



**Offshore Vessel Inspection Database (OVID)
Programme**

**Offshore Vessel Inspection Questionnaire,
Fourth Edition (OVIQ4)**

29 May 2025

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Index

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Section 1

1.1 History of the OVID Programme

In 2009, OCIMF in conjunction with the Oil and Gas Producers (OGP) organisation started the development of the Offshore Vessel Inspection Database (OVID) for launching in early 2010, which will enable OCIMF members to submit their ship inspection reports to OCIMF for distribution to OCIMF members and certain qualifying non-OCIMF members.

Participation in the programme, as either an inspecting OCIMF Member or a programme recipient, was strictly voluntary and each programme recipient determines independently how to evaluate the information contained in the reports received from OCIMF.

Under the OVID Programme, the operator of any offshore ship that is the subject of a report was given a copy of that report and the opportunity to submit written comments relating to the report, to both the inspecting OCIMF Member and to OCIMF. The written comments submitted by the vessel operator forms part of the downloaded report.

Report recipients access the OVID System Index by computer, and this permits the index to be viewed or downloaded. Any authorised recipient can download a report on any vessel at cost determined by the OCIMF Executive Committee, which may be adjusted from time to time.

1.2 Revisions to the Programme

The second edition of the Offshore Vessel Inspection Questionnaire (OVIQ2) was launched on 1 July 2015. The third edition of the Offshore Vessel Inspection Questionnaire (OVIQ3) was launched on 17 September 2018. This document details version 7300 of the OVIQ4 template and was launched on 21 April 2025.

1.3 Uniform Vessel Inspection Procedure

The programme requires that participating submitting companies follow a uniform Vessel Inspection Procedure. This procedure has an **Inspection Element** and a **Report Element**.

The **Inspection Element** uses a series of detailed inspection questionnaires as appropriate for the type of vessel inspected. These questionnaires address issues associated with safety and pollution prevention. Inspectors who are employed or contracted by submitting companies must answer all these questions.

Questions are, in many cases, accompanied by guidance notes and/or references to source documents. Their purpose is to aid the Inspector's response.

The **Report Element** is developed from the completed electronic questionnaire that is submitted by the Inspector, either directly to the OVID web site, or to the submitting company for further processing prior to transmission to the vessel operator and to OVID.

Section 2

2.1 The Offshore Vessel Inspection Questionnaires and OVIQ Computer Programmes

The third edition of the Offshore Vessel Inspection Questionnaires and their accompanying Inspection Reports were introduced in September 2018. The OVID system is comprised of two fundamental elements: -

These are:

1. The **Offshore Vessel Inspection Questionnaire (OVIQ)**, which is an inspection document which relates to the operations and procedures onboard the vessel. The OVID software has a 'Variant wizard' which generates a different question set applicable to the specific type of vessel being inspected. Currently there are 31 different vessel and operational variants.
2. The **Offshore Vessel Particulars Questionnaire (OVPQ)**, which is a document that is completed by the vessel operator and OCIMF does not warrant the accuracy of any information contained within the OVPQ. The OVPQ is a detailed questionnaire of the permanent or semi-permanent characteristics of the vessel. (LOA, height, tank capacities etc.), and also records details of recent operational history. OCIMF does not warrant the accuracy of any information contained within the OVPQ and it is the operators' responsibility to update this document regularly.

Section 3

3.1 Using the OVID Vessel Inspection Questionnaires (“OVIQs”)

The inspection questionnaires used in this programme contain a series of questions related to safety and pollution prevention applicable to the type of vessel that is inspected. These questions are consecutively numbered and are logically grouped into separate chapters.

Each chapter contains a series of questions to be answered by the inspector. Questions **may** be accompanied by guidance, namely:

1. Guidance notes to inspectors,
2. Reference source(s) citing regulation(s) or industry guidelines pertaining to questions; and
3. An indicator to identify issues when an inspector comment is mandatory.

The above-mentioned guidance, regulatory/industry references amplify the questions, and these are provided to assist the inspector to answer the questions.

If the guidance and references lead the inspector to conclude that the question should be answered positively, the box “**Yes**” in the OVIQ computer programme should be checked. On the other hand, if the guidance and any reference sources indicate to the inspector that the question should be answered negatively, the “**No**” box should be checked. Where appropriate, the “**Not Applicable**” box should be ticked.

The inspector **must** respond to all the questions appropriate to the type of vessel being inspected.

Failure to do this will mean that the inspection report cannot be transmitted to the OVID Internet site for processing by the Submitting Company who commissioned the inspection.

The inspector **must** insert an Observation when responding to any question where the response box is marked “**No**”. The Observation **must specify and explain** the reason why a negative response is made. The “**Not Applicable**” response is treated in the same way as a “**Yes**” response and there is no requirement for the reason to be made in the Observations section accompanying the question. However, if, in the inspector’s judgment an explanatory comment is necessary, the inspector may make such comment in the “**Other Comments**” section accompanying the question **provided such comment makes amplification to assist the understanding of a report recipient as to an issue associated with a specific question.** In some cases, where the type of vessel being inspected results in one or more questions being not applicable to that type of vessel, the Report Editor is programmed to automatically answer those questions “**Not Applicable**”.

For some questions, where the guidance note is highlighted, the inspector is required to provide comment as required by the highlighted section of guidance. This requirement is flagged in the printed OVIQ by bold, highlighted, italic text in the guidance notes. In the electronic Report Editor software, it is highlighted in yellow.

At the end of each chapter there is an Additional Comments section. If the inspector has additional comments in respect of subject matter that is not covered by the specific questions in the chapter, the inspector may make such comments in the Additional Comments section.

The above listed requirements are summarised below

Box	Option	Response
Y	Yes	Tick “Yes” if, in the inspector’s professional judgement assisted by the guidance (if provided), a positive response can be made to the question. If, in the inspector’s judgement the Yes response requires to be amplified with further positive comments, the inspector may record such comments in the Other Comments box. Inspectors should keep in mind, that unless an unusual situation needs to be positively described, then a “Yes” response without comment is adequate.
N	No	Tick “No” if, in the inspector’s professional judgement assisted by the guidance (if provided), a negative response should be made to the question.
NA	Not Applicable	Tick “Not Applicable” if the subject matter covered by the question is not applicable to the vessel being inspected. In some cases, the “Not Applicable” response is made automatically within the software and is subject to the type of vessel being inspected. If, in the inspector’s judgement the Not Applicable response requires to be amplified with further comments, the inspector may record such comments in the ‘Other Inspector Comments’ section that accompanies the specific question.
	Observations and Other Inspections Comments	An Observation by the inspector is required for a “No” or “Not Seen” response. Where the question specifically calls for inspector comment irrespective of how the response box is checked, such comments are required to be recorded in the “Other Inspector comments” section that accompanies the question. Inspectors are free to record comments even where a box is checked “Yes” provided such comment makes amplification to assists the understanding of a report recipient as to an issue associated with a specific question.
	Additional Comments	The Additional Comments section at the end of each chapter may be used to record comments in respect of the chapter that are additional to those which the inspector may make when responding to the specific questions.

3.2 OVIQ Availability to Operators

Vessel operators, who require copies of the questionnaires set out in this programme, may obtain them directly from the www.ocimf.org website at no cost to the vessel operator.

Section 4

Conduct of Inspections

4.1 Mandatory Inspection Requirements

The following mandatory inspection requirements must be followed by inspectors in the conduct of their shipboard inspection in order for reports to meet the requirements of the OVID Programme:

4.1.1 General Requirements

1. The inspector must introduce themselves to the Master or the Master's authorised deputy, explain the scope of the inspection and discuss the preferred order in which it will be carried out, prior to commencement of the inspection. Inspectors should co-operate fully to conduct the inspection in the order that will cause the least disruption to the vessel's operations. The inspector must be accompanied by a member of the ship's staff at all times during the course of the inspection.
2. The inspector must set a good example with respect to their communications, behaviour, own personal safety procedures whilst on board the vessel, in the terminal and must wear appropriate personal protection equipment at all times.
3. Electrical or electronic equipment of non-approved type, whether mains or battery powered, must not be active, switched on or used within any gas-hazardous or other hazardous areas. This includes torches, radios, mobile telephones, radio pagers, calculators, computers, photographic equipment and any other portable equipment that is electrically powered but not approved for operation in a gas-hazardous area. It should be borne in mind that equipment such as mobile telephones and radio pagers, if switched on, can be activated remotely and a hazard can be generated by the alerting or calling mechanism and, in the case of mobile telephones, by the natural response to answer the call. Any specific Terminal requirements must be adhered to.
4. Any Observations that the inspector intends to record in the OVIQ must be pointed out and discussed 'on site' at the time with the member of the ship's staff assigned to accompany the inspector. This ensures that the nature of the Observations is fully understood and can also avoid extended discussion at the end of the inspection.
5. On completion of the inspection, some Submitting Companies require the inspector to provide a list of the inspection findings in the form of written observations, others do not. In either case, the inspector must discuss the inspection findings with the Master or the Master's authorised deputy before leaving the vessel. Other than to prepare these observations, however, the inspector must not remain on the vessel to complete the inspection report. It is recognised that on occasions this may not be possible, especially when leaving and joining the vessel is done by helicopter on vessels doing STS operations.
6. All inspectors must take into account their own rest hours and fatigue levels when conducting inspections. 'Back to back' OCIMF inspections are discouraged, and inspectors should complete and submit the report for one vessel before commencing an inspection on another vessel.

4.1.2 Additional Requirements

In addition to the general mandatory requirements list above, the Inspector:

1. **Must** respond by entering the requested information or by checking one response box for each question.
2. **Must**, where guidance to a question is provided, consider all the guidance to determine how the question should be answered.
3. **Must** carefully consider and provide a proper response to every question.
4. **Must** use objective evidence when answering each question (the assurance of the vessel's staff is insufficient evidence or proof);
5. **Must** include an explanatory Observation in the Observation section that accompanies a question when it is answered "**No**".
6. **Must** give the factual basis and specific reasons for any opinions or subjective comments made by the inspector.
7. **Must** note any deficiencies or inspector-observed conditions, even if action was taken to address whilst the inspector was on board.
8. **Must** not use a "**Yes**" response to any question where an inspector's observation or Other inspector comment contains negative elements (if there is such negative Observation or other inspector comment then the answer to that question should be "**No**");
9. **Must not**, in any Other Inspector Comment or Additional Comments:
 - a. Include any overall or partial ship rating or indication of ship acceptability / non-acceptability;
 - b. Include any matter unrelated to the topic of the specific OVIQ chapter
 - c. Provide a summary of each chapter or summary of the inspection observations
10. **Must not** offer any comments or opinions with regard to actions to be taken in respect of any efficiencies or observed conditions noted by the inspector.
11. **Must not** at any time give any verbal indication of ship acceptability / non-acceptability.
12. **Must not** discuss or communicate by any means (verbal, written, electronic or otherwise) any findings, information gained or outcome of the inspection with any third party other than those with a legitimate involvement in the inspection process for that vessel.
13. **Must not** conduct any other inspection or be involved in the provision of any other services while conducting an OCIMF inspection.

4.2 Permitted Inspection Actions

Inspectors *may*:

- I. Include in the "Comments" section accompanying any question, inspector comments even where the question is answered with a "**Yes**" provided such comments give useful information to the report recipient;
- II. Respond to questions or provide comments on the basis of material not included in the guidance specified for the question but must note this reliance and explain reason for the reliance;
- III. Include in the "**Additional Comments**" for each chapter, any comments in respect of the subject matter not addressed by questions contained in the chapter additional to those that the inspector may make in response to the specific questions in the chapter; and
- IV. Respond to questions which are not applicable to either the vessel or its cargo by checking such questions "**Not Applicable**".

4.3 Other Inspection Requirements

1. All inspectors shall follow OCIMF Inspector Code of Ethics. This code is not intended to limit or interfere with the ethics policies or code of conduct of OCIMF member companies employing and/or contracting with inspectors.
2. Ship inspections shall not be conducted at night unless requested by the OCIMF Inspecting member. The vessel's operator must also concur that it is safe to carry out a night inspection and that this will not negatively impact the vessel's compliance with work and rest hour requirements.
3. Inspectors shall limit advance communications with vessels and vessel operators to that information necessary to arrange access and appropriate arrival to and from the vessel, or to communicate intended inspection plans. Inspectors shall not request information concerning the VIQ in advance of their arrival to a vessel. Inspectors shall not communicate with the vessel or vessel operator after completion of OCIMF inspection activities. Following an inspection all communication concerning the inspection shall be managed by the commissioning member.
4. The inspector should consider requesting that equipment be run and tested to confirm that it is in operational order and that officers and crew are familiar with its operation. The inspector must ensure that such requests do not cause delay or interfere with the safety and normal operation of the vessel and does not contradict any terminal local requirements or regulations.
5. It should be recognised that the overall objective of the inspection is to provide the user of a OVID Report with a factual record of the vessel's condition and standard of operation at the time of the inspection and, in turn, allow an assessment of the risk that use of the vessel might pose.
6. The scope of an OVID inspection is dependent on the size and complexity of the vessel, and a typical OVIQ inspection is expected to be **accomplished within an 8-10 hour period**. The inspector must plan their time accordingly and make sufficient allowances to have a suitable period of time available for the inspection. Inspectors must take into account the hours of rest requirements for the vessel's staff that must be observed and ensure that the OVID inspection does not interfere with these.
7. During the course of the inspection ballast/void tank entry is discouraged. Physical assessment of the condition of ballast tanks/void spaces etc can be made only in circumstances where the tank access hatches or plates can be removed, and the tank internals sighted from the deck. In any event, actual tank access should only be made at the specific instructions of the inspecting company, with the authority of the Master and provided that local requirements or regulations allow. In all cases, the enclosed space entry procedures set out in Operator's Management System, associated PTW and Operational Risk Management procedures / practices outlined in GOMO Chapter 4 must be strictly adhered to.
8. Travel for ship inspections on behalf of OCIMF member companies must, at all times, be conducted in a safe manner with due regard to industry best practice and any agreements between the inspector and member companies. Inspectors must ensure that they are able to safely conduct an inspection without undue fatigue.
9. OCIMF Accredited Inspectors shall declare to OCIMF any industry relationships that may or may be perceived to create influence within an OCIMF inspection programme or impair unbiased assessment during a programme inspection. Where necessary, the relationship must be declared within the inspector's profile.
10. OCIMF accredited inspectors are not permitted to carry out concurrent inspection or assurance activities during an inspection commissioned by an OCIMF member. A non-exhaustive list of prohibited behaviour:
 - An inspector shall not carry out 2 OVID inspections at the same time.
 - An inspector shall not carry out an OVID & CMID at the same time.
 - An inspector shall not carry out an OVID and any other operational assurance activity such as DP trials, FMEA Proving Trials, (or any other consultancy work) at the same time.

4.4 Submitting Company Guidance

In order to ensure a consistent and quality report, where possible, submitting companies are requested to consider the following points when planning and conducting OVIQ inspections:

1. It is recommended that the vessel is not inspected during lay up.
2. It is recommended that the vessel is inspected with a full crew complement on board
3. Vessel activity should be considered when conducting OVIQ. As such, periods of high activity such as docking and maintenance periods should be avoided if practicable
4. OVIQ should be commissioned in accordance with vessel class notation and proposed operation
5. The use of ‘Non-SOLAS’ variant is only for use on vessels **less than 500GT** which are not required to comply with SOLAS regulations
6. For vessels which fall under parallel tonnage schemes (e.g., local and international tonnage), it is expected that vessels are inspected based on international tonnage
7. The use of ‘Small Craft’ variant is intended for use on craft **100 GT** or less
8. Validation of OVIQ reports is expected to be conducted in accordance with *OCIMF Inspection Programmes Report Validation: Best Practice*.

4.5 Anonymous Reporting Scheme

1. OCIMF is committed to maintaining the highest of ethical and professional standards within Programmes to provide a foundation of trust within the industry. The Code of Conduct contains general guidelines for programme participation with the highest standards of ethics while the Inspector Code of Ethics guide conduct during an inspection
2. Programme users should be comfortable approaching OCIMF when there is concern that policies or procedures are not being upheld
3. Users who want to submit an anonymous report in confidence are encouraged to use this website, hosted by a third-party hotline provider, **EthicsPoint**. Users are encouraged to submit reports relating to violations stated in our Code of Conduct and Inspector Code of Ethics, as well as questions related to policies and procedure or even to provide positive suggestions and stories.
4. Access to the anonymous reporting scheme can be accessed through OCIMF OVID Inspector profile page or directly to <http://ocimf.ethicspoint.com>
5. NOTES
 - **EthicsPoint is NOT an Emergency Service.** Do not use this site to report events presenting an immediate threat to life or property. Reports submitted through this service may not receive an immediate response. If you require emergency assistance, please contact your local authorities.
 - EthicsPoint is not part of the inspection questionnaire validation process: Do not use this site to challenge inspection observation content, please contact the submitting company directly to discuss the applicability of question guidance

Section 5

The Distributed Report

The responses recorded in the Vessel Inspection Questionnaires (the *Inspection Element*) serve as the basis for development of the second element of the Vessel Inspection Procedure (the *Report Element*) distributed under the programme. The inspector's completed OVIQ must be reviewed by the submitting company prior to processing in the OVID system and transmission to the vessel operator.

The processed OVIQ is automatically converted into a report after the submitting company has processed it in the OVID System. The report does not replicate the pages of the Vessel Inspection Questionnaire but is distributed in abbreviated form. It consists of a conversion of the inspector OVIQ responses into a uniform report format. The report is divided into three sections as follows:

Section 1 General information

Contains the informational responses required in Chapter 1 of the OVIQ plus answers to certain questions from other OVIQ chapters where specific details or dates are required.

Section 2 Questions marked “Yes” without comment.

Lists, by index number **only**, the questions in the OVIQ which have been checked with a “Yes” response, but without inspector comment.

Section 3 Questions marked “No”, “Not Applicable” or otherwise commented upon and any chapter ending **Additional Comments**.

Contains; in their entirety, (a) All OVIQ questions which have been answered with a “No” response, as well as the comments made by the inspector to supplement such responses; (b) All other OVIQ questions which have otherwise been commented upon, together with the comment; and, (c) Any additional comments made at the end of the OVIQ chapters.

General information

Vessel/unit particulars

1.1.1 Name of the vessel/unit

Note: Prefixes (MV, SS etc.) must not be used unless they are actually a part of the registered name of the vessel/unit. The name must be entered exactly as it appears on the Certificate of Registry.

1.1. IMO Number

1.1.3 Reg number

When vessel does not have an IMO number, record vessel registration number.

1.1.4 VIN (Vessel Identification Number)

1.1.5 Country of registration of vessel/unit

If a change of country of registration has taken place within the past 6 months, record the date of change and the previous country of registration in the Comments. Refer to continuous synopsis record.

1.1.6 Gross tonnage

State if vessel/unit has not been measured.

1.1.7 Date vessel/unit delivered

1.1.8 Date of most recent major conversion, if applicable

Provide brief details of most recent major conversion.

1.1.9 Place of inspection

Inspector to include port of inspection and country

1.1.10 Name of the company commissioning the inspection

1.1.11 Time the inspector boarded the vessel/unit

1.1.12 Time the inspector departed the vessel/unit

1.1.13 Time taken for Inspection

Record the time taken to conduct the inspection to the nearest 5 minutes. This is the actual time of inspection and does not include the times the inspection was suspended for any reason (Lunch, PSC inspection etc.). If the inspection took place over two or more days, in two or more sessions, or was carried out by more than one inspector, inspector to record details in comment fields.

1.1.14 Name of the inspector

Include names of all inspectors (if multiple attend)

1.1.15 Is an up-to-date OCIMF OVPQ available on board?

Raise an observation if name of vessel/unit recorded in OVPQ is not the same as it appears on certificate of registry or OVPQ has not been updated within 12 months

1.1.16 Name of the vessel/unit's operator

Note: For the purpose of the OVID Programme, an 'Operator' is defined as the company or entity which exercises day to day operational control of, and responsibility for, a vessel/unit and, where applicable, holds the Document of Compliance under which the vessel/unit is named. The registered owner of a vessel/unit may or may not be the operator.

1.1.17 E-mail address of the operator

1.1.18 Specify the Geographic Region in which the inspection took place

Additional Comments

1.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section. Information of a non-confidential nature related to the circumstances surrounding the inspection should also be recorded here. Examples are the presence of the Operator's superintendent, unusual operations that hampered or curtailed the inspection, etc.

Certification and documentation

Certification

2.1.1 Are all the Class statutory certificates or flag state equivalent listed in the guidance, where applicable, valid and have the annual and intermediate surveys been carried out within the required range dates?

Inspector should undertake a spot check of certificates to validate OVPQ data. Certificates may include the following:

- Certificate of Registry
- Certificate of Class
- Continuous synopsis record
- Document of Compliance.
- Safe Manning Certificate
- Bollard pull certificate (as applicable)

Note: where applicable, the issuing authority for the DoC and the SMC may be different organisations, but the name of the operator of the vessel/unit must be the same on both. There should be a copy (which need not be a certified copy) of the DoC on board.

- Loadline Certificate
- International Tonnage Certificate (ITC)

With respect to SOLAS certificates, if the language used is neither English nor French, the text shall include a translation into one of these languages.

Note: Situations may arise in cases where a Recognised Organisation (RO) issues the original certificates and the vessel/unit's flag State Administration conducts subsequent annual surveys. In such cases, it is acceptable for the flag State to endorse the RO's certificates to attest that the annual surveys have been conducted.

2.1.2 Name of Classification Society

If the vessel has changed class within the past 6 months, record the previous classification society and the date of change as an observation. State if vessel is not classed.

Safety management

2.2.1 Does the vessel/unit have a formal safety management system?

The Company should ensure that the safety management system operating on board the vessel/unit contains a clear statement emphasising the Master's authority. The Company should establish in the safety management system that the Master has the overriding authority and the responsibility to make decisions with respect to safety and pollution prevention and to request the Company's assistance as may be necessary. The Inspector should undertake a spot-check of the list of contents of the procedures manuals to ensure that they are:

- relevant to the vessel/unit;
- written in the working language of the crew. And that they at least contain:
- a safety and environmental policy;
- a Safety Case (where applicable)
- emergency procedures;
- a description of the Master's and crew's responsibilities;
- operation plans;
- procedures for reporting non-conformities and for corrective action;
- maintenance programmes;
- procedures for auditing and reviews;

Occasionally the operator's procedures are available only in computerised versions. Ascertain whether there is access for all personnel to a computer and whether training has been given to all personnel in accessing the operator's procedures using one. In any case, the operator's navigation procedures should be available on the bridge. Make an Observation if paper and electronic systems differ.

2.2.2 Where appropriate, is there objective evidence that the safety management system complies with the requirements of the ISM Code?

If Vessel is ISM certified evidence would be by issuance of DOC and SMS certificates.

If vessel is not required to comply with ISM, does it operate under an SMS which incorporates similar elements as ISM?

Is there evidence of an independent verification of the vessels SMS where it is not ISM certified?

Inspector should give status of operator and vessel with regards to ISM certification (SMC and DOC).

2.2.3 Does an operator's representative visit the vessel/unit at least twice annually?

Record the date of the last 2 visits e.g. Annual ISM and Technical/Marine Inspections.

Verify that office managers have visited the vessel/unit to undertake a formal audit or inspection as per safety management system within the last six months.

2.2.4 Is a recent operator's audit report available and is a close-out system in place for dealing with non-conformities?

Note: Satisfactory evidence should record that corrective action was taken to rectify non-conformities. A close-out system, which includes a time limit for corrective action, informing the operator when completed and the operator ensuring that it has been, should be in place and the inspector should ensure that the required actions have been made within the required time. Operator's audit observations should not be used as a means to record Observations unless there is no evidence of a close out system in place, at which point those observations should be listed in this question only.

2.2.5 Does the Master review the safety management system and report to the operator on any deficiencies?

Note: The Master's review should be carried out annually and documentary evidence should be available.

Make an Observation if no formal notification of the review has been submitted to the company and/or if no appropriate feedback has been received from the company.

Class documentation and surveys

2.3.1 Was last drydocking/underwater survey scheduled?

Inspector to record date of last docking or underwater survey.

If the last drydocking/underwater survey was unscheduled, record observation and reason for docking / survey.

2.3.2 Is the vessel/unit free of conditions of class?

Record any conditions of class or significant recommendations, visas, memoranda or notations of any nature, including due dates as an Observation. Class status report reviewed should not be older than 30 days.

If report not available, note an observation.

Publications

2.4.1 In the last 12 months has the vessel been Laid-up?

Inspector to provide details and specify if it was "Warm" lay-up or "Cold" lay-up

2.4.2 If applicable, was the lay-up and reactivation covered by a Management of Change (MOC) process and did the technical operator follow the Classification Society recommendations.

Inspector to review MOC and maintenance plan utilised. Class Society/P&I Club recommendations often refer to regional and flag state requirements. Where appropriate, Inspector to check for compliance with statutory lay-up requirements.

Additional Comments

2.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Crew and contractor management

General

3.1.1 Are both crew and contractors required to comply with the vessel/unit's safety management systems in full?

While on board the vessel/unit, all contract personnel should work within the vessel/unit's SMS and permit to work system. Verify if this requirement is included in the procedures/familiarization.

3.1.2 Is there a process in place to ensure that any proposed bridging documents integrate effectively with the vessel/unit's safety management system?

Check that the Vessels SMS provides guidance on addressing any conflicts between the vessel/unit's SMS and charterer's requirements.

Check also that there is a formal means of verification that the Senior Staff on board understand the contents of the bridging document.

3.1.3 Are both crew and contractors required to comply with the vessel/unit's drug and alcohol policy and testing regime?

While on board the vessel/unit, all crew and contract personnel should comply with the vessel/unit's D and A policy, except if the Contractor's policy is more restrictive.

