in case of emergencies such as oil-spill,

dragging of anchor, collision/ grounding, fire on board.

The status of water ballast and consumables remaining on board during the lay-up shall be available. The documentation shall be suitable to assist the captain in case of emergency, such as fire, grounding and collision.

A mooring quick release procedure shall be available. This procedure shall include the release of all mooring lines and anchors in case of emergency. The procedure shall also include the fastening of towing lines (fwd./aft) for tug boat assistance.

11.1.2 Procedures to prevent pollution

As a principle, discharge to the sea shall not be permitted. This includes items such as deck drainage, leakage from the stern tube and bunkering procedures.

In case of leakage or oil spill, anti-pollution procedures shall be in place. This may be arranged by shore based assistance.

Provisions for the reception of garbage, sewage, sludge and other waste to shore shall be arranged.

11.1.3 Air and noise pollution

Any emission to air shall be minimized as far as possible. Generators in use shall comply with the MARPOL Annex VI requirements for air emission.

Any noise pollution shall be limited. This applies mainly to portable deck generators. If deemed necessary noise measurements should be taken in the nearest residential areas. Alternatively, the noise emission from the sources may be measured and noise level in the most exposed residential area may be calculated. Measured or calculated noise levels must be compared with the acceptable noise limits (ref. to IMO Res-A.468 XII) and should not exceed 60dB. Noise reducing measures should be carried out if found necessary.

11.1.4 Antifouling coating treatment and marine growth

Generally marine growth should not be removed at the lay-up site. If removal of excessive growth will be necessary upon re-commissioning only such methods are acceptable which will not release any paint particles into the water. These methods include flushing and other methods proven not to have any abrasive effect on the coating.

12. Certification of Lay-up Service Provider

12.1 General

12.1.1 Introduction

Professional lay-up service companies carry out lay-up service on behalf of vessels' owner at certain locations.

A statement of compliance will be issued to the Lay-up service provider provided:

- Lay-up site has been evaluated and found to be safe for the intended vessel lay-up.
- Operational practice of service provider has been reviewed and found to be in accordance with the principal of this guideline.
- Management system of the service provider has been assessed according to ISO 9000 standard or is based on the requirements described in this section.

12.1.2 Scope

The assessment program encompass the service supplier's quality system for training and supervision of personnel being involved in providing lay-up service

12.1.3 Objective

The programme is set to ensure that the service supplier is employing duly qualified personnel when conducting lay-up service according to the practice of this guideline.

12.1.4 Validity

The certification is valid for two (2) years (see also item 12.4).

12.2 Requirements for the supplier

A statement of compliance will be awarded and maintained on the basis of compliance with the following:

12.2.1 Submission of documents

The following documents shall be submitted for review:

- an outline of the supplier's organisation and management structure, including any subsidiaries to be included in the assessment
- a list of nominated agents
- experience of the supplier in the specific service area
- a list of technicians and supervisors
- records of training and experience, including qualifications, of relevant personnel
- description of equipment used for performing lay-up service
- a guide for operators of such equipment.
- training programmes for technicians and supervisors
- procedures, instructions and checklists as specified in 12.3.8
- quality manual and/or documented procedures
- evidence of approval/acceptance by other certification bodies, if any
- information on other activities which may present a conflict of interest
- record of customer claims and corrective actions requested by the Society and/or other certification bodies
- documentation/evidence that the supplier has been authorised or licensed by port authority.

12.2.2 Extent of approval

The service supplier shall demonstrate, as required in 12.3.1 to 12.3.10, that the competence and control needed to perform the service has been implemented.

12.3 Quality assurance system

12.3.1 Requirements to the Quality system

A documented Quality Assurance system complying with the most current version of ISO 9000 series and including the items given in this section (12.3), shall be considered acceptable.