3.1.4 Is the drug and alcohol policy based on 'zero tolerance' (requiring zero Blood Alcohol Content (BAC) and zero drug content) for all on board the vessel/unit?

This would include zero blood alcohol content when boarding the vessel/unit at any time or being in possession at any time while on board.

3.1.5 Do incident investigation procedure include guidance on post incident testing

Inspector to review investigation procedure

3.1.6 Does the operator have a policy for unannounced drug and alcohol testing?

Verify if compliance against the policy can be demonstrated. Verify valid agreement with appropriate testing company available.

3.1.7 Does the operator have a policy and/or procedures in place to support prevention, reporting and response to bullying and harassment, including sexual assault and/or sexual harassment (SASH), including bystanders and bystander intervention?

Does the operator clearly communicate these policies, promote awareness and respectful behaviours /relationships onboard ship. The policy may include;

- *Diversity, equity, inclusion, respect, and conflict resolution*
- *The impact on ship safety, victims and bystanders and the prevention of bullying and harassment, including SASH*

3.1.8 Is there a process in place to ensure prompt and effective confidential reporting of bullying, harassment, and assault?

There should be a process in place to allow confidential prompt and direct reporting to appropriate vessel and shoreside management / support in all cases.

3.1.9 Is there a common language stipulated and is the safety management system documentation in this common language?

Record observation if safety management system is not in common language of the crew.

3.1.10 Is there a system for ensuring communications between contractors, the vessel/unit's crew and third parties?

Where a common language is not spoken by all on board, arrangements should be in place to ensure the effectiveness of communications, without risking misunderstanding or ambiguity, at all times. This should include information on muster stations, emergency alarms and emergency procedures.

Crew-specific

3.2.1 Does the manning level meet or exceed that required by the Minimum Safe Manning Document?

Record the required manning and the actual manning

3.2.2 Does the crew matrix posted for the vessel on the OVID website accurately reflect the information relating to the officers on board at the time of the inspection?

The operator is responsible to maintain up-to-date records relating to the officers and key personnel on board the vessel at any given time, using the electronic Crew Matrix that forms part of the records for each vessel which has been submitted to OVID. Prior to boarding, inspectors can access and download the OVPQ including the Crew Matrix. This can be either printed out or downloaded and used during the inspection to check officer qualifications and experience.

The crew details must be spot checked against the data contained in the matrix and an observation made in the event of any irregularities. Inspectors must take into account that where recent changes of personnel have taken place, it is not realistic to instantly update the matrix and allowances must be made.

Observations must not be made unless the personnel change(s) took place more than seven days before the date of the inspection. It is not essential that the Crew Matrix is provided in paper form and inspectors are not expected to seek a paper copy from the vessel.

Note: Key Personnel include DP Operators, Electrician and Crane Operators

Crew-specific (non barge)

3.3.1 Are the crew members and project crew appropriately qualified for the operations and equipment on board?

This question is for all crew serving on the vessel during sailing and operation, including all positions described in the Minimum Safe Manning document and additional positions. There should be documentary evidence that competency has been assessed by an appropriate authority like the Master or the shore-based management to formally check and verify that joining crew carry original copies of their Certificates of Competency/Proficiency and associated Marine certification for specialized positions such as FRC crews; crane drivers; banksmen; forklift operators; riggers; etc.

For crewmembers hired by contractors, a formalized procedure as a bridging document or similar is available for controlling the crew's competence prior sent onboard. All positions to complete vessel specific familiarization applicable to their position/responsibilities.

3.3.2 For vessels operating on LNG or other alternative fuel types. Has personnel with special duties received specific training as per IGF code?

Masters, engineer officers and all personnel with immediate responsibility for the care and use of fuels and fuel systems on ships subject to the IGF Code shall hold a certificate in advanced training for service on ships subject to the IGF Code. STCW Annex 1 Chapter V Regulation V/3.

3.3.3 For vessel equipped with hybrid power solutions including energy storage systems (ESS), are crew trained in the operation of the ESS?

Check training / familiarisation records.

3.3.4 Does the company operate a formal appraisal system for marine crew?

Comment if it is a developmental system and state who is responsible. HSSE awareness should be one of the appraised behaviours.

3.3.5 Do all personnel maintain hours of rest records and are the hours of rest in compliance with MLC or STCW requirements?

Inspector should ensure that the officers and crew are complying with the company work hours/rest policy and also if the policy reflect STCW (2010) or Relevant Authority for vessel minimum rest periods i.e. ILO Maritime Labour Convention (MLC) 2006, as amended STCW Code, Section A-VIII/1 refers: All persons who are assigned duty as officer in charge of a watch or as a rating forming part of a watch and those whose duties involve designated safety, prevention of pollution and security duties shall be provided with a rest period of not less than:

.1 a minimum of 10 hours of rest in any 24-hour period; and

.2 77 hours in any 7-day period.

The hours of rest provided for in paragraph 2.1 may be divided into no more than three periods, one of which shall be at least 6 hours in length and neither of the other two periods shall be less than one hour in length. The intervals between consecutive periods of rest shall not exceed 14 hours. Exceptions shall not extend beyond two 24-hour periods in any 7-day period. Exceptions are to, as far as possible, take into account the guidance regarding prevention of fatigue in section B-VIII/1.1 which states that "overriding operational conditions" should be construed to mean only essential shipboard work which cannot be delayed for safety, security or environmental reasons or which could not reasonably have been anticipated at the commencement of the voyage.

As per "Recommendations relating to the application of requirements governing seafarers' hours of work and rest" issued by OCIMF in January 2012: "A two watch system, such as 6 on/ 6 off, will provide short-term compliance although technical non-conformances will occur during each rest period under both the STCW and MLC Conventions. In addition, any period of additional work will result in significant non-conformances during subsequent work periods. As a result, it is recommended that any period of 6 on/ 6 off is limited to a short duration and the impact of any recurrence should be taken into account. Where 6 on/6 off watch systems are regularly employed, other mitigating measures should be considered, such as short tours of duty or the provision of extra manning. It should also be recognised that some administrations may consider the practice unacceptable."

3.3.6 Have the Master and/or any officers with direct responsibility for ship handling received appropriate formal training in ship handling for the type of vessel/unit?

Make an Observation if the Master and/or officers who have responsibility for ship handling have not been previously on this type of vessel type.

3.3.7 If the Master has been newly hired within the last 12 months, did he receive appropriate pre-command training, including documented understanding of the Company's expectations?

If the Master has been newly hired within the last 12 months, did he receive appropriate in-house induction, including documented understanding of the Company's expectations?

Inspector to document what training and/or induction was provided to the newly hired Master.

3.3.8 Are the company medical procedures implemented on board?

This should specify certification requirements; when to report issues; vaccination requirements; who is responsible for welfare on board; and reporting of prescription and non-prescription drugs.

Inspector should ensure that medical certification requirements are complied with, vaccinations requirements, drug prescription and welfare on board are monitored against company procedures.

3.3.9 Are Food handlers trained?

All Food handlers should have completed a hygiene course before commencing work. Records or copies of training should be available. N/A response is to be used for a situation when food handlers are not carried.

Crew-specific (barges)

3.4.1 Is an adequate number of personnel required to be on board to perform anticipated marine operations?

There should be sufficient marine crew to manage all planned concurrent marine operations with proper oversight as if each operation was a stand-alone duty.

3.4.2 Do procedures address scenarios which may require down-manning of non-essential personnel from the vessel/unit?

There should be specific groups identified as critical or non-critical with a hierarchy for controlled evacuation should it be deemed necessary, for example, if LSA equipment is compromised or on the onset of heavy weather.

3.4.3 Are the marine crew members and other personnel working on the barge during sailing/operation appropriately qualified for the operations and equipment on board hold appropriate and valid certification and is this verified on joining vessel?

This question is for all crew serving on the vessel during sailing and operation.

Is there a documented procedure that requires the Master or the shore-based management to formally check and verify that joining vessel crew carry original copies of their Certificates of Competency/Proficiency and associated marine certification?

3.4.4 Is there a competence assessment process for the marine crew on board?

Describe whether formal or informal, and who is responsible for assessments.

3.4.5 Does the company operate a formal appraisal system for marine crew?

Comment if it is a developmental system and state who is responsible. HSSE awareness should be one of the appraised behaviours.

3.4.6 Are provisions made to provide the vessel/unit's crew with medical and first aid training and facilities?

There should be documentary evidence of training courses and competency assessments.

3.4.7 Are GMDSS requirements met with regard to qualified radio operator personnel, watchkeeping, and designation for distress communications?

Every ship shall carry personnel qualified for distress and safety radio communication purposes to the satisfaction of the Administration. That person should not be the Master (SOLAS IV/16.1)

3.4.8 Have the Master and/or any officers with direct responsibility for ship handling received appropriate formal training in ship handling for the type of vessel/unit?

Make an Observation if the Master and/or officers have responsibility for ship handling have not been previously on this type of vessel type.

3.4.9 If the Master has been newly hired within the last 12 months, did he receive appropriate pre-command training, including documented understanding of the Company's expectations?

If the Master has been newly hired within the last 12 months, did he receive appropriate in-house induction, including documented understanding of the Company's expectations?

Inspector to document what training and/or induction was provided to the newly hired Master.

3.4.10 Have all the deck officers received formal documented training for the navigational equipment fitted on board?

Specify whether the documented training and competence assessment is on-board using mentor based on-the-job training with assessment, at a recognized shore-based establishment, formal on-board training with an external trainer, or CBT on board?

3.4.11 Does the company have a documented disciplinary process which facilitates removal of personnel from the vessel/unit if deemed to be a risk?

This should include, as a minimum, non-compliance with SMS provisions, anti-social behaviour; alcohol/drug use; or ill discipline.

Check that the Master has authority to take appropriate action and that he is required to inform the vessel/unit's operators of action taken.

3.4.12 Are the company medical procedures implemented on board?

This should specify certification requirements; when to report issues; vaccination requirements; who is responsible for welfare on board; and reporting of prescription and non-prescription drugs.

Inspector should ensure that medical certification requirements are complied with, vaccinations requirements, drugs prescription and welfare on board are monitored against company procedures.

3.4.13 Are Food handlers trained?

All Food handlers should have completed a hygiene course before commencing work. Records or copies of training should be available. N/A response is to be used for a situation when food handlers are not carried.

Vessels routinely carrying contractors

3.5.1 Is there evidence of training contractors in the content of the vessel/unit's safety management system?

Look for records of training and sample responses from contractors. There should be a clear understanding that accidents and incidents amongst the contractor crew must be reported. This should be a statement within the induction documents. Health, Safety, Security and Environmental induction, PTW training etc?

3.5.2 Is there evidence of all contractors being familiarised with the vessel/unit's emergency procedures and requirements?

This may be part of the initial induction process and should include personal reference documents or records of induction.

3.5.3 Are contractors encouraged to be involved in the vessel/unit's safety management processes, such as safety meetings?

Look for evidence of participation or documented input to the agendas. If positively excluded from input, make comment as an Observation.

3.5.4 Is there evidence that contractor staff have appropriate training, rules of engagement and operational procedures for their plant, equipment and work scope onboard?

Inspector to check that contractors have adequate training and procedures in place for the use of their own equipment on board, including operational limitations of their equipment.

3.5.5 Is there evidence that operator verify the adequacy of contractor's equipment prior first use?

Operator should have procedures in place to check certification and/or maintenance records of contractor equipment prior to operation.

3.5.6 Have any additional hazards associated with contractor's operations and equipment been identified and risk assessed, and appropriate control measures put in place?

Control measures should include appropriate medical and other relevant training.

Does the vessel have procedures in place to identify risk associated with contractors working onboard the vessel? This includes technicians activities for marine systems as for operational/project crew.

3.5.7 Do contractors supply appropriate PPE?

Does the PPE provided conform to the requirements of the work instructions, JSA's, PTW's, etc. for the work to be performed onboard.

Additional Comments

3.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Navigation

Navigation

4.1.1 Is there evidence that operator's navigation instructions and procedures are implemented on board?

The ISM Code requires every Company to have an SMS which covers instructions and procedures to ensure safe operation of ships and protection of the environment. This should include practical guidance on navigational safety including:

- *Allocation of bridge watchkeeping duties and responsibilities;*
- *Procedures for passage planning and navigation, including departures from the passage plan;*
- *Chart and nautical publication update and correction procedures;*
- *ECDIS procedures (including chart and software updates);*
- *Procedures to ensure that all essential navigation equipment and main and auxiliary machinery are available and fully operational;*
- *Ship position reporting procedures;*
- *Recording of relevant events and Voyage Data Recorder (VDR) policy;*
- *Use of Bridge Navigational Watch Alarm System (BNWAS) modes (automatic, on and off) and procedures for ensuring correct operation;*
- *Bridge access and distraction prevention procedures;*

The SMS should identify clear levels of authority and lines of communication between the Master, ship's officers, crew and the Company. (BPG 5th edition 1.3) Procedures for ECDIS should, as a minimum address;

- *Safety parameters (contours, depths and safety frame)*
- *Category Zone of Confidence (CATZOC) and UKC*
- *Primary means of navigation for the vessel*
- *T&P Notices, Navtex and Navarea warning management*
- *ENC management and correction process including safety measures to avoid viruses*
- *Contingency planning in the event of dual ECDIS failure*

An up-to-date copy of the operator's navigation policy and procedures must be available on the bridge and officers should demonstrate familiarity with them.

If the policy is provided in electronic format only, a back-up independent means of power supply to the computer must be provided. It is expected that emergency procedures that include failure of key equipment are available in hard copy format.

4.1.2 Have all the deck officers received documented training and competence assessment for the navigational equipment fitted on board?

Specify whether the documented training and competence assessment is on-board using mentor based on-the-job training with assessment, at a recognized shore-based establishment, formal on-board training with an external trainer, or CBT on board?

4.1.3 Do the vessel operating procedures require a minimum of 2 STCW certified navigational officers to be on the bridge throughout operations alongside an installation or within 500-meter zone?

N/A can only be used if vessel never enters any offshore installation safety zone. Reference GOMO chapter 5.

4.1.4 Is there evidence that the 500 meters safety zone entry procedure is applied on board?

There should be a minimum of two STCW certified personnel capable of manoeuvring the vessel away from the installation. Procedure should include the use of checklists to confirm bridge and engine-room status and to limit operational activities on board, such as hot work, while in the 500 m/ safety zone.

4.1.5 Are check lists, such as those for pre-arrival, pre-departure, 500 m zone, watch handover and pilot-Master interchange being completed?

Laminated checklists with records of completion in logbook is acceptable

4.1.6 Does the vessel documented procedures clearly identify the actions to be followed when changing the manoeuvring position on the bridge, taking into account the physical location of the

vessel in relation to the platform and/or the engine/generator status?

Procedures should include a requirement to test control functions in a safe location after changeover.

4.1.7 Is operator's guidance on minimum under keel clearance and squat implemented on board?

The operator should supply guidance for under keel clearance. Record the Under Keel Clearance as defined in the SMS.

4.1.8 Are deck logbooks correctly maintained and is an adequate record being kept of all the navigational activities both at Sea and in Port?

The inspector may accept logs in either written or electronic format where flag state permits electronic recording.

4.1.9 Are records maintained of preventive fire and security rounds completed after each watch?

Note: A lookout should not leave the bridge during the hours of darkness. Preventive fire and security rounds of the vessel/unit should typically be conducted after the end of each watch. On some modern vessels fire and security verification may be done by the use of CCTV

4.1.10 Are the vessel/unit's manoeuvring characteristics displayed on the bridge?

For all ships of 100 m in length and above, a pilot card, wheelhouse poster and manoeuvring booklet should be provided. (IMO Res. A.601 (15)).

4.1.11 Are there documented and clearly identified steering mode change over procedure, including emergency steering, in place?

Simple operating instructions with a block diagram showing the change-over procedures for remote control systems and steering gear power units shall be permanently displayed on the navigation bridge and in the steering gear compartment. (SOLAS V/26.3.1)

4.1.12 Do vessel/unit's officers demonstrate a full understanding of steering changeover practices?

Check that there is a ready means to identify which mode of steering is engaged.

4.1.13 Has the Master written his own standing orders and if applicable night orders?

Standing Order and Night Order Books should be checked to ascertain that all officers are instructed as to their responsibilities. Standing orders should be written by the Master to reflect his own requirements particular to the vessel/unit, the trade and the experience of the deck officers aboard at the time. Night orders should be written as appropriate.

4.1.14 Have the deck officers countersigned the Master's standing and night orders as being read and understood?

4.1.15 Are the Standard Magnetic and/or Gyro compasses in good order?

The magnetic compass must be in good working order and the ship's heading clearly displayed at the main steering position. The binnacle lights must be operational.

Make an observation if the deviation card is older than 2 years.

4.1.16 Has a system been established to ensure that nautical publications and charts, paper and/or electronic, for the intended voyage are on board, current and corrected up to date?

All vessels/units should carry up to date official nautical charts, Sailing Directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage/operations. An on board chart and publication management system is recommended to ensure that records are kept of what charts and publications are carried and when they were last corrected. Note relating to the specific use of electronic charts. To use ECDIS as a stand-alone system without paper charts, two fully independent, IMO type-approved vector chart systems are required.

4.1.17 If fitted, are Master and deck officers familiar with the operation of the ECDIS on board?

The Master and deck officers should be familiar with the operation of the ECDIS. Master and deck officers should be able to demonstrate the operation of the ECDIS including, but not limited to: -

- *Creating and uploading passage plans*
- *Recalling previous voyages*
- *Route checking and management of alarms*
- *Plotting manual fixes (visual bearing and radar range)*
- *Creating parallel index lines*
- *Setting safety depths and safety contours as appropriate to the draught of the vessel*

- *Setting of Safety frame/safety cone*
- *Ensuring system is updated to the latest corrections.*
- *AIS and or Radar overlay if fitted*
- *Understanding of limitations of operating in RCDS mode*
- *Knowledge of SCAMIN and how it is displayed*
- *Knowledge of CATZOCs*
- *Familiarity of deck officers with contingency action in case of ECDIS failure.*

The above list is not exhaustive and the inspector can ask other features to be demonstrated in order assess knowledge of the system. Further guidance to the operation of ECDIS can be found in MSC.1/Circ 1503/Rev. 2 “ECDIS – Guidance for Good Practice”.

If no ECDIS system is fitted on board, answer the question ‘NA

4.1.18 If the vessel is equipped with an Electronic Chart Display and Information System (ECDIS) are the Master and deck officers able to produce appropriate documentation that generic training and type-specific familiarisation has been undertaken?

If the vessel is fitted with an ECDIS unit then the Master and each deck watchkeeper must be in possession of an ECDIS Generic Training certificate. This Generic training must have taken place at an establishment approved by the Flag Administration, address the subjects set out in, and fully address each of the topics contained in the IMO Model Course 1.27, (The operational use of Electronic Chart Display and Information Systems (ECDIS)). An ECDIS Generic Training Certificate conducted on the 2010 syllabus is acceptable. Holders of CoCs according to Regulations II/1 and II/2 of the Annex to the STCW-Convention which are valid with a date over 01.01.2017 and without an ECDIS limitation fulfil the requirement of generic ECDIS training.

If the equipment on board is of a different type (manufacturer) to which the generic training was undertaken, then evidence of familiarisation of the actual equipment fitted on board should be provided.

The checklist contained in “ECDIS - Industry Recommendations for ECDIS Familiarisation” (Published by the Nautical Institute) or an equivalent produced by the manager or equipment manufacturer may be utilised to demonstrate such familiarisation. Record in comments how the familiarisation training was carried out

4.1.19 If the vessel is provided with an Electronic Chart Display and Information System (ECDIS) does it meet the requirements of SOLAS and is an approved backup system provided?

If vessels operate using ECDIS then it must be “type approved” in accordance with IMO Res A.817 (19) / Res MSC.132(82) /MSC.530(106) as amended - dependent on date of installation. Vessels must use only official Electronic Navigation Charts (ENCs).

For vessels greater than 3000GT a secondary means of navigation must also be provided. The secondary means may comprise:

A second “type approved” ECDIS powered from the main and emergency power supply and operating independent of the main ECDIS and connected to the ship’s main power supply and to an independent GPS input. The secondary ECDIS must have the ENC chart database and voyage plan loaded before commencement of the voyage and must be operational at all times when the ship is in coastal waters, or

A full folio of paper charts that satisfies SOLAS carriage requirements, corrected to the latest available Notices to Mariners, covering the intended voyage and showing the intended voyage plan.

ECDIS that is not updated for the latest version of the International Hydrographic Organisation (IHO) standards may not meet the chart carriage requirements set out in SOLAS V Reg 19.2.1.4. The list of current standards is maintained on the IHO web site www.iho.int

The ECDIS should have the latest software updates to ensure the system is stable and remains compliant with the IHO standards for Hardware and handling of ENCs. Record of Equipment for Cargo Ship Safety (Form E) attached to the Cargo Ship Safety Equipment Certificate will state if ECDIS is fitted and the method of back-up (either another ECDIS or paper charts).

4.1.20 Is a lookout maintained at all times when the vessel/unit is at sea?

Does the company have a policy that ensures a lookout is maintained at all times when the vessel/unit is at sea?

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate to the prevailing circumstances and conditions as to make a full appraisal of the situation and the risk of

collision. (Colregs Rule 5) The look-out must be able to give his full attention to the keeping of a proper look-out and no other duties shall be undertaken or assigned which could interfere with that task. Part 4-1 - Principles to be observed in keeping a navigational watch: STCW Code, A-VIII/2, Part 4-1/14 and A-VIII/2, Part 4-1/15

The officer in charge of the navigational watch may be the sole look-out in daylight provided that on each occasion:

- *the situation has been carefully assessed and it has been established without doubt that it is safe to do so;*
- *full account has been taken of all relevant factors including, but not limited to: State of weather; Visibility; Traffic density; Proximity of dangers to navigation; and the attention necessary when navigating in or near traffic separation schemes;*
- *assistance is immediately available to be summoned to the bridge when any change in the situation so requires.*

It is of special importance that at all times the officer in charge of the navigational watch ensures that a proper look-out is maintained. In a ship with a separate chartroom the officer in charge of the navigational watch may visit the chartroom, when essential, for a short period for the necessary performance of navigational duties but shall first ensure that it is safe to do so and that a proper look-out is maintained. (STCW A-VIII/2-3.1/32)

4.1.21 Are use of manual fixes (bearing and range) implemented and documented at appropriate interval on ECDIS or paper charts?

Navigating officers must not become over-reliant on ECDIS. Frequent checks should be made of the ECDIS position fixing system (normally GPS) by the use of other means. Such checks may include:

- *Parallel indexing and use of clearing bearings;*
- *Use of radar to check the accuracy of the charted position by comparing the location of the radar target against the charted symbol;*
- *Visual cross bearings;*
- *Comparison of the signal to noise ratio of the GPS system in use.*

The full functionality of ECDIS cannot be achieved when operating in the raster chart display (RCDS) mode and thus the system should always be operated in ECDIS mode. Data input from the gyro compass, speed log, echo sounder and other electronic equipment should be periodically monitored to ensure accuracy.

A record of position in logbook is not considered sufficient. If a procedure is established to use radar overlay at regular interval is implemented, this is considered sufficient to verify vessel position in lieu of manual plotting. Frequency for use of radar overlay should be specified in procedures or on passage plan and additionally documented in logbook.

4.1.22 Was a comprehensive passage plan available for the previous voyage and did it cover the full voyage from berth to berth utilising appropriate charts and publications?

Prior to proceeding to sea, the Master shall ensure that the intended voyage has been planned using appropriate charts and publications for the area concerned. (SOLAS V/34 and IMO Resolution A.893(21) Guidelines for Voyage Planning)

Notes: The passage plan should be completed by an officer and checked by the Master. Use of the Nautical Institute publication Bridge Team Management reinforces the recommendations contained in Chapter 2 of the ICS Bridge Procedures Guide. Passage planning should be carried out on the chart, although there is a place for the use of a conning notebook, or some information gathered elsewhere. Excessive information in the navigational areas of a chart can be avoided by recording the information away from the track and drawing attention to it by a line or reference letter. The following should be marked on the chart, where it enhances safe navigation:

- *parallel indexing (not from floating objects unless they have been first checked for position);*
- *chart changes;*
- *methods and frequency of position fixing;*
- *prominent navigation and radar marks;*
- *no-go areas (the excessive marking of no-go areas should be discouraged - see below);*
- *landfall targets and lights;*
- *clearing lines and bearings;*
- *transits, heading marks and leading lines;*
- *significant tides or current;*
- *safe speed and necessary speed alterations;*
- *changes in machinery status;*
- *minimum under keel clearance;*
- *positions where the echo sounder should be activated;*

Crossing and high density traffic areas;

- *Safe distance off;*
- *Anchor clearance;*
- *Contingency plans;*
- *Abort positions;*
- *VTS and reporting points, etc.,*

Charted passage planning information should not obscure printed details, nor should the information on charts be obliterated by the use of highlight or felt-tip pen, red pencil, etc.

No-go areas should be highlighted but should be reserved for those areas where the attention of the navigator needs to be drawn to a danger such as shallow water or a wreck close to the course line. Extensive use of no-go areas should be discouraged. No-go areas vary with change of draft and tide and will therefore also vary with the time of passage. They should not therefore be permanently marked.

All courses previous to the last voyage should have been erased. Course lines must not be marked in ink, although it is acceptable to plot alter course positions in ink where these are frequently in use.

Charts of at least the complete previous voyage should be checked to determine that the vessel/unit has been safely navigated. The correct use of traffic separation zones, intervals between position fixes, maintenance of a safe distance off the coast, avoidance of prohibited areas and dangerous wrecks, adherence to printed notes on the charts, etc., will provide evidence of safe navigation.

4.1.23 Is the echo sounder fully functional, showing correct reading, and included in PMS for navigation equipment?

Many modern electronic echo sounders have an in-built memory which can be recalled. If an electronic memory is not provided, the echo sounder should be provided with a printed record.

4.1.24 Do documented procedures clearly prohibit the use of offshore installations as way points?

Courses for transit and approaching offshore installation should be tangential to the surrounding 500m exclusion zone

4.1.25 During Port Entry and Departure, was the position of the vessel/unit monitored?

The safe progress of the vessel/unit as planned should be monitored closely at all times. This will also include track monitoring and regular fixing of the position of the vessel/unit, particularly after each course alteration, and monitoring underkeel clearance.

If ECDIS in use – LOP (Line of position) to be evidenced in ECDIS for last passage. (High speed craft may be exempted from above but they should be able to reconstruct the route on their electronic navigational device)

4.1.26 Is there a system for dealing with navigation warnings?

A system should be in place for monitoring navigational warnings appropriate to the vessel/unit's trading area and for ensuring relevant navigational warnings are brought to the attention of the watchkeeping officers.

4.1.27 Is all navigation equipment in good order?

Regardless of whether a vessel/unit is required by legislation to carry specific navigational equipment, if equipment is fitted then it should be operational. (Ref also to Safety Equipment Certificate for the vessel). Random checks should be made to ensure that equipment is operational.

4.1.28 Are navigation lights in good order?

Primary and secondary systems should be in good order, and there should be a procedure to check the navigation light failure alarm.

4.1.29 Are procedures in place and evidence available to ensure the Master / Chief Engineer has a documented handover?

Are handover notes completed and are they specific for the vessels operations? Verify last handover report.

Additional Comments

4.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Safety and security management

General

5.1.1 Is contact details of the Designated Person Ashore (DPA) or appropriate shore-based contact clearly posted onboard?

5.1.2 Has a vessel/unit safety officer been designated and trained to undertake this role?

One of the primary functions of the safety officer is to inspect all areas of the vessel/unit on a regular basis for safety compliance and to report any deficiencies noted. The purpose is to raise awareness, prevent accidents and to identify regular occurrences that might require the operator's intervention on a fleet-wide basis. The function of the safety officer may not involve equipment maintenance, although it does include identifying equipment deficiencies. Safety Officer training can include in-house or formal shore based training. Training records must match the job description for the Safety Officer within the Safety Management System. The safety officer should work closely with any project-appointed HSE personnel.

5.1.3 Is personal protective equipment provided and available spares on board?

Note: PPE may include as boiler suits, safety footwear, gloves, eye and ear protection, safety harnesses, fall arrestors, and chemical protective equipment etc. Procedures should include the company's requirements for the inspection and replacement of PPE.

5.1.4 Are the PPE requirements for tasks clearly defined and worn as required?

Documented guidance relating to the use of equipment for specific tasks should be provided, preferably in the form of a matrix. Working areas should have clear signs indicating PPE requirements.

5.1.5 Are regular safety meetings held, are the minutes recorded and does the operator provide shore management responses?

Safety meetings permit and record safety discussion among the vessel/unit's officers and, ratings and contractors where appropriate where these relate to safety. Although beneficial to crew (and could be included in the agenda), the primary function of Safety meetings should not be used for the purposes of instruction or training.

COSWP 2010 recommendations: 6-15 Crew

- *1 member elected by officers and ratings together.*

16+ Crew

- *1 elected by officer, 1 by ratings.*

Over 30 ratings

- *1 elected by officers + 3 elected by rating, from deck, engine room and catering. Safety Committee Meetings are only mandatory if safety reps are elected.*

5.1.6 Are there records on board showing that accidents, incidents, non-conformities, including breaches of regulations and near misses are reported, investigated and closed out?

Near misses or incidents should be investigated based on the potential of the incident. Port State Control deficiencies should be recorded as non-conformities. Confirm these items are closed with the stipulated close out dates.

Inspector to record any overdue close out items Inspector should sample a report and note if any breaches of regulations in incident report.

5.1.7 Have officers responsible for incident investigation on board received incident investigation training?

Training can be achieved by CBT and/or inhouse training and is not required to be a formal course.

5.1.8 Are smoking restrictions in place and are they being adhered to?

There should be no smoking at food preparation area. Common areas such as restrooms, cafeterias or conference rooms should be designated as non smoking. Restrictions should include specific controls when the vessel/unit is in the 500 m/ safety zone.

5.1.9 Is there a risk Assessment System in place for the carriage and handling of chemicals?

Have assessments been completed for all/new identified substances?

Reference COSHH or other industry best practice.

Have assessments been communicated to the relevant personnel? Do personnel use the assessments? Are re-assessments carried out and conveyed to the relevant personnel?

Best practice is for all chemicals to be stored within dedicated storage areas with appropriate labelling, safety data sheets and segregation and as per risk assessment findings.

5.1.10 Does the safety management system contain procedures to address the control of hazardous substances used on board the vessel/unit?

This to include the handling, storage and disposal of materials such as shipboard chemicals, lithium batteries, radioactive sources and biocides, together with appropriate formal training and qualification.

Best practice is to have hazardous substances listed within the SMS stored in areas with secondary containment

5.1.11 Does the Vessel/Unit Safety Officer undertake periodic inspection of all areas?

There should be records available that demonstrate that the Safety Officer carrying out a systemic inspection of all areas of the vessel/unit. Suitable records should be available and, where appropriate, defect/non-conformity reporting.

5.1.12 If there a safety observation programme implemented on board?

Inspector should seek evidence of safety observations records demonstrating that system is effective.

Medical**5.2.1 Is the hospital clean and tidy and ready for immediate use?**

Check that the space is not being used for storage or alternative accommodation. Check hospital inventory is maintained to correct levels. Check cleanliness of the hospital.

5.2.2 Is an alarm system fitted in the hospital and is it regularly tested?**5.2.3 Is there an appropriately qualified individual designated to provide medical care on board?**

Inspector to detail which officer is designated to medical care and state their medical training.

5.2.4 Is there a system for verifying and checking medical stores?

Record date last checked and by whom.

5.2.5 Are first aid kits readily available and subjected to regular inspection to confirm their contents?

Check Inspection records. Check the fire and safety plan for the minimum number and distribution of first aid kits. Check eye wash stations.

5.2.6 If cardiopulmonary resuscitation (CPR) equipment is carried, including oxygen resuscitators and/or defibrillators, is it regularly tested?

Check Inspection records.

5.2.7 Are personnel familiar with CPR equipment carried on board?

Check training and medical records

5.2.8 Is medical advice available 24hrs a day?

Dedicated Medical advice should be in place and available 24hrs a day. Emergency numbers should be posted or readily available.

5.2.9 Is there a formal medical evacuation plan in place?

There should be evidence of a documented medical evacuation plan in place and this should be used during appropriate drills. Confirm if in bridging document or standalone procedure and is the process understood?

5.2.10 Are medical drills carried out at periodic intervals?

It is recommended that medical drills are carried out at least biannually and records kept of participants along with drill report and any close out items.

Management of change

5.3.1 Is there a documented procedure in place for the management of change?

The procedure should apply to work arising from temporary and permanent changes to organisation, personnel, systems, process, procedures, equipment, products, materials or substances, and laws and regulations. Work should not proceed unless a Management of Change process is completed which should include, as applicable:

- a risk assessment conducted by all impacted by the change
- development of a work plan that clearly specifies the timescale for the change and any controls
- measures to be implemented regarding:
 - equipment, facilities and process
 - operations, maintenance, inspection procedures
 - training, personnel and communications
 - documentation
- authorisation of the work plan by the responsible person(s) through to its completion

5.3.2 Is there evidence to demonstrate that the MoC process is being properly applied?

For example, the addition or removal of vessel or contractor equipment and related changes to procedures. Confirm suitable records are in place where appropriate.

5.3.3 If any equipment required by operations is retro-fitted or temporarily installed, is there a formal process for assessing the integrity of connections to the vessel/unit's systems?

May include the requirement for Class approval. Vessel/unit systems could include hydraulic, electrical, air, water, drainage and safety systems, such as fire detection.

Drills, training and familiarisation

5.4.1 Is there evidence that all personnel, including contractors and project personnel, receive safety induction and familiarisation?

On-board training in the use of life-saving appliances, including survival craft equipment and in the use of the vessel/unit's fire extinguishing appliances shall be given as soon as possible after a person joins a vessel/unit. Also are the following items covered in the induction?

- Emergency phone number
- HSE information sources
- Notice/bulletin boards etc?
- Inductees met by Master?
- Who is the medic and what his working hours?
- Reporting of allergies to the Medic and any medication being taken.
- Mobile phones policy?
- Safety Reps? (if applicable)
- Introduction to Supervisor?

Familiarisation should be appropriate to their level of role onboard and appropriate training records should be maintained.

5.4.2 Are emergency drills being carried out regularly?

Lifeboat and fire drills should be carried as required by the flag State. Check that all personnel on board are required to routinely participate in drills. Drills shall, as far as practicable, be conducted as if there were an actual emergency

Note: Emergency procedures should at least include collision, grounding, flooding, heavy weather damage, structural failure, fire, explosion, gas or toxic vapour release, critical machinery/equipment failure, re-start after partial or total power failure, rescue from enclosed spaces, serious injury, security and helicopter operations.

5.4.3 Does the vessel/unit have documented procedures for Man Overboard scenarios?

Check arrangements for raising the alarm and for deploying flotation and recovery equipment and appropriate checklist to be readily available on bridge.

The plans and procedures shall identify the equipment intended to be used for recovery purposes and measures to be taken to minimize the risk to shipboard personnel involved in recovery operations (SOLAS III/17-1). MSC.1/Circ.1447 "Guidelines for the development of plans and procedures for recovery of persons from the water" can be used as reference guidelines.

5.4.4 Is regular training in the use of life-saving equipment being undertaken and are appropriate records maintained for each person on board?

All personnel shall be given instructions which shall include but not necessarily be limited to:

- use of lifejackets and thermal protective aids;
- launching and operation of survival craft;
- problems of hypothermia, first-aid treatment for hypothermia and other appropriate first-aid procedures;
- special instructions necessary for use of the vessel/unit's life-saving appliances in severe weather and severe sea conditions.

5.4.5 For vessel equipped with hybrid power solutions including energy storage systems (ESS), are the crew familiar with the fire extinguishing system for the battery room, have they received additional training in the risk related to exposure from gases from a fire in batteries?

Persons who will operate maritime battery systems or perform inspection or maintenance of such systems must have following training:

- potential risks and hazards related to the use of maritime battery systems;
- adapted safety training, procedures, plans and instructions, including any checklists to check the technical condition and suitability of the marine battery system before use;
- equipment-specific training. Completed training must be documented Ref to: Guidelines on requirements for training in chemical energy storage (maritime battery systems). NMD CIRCULARS. DATE: 1/26/2022 VALID TO: 12/31/2027 SERIES: RSV NUMBER: RSV 4 - 2022 CASE NUMBER: 2021/166378

Ship security

5.5.1 Does the vessel/unit have an approved Ships Security Plan (SSP)?

If the vessel/unit is NOT required to have an approved Ships Security Plan (SSP) because of vessel/unit's tonnage or trading area, are there Security Procedures in place?

5.5.2 Is security threat and risk assessment an integral part of voyage planning, and did the passage plan contain security related information for each leg of the voyage?

The passage plan and voyage charts should contain security related information for each leg of the voyage. In order to plan a voyage or transit through a security risk area, the Master should have available current threat information and a security risk assessment based on that information. The information available should include:

- Relevant UKHO or equivalent security charts.
- Industry best management practice guidance (BMP) publications.
- Regional guidance where available.
- Company specific guidance regarding recommended routeing, speed, waiting areas and anchorages.

A detailed threat and risk assessment should be completed for each voyage and activity within a security risk area. This should be reviewed and updated prior to entering an area which requires an increased state of readiness and vigilance and the passage plan amended if necessary. The passage plan should identify points where there will be, for example:

- Changes to security levels.
- Points at which maritime reports should be made (e.g., entering a VRA/VCR)
- Enhanced bridge manning levels (e.g., extra lookouts).
- Vessel speed requirements.
- Restricted access controls.
- Voyage day/night transit considerations.
- Hardening of the vessel.
- No planned maintenance on voyage critical equipment.

The vessel operator should have provided bridge security cards and/or checklists to ensure that all security related considerations were included within the passage plan. The ships security plan is confidential and approved by flag state. Where the master advises that the ship security plan and any other plans relating to security are confidential, the inspector should only confirm their existence by inspection of the front cover. The inspector should address the question based on those documents and records that are not considered confidential in conjunction with the explanations of the accompanying officer.

Where a comment is required to support an observation, it must not provide any detail relating to the content of plans or risk assessments that are reported as confidential.

Inspectors should note that a company may instruct its vessel not to participate in a VRA based on their own internal security assessment. In these circumstances the voyage planning records should identify the VRA reporting points and indicate that reports must not be made to comply with company instructions.

Reference Publications: Global Counter Piracy Guidance for Companies, Masters and Seafarers / BMP5 Best Management Practices to Deter Piracy and Enhance Maritime Security in the Red Sea, Gulf of Aden, Indian Ocean and Arabian Sea / BMP West Africa. Best Management Practices to Deter Piracy and Enhance Maritime Security off the Coast of West Africa including the Gulf of Guinea. 1st Edition / ReCAAP: Regional Guide to Counter Piracy & Armed Robbery against Ships in Asia (2021).

5.5.3 Are Master and officers familiar with the company procedures for hardening the vessel when entering areas of increased security risk, and was there a Vessel Hardening Plan (VHP) available?

Inspector should sight and, where necessary, review the company procedures for hardening the vessel when entering areas of increased security risk. Inspector should review:

- *Vessel Hardening Plan (VHP).*
- *Records of implementation of the VHP such as logbooks, work planning records, reports, photographs etc.*
- *Inventory of hardening materials.*
- *Inspection and maintenance records for security equipment such as water cannons, CCTV, infrared detection cameras, etc.*
- *During the inspection, inspect the hardening materials currently stored on board.*

If the vessel is hardened in accordance with the VHP at the time of the inspection, verify that LSA and FFA is accessible and unobstructed. During discussion with the Ship Security Officer, verify their familiarity with the company procedures for hardening the vessel when entering areas of increased security risk, particularly the VHP. Where the VHP was reported to be an integral part of the ship security plan and confidential, the date of the last review/major changes to the plan should be sighted to verify that a VHP plan existed.

Reference Publications: IMO: ISM Code / OCIMF: Guidelines to Harden Vessels. First Edition.

5.5.4 Are the Master, officers and ratings familiar with the company procedures to control access to the vessel in port and to ensure the safety of visitors, and were these procedures effectively implemented?

The vessel operator should have developed procedures, in accordance with the Ship Security Plan (SSP), to control access to the vessel in port and to ensure the safety of visitors. These procedures should include:

- *Access control*
- *Visitor Induction*

When boarding the vessel, observe the security arrangements and induction and familiarisation procedures for visitors.

During the course of the inspection, observe the arrangements for regular patrols of the deck to monitor potential unauthorised access points.

5.5.5 Are the Master and officers familiar with regional maritime security reporting requirements and operation of the ship security alert system (SSAS) and has this equipment been regularly tested?

Inspector should sight the 24-hour contact details for the CSO. Verify with the Master or SSO that:

- *They were familiar with the company procedures for voluntary security reporting in VRAs.*
- *SSAS, LRIT and dedicated standalone security communications equipment, if fitted, is in satisfactory condition, regularly tested and records maintained.*

Inspector should verify that participation in operational VRAs had been considered during each passage planning phase, and; Where security reporting to VRAs was required by company procedures, there was evidence that reports had been made as required, or Where security reporting to VRAs was not to be made in accordance with company procedures the passage plan was annotated with the actions to take, if any, when passing reporting points.

Inspector should verify officer awareness of the:

- *Purpose and operation of the SSAS, LRIT and dedicated standalone security communications equipment, if fitted.*
- *24-hour contact details of the CSO.*

Inspectors should not request details of communications equipment or to sight test and maintenance records

5.5.6 Does the Ship Security Officer (SSO) have a valid Certificate of Proficiency and a full understanding of their role, and are ship security records of port calls being maintained as required by SOLAS?

Inspector should;

- *Sight and verify the SSO's Certificate of Proficiency.*
- *Sight and where necessary review, the sections of the SMS relating to ship security.*
- *Sight evidence of regular security inspections of the vessel by the SSO.*
- *Sight the ship security records for the last 10 port calls.*
- *Interview the SSO to verify their familiarity with their role, responsibilities, and duties.*
- *Interview a rating to verify their knowledge of vessel specific security procedures*

5.5.7 Are the Master and officers familiar with the company procedures for cyber security risk management, and have these procedures been fully implemented?

The vessel operator should have developed procedures for cyber risk management that:

- *Identified the roles and responsibilities of users, key personnel, and management both ashore and onboard - The officer with responsibility for cyber risk management on board.*
- *Identified the IT (information technology) and OT (operational technology) systems at risk on board such as Cargo management systems, Bridge systems, Propulsion and machinery management and power control systems, Access control systems, Administrative and crew welfare systems, Communication systems.*
- *Described technical protection measures to protect against a cyber incident such as Physical security of network components, Anti-virus software, Application software management, Back-up facilities, Control of crew internet access, Control of administrator profiles, user profiles and passwords.*
- *Described procedural protection measures to protect against a cyber incident such as Cyber security training and awareness raising for crew members, Control of local and remote access to the IT and OT systems, Control of the use of personal devices on board, equipment disposal (including data destruction), Contingency plans for possible cyber incidents.*

Inspector should check the following are in place;

- *Company procedures for cyber risk management*
- *Inventory/register of sensitive IT/OT systems*
- *Cyber Contingency plans are available in hard copy*
- *Contact details for technical support are available (from either vessel operator or external IT contractor)*
- *Records of cyber security training*

The inspector should not request to review any of the documents and records above considered to be confidential. Reference Publications: ISM Code / MSC-FAL.1/Circ.3 Guidelines on maritime cyber risk management / The Guidelines on Cyber Security Onboard Ships Version 4 / Resolution MSC.428(98) Maritime cyber risk management in safety management systems.

Control of work

5.6.1 Does the vessel/unit operate a documented permit to work (PTW) system?

A permit to work system should:

- *cover all areas of the vessel/unit*
- *address vessel/unit crew and contractor work scopes*
- *define the scope of work*
- *identify hazards and assess risk*
- *establish control measures to eliminate or mitigate hazards*
- *link the work to other associated work permits or simultaneous operations*
- *be authorised by the responsible person(s)*
- *communicate the above information to all involved in the work*
- *ensure control over the return to normal operations*

The system should cover, as a minimum, the following activities:

- *hot work*

- confined space entry
- hazardous tasks
- work involving high voltages
- working at height and over the side
- Lock Out/Tag Out processes
- the need for multiple permits
- work on stored systems containing stored energy e.g. pressure vessels

5.6.2 Does the PTW system specify roles and responsibilities?

e.g. Performing authority, Area Authority, Isolating Authority, Gas Tester, Fire Watch and Enclosed Space standby

5.6.3 Is there a register recording permits issued and isolations performed?

As best practice the register should record the permit number, area of work, summary of task, date/ time permit is issued, revalidated and finally cancelled on completion of work. For isolations, the register should record the isolation certificate number, summary of equipment isolated date / time of issue and final cancellation.

5.6.4 Are the period of validity and requirements for revalidation specified on the permit?

Best practice limits a permit's validity to specified individuals on a single shift. A new PTW should be raised after shift change.

5.6.5 Do personnel receive formal induction in the use of the PTW system?

Procedures should include specific training on an individual's roles and responsibilities.

5.6.6 Does the PTW system include an audit process?

Check that the audit is carried out by shore and vessel management. Check that there is an effective process of auditing permit compliance, at least on a monthly basis.

5.6.7 Does the PTW or SMS include a "Stop the Job" policy or statement?

The policy or statement should develop and encourage a "Stop the job" culture if anyone feels unsafe or uncertain about any aspect of a task or operation.

5.6.8 Is there evidence that an effective isolation process is implemented on board as part of the PTW system?

Any work on energy systems;

- mechanical, electrical, process, hydraulic and others
- should not proceed unless:
- the method of isolation and discharge of stored energy are agreed and executed by a competent person(s)
- any stored energy is discharged
- a system of locks and tags is utilised at isolation points
- a test is conducted to ensure the isolation is effective
- isolation effectiveness is periodically monitored (is there evidence of positive isolation?)

Check also if a long-term isolation record is maintained and if there is evidence of a policy for the temporary re-instatement of systems.

5.6.9 Are documented procedures in place to ensure safe work on high voltage systems and do they address appropriate access arrangements?

'High Voltage' is generally deemed to be >1000 volts (or less if company specifies). Procedures should require a re-test for dead when a change in conditions associated with the work is experienced. Procedures should require two personnel to be present when working on exposed conductors.

5.6.10 If the vessel/unit has high voltage equipment, are staff suitably trained to perform maintenance on it?

HV Training and Awareness procedures should be in place and staff should be aware of potential hazards associated with high voltage systems. Procedures may include, but are not limited to:

- Awareness training to understand the risks of high voltage electricity
- Safe system of work for maintenance procedures
- Repairs/maintenance of high voltage equipment only conducted by certified/competent persons
- Use of Lock Out / Tag Out system and warning signs during maintenance or repair
- Medical emergency procedures

5.6.11 Is there evidence that hot work procedures are implemented on board?

Hot work' is defined as any work involving sources of ignition or temperatures sufficiently high to cause the ignition of a flammable gas mixture. In conducting hot work:

- *the workspace and bilges shall be clean, dry and free of oil*
- *the vessel/unit should be outside the 500m or safety zone of an installation*
- *the workspace and enclosed spaces should be tested immediately prior to starting the Hot Work and shown to have an LEL of less than 1 percent*
- *all meters used shall be properly calibrated and their function tested just prior to being used*
- *the atmosphere should be monitored and ventilated throughout the hot work*
- *work pieces should be clamped into position and not held by hand*
- *fire resistant blankets should be used to shield other areas and prevent sparks from falling to lower levels*
- *fire hoses should be rigged and charged with water at all times*
- *a trained fire watch should be continually in attendance*
- *if outside machinery spaces/workshops, all cargo operations and oil transfers should be stopped*
- *if multiple repairs are to be carried out in different locations, each job should be planned and executed as an individual and separate repair*
- *all other work must be considered Gas testers should be trained and deemed competent.*

A hot work permit should cover the requirements for a fire watch and fire watchers should be trained and deemed competent. The fire watch should continue until there is no further danger. Best practice is for hot work to stop well before a permit is due to expire to allow the fire watch to continue under its control.

5.6.12 If electric welding equipment is provided, is it in good order, inspected regularly and are written safety guidelines available on site?

Welding and other equipment used for hot work should be carefully inspected before each occasion of use to ensure that it is in good condition. Where required, it must be correctly earthed. Special attention must be paid when using electric arc equipment to ensure that:

- *electrical supply connections are made in a gas free space.*
- *existing supply wiring is to carry the electrical current demand without overloading, causing heating.*
- *insulation of flexible electric cables is in good condition.*
- *the cable route to the work site is the safest possible, only passing over gas free or inerted spaces.*
- *the welding return lead should be connected as near as practicable to the welding arc; metal rails, pipes and frames should not be used as part of the welding circuit unless they are a part of the work piece itself.*

5.6.13 If gas welding and burning equipment is provided, is it inspected regularly and in good order?

Check records of inspection.

Confirm that flashback arrestors are fitted and in good order. Flashback arrestors should be fitted at both the cylinders and workstation as recommended by the USA Operational Safety and Health Admin (OSHA) the UK Health and Safety Executive and other national safety authorities where long lengths of piping between the cylinders and the blowtorch are involved.

5.6.14 Are spare oxygen and acetylene cylinders stored apart in a dedicated storage and is the storage in a clearly marked, well-ventilated position outside the accommodation and machinery spaces?

Notes: Oxygen will not burn or explode, it only supports combustion; however, a small amount of excess oxygen will allow materials which are not normally combustible to burn with ferocity. Industrial oxygen cylinders are painted blue. Acetylene is 92.3% carbon and 7.7% hydrogen, is lighter than air and is highly flammable with a LEL of 2.5%. Acetylene cylinders are painted maroon.

Oxygen and Acetylene should be kept in separate compartments except in the case of the cylinders that are in use, which may be stored in the same compartment. Cylinders should be stowed away from heat sources and should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Full and empty cylinders should be segregated.

Cylinders should be stored with the valve end up. Storage areas should be free of combustible material and not exposed to salt or other corrosive chemicals.

Check whether there is a procedure in place to verify the contents of gas cylinders. Where the total number of acetylene and oxygen cylinders (regardless of size) including spare cylinders does not exceed 8, both gases may be kept in the same room. Where the total number of acetylene and oxygen cylinders (regardless of size) including spare cylinders exceeds 8, the gas cylinder central shall consist of two gas-tightly separated rooms, one for acetylene and one for oxygen. (NMD Reg 422 (25th Apr 2002) §14).

5.6.15 Are there documented procedures in place covering the use of portable electrical equipment on deck?

Supply voltage should be documented by inspector.

Procedure should also include controls on the use of wandering leads and their inspection and maintenance requirements. Double insulated tools or powered by low voltage isolation transformer should be considered to protect personnel from electric shock.

5.6.16 Is there an effective inspection and testing programme in place to ensure that all portable electrical equipment used on board is maintained in a satisfactory condition and included in the vessel PMS? Is there documented procedure for testing portable appliance/equipment within SMS including the use of portable electrical equipment on deck?

Is an annual audit of portable electrical equipment carried out?

Record the last audit date of the portable appliances/equipment.

Reference: IEE Code of Practice for In-service Inspection and Testing of Electrical Equipment.