The supplier shall have a documented quality assurance system, covering at least:

- maintenance and calibration of the equipment
- training programmes for the supervisors and the technicians
- supervision and verification of operation to ensure compliance with the approved operational procedures
- quality management of subsidiaries and agents
- job preparation
- recording and reporting of information
- code of conduct for the activity
- periodic review of work process procedures, complaints, corrective actions, issuance, maintenance and
- control of documents.

12.3.2 Training of personnel

The supplier is responsible for the qualification and training of its supervisors and technicians as applicable (see item 12.3.3 and 12.3.4).

12.3.3 Supervisor

The supplier shall have a supervisor responsible for the correct execution of annual surveys on board and for the professional standard of the technicians and their equipment as well as for the professional administration of the working procedures.

The supervisor shall have passed the internal training as specified in the training programme and shall have minimum two (2) years education from a technical school and have minimum two (2) years experience as a commission/ installation technician or equivalent experience.

12.3.4 Technicians

The technician carrying out the annual performance test shall have passed the internal training as specified in the training programme and have at least one (1) year's technical school in addition to at least one (1) year experience as a commission/ installation technician.

12.3.5 Personnel records

The service supplier is required to keep records of approved supervisor/technicians. The record shall contain information on age, formal education, training and experience for the service.

12.3.6 Equipment

The service supplier shall have all the necessary equipment and facilities for the service. A record of the equipment used shall be kept. The record shall contain information on maintenance and date of calibrations as relevant.

12.3.7 Administrative procedures

The service supplier shall have an order reference system where each engagement is traceable to the service record/ report.

12.3.8 Procedures and Instructions

The service supplier shall have documented procedures, instructions and checklists stating how to carry out the service.

12.3.9 Verification

The service supplier shall have a system for monitoring that the services provided are carried out in accordance with approved procedures.

12.3.10 Sub-contractors

If any parts of the service shall be subcontracted, the Society shall receive information about such agreements and arrangements without delay. Subcontractors are subject to the requirements specified in this programme.

12.4 Approval procedures**12.4.1 Initial audit**

The DNV surveyor will carry out an audit of the service supplier once all documentation and information received have been evaluated.

12.4.2 Renewal audit

Renewal of certification shall be made at intervals not exceeding 2 years.

Verification shall be through audits confirming, or otherwise, those approved conditions are being maintained.

Annual audits may be required if found necessary by the Society.

At least three months before the certificate expires, the supplier shall apply to the Society for renewal of the certification.

12.5 Information of alteration to the Certified Service Operation System**12.5.1 Alteration**

In case of any alteration to the certified service operation system of the supplier, then such alteration shall be reported immediately to the Society.

A re-audit may be required when deemed necessary by the Society.

12.6 Cancellation of the certification**12.6.1 Right to cancel**

The Society reserves the right to cancel the certification in the following cases:

- where the service was improperly carried out
- where a surveyor finds deficiencies in the approval of the service operation system of the supplier and appropriate corrective action is not taken
- where the supplier fails to inform of any alteration, as given in 12.5.1
- where renewal audits, as described in 12.4.2, have not been completed to the Society's satisfaction
- where wilful acts or omissions are ascertained.

12.6.2 Information

The Society reserves the right to inform interested parties about the cancellation of Statement of Compliance.

12.6.3 Re-certification

A supplier whose certification had been cancelled may apply for re-certification after a period of six (6) months. Re-certification is not allowed if the cancellation was based on a grave fault, such as a violation of ethics.