5.6.17 Are all spaces that are classed as 'enclosed spaces' identified and clearly marked?

All spaces not normally ventilated should be considered as 'enclosed spaces'. An enclosed space is any enclosed area that:

- *is large enough for personnel to enter*
- *has limited or restricted means of entry*
- *is not designed for normal or continuous occupancy.*

It can be any space of an enclosed nature where there is a risk of death or serious injury from hazardous substances or dangerous conditions (e.g. lack of oxygen, machinery located within the space, etc). Enclosed spaces include cargo tanks, bulk tanks, ballast tanks, fuel tanks, water tanks, lubricating oil tanks, slop and waste oil tanks, sewage tanks, cofferdams, duct keels, void spaces and trunkings, pipelines or fittings connected to any of these. They also include any other item of machinery or equipment that is not routinely ventilated and entered, such as boilers and main engine crankcases.

5.6.18 Is there evidence that enclosed space entry procedures are implemented on board?

Procedures should ensure that no person shall enter any enclosed space unless all other alternatives to entry have been considered and:

- *a valid entry permit has been issued (Note: some permit systems may require a work permit in addition to an entry permit for work conducted in an enclosed space).*
- *Lock Out/Tag Out of pipework and machinery has been completed with fully completed isolation tags and locks in place (as required).*
- *the work space has been tested and found gas free*
- *ventilation is maintained throughout entry and the atmosphere is monitored*
- *adequate lighting, including a back-up source and safe access has been provided.*
- *during the hazard assessment phase, the vessel/unit's contingency plan for enclosed space rescue should be reviewed to ensure it is appropriate for the specific entry, its contents discussed and the necessary equipment readily available.*
- *an experienced person should be standing by who is capable of initiating the alarm/response procedure.*
- *communications procedures have been agreed.*

MO(D)U Code IMO RESOLUTION MSC.358(92) and 1989/2009 MODU Codes (Chapters 14.13/14.14) have requirements for enclosed space entry and rescue drills. 14.13 Enclosed space entry and rescue drills. Crew members with enclosed space entry or rescue responsibilities should participate in an enclosed space entry and rescue drill to be held on board the unit at least once every two months.

Each enclosed space entry and rescue drill should include:

- 1 checking and use of personal protective equipment required for entry;*
- 2 checking and use of communication equipment and procedures;*
- 3 checking and use of instruments for measuring the atmosphere in enclosed spaces;*

4 checking and use of rescue equipment and procedures;
5 instructions in first aid and resuscitation techniques.

5.6.19 Are portable gas and oxygen analysers provided appropriate to the vessel/unit's operations and are they calibrated and in good order?

Check calibration records and that tests and inspections are included in the vessel/units planned maintenance system.

5.6.20 Are personnel onboard trained in the use and calibration of portable oxygen and gas analysers?

Portable oxygen and gas analysers are analysers used to evaluate the atmosphere of an enclosed space prior to entry. Training records should be maintained for are personnel responsible for testing atmosphere. Shoreside calibration by a service provider approved by the maker is acceptable in lieu of calibrating onboard.

Where calibration is carried out onboard, at least one officer should have evidence of appropriate training (CBT, shore based course or similar).

5.6.21 Is there evidence that working at height or overside work procedures are implemented on board?

A permit may be required, for example, when any worker is:

- *exposed to a possible fall of two metres or more*
- *working near an exposed edge*
- *working outside of the vessel/units side railings*
- *working over the vessel/unit's side*
- *using scaffolding If fall arrest equipment is to be used it must have:*
- *a proper anchor and suitably mounted*
- *a full body harness using double latch self locking snap hooks at each connection*
- *synthetic fibre lanyards*
- *a shock absorber*

A visual inspection of the fall arrest equipment should be completed prior to use and any damaged or activated components taken out of service?

Lifting equipment

5.7.1 Are all cranes in a satisfactory condition?

Inspector should carry out a general visual inspection of all cranes and inspect condition of main components of crane including pedestal and foundation.

5.7.2 Are up to date records maintained for the regular inspection, maintenance and testing of all lifting equipment/devices?

e.g. chain register/ lifting appliance register, planned maintenance system, etc.

Note: Lifting devices include:

- *Pedestal cranes*
- *Mobile cranes*
- *Overhead gantry cranes*
- *Loose lifting gear*
- *chain hoists, lever hoists, slings, shackles, pendants etc.*
- *Wire line masts*
- *Draw works and travelling block*
- *Lifts for persons or goods*
- *Abseiling equipment*
- *Sling-sets attached to containers or pieces of equipment*
- *Runway beams and pad eyes to which lifting equipment is anchored or fixed*
- *Emergency escape equipment found on offshore installations such as lifeboats (including any davits, winches, ropes, etc.) and Donuts.*

Periodic inspection should be carried out in accordance with the relevant legislation and such inspections may be carried out by third parties. All equipment, which requires thorough examination should have been identified. Prior to using

lifting equipment for the first time a thorough examination should be carried out, unless the equipment has not been used before and is not more than 12 months old.

A thorough examination must be carried out if the safety of the lifting equipment is dependent upon installation or assembly conditions. All lifting equipment deteriorates in use and therefore a thorough examination must be carried out. Examples of thorough examination intervals are:

- every 6 months if the equipment and lifting accessories are used for lifting persons
- every 12 months for all other lifting equipment (chain hoists, lever hoists etc)

A thorough examination should also be carried out following exceptional circumstances which may have jeopardised the safety of the equipment, for example, following an overload or change out of a major load path item. In addition to thorough examinations, where user risks have been identified inspections should be carried out. The inspection should include visual checks and function tests and be carried out by persons competent to do so.

Any lifting equipment used for lifting persons should be formally designed, constructed and inspected for manriding operations, by an independent third party

5.7.3 Has the vessel/unit undergone annual survey of the crane(s) within last 12 months?

Inspector to provide date of last survey/inspection and due date for next survey/inspection

5.7.4 Has proof load testing and examination been completed by certifying authority within last 5 years?

Inspector to provide date of last test and due date for next test. Periodic NDT inspections should be completed by competent party and completed on at least 5 year cycle.

Inspector to detail date of last NDT inspections

5.7.5 Are all cranes covered under planned maintenance system (PMS)?

PMS should provide detail for inspection, maintenance and changeout schedule for all key crane systems including periodic structural inspection process for all main structural components (boom, gantry, foundation).

5.7.6 Has the vessel/unit undergone any major modifications, upgrades or repairs to the crane(s)?

Inspector to provide detail and date of modifications/repairs.

5.7.7 Are test certificates available onboard for all items of loose lifting equipment and are they subject to inspection and maintenance programme?

Loose lifting equipment includes wire or webbing slings, shackles, eyebolts, etc. Throughout the life of any piece of lifting equipment it must be accompanied by a valid certificate to show that it has been manufactured properly and subsequently received thorough examination, to ensure continued integrity and fitness for safe use. For small items of equipment such as small shackles, batch certificates may be issued.

Examples of Inspection and maintenance programme may include;

- on board inspection regimes
- change out on a periodic basis of a rigging locker or,
- the use of third party inspection companies.

5.7.8 Are safety devices associated with lifting appliances fully operational?

Examples include emergency stops, load and overload indicators, limit switches (e.g., hook stop).

5.7.9 Are cranes, derricks, pad eyes and other securing points clearly marked with their SWL?

Safe Working Load (SWL) - the maximum load that the equipment may safely lift.

If it is not possible to mark the equipment with the SWL, a coding system or labels may be used. If the SWL is dependent upon the configuration of the equipment, the SWL for each configuration should either be marked on the equipment or the information kept with the equipment where it is readily available to the operator, for example load-radius charts. Where the SWL changes with the operating radius of the equipment, a load-limiting device may need to be fitted to inhibit the equipment and provide visual and/or audible warnings.

Any structural element of a piece of lifting equipment which can be separated from the equipment (boom section, slew ring, etc.) should be marked to indicate the equipment of which it is a part. Where a number of accessories are brought

together and not dismantled, for example a spreader beam with slings and shackles, the assembly should be marked to indicate its safety characteristics.

Lifting equipment and accessories should be marked with any relevant safety information such as the thickness of plates, which may be lifted with a plate clamp.

Lifting equipment designed for lifting persons should be marked as such and the carrier should display the SWL and maximum number of persons, which may be carried.

5.7.10 Are all items of lifting gear marked with a unique identification?

The equipment should be hard stamped

- e.g. ferrules on wire slings: affixed with a metal plate
- e.g. chain hoist; or painted onto the equipment
- e.g. runway beams.

5.7.11 Is a colour-coding or alternative system in use to identify inspected lifting equipment?

Check that it is being adhered to, i.e. no evidence of wrong colour/non-coded equipment in use, that non-coded/wrong colour equipment is quarantined (and access to same is denied).

5.7.12 Is there a programme for routine testing, i.e. start-up, daily, weekly and monthly checks of lifting equipment?

Including the use of check lists. Inspectors should verify that checklists for equipment are in use and where defects are identified they are being addressed via the maintenance supervisor and the PMS.

5.7.13 Is there a documented procedure requiring that all lifting operations are properly planned?

The plan will need to address the risks identified during a risk assessment and should identify all resources, procedures and responsibilities necessary for safe operation. The degree of planning will vary considerably depending on the type of lifting equipment and complexity of the lifting operation and degree of risk involved. There are two elements to the plan: the suitability of the lifting equipment and the individual lifting operation to be performed.

As a means of minimising risk, the plan should consider the following areas:

- working under suspended loads
- breakdown in communication during blind lifting
- attaching/detaching the load
- environment and location
- proximity hazards
- lifting persons with non-dedicated equipment
- overloading
- pre-use checks by the operator
- deterioration in the condition of lifting accessories
- the experience, competence and training of all associated personnel.

Following a risk assessment and preparation of a standard instruction or procedure, the person using the equipment can normally plan routine lifts on an individual basis. A routine plan should be reviewed on a regular basis to ensure that it remains valid.

For any lifting operation it is necessary to:

- (a) ensure that a risk assessment is in place
- (b) select suitable equipment for the range of tasks
- (c) plan the individual lifting operation Particular responsibilities are placed on the deck crew and crane operator to ensure that radio communication is maintained, especially during blind lifting.

Lifts utilising cranes, hoists, or other mechanical lifting devices should not commence unless:

- an assessment of the lift has been completed and the lift method and equipment has been determined by a competent person(s)
- operators of powered lifting devices are trained and certified for that equipment
- rigging of the load is carried out by a competent person(s)
- lifting devices and equipment have been certified for use within the last 12 months (at a minimum)
- the load does not exceed dynamic and/or static capacities of the lifting equipment

- any safety devices installed on lifting equipment are operational
- all lifting devices and equipment have been visually examined before each lift by a competent person(s)

5.7.14 Does the vessel/unit have a system in place for the quarantine of damaged or uncertified lifting equipment?

Check for a quarantine area on board the unit, Inspector to document if the quarantine area is secure from reuse once items are deposited. Inspectors may be advised that damaged equipment is destroyed to prevent re use and should check for procedures that document this requirements and examples /records of equipment with drawn from service and destroyed.

Lifting equipment (barge)

5.8.1 Does the vessel/unit have a system in place for the quarantine of damaged or uncertified lifting equipment?

Check for a quarantine area on board the unit, Inspector to document if the quarantine area is secure from reuse once items are deposited. Inspectors may be advised that damaged equipment is destroyed to prevent re use and should check for procedures that document this requirements and examples/records of equipment with drawn from service and destroyed.

5.8.2 Is the vessel/unit equipped with service cranes covering all anticipated operations?

Located to minimise blind sectors.

5.8.3 Is an inspection and maintenance programme in place for other lifting equipment such as wire or webbing slings, shackles, eyebolts etc?

Throughout the life of any piece of lifting equipment it must be accompanied by a valid certificate to show that it has been manufactured properly and, subsequently received thorough examination, to ensure continued integrity and fitness for safe use. For small items of equipment such as small shackles, batch certificates may be issued.

5.8.4 Are test certificates available onboard for all items of loose lifting equipment including wire or webbing slings, shackles, eyebolts, etc?

Throughout the life of any piece of lifting equipment it must be accompanied by a valid certificate to show that it has been manufactured properly and, subsequently received thorough examination, to ensure continued integrity and fitness for safe use. For small items of equipment such as small shackles, batch certificates may be issued.

5.8.5 Are safety devices associated with lifting appliances fully operational?

e.g. emergency stops, load and overload indicators, etc

5.8.6 Are cranes, derricks, pad eyes and other securing points clearly marked with their SWL?

Safe Working Load (SWL) - the maximum load that the equipment may safely lift.

If it is not possible to mark the equipment with the SWL, a coding system or labels may be used. If the SWL is dependent upon the configuration of the equipment, the SWL for each configuration should either be marked on the equipment or the information kept with the equipment where it is readily available to the operator, for example load-radius charts.

Where the SWL changes with the operating radius of the equipment, a load-limiting device may need to be fitted to inhibit the equipment and provide visual and/or audible warnings. Any structural element of a piece of lifting equipment which can be separated from the equipment (boom section, slew ring, etc.) should be marked to indicate the equipment of which it is a part. Where a number of accessories are brought together and not dismantled, for example a spreader beam with slings and shackles, the assembly should be marked to indicate its safety characteristics.

Lifting equipment and accessories should be marked with any relevant safety information such as the thickness of plates, which may be lifted with a plate clamp.

Lifting equipment designed for lifting persons should be marked as such and the carrier should display the SWL and maximum number of persons, which may be carried.

5.8.7 Are all items of lifting gear marked with a unique identification?

The equipment should be hard stamped

- e.g. ferrules on wire slings: affixed with a metal plate
- e.g. chain hoist; or painted onto the equipment
- e.g. runway beams.

5.8.8 Is a colour-coding or alternative system in use to identify inspected lifting equipment?

Check that it is being adhered to, i.e. no evidence of wrong colour/non-coded equipment in use, that non-coded/wrong colour equipment is segregated and access to same is denied.

Where there is more than one winch in a drilling derrick it may be possible for a winch, which has not been designated for man-riding, to be used for lifting of persons. In such a case all winches shall be clearly marked as either being suitable for lifting of persons or not.

5.8.9 Is there a programme for routine testing, i.e. start-up, daily, weekly and monthly checks of lifting equipment?

Including the use of check lists.

5.8.10 Is there a procedure requiring that all lifting operations are properly planned?

The plan will need to address the risks identified during a risk assessment and should identify all resources, procedures and responsibilities necessary for safe operation. The degree of planning will vary considerably depending on the type of lifting equipment and complexity of the lifting operation and degree of risk involved. There are two elements to the plan: the suitability of the lifting equipment and the individual lifting operation to be performed.

As a means of minimising risk, the plan should consider the following areas:

- *working under suspended loads*
- *breakdown in communication during blind lifting*
- *attaching/detaching the load*
- *environment and location*
- *proximity hazards*
- *lifting persons with non-dedicated equipment*
- *overloading*
- *pre-use checks by the operator*
- *deterioration in the condition of lifting accessories*
- *the experience, competence and training of all associated personnel.*

Following a risk assessment and preparation of a standard instruction or procedure, the person using the equipment can normally plan routine lifts on an individual basis.

A routine plan should be reviewed on a regular basis to ensure that it remains valid. For any lifting operation it is necessary to:

- (d) *ensure that a risk assessment is in place*
- (e) *select suitable equipment for the range of tasks*
- (f) *plan the individual lifting operation*

Particular responsibilities are placed on the deck crew and crane operator to ensure that radio communication is maintained, especially during blind lifting.

Lifts utilising cranes, hoists, or other mechanical lifting devices should not commence unless:

- *an assessment of the lift has been completed and the lift method and equipment has been determined by a competent person(s)*
- *operators of powered lifting devices are trained and certified for that equipment*
- *rigging of the load is carried out by a competent person(s)*
- *lifting devices and equipment have been certified for use within the last 12 months (at a minimum)*
- *the load does not exceed dynamic and/or static capacities of the lifting equipment*
- *any safety devices installed on lifting equipment are operational*
- *all lifting devices and equipment have been visually examined before each lift by a competent person(s)*

Offshore personnel transfer

5.9.1 Does the vessel/unit have documented procedures for transfer of personnel offshore?

For all methods of transfer, a risk assessment should be carried out prior to operations to ensure that transfer can be completed in a safe manner. Crane/Lifting Operations

- *A means of communication must be provided between the passenger and the lifting equipment operator. May be either hand signals or radio communication.*

- *The equipment must be manned at all times during person-lifting operations.*
- *Reliable means of rescue available in the event of equipment failure.*
- *Appropriate supervision is made available for the operations.*
- *Suitable PPE should be worn and Personnel Locator Beacons (PLB) should be considered and used if available. If a crane is to be used for lifting persons it should be class approved for Man Riding operations and the following must be in place:*
 - *Free-fall capability lock-out*
 - *Hoisting and lowering limiters*
 - *Rated capacity indicator and limiter*
 - *Schedule of daily inspections of the crane or winch and carrier by a competent person*
 - *Is there instruction for all persons involved*
 - *passenger, operator, supervisor, etc*
- *Suitable PPE should be worn and Personnel Locator Beacons (PLB) should be considered and used if available*
- *Boat/Swing Rope Transfer*
 - *A suitable means of communication should be available throughout operation*
 - *Dedicated transfer areas should be free from obstructions, debris and surfaces should be non slip*
 - *Sufficient personnel should be available to assist during transfer*
 - *Suitable Lifesaving Appliances should be available at or close to the transfer area*
 - *Suitable PPE should be worn and Personnel Locator Beacons (PLB) should be considered and used if available*
 - *Where appropriate, secondary lifelines should be used*
 - *Where fitted, Swing Ropes should be knotted and checked as part of vessel's regular maintenance programme.*
 - *Where fitted, Boat/Surfer landings should be in good order and regularly inspected as part of vessel's regular maintenance programme*

Reference IAGC Marine Environment Safety Manual IMCA M202 Guidance on transfer of Personnel to and from Offshore Vessels Marine transfer of personnel - Step change in safety - Oil & Gas UK

5.9.2 Are all personnel transfer equipment subject to an inspection and certification regime?

Sight certification and inspection records. Where fitted, boat/surfer landings should be in good order and regularly inspected as part of vessel's regular maintenance programme. Inspection regimes for transfer equipment to follow OEM requirements and inspectors should document the periodic inspection regime in place for this equipment.

5.9.3 Have all personnel involved in lifting/man riding operations been trained and certified to carry out such operations?

Does the crane operator have a valid offshore crane operator OPITO stage 3 certificate or equivalent?

Does the banksman have a valid banksman OPITO stage 3 certificate or equivalent?

5.9.4 Where fitted, is the offshore personnel gangway certified and subject to an inspection programme?

5.9.5 Is there a formal check system for confirming who crosses the gangway, and is there an effective back up check system to ensure discrepancies are raised and addressed?

All procedures/checks should be positive action type, not a default system. A secondary check process should also be in place as a back-up.

The Inspector should make an Observation if positive and secondary systems are not effectively operated.

5.9.6 If the gangway is stabilised, does the control function use a dedicated crew?

Inspector should make an Observation if Marine Control Room staff are expected to control gangway, DP systems and mooring winches concurrently.

5.9.7 Are effective documented procedures in place for the use of small boats that include working from them, personnel transfer and the launch and recovery?

Procedures for transfer of personnel at sea, including:

- *transfer only to occur if all parties agree*
- *transfer to comply with locally enforced regulations*
- *transfer only to occur if personnel being transferred are willing to be so* Procedures for launch, recovery and all normal operations of the small boat, including:
 - *test of radio communications before launch and recovery*
 - *pre-launch 'toolbox' meeting*

- use of appropriate launching and recovery arrangements

Small boats likely to be used to assist in emergency towing line rigging should have their flooring suitable to carry emergency equipment to the tow

Life saving appliances

5.10.1 Are vessel/unit-specific life-saving equipment training manuals available?

A training manual shall be provided in each crew mess room and recreation room, or in each cabin. (SOLAS III/35.2) The training manual shall contain instructions and information, in easily understood terms illustrated wherever possible, on the life-saving appliances provided in the vessel/unit and on the best methods of survival. Any part of such information may be provided in the form of audio-visual aids in lieu of the manual. The following shall be explained in detail:

- donning of lifejackets, immersion suits and anti-exposure suits;
- muster at assigned stations;
- boarding, launching and clearing the survival craft and rescue boats;
- method of launching from within survival craft;
- release from launching appliances;
- illumination in launching areas;
- use of all survival equipment;
- with the assistance of illustrations, the use of radio life-saving appliances;
- use of drogues;
- use of engine and accessories;
- recovery of survival craft and rescue boats, including stowage and securing;
- hazards of exposure and the need for warm clothing;
- best use of survival craft facilities in order to survive;
- methods of retrieval, including the use of helicopter gear;
- all other functions contained in the muster list and emergency instructions; and
- instructions for repair of the life saving appliances. (SOLAS III/35.3) This is considered best practice for non-SOLAS vessels

5.10.2 Are vessel/unit-specific life-saving equipment maintenance instructions available and are weekly and monthly inspections being carried out?

The following tests and inspections shall be carried out weekly and a report of the inspection shall be entered in the log-book:

- all survival craft, rescue boats and launching appliances shall be visually inspected to ensure that they are ready for use. The inspection shall include, but is not limited to, the condition of hooks, their attachment to the lifeboat and the on-load release gear being properly and completely reset;
- all engines in lifeboats and rescue boats shall be run for a total period of not less than 3 minutes, provided the ambient temperature is above the minimum temperature required for starting and running the engine. During this period of time, it should be demonstrated that the gearbox and gearbox train are engaging satisfactorily. If the special characteristics of an outboard motor fitted to a rescue boat would not allow it to be run other than with its propeller submerged for a period of 3 minutes, it should be run for such a period as prescribed in the manufacturer's handbook. In special cases, the Administration may waive this requirement for ships constructed before 1 July 1986;
- lifeboats, except free-fall lifeboats, on cargo ships shall be moved from their stowed position, without any persons on board, to the extent necessary to demonstrate satisfactory operation of launching appliances, if weather and sea conditions so allow; and
- the general emergency alarm shall be tested. (SOLAS III/20.6)

All lifeboats, except free-fall lifeboats, shall be turned out from their stowed position, without any persons on board if weather and sea conditions so allow. (SOLAS III/20.7.1)

Monthly inspections. Inspection of the life-saving appliances, including lifeboat equipment, shall be carried out monthly using the checklist required by regulation 36.1 to ensure that they are complete and in good order. A report of the inspection shall be entered in the log-book. (SOLAS III/20.7.2)

Instructions for on-board maintenance shall be easily understood, illustrated wherever possible and as appropriate, shall include for each appliance:

- a checklist for use when carrying out the monthly inspections required by SOLAS III/20.7.2 and SOLAS III/36.1;
- maintenance and repair instructions;

- a schedule of periodic maintenance;
- a diagram of lubrication points with the recommended lubricants;
- a list of replaceable parts;
- a list of sources of spare parts; and
- a log for records of inspections and maintenance. (SOLAS III/36) This is considered best practice for non-SOLAS vessels

5.10.3 Are muster lists displayed onboard?

Muster lists and emergency instructions shall be exhibited in conspicuous places throughout the vessel/unit including the navigation bridge, engine room and crew accommodation spaces. (SOLAS III/8.3) The muster list shall show the duties assigned to the different members of the crew including:

- closing of the watertight doors, fire doors, valves, scuppers, side scuttles, portholes and other similar openings in the ship;
- equipping of the survival craft and other life-saving appliances;
- preparation and launching of survival craft;
- general preparations of other life-saving appliances;
- muster of passengers;
- use of communication equipment;
- manning of fire parties assigned to deal with fires; and
- special duties assigned in respect to the use of fire-fighting equipment and installations. (SOLAS III/37.3)

The muster list shall specify which officers are assigned to ensure that life-saving and fire appliances are maintained in good condition and ready for immediate use. (SOLAS III/37.4)

The muster list shall specify substitutes for key persons who may become disabled, taking into account that different emergencies may call for different actions. (SOLAS III/37.5)

The muster list shall be prepared before the vessel/unit proceeds to sea. (SOLAS III/37.7)

5.10.4 Is there a maintenance and test schedule for lifeboat, Rescue boat on-load release gear, davit launched liferaft automatic release hooks, and free-fall lifeboat release systems, where fitted?

Lifeboat or rescue boat on-load release gear, including free-fall lifeboat release systems shall be:

- maintained in accordance with instructions for on-board maintenance as required by regulation 36;
- subjected to a thorough examination and operational test during the annual surveys required by regulations I/7 and I/8 by properly trained personnel familiar with the system; and
- operationally tested under a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of person and equipment whenever the release gear is overhauled. Such over-hauling and test shall be carried out at least once every five years. (SOLAS III/20.11.2) Davit-launched liferaft automatic release hooks shall be:
- maintained in accordance with instructions for on-board maintenance as required by regulation 36;
- subjected to a thorough examination and operational test during the annual surveys required by regulations I/7 and I/8 by properly trained personnel familiar with the system; and
- operationally tested under a load of 1.1 times the total mass of the lifeboat when loaded with its full complement of person and equipment whenever the release gear is overhauled. Such over-hauling and test shall be carried out at least once every five years. (SOLAS III/20.11.3)

Note: Of particular importance in the checking of lifeboats is the on-load release system fitted to enclosed lifeboats and the maintenance routines for them. A high percentage of accidents at sea are attributed to lifeboats and their release systems. (MSC.1/Circ 1206/Rev1).

5.10.5 If vessel/unit has lifeboats, are the lifeboats, including their equipment and launching mechanisms, in good order?

Each survival craft shall be stowed in a state of continuous readiness so that two crew members can carry out preparations for embarkation and launching in less than 5 minutes. (SOLAS III/13.1.3)

Each lifeboat shall be launched with its assigned operating crew aboard and manoeuvred in the water at least once every three months during an abandon ship drill. (SOLAS III/19.3.3.3)

In the case of a lifeboat arranged for free-fall launching, at least once every three months during an abandon ship drill, the crew shall board the lifeboat, properly secure themselves in their seats and commence launch procedures up to, but not including the actual release of the lifeboat (i.e., the release hook shall not be released). The lifeboat shall then either be free-fall launched with only the required operating crew on board, or lowered into the water by means of the secondary

means of launching with or without the operating crew on board. In both cases, the lifeboat shall thereafter be manoeuvred in the water by the operating crew. At intervals of not more than six months, the lifeboat shall either be launched by free fall with only the operating crew on board, or simulated launching shall be carried out in accordance with the guidelines developed by the Organization. (SOLAS III.19.3.3.4)

Emergency lighting for mustering and abandonment shall be tested at each abandon ship drill. (SOLAS III/19.3.3.9)

Falls used in launching shall be inspected periodically (Refer to Measures to prevent accidents with lifeboats (MSC.1/Circ.1206) with special regard for areas passing through sheaves and renewed when necessary due to deterioration of the falls or at intervals of not more than 5 years, whichever is the earlier. (SOLAS III/20.4.1)

Each free-fall lifeboat shall be fitted with a release system which shall be designed to test the release system without launching the lifeboat. (LSA Code IV/4.7.6.4)

Each lifeboat shall be clearly marked with the number of persons for which the lifeboat is approved and the name and port of registry. Means of identifying the ship to which the lifeboat belongs and the number of the lifeboat shall be marked in such a way that they are visible from above. (LSA Code IV/4.4.9)

Notes: It is very important to check the lifting hooks and their associated structure, in particular the connections to the lifeboat keel. These are occasionally found to be severely wasted.

Lifeboat equipment is detailed in the LSA Code IV/4.4.8 and the general requirements for enclosed lifeboats in the LSA Code IV/4.6, although under SOLAS III/32.3.5 the totally enclosed lifeboats carried on ships constructed before 1st July 1986 need not comply with the requirements of the LSA Code IV/4.6.

Amendments to SOLAS III/19 (Emergency training and drills) and 20 (Operational readiness maintenance and inspections) came into force on 1st July 2006. The amendments concern the conditions in which lifeboat emergency training and drills should be conducted and introduce changes to the operational requirements for maintenance, weekly and monthly inspections so as not to require any persons to be on board, and servicing of launching appliances and on-load release gear.

5.10.6 If fitted, are lifeboat operating instructions clearly displayed?

Posters or signs shall be provided on or in the vicinity of survival craft and their launching controls shall:

- illustrate the purpose of the controls and the procedures for operating the appliance and give relevant instructions or warnings;
- be easily seen under emergency lighting conditions; and
- use symbols in accordance with resolution A.760, as amended by MSC.82(70). (SOLAS III/9.2)

5.10.7 If vessel/unit has a rescue boat, is the rescue boat, including its equipment and launching arrangement available for use and in good order?

Rescue boats shall be stowed in a state of continuous readiness for launching in not more than 5 minutes. (SOLAS III/14.1)

Notes: Rescue boat equipment is detailed in the LSA Code V/5.1.2.2, 3 and 4. With respect to launching equipment, rescue boats should comply with the requirements of the LSA Code 4.4.7.6 (by LSA Code 5.1.1.1) and either have two release capabilities, one off-load and one on-load, or only one if the rescue boat can only be released when waterborne. The on-load release shall be:

- Protected against accidental or premature use;
- To prevent a premature on-load release, on-load operation of the release mechanism should require a sustained and deliberate action by the operator;
- To prevent an accidental release the mechanical protection (interlock) should only engage when the release mechanism is properly and completely set;
- The release mechanism shall be so designed that crew members in the lifeboat can clearly observe when the release mechanism is properly and completely reset;
- Clear operating instructions should be provided with a suitable worded warning notice;
- Where a single fall or hook system is used for launching, the above requirements need not apply and a single capability to release the rescue boat only when it is waterborne will be adequate.

Does the unit have sufficient personnel assigned to operate the rescue craft?

Inspector to sample the records for persons currently aboard the unit and their relief (back-to-back) for the minimum required rescue boat training and certification.

Inspector to examine training and drills records to ascertain if the assigned personnel have experience operating the installed equipment.

5.10.8 Are liferafts in good order, within due date and operating instructions clearly posted?

Posters or signs shall be provided on or in the vicinity of survival craft and their launching controls shall:

- *illustrate the purpose of the controls and the procedures for operating the appliance and give relevant instructions or warnings;*
- *be easily seen under emergency lighting conditions; and*
- *use symbols in accordance with resolution A.760, as amended by MSC.82. (SOLAS III/9.2)*

5.10.9 Are hydrostatic releases, where fitted, correctly attached?

Every liferaft shall be stowed with its painter permanently attached to the ship. (SOLAS III/13.4.1)

Each liferaft or group of liferafts shall be stowed with a float-free arrangement so that each floats free and if inflatable, inflates automatically when the ship sinks. (SOLAS III/13.4.2)

Liferafts shall be so stowed as to permit manual release of one raft or container at a time from their securing arrangements. (SOLAS III/13.4.3)

Note: Some hydrostatic release manufacturers recommend that each liferaft is fitted with its own individual hydrostatic release unit (HRU), to prevent the possibility, where more than one liferaft is utilising the same release, of one of the liferafts breaking the weak link before the second or subsequent liferafts have inflated. Where more than one liferaft is attached to a single HRU, each of the rafts must be fitted with its own weak link. Liferafts stowed in the forward part of the vessel do not require a HRU.

5.10.10 Are survival craft portable VHF radios and Search and Rescue Radar Transponders (SART's) in good order and charged?

At least two-way VHF radiotelephone apparatus shall be provided on every cargo ship of 300 gross tonnage and upwards but less than 500 gross tonnage.

At least 3 two-way VHF radiotelephone apparatus shall be provided on every cargo ship of 500 gross tonnage and upwards. (SOLAS III/6.2.1.1)

The two-way radiotelephone should be capable of operation on the frequency 156.800 MHz (VHF channel 16) and on at least one additional channel. (Res. A.809/3.1)

The source of energy should be integrated in the equipment and may be replaceable by the user. In addition, provision may be made to operate the equipment using an external source of electrical energy. (Res. A.809/12.1)

Equipment for which the source of energy is intended to be user-replaceable should be provided with a dedicated primary battery for use in the event of a distress situation. This battery should be equipped with a non-replaceable seal to indicate that it has not been used. (Res. A.809/12.2)

Equipment for which the source of energy is intended to be non-user-replaceable should be provided with a primary battery. The portable two-way radiotelephone equipment should be fitted with a non-replaceable seal to indicate that it has not been used. (Res. A.809/12.3)

At least one radar transponder shall be carried on each side of every cargo ship of 500 gross tonnage and upwards. The radar transponders shall be stowed in such locations that they can be rapidly placed in any survival craft (other than the forward liferaft). On ships equipped with free-fall lifeboats, one of the transponders shall be stowed in the free-fall lifeboat and the other located in the immediate vicinity of the navigation bridge so that it can be utilised on board and ready to transfer to any other survival craft. (SOLAS III/6.2.2)

Note: The requirements for survival craft two-way VHF radios are contained in IMO Res. A.809(19) as amended.

5.10.11 Are lifebuoys, lights, buoyant lines, quick release mechanisms and self-activating smoke floats in good order?

Cargo ships shall carry not less than the following numbers of lifebuoys:

- *Under 100 metres in length – 8;*
- *between 100 metres and under 150 metres – 10;*
- *between 150 metres and under 200 metres – 12;*

- 200 metres and over – 14. (SOLAS III/32.1.1)

Lifebuoys shall be:

- *So distributed as to be readily available on both sides of the ship and as far as practicable on all open decks extending to the ship's side;*
- *At least one shall be placed in the vicinity of the stern; and*
- *So stowed as to be capable of being rapidly cast loose and not permanently secured in any way. (SOLAS III/7.1.1) At least one lifebuoy on each side of the ship shall be fitted with a buoyant line, equal in length to not less than twice the height at which it is stowed above the waterline in the lightest seagoing condition, or 30 metres, whichever is the greater. (SOLAS III/7.1.2) Not less than one half of the total number of lifebuoys shall be provided with self-igniting lights; Not less than two of these shall also be provided with lifebuoy self-activating smoke signals capable of quick release from the navigating bridge; Lifebuoys with lights and those with lights and smoke signals shall be distributed equally on both sides of the ship and shall not be the lifebuoys provided with lifelines. (SOLAS III/7.1.3) Lifebuoys intended to operate the quick-release arrangement provided for the self-activated smoke signals and self-igniting lights shall have a mass sufficient to operate the quick release arrangement. (LSA Code II/2.1.1.7)*

Verify date of rechargeable batteries and spare lithium batteries carried and date of expiry not exceeded. SARTS battery dates to be in date.

5.10.12 Are lifejackets in good order?

A lifejacket shall be provided for every person on board and, in addition, a sufficient number of lifejackets shall be carried for persons on watch and for use at remotely located survival craft stations. The lifejackets carried for persons on watch should be stowed on the bridge, in the engine control room and at any other manned watch station. (SOLAS III/7.2.1)

The lifejackets used in totally enclosed lifeboats, except free-fall lifeboats, shall not impede entry into the lifeboat or seating including operation of the seat belts in the lifeboat. (SOLAS III/7.2.3)

Lifejackets selected for free-fall lifeboats and the manner in which they are carried or worn, shall not interfere with entry into the lifeboat, occupant safety or operation of the lifeboat. (SOLAS III/7.2.4)

Make an Observation if more than one type of lifejacket is carried on board.

5.10.13 Are lifejacket donning instructions displayed?

Ensure instructions include all types of lifejackets carried on board.

5.10.14 If vessel is outfitted with immersion suits, are the immersion suits available for use and free of defects?

An immersion suit or an anti-exposure suit, of an appropriate size, shall be provided for every person assigned to crew the rescue boat. If the ship is constantly engaged in warm climates where, in the opinion of the Administration thermal protection is unnecessary, this protective clothing need not be carried (SOLAS III/7.3)

An immersion suit complying with the requirements of section 2.3 of the LSA Code shall be provided for every person on board the ship. These immersion suits need not be required if the ship is constantly engaged on voyages in warm climates where, in the opinion of the Administration, immersion suits are unnecessary. (SOLAS III/32.3.2)

If a ship has any watch or work stations which are located remotely from the place or places where immersion suits are normally stowed, additional immersion suits shall be provided at these locations for the number of persons normally on watch or working at those locations at any time. (SOLAS III/32.3.3)

Inspector should ensure periodical inspection of the immersion suits (MSC/Circ.1047) and the three year testing (MSC/Circ.1114)

5.10.15 Are pyrotechnics, including line throwing apparatus, in date and in good order?

Not less than 12 rocket parachute flares shall be carried and be stowed on or near the navigation bridge. (SOLAS III/6.3)

A line throwing appliance complying with the requirements of section 7.1 of the Code shall be provided. (SOLAS III/18)

An illustrated table describing the life-saving signals shall be readily available to the officer of the watch. (SOLAS V/29)

For non-SOLAS vessels less pyrotechnics may be carried by local regulations and should be stated as such in observations if less than the above guidance is carried.

5.10.16 Are the locations of life saving appliances marked with IMO or equivalent certifying authority symbols?

Containers, brackets, racks and other similar stowage locations for life-saving equipment shall be marked with symbols in accordance with IMO Res. A.760(18) (as amended by Resolution MSC.82(70)) indicating the devices stowed in that location for that purpose.

If more than one device is stowed in that location, the number of devices shall also be indicated. (SOLAS III/20.10)

5.10.17 Is the LSA plan seen to be up to date and represent the current arrangements on the Vessel/Unit?

5.10.18 If the vessel has been retrofitted with hybrid power solutions, such as energy storage systems (ESS), have relevant safety documentation been updated?

Example documentation includes SOLAS Fire training manual, Fire and Safety plans, Management of Change (MOC), etc

Fire-fighting

5.11.1 Are vessel/unit-specific fire training manuals available?

The training manual shall explain the following in detail:

- *general fire safety practice and precautions related to the dangers of smoking, electrical hazards, flammable liquids and similar common shipboard hazards;*
- *general instructions on fire-fighting activities and fire-fighting procedures, including procedures for notification of a fire and use of manually operated call points;*
- *meanings of the vessel/unit's alarms;*
- *operation and use of fire-fighting systems and appliances;*
- *operation and use of fire doors;*
- *operation and use of fire and smoke dampers; and*
- *escape systems and appliances. (SOLAS II-2/15.2.3.4)*

A training manual shall be provided in each crew mess room and recreation room, or in each crew cabin. (SOLAS II-2/15.2.3.1)

The training manual shall be written in the working language of the ship. (SOLAS II-2/15.2.3.2) This is considered best practice for non-SOLAS vessels.

5.11.2 Are vessel/unit-specific fire fighting equipment maintenance instructions available and are weekly and monthly inspections being carried out?

Maintenance, testing and inspections shall be carried out based on the guidelines in MSC.1/Circ.1432. The maintenance plan shall be kept on board the ship and shall be available for inspection. (SOLAS II-2/14.2.2.2)

The maintenance plan shall include at least the following fire protection systems and fire fighting systems and appliances, where installed:

- *fire mains, fire pumps and hydrants, hoses, nozzles and international shore connections;*
- *fixed fire detection and fire alarm systems;*
- *fixed fire extinguishing systems and other fire extinguishing appliances;*
- *automatic sprinkler, fire detection and fire alarm systems;*
- *ventilation systems, including fire and smoke dampers, fans and their controls;*
- *emergency shutdown of fuel supply;*
- *fire doors, including their controls;*
- *general emergency alarm systems;*
- *emergency escape breathing devices;*
- *portable fire extinguishers, including spare charges;*
- *fire fighter's-outfits;*
- *inert gas systems;*
- *deck foam systems;*
- *fire safety arrangements in cargo pump rooms; and*
- *flammable gas detectors. (SOLAS II-2/14.2.2.3) and 14.4)*

The maintenance programme may be computer-based. (SOLAS II-2/14.2.2.4)

5.11.3 Are records available to show that samples of foam compound have been tested at regular intervals?

Portable foam applicators (MSC.1/Circ.1432):

Portable containers or portable tanks containing foam concentrate, excluding protein based concentrate, less than 10 years old, that remain factory sealed can normally be accepted without the periodical foam control tests required in MSC.1/Circ.1312 being carried out.

Protein based foam concentrate portable containers and portable tanks should be thoroughly checked and, if more than five years old, the foam concentrate should be subjected to the periodical foam control test required in MSC.1/Circ.1312, or renewed; and the foam concentrates of any non-sealed portable containers and portable tanks, and portable containers and portable tanks where production data is not documented, should be subjected to the periodical foam control tests required in MSC.1/Circ.1312.

The first periodical control of medium expansion foam concentrates stored on board should be performed after a period of 3 years and, after that, every year. (MSC/Circ.798/5.1)

A record of the age of the foam concentrates and of subsequent controls should be kept on board. Ref. T4/4.01 MSC.1/Circ.1312 Revised 10 June 2009

5.11.4 Is a fire control plan exhibited within the accommodation, is a copy available externally and is equipment correctly marked on it?

Note: The requirements for fire plans are contained in SOLAS II-2/15.2.4. IMO Resolution A.654(16) recommends the symbols to be used on fire control plans.

5.11.5 Are fire mains, pumps, hoses and nozzles in good order and available for immediate use?

Check that isolating valves in fire and foam system lines are clearly marked and in good order. Check that fire hoses are pressure tested at least 5 yearly. (SOLAS II-2 The Maintenance and inspection of fire protection systems and appliances).

Inspector should test the starting and operation of main and emergency fire pumps including noting that adequate water pressure is available.

5.11.6 Is the International shore fire connection readily available externally and is the location clearly marked?

The connection shall be of steel or other suitable material. The connection shall be kept aboard the vessel/unit together with a gasket of any material suitable, with four 16 mm bolts, 50 mm in length and eight washers. (FSS Code 2.2)

If fixed on a vessel/unit, the connection should be accessible from both sides of the vessel/unit and its location should be clearly marked. The shore connection should be ready for use whenever a vessel/unit is in port.

5.11.7 Are fixed fire detection and alarm systems, if fitted, in good order and tested regularly?

Notes: There should be a procedure for whenever a zone of a fire detection system is isolated to ensure that relevant personnel are aware of the isolation and the reason for it and to ensure that the zone is reinstated as soon as possible.

The engine room should not be operated unmanned with any zone in the space isolated.

Spaces not covered by a fire detection system should be covered by regular fire patrols. Such patrols should not utilise the bridge lookout during the hours of darkness.

5.11.8 Are fixed fire extinguishing systems, where fitted, in good order and are clear operating instructions posted?

Check that relevant crew are familiar with operating procedures.

Inspectors shall check that the procedures as posted and written for operation are relevant to the systems and equipment and can be followed logically and any equipment requiring operation is marked legibly. Any spaces served by the system should be clearly marked with warning signage.

5.11.9 Is the emergency fire pump in full operational condition and are starting instructions clearly displayed?

Consistent with safety and without interfering with the Vessel's operations, request to witness the starting and operation of the emergency fire pump. If a priming system has been fitted to the emergency fire pump, it must be class approved.

Inspectors shall check that the procedures as posted and written for operation are relevant to the equipment and can be followed logically and any equipment requiring operation is marked legibly.

5.11.10 Are portable fire extinguishers in good order with operating instructions clearly marked?

Each extinguisher should be clearly marked with the following minimum information:

- *name of the manufacturer;*
- *type of fire for which the extinguisher is suitable;*
- *type and quantity of extinguishing medium;*
- *approval details;*
- *instructions for use and recharge (it is recommended that operating instructions be given in pictorial form);*
- *year of manufacture;*
- *temperature range over which the extinguisher will operate satisfactorily; and*
- *test pressure. (FSS Code 4 and IMO A.602(15) Revised Guidelines for Marine Portable Fire Extinguishers)*

One of the portable fire extinguishers intended for use in any space shall be stowed near the entrance to that space. (SOLAS 2004 II-2/10.3.2.2)

For vessels constructed after 1st July 2002, spare charges shall be provided for 100% of the first ten extinguishers and 50% of the remaining fire extinguishers capable of being recharged on board. Not more than sixty total spare charges are required. Instructions for recharging shall be carried on board. (SOLAS 2004 II-2/10.3.3.1)

For fire extinguishers which cannot be recharged on board, additional portable fire extinguishers of the same quantity, type, capacity and number shall be provided in lieu of spare charges. (SOLAS 2004 II-2/10.3.3.2)

For vessels constructed before 1st July 2002, spare charges shall be provided in accordance with requirements specified by the Administration. (SOLAS 1974 II-2/6.2)

Note: Portable fire extinguishers must be hydrostatically tested every 10 years or lesser period if so required by the Administration. The date of the hydrostatic test must be stamped on the cylinder. Certain administrations may have their own requirements for the carriage of portable extinguishers and spare charges. Where possible, decommissioning and disposal of fire extinguishers should be conducted by suitably qualified contractors (ref BMA Safety Flash 22-02).

5.11.11 Are firemen's outfits and breathing apparatus in good order, provided with fully charged cylinders and ready for immediate use?

A number of spare charges, suitable for use with the apparatus provided, shall be available on board to the satisfaction of the Administration. (SOLAS 74 II-2/17.1.2.2)

Two spare charges shall be provided for each required breathing apparatus.....cargo ships that are equipped with suitably located means for fully recharging the air cylinders free from contamination need carry only one spare charge for each required apparatus. (SOLAS 2004 II-2/10.2.5)

For vessels constructed before 1st July 2002, the breathing apparatus may be either a smoke helmet type, or a self-contained compressed air type. A number of spare charges suitable for use with the apparatus provided shall be available on board to the satisfaction of the Administration. (SOLAS 1974 II-2/17.1.2)

The outfits shall be kept ready for use in an easily accessible location that is permanently and clearly marked and, they shall be stored in widely separated positions. (SOLAS 1974 II-2/17.4 and SOLAS 2004 II-2/10.3.1)

Notes: Although SOLAS recommends 'widely separated positions', fire-fighting training advocates that breathing apparatus should be used by personnel in pairs.

Self-contained breathing apparatus should be checked for condition and satisfactory operation. With the apparatus charged and the cylinder valve closed, the drop in pressure should not be more than 10 bars in one minute. (Manufacturer's instructions) Annual inspections should be carried out to ensure that the air quality of breathing apparatus air recharging systems is satisfactory. (IMO MSC.1/Circ.1432)

Breathing apparatus shall be a self-contained compressed air-operated breathing apparatus for which the volume of air contained in the cylinders shall be at least 1,200 l, or other self-contained breathing apparatus which shall be capable of functioning for at least 30 min. All air cylinders for breathing apparatus shall be interchangeable. (FSS Code 3.2.1.2)

Notes: Air cylinders should be charged to not less than 10% below full. BA air cylinders should be hydrostatically tested every 5 years or lesser period if so recommended by the manufacturer. (4-Year testing intervals are customary for some composite wound cylinders.) The hydrostatic test date must be stamped on the cylinder.

For ships constructed on or after 1 July 2014, a minimum of two two-way portable radiotelephone apparatus for each fire party for fire-fighter's communication shall be carried on board. Those two-way portable radiotelephone apparatuses shall be of an explosion-proof type or intrinsically safe. Ships constructed before 1 July 2014 shall comply with the requirements of this paragraph not later than the first survey after 1 July 2018. (SOLAS II-2/10.4).

Compressed air breathing apparatus shall be fitted with an audible alarm and a visual or other device which will alert the user before the volume of the air in the cylinder has been reduced to no less than 200 L. New ships constructed (keel-laid) on or after 1 July 2014 and existing ships (ships constructed before 1 July 2014) shall comply with the requirements by 1 July 2019. (FSS Code 3/2.1.2.2)

5.11.12 If fitted, are emergency escape breathing devices in good order and ready for immediate use?

All ships shall carry at least two emergency escape breathing devices within accommodation spaces. (SOLAS II-2/13.3.4.2)

On all ships, within the machinery spaces, emergency escape breathing devices shall be situated ready for use at easily visible places, which can be reached quickly and easily at any time in event of fire. The location of EEBD's shall take into account the layout of the machinery space and the number of persons normally working in the spaces. (SOLAS II-2/13.4.3.1)

Spare emergency escape breathing devices shall be kept on board. (SOLAS II-2/13.3.4.1)

Training in the use of the EEBD should be considered a part of basic safety training. (MSC/Circ.849)

Note: The requirements for EEBD's are contained in Chapter 3/2.2 of the FSS Code and MSC/Circ.849 and among other measures or definitions, stipulate:

- *an EEBD is a supplied air or oxygen device only used for escape from a compartment that has a hazardous atmosphere and shall be of an approved type.*
- *EEBDs shall not be used for fighting fires, entering oxygen deficient voids or tanks, or worn by fire-fighters. In these events, a self-contained breathing apparatus, which is specifically suited for such applications, shall be used.*
- *the EEBD shall have a service duration of at least 10 min. The EEBD shall include a hood or full face piece, as appropriate, to protect the eyes, nose and mouth during escape.*
- *hoods and face pieces shall be constructed of flame-resistant materials and include a clear window for viewing.*
- *an inactivated EEBD shall be capable of being carried hands-free.*
- *an EEBD, when stored, shall be suitably protected from the environment.*
- *brief instructions or diagrams clearly illustrating their use shall be clearly printed on the EEBD. The donning procedures shall be quick and easy to allow for situations where there is little time to seek safety from a hazardous atmosphere.*
- *maintenance requirements, manufacturer's trademark and serial number, shelf life with accompanying manufacture date and name of the approving authority shall be printed on each EEBD.*
- *all EEBD training units shall be clearly marked.*

5.11.13 Are accommodation and ventilation fan emergency stops in good order and clearly marked to indicate the spaces they serve?

Inspector should detail frequency of inspection and date of last test.

5.11.14 Are fire flaps in good order and clearly marked to indicate the spaces they serve?

Inspector should detail frequency of inspection and date of last test.

5.11.15 If vessel has FiFi notation, is the associated equipment in good order?

State notation class.

Check the condition of monitors, pumps, water spray, foam concentrate, etc

Inspector should ensure that the use of FiFi equipment does not render other equipment unusable i.e. tunnel thrusters not available?

On vessels with a FiFi II crew should be aware of potential risks of incorrect use of fire fighting equipment due to high pressure of monitors.

5.11.16 Are Fire Doors Operational and part of a planned maintenance and inspection regime?

Ensure Fire doors have not been prevented from opening or closing, are in good working order and included within any planned preventative maintenance and inspection regimes.

Ensure Personnel are aware of the Safety Criticality of fire doors and their closing mechanisms.

Access

5.12.1 Is a safe means of access provided, including, where appropriate, the provision of a gangway, accommodation ladder, pilot ladder, safety net, lifebuoy and line?

Safety nets should be provided wherever there is a possibility of a person falling over or through the side rails of the gangway and should be rigged to prevent anyone falling between the vessel/unit and the quay. Where the rails provide protection, a safety net might not be necessary.

*Regardless of whether the gangway is supplied by vessel or shore, it is the vessel/unit's responsibility to ensure that a safety net is rigged. **If the means of access are considered to be unsafe, then the inspector must not put him/herself at risk by going on board.***

A lifebuoy with a self activating light and also a separate buoyant safety line attached to a quoit or some similar device must be provided ready for use at the point of access aboard the ship.

5.12.2 Where the vessel/unit is not fitted with a helideck, and Chapter 14 is not applicable, does the vessel/unit have a set of procedures/guidance for helicopter winching operations in the event that they may need to be enacted?