Appendix A

Summary of Lay-up Considerations

Table A-1 Summary of lay-up considerations				
	<i>Hot lay-up</i>	<i>Cold lay-up</i>	<i>Ref.</i>	<i>Comments</i>
Re-commissioning period (approx.)	1 week	1 month	Sec.3	Depending on preservation and maintenance level
Class status	Change status to “Laid-up”	Change status to “Laid-up”	Sec.4	
Class attendance	Next Annual Survey of laid-up vessel	Annual Survey of laid-up vessel	Sec.4.1	
ISM and ISPS	Suspended after 3 month, Re-activation audit needed	Invalid Interim Audit needed	Sec.5	
Insurance	Port risk only. Lay-up return may apply	Port risk only. Lay-up return may apply	Sec.6	
Flag	Flag Requirement for Lay-up	Flag Requirement for Lay-up	Sec.7.1	
Manning	Engineering and navigation officers	Fire, leakage, mooring and security watch	Sec.7.2	Flag and local port authorities may have additional requirements
Fire Safety	As in operation, may be limited to E/R and high risk areas	As in operation, may be limited to E/R and high risk areas	Sec.8.6	
Lifesaving appliances	As in operation, may reduce due to reduced manning	Operational for lay- up personnel	Sec.8.6	
Lay-up declaration	Yes	Yes	Sec.2	Applicable for lay-up returns/reduced insurance
Preservation declaration	To be considered	To be considered	Sec.9.1	May be reflected in a reduced re-commissioning scope for DNV classed vessels. May have positive effect on insurance own risk.

Appendix B

Summary of Vessel Type Lay-up Considerations

	<i>Preparation of lay-up</i>	<i>Lay-up</i>	<i>Re-commissioning</i>
Tanker	Gas free, especially for cargo tanks, slop tanks, pump room, cofferdams and cargo pipes. Cargo residues remaining in cargo tank should be properly cleaned to avoid corrosion. Maintaining oil major vetting status should be considered during planning. Ref. 8.6	Cargo Tanks to be kept either full or empty –dry. Inhibitors and anodes should be used if the cargo tanks are kept full. Ref. 8.7	
Bulk Carrier		It is preferably to have ballast holds fully ballasted to keep the draft and reduce wind load. Ref. 8.4	
Containership	Extreme rolling may happen in light/ballast condition of container ships during transit to and from laid up site. Sea state limitations should be calculated and included in the lay-up plan to avoid such extreme rolling. Ref. 8.9		Extreme rolling may happen in light/ballast condition of container ships during transit to and from laid up site. Sea state limitations should be calculated and included in the lay-up plan to avoid such extreme rolling. Ref. 8.9
Gas Carrier		Particular attention to large sea openings of sea water coolers and condensers, if left open, the seawater connections shall be blanked off. Ref. 8.6.4	

Appendix C
Request for Declaration



DET NORSKE VERITAS

Date of issue:
(yyyy-mm-dd)

**REQUEST FOR DECLARATION
REGARDING LAY-UP VESSELS**

Particulars of Vessel

Name of Vessel: " " _____

Signal Letters: _____

Port of Registry: _____

Gross Tonnage: _____

Deadweight: _____

Type of Ship: _____

IMO Number: _____

Owner: _____

Manager: _____

Lay-up information

Date of Lay-up: _____

Lay-up location: _____

Water depth on location: _____

Manning/Watchkeeping: _____

Draught fwd: _____

Draught aft: _____

Mooring arrangement: _____

The vessel is moored in block with:

Name of Vessel on Port Side: " " _____

Name of Vessel on Stbd Side: " " _____

Documents to be submitted for review (For Information)

- General arrangement plan (if not in DNV class)
- Ballasting and draught for the vessel in the proposed lay-up condition.
- Area chart with indication of vessel location.
- Expected statistical weather conditions.
- Chart showing depth curves and bottom soil conditions.
- Security arrangements and procedures.
- Proposed position and heading of vessel.
- Planned manning and watch-keeping.
- Mooring arrangement:
 - number of anchors and length of chain cables to be used.
 - proposed mooring pattern.
 - chart indicating bollard position, bollard capacity and individual distances between bollards ashore if applicable.
- Emergency contingency plan.
- Anti-pollution measures.

Place: (place) Date: (yyyy-mm-dd)

Authorized signature

(name)
(title)

This form is to be filled out by the owner's representative and sent to DNV Maritime "Technical Advisory Ship and Offshore (NTANO364)
Fax: +47 67 57 99 11. E-mail: HIM@dnv.com