There should be a plan in place for possible medivac or other abnormal operation involving helicopter transfer of goods or personnel by winch. Factors addressed should include location on deck for winch drop, personnel involved, communications protocol and recommended equipment ref. ICS Guide to Helicopter/Ship Operations.

Additional Comments

5.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Pollution prevention and environmental management

Pollution prevention

6.1.1 Is the Engine Room (Part I) Oil Record Book (ORB) and, if applicable, Part 2, correctly completed?

The IOPP Form A (2.2) indicates whether a vessel is fitted with a 15 ppm oily water separator and 15 ppm oil content meter fitted with an alarm and automatic stopping device. Discharge of bilges or transfer from a bilge holding tank to overboard through this equipment should be recorded in section D of the ORB. Section E should be used ONLY in cases where automatic starting systems that are activated by float switches in bilge wells or bilge holding tanks.

ORB entries should be signed (not initialled) and each completed page should be signed by the Master.

If the oily water separator is not fitted with an operational automatic stopping device, do entries in the Oil Record Book Part I indicate that it has not been used in a Special Area?

The Record Books may form part of an existing logbook or electronic record book.

Where the vessel is using an electronic record book for recording the entries required in the Record Books, instructions for the use of the electronic record book should be provided, including automatic backing up of data to offline storage and an appropriate method of data recovery if the system were to fail or not be available from the ship's network. The use of the electronic record book should be authorised by a Declaration from flag/class.

6.1.2 Are controls in place to manage ozone depleting substances in compliance with MARPOL or local requirements?

The vessel operator should have developed procedures for maintaining the Ozone-depleting Substances Record Book, either in paper or electronic format, in accordance with MARPOL Annex VI and any Flag Administration guidance.

The procedures should include:

- *The operations and emissions required to be entered in the Ozone-depleting Substances Record Book, i.e.:*
 - o *recharge, full or partial, of equipment containing ozone-depleting substances.*
 - o *repair or maintenance of equipment containing ozone-depleting substances.*
 - o *discharge of ozone-depleting substances to the atmosphere, both deliberate and nondeliberate.*
 - o *discharge of ozone-depleting substances to land-based reception facilities.*
 - o *supply of ozone-depleting substances to the ship.*
- *Who is required to enter the details of an operation or emission into the Ozone-depleting Substances Record Book.*
- *When entries are required to be made in the Ozone-depleting Substances Record Book.*
- *When the Master is required to verify the accuracy of the Ozone-depleting Substances Record Book entries and sign each page.*
- *The procedure for correcting entries made in error.*
- *The procedure for entering operations or emissions which had been overlooked and not entered in the Ozone-depleting Substances Record Book in the correct chronological order.*
- *Instructions for retention of completed Ozone-depleting Substances Record Books.*

Where the vessel is using an electronic record book for recording the entries required in the Ozone depleting Substances Record Book, instructions for the use of the electronic record book should be provided, including automatic backing up of data to offline storage and an appropriate method of data recovery if the system were to fail or not be available from the ship's network. The use of the electronic record book should be authorised by a Declaration from flag/class.

The Ozone-depleting Substances Record Book may form part of an existing logbook or electronic record book.

A list of equipment on board containing ozone-depleting substances is included in the "Supplement to the International Air Pollution Prevention Certificate (IAPP Certificate), section 2.1." Check IOPP certificate for details regarding gases onboard.

6.1.3 Are controls in place to manage fluorinated refrigerant gases in compliance with local requirements?

Controls should include;

- *Systems containing fluorinated refrigerant gases are included in the Planned Maintenance System, including recording and investigating leaks (relevant to the size of the system).*

- Records available for fluorinated gases held onboard.
- Records maintained up to date.
- Relevant crew trained in the management of fluorinated refrigerant gases. In-house training is accepted, although accredited training is preferable.

6.1.4 Do the sludge and bilge tanks designated in Form A or Form B of the IOPP Certificate and those listed in the Oil Record Book Part I, agree?

Notes: Details of bilge and sludge tanks can be obtained from Form A of the IOPP Certificate, although the recording of bilge tanks (section 3.3) is not a MARPOL requirement and is therefore voluntary. Notwithstanding the foregoing, if an engine room bilge tank is used for the purposes of holding engine room residues, this tank and details of its contents must be recorded in the Oil Record Book Part I.

In Part I, Section C should be used for the disposal of sludge and other oil residues such as drainage, leakage, exhausted oil etc. and this section should be completed weekly. Section D (Non-Automatic Discharge) should be compiled for the disposal of bilge water as and when it occurs.

Masters should obtain from the operator of the reception facilities, which includes barges and tank trucks, a receipt or certificate detailing the quantity of tank washings, residues or oily mixtures transferred, together with the time and date of the transfer. This receipt or certificate, if attached to the Oil Record Book Part I, may aid the Master of the ship in proving that his ship was not involved in an alleged pollution incident. The receipt or certificate should be kept together with the Oil Record Book Part I.

6.1.5 Are thruster seals free of hydraulic leaks?

Inspector should observe water around vessel for any signs of leakage.

6.1.6 Are containment arrangements fitted around hydraulic machinery permanent, in case of leaks, and well maintained?

Check equipment logs and maintenance records.

Inspectors shall validate that containment arrangements are routinely checked and drained to an oily water separator. Where temporary equipment is used, is a temporary containment system established and monitored as part of routine work systems?

Where the vessel is using an electronic record book for recording the entries required in the Record Books, instructions for the use of the electronic record book should be provided, including automatic backing up of data to offline storage and an appropriate method of data recovery if the system were to fail or not be available from the ship's network. The use of the electronic record book should be authorised by a Declaration from flag/class.

6.1.7 Does the vessel have a system to manage hydraulic hoses within planned maintenance system?

Inspector to check hose replacement strategy/interval.

6.1.8 Is there evidence that the oily water separator control system and engine room bilge oily water separator/filtering system is maintained in good working order and is taper proof?

Check equipment logs and maintenance records.

Inspectors shall validate if the operation and testing of the OWS is included in the PMS and record if it not included in the PMS.

Check records of training and familiarisation conducted on board to operate the specific oil filtration equipment.

Are cleaning and other chemicals used in areas that drain to the oily water separator control system and engine room bilge oily water separator/filtering system compatible with the separation system (refer original equipment manufacturer or PMS guidance)?

Where the vessel is using an electronic record book for recording the entries required in the Record Books, instructions for the use of the electronic record book should be provided, including automatic backing up of data to offline storage and an appropriate method of data recovery if the system were to fail or not be available from the ship's network. The use of the electronic record book should be authorised by a Declaration from flag/class.

6.1.9 Are emergency bilge pumping arrangements ready for immediate use; is the emergency bilge suction clearly identified and, where fitted, is the emergency overboard discharge valve provided with a notice warning against accidental opening?

6.1.10 Are there any bilge spaces pumped directly overboard and are appropriate arrangements in place to monitor and prevent "contaminants" being discharged overboard?

Inspector to verify appropriate controls are in place to monitor and prevent any 'contaminants' from being discharged overboard.

6.1.11 Is an approved MARPOL Ship Energy Efficiency Management Plan (SEEMP) provided?

Were the Master and senior officers familiar with the contents and requirements of the Ship Energy Efficiency Management Plan (SEEMP) and had these been fully implemented?

Is ship fuel oil consumption data collected on an annual basis and reported as required?

6.1.12 Were the documents and records required by MARPOL Annex VI Regulation 13 for the control of NOx and associated emissions in good order?

The details of each marine diesel engine installed on board to which MARPOL Annex VI regulation 13 applies can be found in paragraph 2.2.1 of the Record of Construction and Equipment, which is a supplement attached to the vessel's International Air Pollution Prevention (IAPP) Certificate.

The level of NOx emissions for each engine is described by Tier designation. Tier I and Tier II status are usually achieved via engine design. Tier III status is achieved by the use of additional equipment, such as Selective Catalytic Reduction (SCR) or Exhaust Gas Recirculation (EGR) systems. Such equipment is not run continuously and must be operating to achieve Tier III status. Thus, engines may be run at Tier II or Tier III depending upon local requirements. Engines must be operating in Tier III mode in a NOx Emission Control Area that applies to the vessel. MARPOL Annex VI and the NOx Technical Code require Technical Files for each of these diesel engines to be maintained on board.

Shipboard oil and marine pollution emergency plans

6.2.1 Is an approved MARPOL Shipboard Oil Pollution Emergency Plan (SOPEP) or Shipboard Marine Pollution Emergency Plan (SMPEP) provided?

An SMPEP is not mandated by any legislation and is a best practice among vessels that do not have to comply with the below MARPOL regulation. Every oil tanker of 150 GT and above and every ship other than an oil tanker of 400 GT and above shall carry on board a shipboard oil pollution emergency plan approved by the Administration. (MARPOL Annex I/37).

The plan shall be written in the working language of the Master and officers and shall at least consist of:

- (a) the procedure to be followed by the Master or other persons having charge of the ship to report an oil pollution incident;*
- (b) the list of authorities or persons to be contacted in the event of an oil pollution incident;*
- (c) a detailed description of the action to be taken immediately by persons on board to reduce or control the discharge of oil following the incident; and*
- (d) the procedures and point of contact on the ship for co-ordinating shipboard action with national and local authorities in combating the pollution. (MARPOL Annex I/37.2)*

Every ship of 150 GT and above certified to carry noxious liquid substances in bulk shall carry on board a shipboard marine pollution emergency plan for noxious liquid substances approved by the Administration. (MARPOL Annex II/17)

The plan shall be written in a working language or languages understood by the Master and officers and shall at least consist of:

- (a) the procedure to be followed by the Master or other persons having charge of the ship to report a noxious liquid substances pollution incident;*
- (b) the list of authorities or persons to be contacted in the event of a noxious liquid substance pollution incident;*
- (c) a detailed description of the action to be taken immediately by persons on board to reduce or control the discharge of noxious liquid substances following the incident; and*
- (d) the procedures and point of contact on the ship for co-ordinating shipboard action with national and local authorities in combating the pollution. (MARPOL Annex II/17.2)*

In the case of ships to which regulation 17 of Annex II of the present Convention also applies, such a plan may be combined with the shipboard marine pollution emergency plan for noxious liquid substances required under regulation 17 of Annex II of the present Convention. In this case, the title of such a plan shall be "Shipboard marine pollution emergency plan". (MARPOL Annex I/37.3 and Annex II/17)

Note: The plan is subject to re-approval after a change of management.

6.2.2 Is there evidence that contents of the SOPEP/SMPEP Manual have been reviewed on regular basis?

6.2.3 Is there evidence that regular SOPEP/SMPEP drills being carried out?

Drill matrix and drill minutes shall be witnessed for compliance. Corrective actions arising from drills are addressed and closed.

Are personnel familiar with the location and use of the oil/chemical spill clean up material and PPE provided, including the specific PPE required for the cargo(es) on board?

Bulk liquid transfers

6.3.1 Are spill containment arrangements provided in way of bulk transfer manifolds and savealls fitted around relevant tank vents?

If not permanent, comment on temporary arrangements provided.

6.3.2 Are manifold spill containers, if provided, empty and are the drainage arrangements satisfactory?

6.3.3 Are means readily available for dealing with small oil or chemical spills?

SOPEP kits should be located near identified spill hazards. Inspector to check there is a process for checking and re-stocking kits.

Ballast water management

6.4.1 Does the vessel/unit have an approved ballast water and sediments management plan?

The International Convention for the Control and Management of Ships' Ballast Water and Sediments to help prevent the spread of harmful aquatic organisms carried by ships' ballast water and will require all ships to implement a ballast water and sediments management plan.

Is the Ballast Water Management Plan written in the working language of the ship?

AND if the working language of the ship is not English, French or Spanish, is a translation into one of these languages provided?

Were the Master, deck officers and engineer officers familiar with the vessel's Ballast Water Management Plan and were records available to demonstrate that ballast handling had been conducted in accordance with the plan?

6.4.2 Does the vessel / unit have a ballast water management treatment system and are records being maintained of all ballast water exchanges?

If vessel engaged in Cabotage trade only this can be NA. If vessel is trading or moves across international regions then there should be some record available.

Check equipment logs and maintenance records.

Inspectors shall validate if the operation and testing of the ballast water management treatment system, where fitted, is included in the PMS and record if it not included in the PMS.

Ballast water record book is witnessed and details filling and discharge of each tank, according to time, date, location and the treatment applied to the water.

Where the vessel is using an electronic record book for recording the entries required in the Record Books, instructions for the use of the electronic record book should be provided, including automatic backing up of data to offline storage and an appropriate method of data recovery if the system were to fail or not be available from the ship's network. The use of the electronic record book should be authorised by a Declaration from flag/class.

6.4.3 Is Ballast Water Treatment System included in planned maintenance system and are crew familiar with operation of the system?

Inspector should check maintenance record for BWTS.

Waste management

6.5.1 Does the vessel/unit have a garbage management plan and has garbage been handled and disposed of in accordance with MARPOL?

As of Jan 2013 MARPOL has been updated. Every ship of 100 gross tonnage and above, and every ship which is certified to carry 15 persons or more, shall carry a garbage management plan which the crew shall follow. (MARPOL Annex V/9.2)

Every ship shall display placards which notify the crew of the disposal requirements of garbage. (MARPOL Annex V/9.1.a)

The placards shall be written in the working language of the ship's personnel and, for ships engaged in voyages to ports or offshore terminals under the jurisdiction of other Parties to the Convention, shall also be in English, French or Spanish. (MARPOL Annex V/9.1.b)

When garbage is mixed with other discharges having different disposal or discharge requirements the more stringent requirements shall apply. (MARPOL Annex V/5.3)

Waste receptacles should be constructed of non-combustible materials with no openings in the sides or bottom. (SOLAS 2004 II-2/4.4.2)

The disposal into the sea of all plastics, including but not limited to synthetic ropes, synthetic fishing nets, plastic garbage bags and incinerator ashes from plastic products which may contain toxic or heavy metal residues, is prohibited; (MARPOL Annex V/3.1(a))

The storage locations for garbage should be carefully selected to ensure that the garbage presents no potential hazard to adjacent spaces. Particular consideration should be given to the storage of garbage that is designated as 'special waste', such as batteries, sensors and fluorescent tubes, to ensure that only compatible materials are stowed together.

6.5.2 Has the Garbage Record Book been correctly completed?

Vessels less than 100 GT that do not have to comply with MARPOL there should be a record entered in the vessel log book if the vessel does not use a Garbage record book.

The Garbage Record Book, whether as a part of the ships official log-book or otherwise, shall be in the form specified in the appendix to this Annex; (MARPOL Annex V/9/3)

(a) each discharge operation, or completed incineration, shall be recorded in the Garbage Record Book and signed for on the date of the incineration or discharge by the officer in charge. Each completed page of the Garbage Record Book shall be signed by the Master of the ship. The entries in the Garbage Record Book shall be at least in English, French or Spanish. Where the entries are also made in an official language of the State whose flag the ship is entitled to fly, these entries shall prevail in case of a dispute or discrepancy;

(b) the entry for each incineration or discharge shall include date and time, position of the ship, description of the garbage and the estimated amount incinerated or discharged;

(c) the Garbage Record Book shall be kept on board the ship and in such a place as to be available for inspection in a reasonable time. This document shall be preserved for a period of two years after the last entry is made on the record; (MARPOL Annex V 9/3)

If applicable, equipment on board is available to provide that food waste is comminute or ground to particle size < 25mm prior to discharge in accordance with MARPOL Annex V.

Inspector to verify records confirm hazardous wastes are to be stored in designated waste storage areas with secondary containment in place for liquid waste. Note: receipts for garbage landed ashore should be retained and filed on board.

Note: electronic log may be acceptable by Flag State

6.5.3 Are controls in place to ensure that sewage treatment plant discharges comply with MARPOL or local requirements?

The inspector should check what performance /function test are required by the PM system or OEM manuals and document any variance from the procedures. If there are no procedures and there is no evidence of testing this shall be recorded as a No.

Where appropriate, controls should be in place to prevent the unauthorised discharge of sewage. Such measures shall ensure that all discharges comply with the requirements of MARPOL Annex IV and local requirements as applicable. Evidence may include, but not be limited to, procedures within SMS or vessel operating manual, Chief Engineer Standing Orders, crew training and appropriate signage/physical barriers. Alternatively, holding tank arrangements should be provided to facilitate disposal ashore. Reference: MARPOL Annex IV, Chapters 1 and 3.

Additional Comments

6.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Structural condition

General

7.1.1 Is the hull, weather decks and superstructure free from visible structural defects that warrant further investigation?

Inspection should include checking for any evidence of wastage, leakage, corrosion, structural problems including collision/jetty contact damage or distortion from heavy weather. Crew should be aware of permitted deck loading capacity.

7.1.2 Where deck sheathing exists, check the condition and make an observation if there is a potential risk to personnel and operation?

7.1.3 Are internal spaces free from visible structural defects that warrant further investigation?

Request to sight UTI reports where applicable and any owners hull condition survey report or asset integrity reports.

Is there evidence of a ballast tank and enclosed space entry programme that is in use and up to date.

Inspectors shall request sight of NDT records of tanks and class reports to validate that steel internal stiffener and hull plating thickness and anode condition is being periodically monitored to meet class requirements. Where evidence of steel wastage requiring additional monitoring or repairs is evident the inspector shall record this.

7.1.4 If there has been any significant structural damage to the vessel/unit, have repairs been undertaken to the satisfaction of an attending Class surveyor?

Inspection of the hull should include checking for any evidence of structural problems including collision/jetty contact damage or distortion from heavy weather. State which side of vessel inspected.

7.1.5 If the vessel has any through-hull penetrations (eg, HiPAP, Moonpools, etc), are they in good order and subject to Class approval?

Check that the planned maintenance system covers the checking and maintenance of valves and top plate assembly. If the vessel is not subject to class inspections ensure that the local Flag State have similarly approved any through hull penetrations and they are subject to regular inspection.

Stability

7.2.1 Is there a designated person responsible for cargo and/or ballast operations?

7.2.2 Are stability records maintained on board in line with the operators procedures?

Where appropriate, records should be maintained to verify stability calculations at all stages of the voyage. Such stages could include Port departure, Port arrival and discharge / backload of significant amounts of cargo.

Does the operator have a policy detailing the frequency of stability calculations?

Are calculations being conducted and documented in accordance with this policy. In all cases where deck cargo is carried, a realistic weight and location (including height and COG of cargo) should be given in the stability calculation and, where pipes are carried on deck, consideration should be given to water entrapment within tubular cargo. For the purposes of the stability calculation, a quantity of trapped water (equal to a certain percentage of the net volume) should be assumed in and around the pipes.

Reference

- IMO 2008 Intact Stability Code
- IMO Resolution A.469 (XII) Guidelines for the Design and Construction of Offshore Supply Vessels
- IMO Resolution A.749 (18) Code on Intact Stability for All Types of Ships Covered by IMO Instruments"

7.2.3 Is an approved stability book available onboard?

Some administrations may permit this information to be provided in the form of a simplified stability letter. Scenarios should cover likely credible events, including collision and hull breach. SOLAS Consolidation Edition (2020) Part B-1, Stability, Regulations 5&6, Pages 59-61, Damage stability is required for cargo ships of >80m and all passenger ships.

Inspector should check that damaged stability is in place when applicable.

7.2.4 Is a class/flag approved loading stability computer/software package in use?

If a class/flag approved loading stability computer/software package is not available, record in other comments, how stress and stability calculations are performed.

7.2.5 Are there records indicating that the operational accuracy of the stability computer/software package is tested regularly?

Class approved data should be used and the tests should be carried out at the annual survey. Regular on-board testing should also take place and records attesting to this should be maintained.

7.2.6 Are responsible personnel (for ballast control and stability operations) aware of the limitations, if any, as noted in stability booklet?

Depending on vessel/unit type, free surface effects may differ widely. Check for any limitations in number of slack tanks noted in stability booklet.

7.2.7 Is there a system of verifying accuracy of tank gauging systems and level alarms?

Check records in PMS. For vessels with dual gauge system, check that records indicate that both systems are checked/compared.

7.2.8 Do documented procedures require checking of differences between actual and calculated displacements and are records maintained?

Weight discrepancies (missing weights) should be assumed to be located at the main deck level or above. Inspector should check record of draft surveys and record of 'unknown weight'.

Inspectors shall record the difference in displacement between the loading computer and that provided by reading the actual drafts.

Structural modifications

7.3.1 Has the vessel/unit's Classification society or certifying authority been involved in assessing/approving any structural modifications to the vessel/unit?

Class records should be examined to confirm that Class has been involved whenever significant modifications have occurred.

7.3.2 Is there evidence that the vessel/unit's stability information has been updated when structural or mission specific equipment modifications have taken place?

Inspector should verify if stability changes have been approved by Class. Minor changes to light weight condition may not require new stability calculation however this should be confirmed by class.

7.3.3 If applicable, are the vessel/unit's Master and Officers fully aware of the changes to stability information as a result of the structural or plant modifications?

Are changes tracked in Lightship data log?

Additions of structure and weight since the last inclining experiment or update to the stability book/programme shall be tracked in a light ship changes log maintained by the supervisor responsible for stability calculations.

Inspectors should seek sight of the light ship changes register and confirm that items are tracked by location with weights VCG and LCG entered, and it is up to date. Supervisory personnel should demonstrate a clear understanding on the effect of structural additions on Variable Deck Load/Displacement.

7.3.4 If structural modifications have been undertaken, do they agree with the details recorded on the OVPQ?

Inspector should verify that the OVPQ has accurately recorded any modifications that have been made to the vessel/unit.

Additional Comments

7.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Operations

Survey

8.1.1 Are there documented procedures and general safety arrangements in place for activities on the exposed working decks?

Including requirements for PPE, lifejackets, lifebuoys.

Check safety signage and availability of fall arrestor equipment for more than one person to use in open slip-ways. CCTV monitoring of working areas and slip-ways from bridge and/or instrument room.

8.1.2 Are arrangements in place for securing survey equipment on the working deck?

All loose equipment should be appropriately secured and system in place to periodically check sea fastenings. Where appropriate, vessels should have completed;

- *Evaluation of strength and load distribution on deck with respect to Survey system and auxiliary equipment*
- *Evaluation of sea fastening arrangement for the Survey system with respect to dynamic loading from vessel movement*

8.1.3 Are risk assessments carried out for all survey operations?

Check that assessments include equipment deployment and recovery operations.

8.1.4 Does the vessel/unit's Permit to Work/Lockout-Tagout documented procedure cover all survey equipment?

e.g. lockout/tag-out procedures for HP system; procedures for protecting crew from electrocution from active or powered gun arrays under repair; lockout/tag-out system for gun array power (as necessary).

8.1.5 Are communications, including backup systems, suitable for operations on the working deck?

Check communication equipment (intercoms, telephones and UHV/VHF hand-held radios) including backup arrangements for:

- *Communications between the working deck and the surveyors in the instrument room*
- *Communication between the bridge and surveyors*

8.1.6 Is fire detection/fire fighting equipment provided for seismic equipment and is it in good working order?

Foam smothering, for oil-filled seismic streamers, including smoke/heat detectors in high-risk areas.

8.1.7 Are there specific documented procedures and equipment that address streamer oil spills?

Procedures and equipment (drainage to tank) for leakage of streamer oil from seismic streamer reels: availability of oil-spill kit. Procedures for handling spillages of streamer oil and hydraulic oil.

8.1.8 Are documented procedures in place addressing the safety of High Pressure operations?

Comment on the adequacy and suitability of the following:

- *high pressure (HP) air warning lights and audible alarms; and warning signage at all entrances to gun deck*
- *lockout/tag-out procedures for HP system*
- *procedures for protecting crew from electrocution from active or powered gun arrays under repair*
- *lockout/tag-out system for gun array power (as necessary)*
- *screen or cage should be around HP manifold in gun control cabinet*
- *eye wash stations on gun deck*
- *eye and ear protection to be worn when deploying and recovering air guns*
- *procedures to prevent the use of air guns when vessel is in the vicinity of divers*
- *'Soft start' procedures to mitigate possible harm to marine mammals*

8.1.9 Are effective documented procedures in place to address streamer handling?

Confirm that checks are made on in-sea and onboard survey equipment before deployment and recovery

- *are checklists in use and regularly reviewed?*

Procedures for recovery and deployment of all in-sea survey equipment, to include:

- *towing arrangements and securing points*

- checks on weather, water depth, possible obstructions and traffic
- checks of communications between deck, instrument room and bridge
- clear guidance on what work is permissible on the working deck during poor weather/sea conditions. Procedures to include protecting crew from electrocution from active electronic streamers
- power removed from streamer before opening sections on deck.

8.1.10 Are effective emergency procedures in place that address streamer handling activities?

Procedures for streamer handling in the following circumstances:

- black-out
- engine failure
- steering failure
- collapse of diverter equipment (as appropriate for multi-streamer vessels)
- tangled streamers (as appropriate for multi-streamer vessels)

Means of severing cable at point of deployment (appropriate to seabed or ocean bottom seismic survey vessels only)

Emergency stop buttons for streamer winches and hydraulic equipment.

8.1.11 Is the vessel equipped with emergency stop buttons for streamer winches and hydraulic equipment, are they in good order and regularly tested?

Note frequency and records of tests.

8.1.12 Are documented procedures in place for the use of small boats that include working from them, personnel transfer and the launch and recovery?

Procedures for transfer of personnel at sea, including:

- transfer only to occur if all parties agree
- transfer to comply with locally enforced regulations
- transfer only to occur if personnel being transferred are willing to be so

Procedures for launch, recovery and all normal operations of the small boat, including:

- test of radio communications before launch and recovery
- pre-launch 'toolbox' meeting
- use of appropriate launching and recovery arrangements.

Procedures should include typical workboat operations such as changing streamer sections, cleaning streamers and working on tail buoys.

8.1.13 Is the equipment listed in the guidance available for use during small boat operations?

- dry suits, dedicated lifejackets and helmets
- maintenance equipment for boat and engine
- emergency equipment appropriate to climate and location

8.1.14 Is survey gear lifting equipment in good order, certified and regularly inspected?

Check inspection records.

8.1.15 Are there documented procedures covering the storage, handling and disposal of lithium batteries?

Procedures including:

- availability of suitable fire extinguishing equipment
- batteries stored correctly in designated areas for a defined limited period
- procedures established for handling lithium batteries
- personnel trained in handling lithium batteries and aware of special dangers thereof.

8.1.16 Are suitable safety arrangements in place on working deck to protect personnel against moving and/or high voltage machinery?

8.1.17 Are there suitable guards in place across stern?

8.1.18 Is the survey control system integrated/connected with vessel/unit's bridge?

Do navigators/DPOs have displays showing operational status in relation to vessel/unit's position, and do survey personnel have full information on vessel/unit's track, position and propulsion status?

8.1.19 Does the vessel/unit have a Crew competence/training matrix that addresses Survey operations?

Spot check training, experience and certification records carried by personnel/crew

8.1.20 Does the vessel/unit have a competence matrix that addresses maintenance activities associated with the Survey equipment?

Spot check training, experience and certification records carried by personnel/crew

8.1.21 Are the instrument rooms / laboratories suitably designed, protected and in good order?

There should be two, properly marked emergency exits. Spaces should be covered with appropriate fire detection and extinguishing capability. Where appropriate, the emergency power cut off switch should be clearly marked and protected from inadvertent use.

8.1.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Geotechnical survey**8.2.1 Are there documented procedures and general safety arrangements in place for activities on the exposed working decks?**

Geotechnical Procedures

The conduct of certain geotechnical operations, including core sampling, may involve the manual handling of samples from the main deck to laboratory or testing areas. Appropriate procedures and controls should be in place to ensure that such operations are appropriately managed and handling areas are well lit, free from obstructions, clearly marked and minimise handling where possible.

If applicable, procedures should be in place to deliver lifting and handling training is in place and lifting/handling aids are provided.

8.2.2 Are arrangements in place for securing survey equipment on the working deck?

All loose equipment should be appropriately secured and system in place to periodically check sea fastenings. Where appropriate, vessels should have completed;

- *Evaluation of strength and load distribution on deck with respect to Geotechnical system and auxiliary equipment*
- *Evaluation of sea fastening arrangement for the Geotechnical system with respect to dynamic loading from vessel movement*

8.2.3 Are risk assessments carried out for all survey operations?

Risk Assessments should include procedures for the emergency recovery of seabed equipment, black-out, positioning failure.

Procedure should also address the severing cables and hoses associated with seabed equipment. Includes use of emergency stops for overside equipment, hydraulic equipment and winches.

Procedures should include location-specific requirements for instrument and compressor rooms, e.g. two exits, emergency stops, limitations on flammable materials.

8.2.4 Does the vessel/unit's Permit to Work/Lockout-Tagout documented procedure cover all survey equipment?

e.g. lockout/tag-out procedures for HP system; procedures for protecting crew from electrocution from active or powered gun arrays under repair; lockout/tag-out system for gun array power (as necessary).

8.2.5 Are communications, including backup systems, suitable for operations on the working deck?

Check communication equipment (intercoms, telephones and UHF/VHF hand-held radios) including backup arrangements for:

- *Communications between the working deck and the surveyors in the instrument room*
- *Communication between the bridge and surveyors*

8.2.6 Are documented procedures in place for the use of small boats that include working from them, personnel transfer and the launch and recovery?

Procedures for transfer of personnel at sea, including:

- *transfer only to occur if all parties agree*
- *transfer to comply with locally enforced regulations*
- *transfer only to occur if personnel being transferred are willing to be so*

Procedures for launch, recovery and all normal operations of the small boat, including:

- *test of radio communications before launch and recovery*
- *pre-launch 'toolbox' meeting*
- *use of appropriate launching and recovery arrangements*

Equipment to be available:

- *dry suits, dedicated lifejackets and helmets*
- *maintenance equipment for boat and engine*
- *emergency equipment appropriate to climate and location*

8.2.7 Is there a written documented procedure for transducer deployment and recovery?

Procedures available for raising and lowering of poles and the operation covered by a permit to work?

8.2.8 Is survey gear lifting equipment in good order, certified and regularly inspected?

Check inspection records.

8.2.9 Are there documented procedures for the launching and recovery of survey equipment, including use of checklists?

Checks made on in-sea and onboard survey equipment before deployment and recovery:

- *Are checklists in use and regularly reviewed?*

Procedures for recovery and deployment of all in-sea survey equipment, to include:

- *checks on weather, water depth, possible obstructions and traffic*
- *checks of communications between deck, instrument room and bridge*
- *clear guidance on what work is permissible on the back deck during poor weather/sea conditions*

8.2.10 Do stability calculations address the impact of lifting operations associated with seabed activities?

Assessment to include impact of overside weights on GM.

8.2.11 Are the instrument rooms / laboratories suitably designed, protected and in good order?

There should be two, properly marked emergency exits. Spaces should be covered with appropriate fire detection and extinguishing capability. Where appropriate, the emergency power cut off switch should be clearly marked and protected from inadvertent use.

8.2.12 Is the geotechnical control system integrated/connected with vessel/unit's bridge?

Do navigators/DPOs have displays showing operational status in relation to vessel/unit's position, and do survey personnel have full information on vessel/unit's track, position and propulsion status?

8.2.13 Does the vessel/unit have a Crew competence/training matrix that addresses Geotechnical operations?

Spot check training, experience and certification records carried by personnel/crew.

8.2.14 Does the vessel/unit have a competence matrix that addresses maintenance activities associated with the Geotechnical equipment?

Spot check training, experience and certification records carried by personnel/crew.

8.2.15 Are video monitoring facilities for critical positions/operations of the geotechnical system in good order?

Monitors should be at Lay Control and bridge conning position if vessel/unit's movement is critical.

8.2.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Diving

8.3.1 Does the vessel/unit or dive spread module have a valid Dive System Safety Certificate?

State authority issuing the certificate and include diving mode - Air and/or Saturation

8.3.2 Has the system been surveyed in the last 12 months and has the Dive System Safety Certificate had its annual endorsement?

8.3.3 Has the vessel/unit's record of equipment for the Cargo Ship Safety Equipment Certificate been endorsed with details of the hyperbaric rescue unit and its capacity?

For Saturation Diving Operations, this should YES or NO only.

Inspector to provide details of hyperbaric rescue unit and state certifying authority

8.3.4 Are procedures in place for the control of the storage, handling and connection of breathing gas cylinders?

8.3.5 Are all parts of the diving system that are sited on deck protected from the sea, icing or any damage that may result from other activities on board the vessel/unit?

Freeboard should not be less than 1.5 metres - make an Observation if this is not the case.

8.3.6 Has an evaluation been carried out to ensure the vessel/unit will have sufficient intact and residual dynamic stability in all load conditions whilst the diving system and auxiliary equipment are installed on the vessel/unit?

Inspector should sight calculation records.

8.3.7 Has an evaluation of the strength and load distribution on the deck of the vessel/unit been carried out with respect to diving system and auxiliary equipment placement?

Inspector should sight records of assessment and calculation.

8.3.8 Has an evaluation of the sea fastening arrangement for the diving system, including auxiliary equipment, been carried out with respect to dynamic loading with vessel movement, including survival condition of the vessel/unit?

Inspector should sight records of evaluation.

8.3.9 Has the sewage system for the saturation system been linked up with vessel/unit's sewage system and is it fully in compliance with MARPOL IV Regulations for the Prevention of Pollution by Sewage from Ships?

If not connected to the ship's system, provide information on arrangements made.

8.3.10 Is the diving system and habitat protected from the effects of fire?

Items to be checked include:

- structural fire protection (A60 bulkheads and doors)
- auto fire detection and alarms
- fixed fire extinguishing system
- portable fire extinguishers
- one located by entrance to space containing the diving system.

8.3.11 Where pressure vessels are situated in enclosed spaces, is a manually actuated water spray system provided to cool and protect such pressure vessels?

System should have an application rate of 10 l/m²/per minute of the horizontal projected area of the pressure vessel.

8.3.12 Where pressure vessels are situated on open decks, are sufficient means in place to provide a water spray?

This may be provided by fire hose. If this is the case, check if hose is in place and the availability of sufficient hydrants.

8.3.13 Has the safety and integrity of the electrical connection of the diving system to the vessel/unit's system been formally assessed?

Check that records of a formal assessment and regular maintenance and inspection are available.

8.3.14 Is the integrity of the electrical power supply to the diving system ensured in an emergency?

Check that the vessel/unit's emergency power source has sufficient electrical power capacity to supply the diving system and the emergency load for the vessel/unit at the same time?

If the vessel/unit's emergency power source is not the dive system alternate source of power, state what the alternative source of electrical power is for the dive system in event of failure of main source?

The alternative source of electrical power should be located outside the machinery casings to ensure its functioning in the event of fire or other casualty causing failure to the main electrical installation.

8.3.15 Is the communication system arranged for direct two-way communication between the dive control stand and the bridge or DP control room and is a suitable back-up system available?

8.3.16 Have periodic training drills of the hyperbaric rescue system been carried out?

State frequency of drills.

8.3.17 Has the hyperbaric rescue unit/SPHL been launched for test at annual survey or within the last 6 months as per IMCA guidelines?

IOGP 478 (Performance of saturation diving emergency hyperbaric evacuation and recovery) requires the launch of SPHL to be conducted every 6 months.

8.3.18 Where the primary means of launching depends on the ship's main power supply, is a secondary and independent launching arrangement provided?

8.3.19 Have calculations been conducted to evaluate the dynamic snatch and impact loadings that may be encountered by the hyperbaric rescue unit on launch and recovery, in particular taking into consideration freeboard, sea height and worst case of trim and list?

Where a diving system has been retro-fitted, check that formal calculations are available.

8.3.20 Do brakes on the handling system engage automatically in the event of power failure and are they provided with manual means of release?

8.3.21 Are risk assessments carried out for all Diving operations?

Check that assessments include equipment deployment, recovery operations, operating in a SIMOPS environment, diving between anchor lines, use of habitats, conducting operations on live equipment etc.

8.3.22 Where diving equipment is situated on the working deck are there effective arrangements in place for securing it?

8.3.23 Does the Vessel/Unit have an Emergency Drills Matrix for dive ops with a guidance section laying out recommended actions for each member of the diving project, marine and shore side personnel?

The diving contractor should develop generic emergency training scenarios and procedures. Trials and drills should be undertaken to train personnel and to test the efficiency of the procedures, the interfaces and the equipment that affect the successful execution of the Hyperbaric Evacuation Plan (HEP). Reference: IOGP 478

8.3.24 Are valid umbilical excursion charts held onboard and available to crew?

A diagram specific to each vessel should be provided in both DP and dive control to enable the DP operator and the

diving supervisor to visualise the relative position of the vessel, the deployment device and the divers in relation to the worksite, and to plan operations accordingly. Reference: IMCA D 010

8.3.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Oil recovery

8.4.1 Is the vessel certified for oil recovery operations?

State certification standard and body. If 'Yes', state date of certification and last inspection in the Comments section.

8.4.2 Has the Classification society approved an Oil Recovery Operations (ORO) Manual?

Example contents of Manual:

- operating and maintenance procedures, including steps to be taken in preparation for oil recovery operations
- equipment, capacity data, guidance on how to operate vessel during recovery ops.
- specific instructions that all portable equipment utilised for recovery operations is certified for use in gas hazardous atmosphere
- instructions for mounting/securing portable equipment, blanking off of pipes, etc.
- list of electrical equipment required to be disconnected during recovery operations
- tank cleaning procedures for tanks used during recovery operations
- Hazardous Area Plan
- spill response equipment arrangement plan.

8.4.3 Are tanks for recovered oil ready for immediate use?

Where N/A is used, Inspector to provide justification for selection

8.4.4 Is cabinet for electric supply to oil recovery equipment easily accessible and placed in a protected area?

Check that outlet sockets mounted in the cabinet are in good condition, well maintained and ready for immediate use.

8.4.5 If fitted, is equipment such as booms, skimmers, air hoses for inflating boom, etc. well maintained?

Check availability of air and power outlets.

8.4.6 If oil recovery equipment is not permanently fitted, are attachments for equipment or doubling plates welded to steel deck maintained and in good condition?

8.4.7 If fitted, are liquid dispersant systems in good condition and are the crew familiar with the documented procedures for the use and operation of the system?

Check the condition of storage arrangements, spray booms and pumps, etc.

Check expiration date of dispersant if applicable and name the type of dispersant carried.

Inspector to record dispersant details including name, quantity and expiration date.

8.4.8 Have personnel been trained in oil recovery operations?

Formal training may be required, depending on area of operation. Check that hazard of recovered oil (e.g. explosiveness, H2S) are addressed.

8.4.9 Are safety arrangements relating to the recovery and handling of hydrocarbons in place?

For example, provision of deadlights for windows/portholes facing deck areas; fixed and portable fire-fighting equipment and appropriate Crew PPE.

8.4.10 Are recovered oil tanks (fixed and portable) provided with suitable ventilation arrangements?

Check presence and condition of flame screens.

8.4.11 Has the oil recovery equipment been tested in exercises regularly?

Record the date of the last full scale equipment deployment exercise.

8.4.12 Are risk assessments carried out for all Oil Recovery operations?

Check that assessments include installing additional equipment, equipment deployment and recovery operations, and storage of recovered oil on board.

8.4.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Heavy lift**8.5.1 Are all cranes certified by a recognised certifying authority**

Recognised certifying authority such as IACS member.

Inspector to provide detail of certification.

8.5.2 If no certifying authority is in place, has the crane been inspected by manufacturer or other qualified third party?

Inspector to provide detail.

8.5.3 Does the vessel/unit have a competence/training matrix that addresses crane and ballast control operations?

Spot check training, experience and certification records. Check that refresher training is in place for specialist positions such as offshore crane operators and ballast control operators.

8.5.4 Does the company have documented procedures in place to ensure that the Master is provided with necessary pre-voyage guidance?

Guidance should be provided on issues that include weather restrictions, voyage routeing, motion limitations, project specific lift analysis and transport manual.

8.5.5 Are procedures in place for the formal planning of all heavy lifts cargo and their transportation?

Inspector to consider;

- (a) Concentrated deck loads, strength verification, stress level in cargo Cribbing / grillage.*
- (b) Sea fastening with due regards to cargo design basis and anticipated vessel motions, cargo buoyancy and wave slam.*
- (c) Cargo specific route analysis for the intended voyage, limiting metocean condition, heading management, contingency plans for loss of main propulsion / redundancy, adverse weather, including identification of safe haven.*
- (d) Transport analysis - motion, stability and limitations imposed*

8.5.6 Does the vessel/unit have a competence/training matrix that addresses crane and lifting gear maintenance activities?

Spot check training and certification records. Check that the vessel/unit's crew are trained and certified for inspecting lifting equipment.

8.5.7 Is there an effective lifting equipment management system in place?

To include:

- the marking of all equipment to correspond to a certificate*
- availability of all certificates on board*
- clear criteria for retirement of wires*
- controls to prevent the unauthorised modification of lifting equipment.*

8.5.8 Is there a periodic inspection and maintenance system in place covering all wire ropes?

Inspector to consider all lifting wires (main hoist, auxiliary hoist, whip, boom hoist, etc)

8.5.9 Is there a periodic inspection and maintenance system in place covering the blocks, sheaves and hooks?

System should detail for inspection, maintenance and changeout schedule for all blocks, sheaves and hooks.

8.5.10 Are certificates available for all wire ropes?

Valid certification should be available for all wire ropes which form part of the crane(s).

8.5.11 Is there a formal, time-based retirement/replacement policy for all wires?

Inspector to detail criteria for retirement.

8.5.12 Are all lifting operations formally planned and risk assessed?

Planning should include;

- Crane Design
- Maximum load due to environmental conditions

8.5.13 Are there clear environmental conditions and/or motion criteria defined for crane operations?

Crew should be aware of design operating criteria and approved crane load/radius chart

8.5.14 Are manufacturer load charts available onboard?

Inspector to confirm charts are available and in use.

8.5.15 Are there documented procedures and general safety arrangements in place for activities on the exposed working decks?

Including requirements for PPE, lifejackets, lifebuoys. Check safety signage and availability of fall arrestor equipment for more than one person to use in exposed areas.

8.5.16 Do the emergency procedures cover additional risks associated with the vessel/unit's heavy lift operations?

e.g. loss of stability/watertight integrity, loss of moorings/station keeping, emergency disconnect, helicopter accidents, severe weather, tidal waves, tsunamis, solitons. Procedures to be available onboard, evidence that personnel are familiar with them.

8.5.17 Are crane operators aware of crane failure (fail safe) modes?

Inspector to record what is the failure (fail-safe) condition of hoists during lifting operations

8.5.18 Is there a competent person in charge of ballast control and stability calculations?

All personnel involved in ballast control operations should be trained and certified in line with IMO Resolution A.891(21), includes, Barge Supervisor and Ballast Control Operator. Comprehensive Stability Courses have been developed and approved by the IADC / NI which after completion of specified seetime and completion of a logbook may result in the issue of a Ballast Control Operator Certificate.

8.5.19 Can the Ballast Control Operators (BCO's) demonstrate knowledge of the vessel/unit's ballast system, the control of free surface effects and the consequences of inadvertent ballast shift?

Demonstrated via induction and vessel specific training records. If semi-submersible, to be capable of taking unit to survival draft if required.

8.5.20 Is the stress and stability information included with the plan for current operations; have stability and where applicable, stress calculations been performed for the current operation and do the BCO's understand any limitations?

Inspectors should determine that prior to transfer of cargo, calculations have been made for stress and stability conditions for the start, interim and completion of transfer conditions. Regular monitoring of stress and stability should be taking place throughout cargo transfer to ensure that the conditions have been maintained within design limits.

8.5.21 Is there an inclinometer located near the ballast control panel?

Inspector to detail type of inclinometer (eg, MRU, Hydraulic, Mechanic) and specify if fitted with automatic recording device.

8.5.22 Are draft gauges operating correctly?

Check the procedure for calibration and cross reference to visual and loading computer values.

8.5.23 Does the vessel have a system in place to actively monitor vessel motion?

Inspector to consider:

- (a) *Does the onboard system have a warning feature when vessel motions exceed set / designed limits for the cargo transported on board?*
- (b) *Does the onboard system have features to simulate the vessel motions for an upcoming or any intended change to vessel heading?*
- (c) *Are the key personnel onboard trained and familiar with the use of the motion sensing system as well as simulating the vessel behaviour for the likely / anticipated condition?*

8.5.24 Is there a system for training and drills covering the stability issues associated with ballast, bilge and crane systems, in both normal and emergency conditions?

Check that regular drills have taken place using the emergency ballast and bilge control system.

8.5.25 Is there a system of verifying and recording the calibration of tank gauging systems and level alarms?

Tanks should be manually sounded at least once per week and compared to remote reading gauges. Discrepancies should be recorded and available to the BCO. Ensure that sounding tubes are not blocked and that sounding pipes are marked indicating the tank served and are fitted with a cap.

For tanks equipped with remote dual sensors, verification should be done regularly to make sure that the sensors are aligned shows same level in the tank.

8.5.26 Is there a system for recording changes to the vessel/unit's lightweight condition?

Documented procedure with record sheets showing additions/deletions since last inclining experiment conducted.

8.5.27 Are lightweight changes effectively incorporated into stability calculations?

System of cross checking to assure manual inputs. Inspector to verify that inventories of variable weights appear reasonable and accurate.

8.5.28 Are the ballast and bilge systems covered by an FME(C)A?**8.5.29 Is there a system for controlling the override of bilge and ballast system alarms?**

To be covered in procedures and documented.

8.5.30 Is access to the ballast control panel restricted?

System to be in place to prevent unauthorised operation of bilge and ballast system.

8.5.31 Is the ballast control position attended continuously during lift operations?

Ballast station to be manned continuously to ensure prompt action can be taken when required.

8.5.32 Is there a communication system arranged for direct two-way communication between the crane operators and the bridge. Is a suitable back-up system available?**8.5.33 Are all watertight doors, hatches and other openings on or near submersible decks in good order?**

Seals, locking devices and remote indicators should be in good order and fully functional.

8.5.34 Is there a positive feedback/checklist system for ensuring all such openings are secure for appropriate stages of the operation?

Check past records for compliance with procedures and best practice

8.5.35 Is access to crane controls restricted?

Security system should ensure that unauthorised operation is prevented

8.5.36 Is the main crane control console continuously attended by a qualified crane operator when lifting?**8.5.37 Is there a system for monitoring crane status during use and when stowed?**

Crane should be regularly checked to see if slewing or rocking motions are controlled in a seaway; tension monitoring equipment should be operational.

8.5.38 Are crane alarm systems all operational and in good order?

Inspector to confirm that there are automatic devices in place to prevent boom from being raised/lowered outside of allowable positions. In addition, there should be devices in place to prevent all lifting wires being operated outside allowable positions

8.5.39 Are load indicators fully operational and calibrated?

Inspector to provide date of last calibration and note observation if over 12 months.

8.5.40 Are there at least two ballast pumps available to pump out each ballast tank?

The pumps should be physically separated so that loss or damage to one pump will not adversely affect the other pump. To be confirmed by FME(C)A.

8.5.41 Are pumphouse emergency bilge suction valves clearly marked, fitted with a position indicator and capable of remote operation?**8.5.42 Is the emergency bilge suction and pump tested and are records maintained?**

Record method and date of last test.

8.5.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Anchor handling**8.6.1 Is the vessel classed for anchor handling operations?**

If yes, state class and service notation. Inspector to check if AHTS equipment is included in class survey records.

8.6.2 Does the vessel have a Bollard Pull certificate?

Record date of test and continuous bollard pull as per certificate. If certificate is more than 5 years old, not issued by current Class and/or not in current vessel name record as observation.

8.6.3 Are certificates for the towing wire and anchor handling wire including sockets available onboard?

Original wire certificates should be available. If long nose spelter sockets are on work/AH wire record as observation.

8.6.4 Are all work, tow and anchor handling wires inspected and tested on a periodic basis?

All wires should be subject to annual inspection by an independent competent party. Wires should be re-socketed once every 2.5 years. Sections of work wires and tow wires should be cut and sent for shore analysis by RO approved vendor at intervals not exceeding 5 years.

8.6.5 Does the vessel carry out risk assessments for each specific operation?

The assessments must also embrace the risk to which the vessel can be exposed. During recovery and deployment of anchors, the vessel will often be affected by great forces. A high level of tensile forces (tension) in the chain or wire may cause great heeling moment and high astern or transverse speed of motion in the anchor handling vessel. A simultaneous loss of thrust force on the vessel's own propellers and or fatal rudder position may result in a rotation which leads to a considerable increase in transverse forces. Environmental conditions as wind, waves and currents will also influence the operations.

8.6.6 Does the vessel have contingency plans for operations associated with anchor handling?

Procedures for unintended situations and in particular entire or partial loss of bollard pull, are to be established. They should describe, for each type of equipment (including but not limited to anchor handling winch, wire/chain stopper (such as Karm Fork or Shark Jaw)), emergency release methods, time delays and release speed in both normal operating condition and dead ship condition. Entire or partial loss of vessel's bollard pull will cause the vessel to be pulled astern with great forces by the tension in anchor arrangement.

These procedures are to be known by the crew and vital information displayed on the bridge or any other appropriate location.

8.6.7 Does the vessel have displayed on the bridge a document to show the acceptable vertical and horizontal transverse force/tensions to which the vessel can be exposed?

Calculations must show the max acceptable tension in wire/chain in order for the vessel's maximum heeling to be less than one of the following angles whichever occurs first:

- Heeling angle equivalent to a GZ value equal to 50% of GZ max
- The angle of flooding, which results in water on working deck
- 15 degrees

The most unfavourable conditions for transverse tension are to be considered for the calculations, usually chain acting transversely over the side to the outer pins.

The displayed information is to be under the form of curves, prepared so that the master can easily determine the maximum tension that can be applied to the vessel, as a function of the draught, trim and horizontal angle between the longitudinal axis or the guide pin and the wire/chain. (Ref NMD circular Date: 03/31/2014 / Number: RSV 3 - 2014)

8.6.8 Is there a notice posted on the bridge giving instructions for emergency release procedures?

To include, e.g. the operation of winch stops, wire release, wire/chain stoppers and the shutdown of associated systems. It must be stated that anchor handling must be discontinued, the gear and equipment relieved or emergency released if the vessel is exposed to greater load/force/tension than anticipated in the plans.

8.6.9 Are emergency release systems regularly tested and records maintained?

Comment on the frequency and nature of testing (under load or static) and crew familiarity with the nature of the release. Maintenance and testing of these systems should be included as part of the planned maintenance regime.

8.6.10 Does the vessel operating manual have a written procedure for safe anchor handling operations in differing water depths?

Check, if appropriate, that deep water anchoring operations are included. Though it is recognised that this is an arbitrary distinction, "deep water" is generally considered to be depths in excess of 300 metres. However, any assessment of what might be considered as "deep water" operations should take into account the capabilities of the vessels supporting such activities. During deep water moves the weight on stern roller can be hundreds of tonnes, which may be applied at a distance off centre line according to the set-up of the towing pins. This may add to listing moments and stern trim, increasing the risk of a flooded deck, e.g. from a breaking wave which can maybe result in a temporary reduction in stability.

8.6.11 Does the vessel operating manual include written procedures for SIMOPS and tandem vessel operations?

During tandem and/or joint towing operations, the towing gear must be connected with emergency release so that in case of a breakage in towing line or loss of power/bollard pull in one of the vessels, the other vessel may quickly be disconnected. A communication plan for the operation must be established which in particular ensures an effective and coordinated action in case of any unintended incident.

8.6.12 Is all anchor handling equipment secured when not in use?

8.6.13 Does the vessel's operating procedure define a minimum of two deck officers capable of taking control of the vessel to be on the bridge throughout anchor handling operations?

Vessel's operating procedures for bridge manning should be in line with industry standards such as GOMO, which requires 2 deck officers to be present during anchor handling operations.

8.6.14 Has the effect of slack tanks been addressed within the stability manual?

The stability manual should address the effect of slack tanks and the sequence for emptying fuel oil and potable water tanks.

8.6.15 Do documented procedures address the use of anti-roll tanks during anchor handling?

The use of anti-roll tanks can adversely affect stability.

8.6.16 Is there recorded evidence of regular testing, inspection and maintenance of all anchor handling equipment including emergency release functionality included in vessel maintenance management system?

Equipment may include anchor handling winch, AH wire, Work wire, pennant wires, stretcher ropes, Gob wire/chain, wire/chain stopper such as shark jaw/karm fork, spooling gear, stern roller. There should be evidence that wires are regularly lubricated. Inspector should check first layers of anchor handling wire and look for flattened areas, broken strands, heavy external corrosion or kinks.

8.6.17 Does the vessel have a tension gauge and/or tension limiter to monitor bollard pull and is it regularly calibrated?

Where fitted, inspector should record company policy regarding frequency of winch tension measurement calibration and function testing of render function if fitted. Record date of last calibration, calibration should be within 12 months.

8.6.18 Are bollard pull figures available for when power is diverted to transverse thrusters or other large power consumers?

Use of thrusters and/or winches may reduce the available power for main propulsion resulting in a reduced bollard pull. Masters should be aware that bollard pull, as measured for the vessel's certificates, in some cases, does not allow for the power used by deck machinery, thrusters and other consumers diverted from the main propulsion. As a minimum, curve showing the maximum available bollard pull for anchor handling as a function of total electrical power balance (accounting for the power consumption of side or azimuth thrusters and winches) must be available to crew.

Note: Inspector should consider vessel power generation as, where vessel propulsion is direct drive, the bollard pull should not be affected by power consumption.

8.6.19 Where towing winch render or emergency release systems are not fitted, is the vessel provided with readily available emergency wire cutting equipment?

8.6.20 Are tugger winches and wires in a satisfactory condition?

Check certification and inspection records. Inspector to check wire condition for broken wires, lack of grease, hand-spliced eyes, etc. Check that protection is provided for operators.

8.6.21 Does the Master, Bridge Officers and Deck Personnel have appropriate anchor handling training and experience?

Deck or engineer officers should undertake a formal anchor handling familiarisation course or programme. This can be a combination of deck and bridge experience in a real or simulated environment. Participation in any such programme should be recorded.

Able seamen should be trained in guidelines, procedures and safe equipment use before assignment to independent anchor handling work on deck. All training is to be documented. At least captain, chief mate and one member of each deck watch should have performed a minimum of 5 anchor handling operations.

Inspector should report level of training and experience as a comment. Master must be familiar with;

- *maximum force/tension in wire or chain, as well as corresponding lateral point of direction to meet maximum heeling criteria;*
- *any tank restrictions (i.e. ballast tank and/or roll reduction tank usage, fuel oil burn off sequences, etc.) determined by the stability calculations;*
- *list of protected flooding openings that need to be kept closed;*
- *wind and/or wave restrictions.*

8.6.22 Are records available confirming the training of winch operators?

Winch operators should be competent in the winch design and operation, control systems, operating modes, emergency release systems and limitations. They should also be competent in the use of towing pins, shark jaws and associated torque-release equipment as well as pulling power and the impact on stability. Winch operator should undergo formal training preferably in collaboration with manufacturer.

Inspector should report level of training and experience as a comment.

8.6.23 Where winches are not visible from the bridge, is there a system in place to enable remote monitoring?

For example are remote video (CCTV) coverage of garage located winches available on the bridge. Inspector to provide comment if CCTV system has the capability to record.

8.6.24 Is there evidence of anchor handling operations planning?

Prior taking part in anchor handling operation, Master should make sure that calculations are carried out and that plans are made clearly showing the loads/forces (tension) that may occur. If necessary, this information must be recovered from the principal. Such calculations must take into consideration the weight of the anchor lines (chain) in question and the anticipated force/tension which may occur or be required in any phase of the operation. Verification must be made that the calculated forces are within capacity of the vessel.

8.6.25 Are communications between the bridge and working deck, including backup systems, in working order?

Check communication equipment (intercoms and UHF/VHF hand-held radios) including backup arrangements.

8.6.26 Are anchor handling winch, towing pins and wire/chain stopper in good order and reported to be fully operational?

Inspector should verify satisfactory operation of equipment, including review of below deck areas in vicinity of equipment noted within question for signs of water ingress.

8.6.27 Are safe areas beyond the crash barriers clear of obstructions and easily accessible to the crew from the working deck?

8.6.28 Is the vessel provided with a stability instrument compliant with the requirements of international code on intact stability part B - ship engaged in anchor handling operations?

International Code on Intact Stability Part B – “Ships engaged in anchor handling operations” , is described in chapter 2.7.5.1 of RESOLUTION MSC.415(97) (adopted on 25 November 2016) AMENDMENTS TO PART B OF THE INTERNATIONAL CODE ON INTACT STABILITY, 2008 (2008 IS CODE).

Two types of stability instrument may be used on board:

- *either a software checking the intended or actual tension on the basis of the permissible tension curves; or*
- *a software performing direct stability calculations to check compliance with the relevant criteria, for a given loading condition (before application of the tension force), a given tension and a given wire position (defined by angles α and β).*

8.6.29 Is vessel provided with preventive measures to mitigate the risk of water ingress through the inspection openings on the anchor handling systems?

Inspector should review potential and actual installation of anchor handling system deck cover plates, protection systems for ship electronic control systems in vicinity of potential water ingress areas by way of Towing pins and wire/ chain stoppers.

8.6.30 Are appropriate instructions available for application of silicone sealant and/or installation of gasket available to ensure the watertightness of the anchor handling system housing?

Inspectors should review instructions provided to masters and crew with regards to application of silicone sealant, installation of gasket or other means as appropriate.

8.6.31 Are appropriate instructions available for testing the watertightness of the anchor handling system after completion of any works and installation of the inspection covers?

Inspectors should review ensure appropriate instructions are in place to ensure systems are verified watertight following maintenance and/or inspection.

8.6.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Towing/pushing

8.7.1 Is the vessel classed/certified for Towing and/or Pushing operations?

If yes, please state class or certifying notations. Make a clear statement if the certificate is more than 5 years old.

8.7.2 Is the vessel's fendering in good condition?

Fenders should be fitted in areas of the probable contact with another vessel's hull during towing assistance (e.g. pushing), ship-to-ship personnel or equipment transfer. All chains and hardware used to secure the fenders should be in good condition and the fendering placed in such a way as to avoiding steel to steel contact.

8.7.3 Is tow winch, including associated hoses and brake linings, in good order?

Inspectors shall visibly inspect each winch. Mounting brackets should be in good condition with no obvious cracks or defects. Hydraulic and air hoses shall have all fittings tight and no leaks present. Winch controls should be in good working order with minimal wastage. Winches are to be lubricated per vessel's preventative maintenance schedule.

8.7.4 Is the towing gear visually in good condition?

Inspectors to check condition of all towing condition including shackles, gobbing arrangements and observe general condition.

8.7.5 Are certificates for the towing wire and anchor handling wire including sockets available onboard?

Original wire certificates should be available. If long nose spelter sockets are on work/tow wire record as observation

8.7.6 Is there a formal, time-based retirement/replacement policy for the towing assembly?

Tow line assemblies (pennant and stretchers) must be replaced every 12 months. Any extension in replacement past 12 months shall be made based on formal analysis by a 3rd party SME and confirmation that the components are stored and maintained between use in accordance with the manufacturer's guidance.

On vessels where inspections of the tow line assembly identify significant damage, replacement may be less than 12 months. Connecting shackles must be replaced every 36 months provided they are fully inspected, tested and certified using NDT techniques annually.

8.7.7 Does the vessel maintain a towing log in accordance with IMO guidelines?

Tow log should as a minimum record the following date installed, certificate number and issuing authority, time in use, shock or unusual loads, inspection results, size, MBL, and length.

The record of service must contain confirmation of towing drum and contact surface preparation is suitable for installation and the use of towline was in accordance with manufacturer recommendations. Reference IMO MSC/Circ.884

8.7.8 Does the vessel adhere to the IMO guidelines with regard to the minimum breaking load (MBL) of the towline?

Bollard Pull (BP) less than 40T then $MBL = 3.0 \times BP$;

Bollard Pull (BP) = 40T to 90T then $MBL = (3.8 - BP/50) BP$;

Bollard Pull (BP) greater than 90T then $MBL = 2.0 \times BP$ (all numbers in tonnes).

Reference IMO MSC/Circ.884

8.7.9 Does the vessel have procedures, including contingency plans, in place that address towing and pushing activities?

The contingency plan should include MOB, measures to be taken following the loss of tow, towline parting, propulsion failure and the onset of adverse weather, including heaving to and taking shelter.

When vessel is engaged in towing operations do procedures require all weathertight doors, hatches, manholes, ports and windows on the weather deck required to be closed and secured to prevent downflooding in the event of deck edge immersion?

A check to ensure that such arrangements are closed should be included in a pre-towing checklist. They should also be easily identifiable, for example by painting doors and hatches a different colour or with a warning on both sides saying "To remain closed while towing". Should a situation arise where tension in the towline causes the tug to heel over and the deck edge to be immersed, the delay in down flooding afforded by having watertight integrity on the weather deck may be vital in providing sufficient time for the quick release mechanism to be activated or for the tug to be manoeuvred to lessen the tension in the towline

8.7.10 Does the vessel have a searchlight that can be directed from the vessel's main steering station and is it in good working order?

Searchlight should provide illumination both forward and aft, allowing tug to approach the tow either bow or stern on.

8.7.11 Does the vessel carry a spare towline, stretchers, shackles and associated equipment that meet all the requirements for the main gear?**8.7.12 Are all wire rope terminations on board made with hard eyes with evidence that socketing has been done by a competent person?**

If any terminations use long nose or hand-spliced, respond 'No' and provide an observation.

8.7.13 Is the winch fitted with equipment to measure the tension of the towline and is the information displayed in the wheelhouse?

Inspectors shall sight and record the date of last calibration. Calibration may be a full calibration done during a bollard pull test or, in the case of older models, may be done by setting the tension monitor to zero when there is no tension on the winch.

8.7.14 Is a tow winch brake alarm fitted and audible in the wheelhouse?

Alarm to be set for slippage/overloading of winch

8.7.15 Does the vessel have a tension gauge and/or tension limiter to monitor bollard pull and is it regularly calibrated?

Tension gauge should be calibrated annually. Inspector to document date of last calibration.

8.7.16 Are records of inspection and service of the towline available on board?

There should be evidence that wires are regularly lubricated. Inspector should check first layers of towing wire and look for flattened areas, broken strands, heavy external corrosion or kinks.

Inspector should confirm records are available to demonstrate destructive testing is carried out on a periodic basis.

8.7.17 Does the vessel Operator have an adequate replacement policy with valid certificates for the towing line(s) in use?

Replacement policy should be based on Manufacturer's recommendation and periodic onboard line inspections. Independent third party testing results should be used to verify the length of service time.

8.7.18 If using High Modulus Polyethylene (HMPE), is the contact surface for the HMPE tow line clean and sufficiently smooth to avoid damage to tow line?

Contact surface should be clean and smooth with non-abrasive fittings to avoid damage. Surface maintenance should be part of routine inspection program.

8.7.19 If applicable is there a system for prevention of chafing of the tow-wire?

Sufficient towing wire protectors shall be provided to prevent the towing wire from being damaged by abrasion and chafe against tow bars, cargo protection rails, bulwarks or stern roller.

8.7.20 If applicable, does the vessel have a suitable towing wire arrangement to prevent girting?

Risk assessment, procedures and checklists in place to address the issue of girting. A towline under tension will exert a heeling moment on the tug if the line is secured around amidships and is leading off toward the beam. If the force in the towline is sufficiently powerful, it may overcome the tug's righting lever and cause it to capsize. Girting can occur very rapidly, and incidents have occurred where crew members have not been able to escape in time. Moreover, it should not be assumed that the winch or winch brake will render or that the towline will break before a potential girting situation occurs as less force may be required to capsize the tug.

8.7.21 Are emergency release systems regularly tested and records maintained?

Comment on the frequency and nature of testing (under load or static) and crew familiarity with the nature of the release. Maintenance and testing of these systems should be included as part of the planned maintenance regime.

8.7.22 If towline is not provided with quick release capability, does the vessel have cutting gear readily available?

There should be documented procedures available and associated risk assessments for the cutting of such wires in an emergency.

8.7.23 If used, do shock lines and/or towing stretchers have the capability to deal with the expected dynamic loads?

Where used, stretchers shall have a minimum MBL of 3 times vessel bollard pull. Reference: OCIMF Static Towing Assembly Guidelines (STAG)

8.7.24 Has the Master appropriate experience of towing/pushing operations on this particular type of vessel?

State Master's experience. For U.S. mariners (license endorsement or Towing Officer Assessment Record) or countries which require documented towing competence assessments or a towing endorsement on their license, is such license endorsement or documented assessment in place.

8.7.25 If applicable, have the Master and/or any officers with direct responsibility for ship handling received appropriate formal training in ship handling for non-conventional propulsion system?

Examples of non-conventional propulsion systems: Azimuth Stern Drive, Voith Schneider or Rotor Tug Propulsion.

Master and/or any officers with direct responsibility for ship handling should undertake a formal ship handling familiarisation course or programme having the objective to maximise the benefits of propulsion fitted and enhance the efficiency of towing operation. This can be a combination of real and/or simulated environment. Participation in any such programme should be recorded.

8.7.26 Are risk assessments carried out for all towing/pushing operations?

Check that assessments include equipment deployment and recovery operations.

8.7.27 Is the vessel fitted with necessary towing navigation lights for compliance with Collision Regulations?**8.7.28 Are the Master and officers aware of vessel performance capabilities and limitations?**

Inspector to interview Master/officers on this topic and identify what limiting criteria is used for reference (including weather limitations, thruster limits, etc).

8.7.29 Are deck officers aware of the stability conditions during towing operations and understand limitations associated?

All the loading conditions reported in the trim and stability booklet, with the exception of lightship, should have been checked by class in order to investigate the ship's capability to support the effect of the towing force in the beam direction.

Master of the vessel should receive information in the Trim and Stability Booklet regarding cargo and/or ballast limitations, list of protected flooding openings that need to be kept closed, wind and/or wave restrictions, etc., necessary to ensure that the stability is in compliance with the criteria applicable.

If any loading condition requires water ballast for compliance with the criteria, the quantity and disposition should be stated in the Guidance to the Master.

8.7.30 Are the calculated indirect towing forces available to the Master and deck officers?

Guidance - Indirect towing is a method used by tug to exert dynamic forces on the tow line substantially beyond its static bollard pull; e.g. using a tug's weight, bulk and underwater surface area or by turning obliquely to a tow line to produce additional forces to stop or turn a ship under way.

8.7.31 Does the Operator have good visibility of the work area from the vessel's control station?

Operator refers to the vessel master or deck officer who is on watch and handling the vessel.

8.7.32 If there are visibility limitations caused by physical vessel design, are there risk mitigations employed to address them such as radios and talk back devices and are they in good working order?

If visibility is limited are there means such as radios or deck talk-back boxes used to communicate with crew. Inspectors shall ask crew to operate all such devices and note what the visibility restrictions are and how they are addressed by vessel crew.

Inspectors should determine if the vessel has a folding mast and if precautions are being taken to avoid the mast making contact while working alongside a vessel.

8.7.33 Is there a sufficient number of portable VHF or UHF and spare batteries available on board?

Available quantity should take into account the need for communication of tug personnel deployed on board an unmanned tow for inspections or during an emergency.

8.7.34 Is there a notice posted on the bridge giving instructions for emergency release procedures?

To include, e.g. the operation of winch stops, wire release and the shutdown of associated systems. It must be stated that towing must be discontinued, the gear and equipment relieved or emergency released if the vessel is exposed to greater load/force/tension than anticipated in the plans.

8.7.35 Are bollard pull figures available for when power is diverted to transverse thrusters or other large power consumers?

Use of thrusters and/or winches may reduce the available power for main propulsion resulting in a reduced bollard pull.

Masters should be aware that bollard pull, as measured for the vessel's certificates, in some cases, does not allow for the power used by deck machinery, thrusters and other consumers diverted from the main propulsion. As a minimum, curve showing the maximum available bollard pull for anchor handling as function of total electrical power balance (accounting for the power consumption of side or azimuth thrusters and winches) must be available to crew.

8.7.36 Does the operator have a policy in place covering the use of recessed bitts?

A recessed bitt is defined as a bitt inset into the ship's hull above the water line used to connect the tow line. Where applicable, inspectors should look for a formal policy that covers working with recessed hull bitts and require extra caution for the tug crew when connecting/disconnecting the tow line.

8.7.37 If the vessel has a STAPLE, is the SWL for the staple and the angles of operability known to the vessel master and deck officers?

Guidance - Inspectors shall list the SWL of the Staple. Staple may also be referred to as the fwd towing staple or towing fair lead.

8.7.38 Does the vessel have bow towing capability when conducting static tow operations?

8.7.39 For vessels engaged in static towing operations, does the towing assembly comply with the recommendations of OCIMF Static Towing Assembly Guidelines (STAG)?

8.7.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Supply

8.8.1 Is the vessel provided with operator's policy statements, guidance and documented procedures with regard to safe supply boat operations?

Specific to operational matters, such as cargo stowage, handling of cargo, IMDG and NLS.

8.8.2 Does the vessel carry out risk assessments for specific supply operations?

Risk assessment should include wind and sea conditions.

8.8.3 Are officers aware of maximum deck load capacity and deck strength?

8.8.4 Has a formal risk assessment been completed for all cargo operations that the vessel is likely to perform offshore?

Risk assessments should specifically capture the risks of the vessel working stern to weather particularly with "open stern" vessel.

Inspector to verify that the Safety Management System provides clear guidance in the following areas and officers are aware of this guidance:

- *triggers that would cause cargo operations to be stopped requiring further risk assessments to be performed so as to determine if additional barriers are required in order to resume cargo operations. These triggers include, but are not limited to, water being shipped on deck, vessel motion, vessel orientation (stern to weather / head to weather), current and expected sea state*
- *eliminating/minimising unsecured cargo during the cargo securing process*
- *arrangement of cargo placement and tank contents so as to minimise stern trim to maintain sufficient freeboard at the stern*
- *cargo placement to provide unobstructed escape routes for crew working on deck*

8.8.5 Does the vessel have a clear deck policy and is it implemented onboard?

Inspector should check policy and procedures are in place to actively manage deck operations. Reference: OCIMF Deck Cargo Management onboard Offshore Vessels G-OMO, Chapter 9.6

8.8.6 Does the operating manual include documented procedures for restoring stability in case unstable conditions develop during cargo operations and are the officers aware of corrective action to be taken?

Do all officers know how to operate stability program?

Does Master standing order state that Duty officer should call Master if unsure of vessels stability condition during cargo operations?

8.8.7 Are officers aware of the dangers of entrapped water on deck particularly when carrying pipe cargoes?

Ref: 2008 IS Code

8.8.8 Are officers aware of the effects of free surface particularly when transferring liquids at sea?

8.8.9 Has the deck area been marked to identify areas where cargo must not be loaded?

When loading deck cargoes care should be taken to avoid any obstruction to safety zones, freeing ports/drainage arrangements, doors and hatches or aft mooring station.

8.8.10 Are Material Safety Data Sheets (MSDS) on board for all the products being handled and are all officers familiar with their content?

The cargo plan can be produced from a shore base planning group but there should be some evidence that the vessel crew/captain have reviewed this, know where the dangerous cargoes are located and found it acceptable.

8.8.11 Is there a system, including back-up, to ensure effective verbal communication between the vessel deck, vessel bridge and installation?

8.8.12 Are the emergency stops for bulk transfer pumps tested and are records available?

Record date of last test and frequency of testing programme

8.8.13 Is there evidence of formal pre-transfer checks being held between the vessel/unit and the receiving/discharging facility before the transfer of Bulk Liquids begins?

This question references bulk transfers only and not bunkering/fuelling the vessel. Inspectors are to validate a documented pre-transfer checklist is in place and forms part of the that is being completed for each fuel or Hazardous and noxious bulk liquid.

8.8.14 Are all bulk cargo tanks, pumps, valves and pipeline systems in good order and fully tested as appropriate?

Bulk cargo pipelines should be colour coded and free of soft patches or other temporary repairs. Bulk cargo connections should be clearly marked/colour coded and blanked or capped when not in use.

8.8.15 Are there established routines to monitor ventilation from tanks containing hazardous or flammable materials, including oil based muds?

Ventilation from tanks containing hazardous or flammable materials should be monitored for the formation of hazardous conditions on the vessel i.e. Flammable, explosive, toxic vapour accumulation. A plan should be in place to both prevent the occurrence hazardous vapour accumulation.

8.8.16 Are safe areas beyond the crash barriers clear of obstructions and easily accessible to the crew from the working deck?

8.8.17 Are tugger winches and wires associated with positioning cargo in a in good order?

Check certification and inspection records.

Check that protection is provided for operators.

8.8.18 Is the deck cargo securing/lashing equipment in a good order?

Check records of inspection.

8.8.19 Are bulwarks, cargo stanchions and the deck sheathing free of defects?

8.8.20 Does the 500 meters zone pre-entry check list require vessel propulsion and machinery to be set up in such a way as to ensure redundancy whilst carrying out supply operations?

Inspector to document what procedures are in place. As a minimum, redundancy should address fuel and power supply. For DP vessels, expectation is that they will operate in line with FMEA all times when manoeuvring within a 500m safety zone.

8.8.21 Has the vessel station keeping remained incident free within last 12 months?

If No then give details of incidents.

8.8.22 Are hose connections and coupling colour codes compatible with Industry Guidelines?

Hose connection should be clearly marked/stencilled as for what purpose they serve, or colour coded in line with industry guidelines such as IMO OSV code or GOMO guidelines.

Are camlock couplings locking levers (if used) secured against accidental opening under pressure?

8.8.23 Are Data Cards available on board for visited offshore installations?

Data Cards should contain information on crane operating limits, the location of prohibited areas, submerged obstacles, production risers, etc.

8.8.24 Does the vessel have a 500m entry check list and is it in line with Industry guidelines?

500m checklist should follow guidelines of GOMO or other industry standards.

8.8.25 Is there evidence that 500m Safety Zone pre-entry checks have been carried out in conjunction with the installation?

8.8.26 Has the bulk cargo pumping and dry bulk systems been verified as operational?

Check the Log for recent bulk cargo operations and whether any delays were experienced due to the vessels bulk system.

8.8.27 Is there evidence that bulk backload are carried as per operator's procedures and industry best practices?

Ref: GOMO

8.8.28 Have all potential hose snagging points been identified and suitable precautions put in place?

Ref: GOMO

8.8.29 Are hazardous cargoes are carried in compliance with the IMDG code segregation requirements?

Check segregation of hazardous cargoes as per relevant section of the IMDG code.

Check if Radio-active material was carried on board and if it was in limited quantity and if required paperwork was in order.

8.8.30 Is there evidence that bulk hoses are handled as per operator's procedures and best industry practices?

Are hose hanging off pins fitted?

Crew aware of use of hose hanging off procedures and Risk Assessment in place?

Are procedures in line with GOMO or other industry guidelines?

8.8.31 If carried, are the hoses and connections used for the transfer of bulk liquids free of defects?

Focus on hydraulic fracture applications and other speciality services. Also applicable to OSV's which supply all or part of the hose string for transfer operations.

8.8.32 If carried, are all transfer hoses routinely tested?

Records to be sighted confirming regular tests for pressure. Confirm there is a process of routine inspection of hoses.

During operations, inspection of hoses is primarily by 'close visual inspection' of the entire hose length, paying particular attention to the end terminations. Close visual inspection means a visual check of the entire external area of the flexible hose assembly paying particular attention to blisters, deep lacerations or abrasions exposing inner core or fabric, unravelling of the outer cover, surface cracking and misalignment of coupling paint marks.

Floatation collars should be secure and in the correct position.

Water should be used to carry out leak tests wherever possible. The use of compressed gas such as air or nitrogen for any form of leak or pressure test is not permissible because: large volumes of pressurised gases are dangerous; hoses are not designed for pressurised gas; leaks in hydrocarbon hoses can produce a flammable mist; pinhole leaks are not always detected.

8.8.33 If carried, are transfer hoses fitted with lifting saddles and stowed in racks?

8.8.34 If carried on board, are transfer hoses fitted with flotation collars?

Check also fitted with reflective tape. Number and distribution of floatation collars to be in accordance with guidance contained in G-OMO

8.8.35 If vessel/unit is classified to carry Methanol or other alcohol based substances, are items listed in guideline adhered to?

1. *Is the vessel equipped with an alcohol resistant type foam extinguishing system?*
2. *Suitable procedures in place for loading, discharging, inerting*
3. *Are cofferdams and cargo tanks inerted (if applicable)*
4. *Does the Master and crew have training to carry LFL cargoes*

8.8.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

ERRV

8.9.1 Does the vessel have a valid Standby certificate?

State certifying authority, scope, operational area, date of certification and period of validity.

8.9.2 Does the vessel have an operations manual, work instructions and documented procedures covering all aspects of operation?

The procedures should include the safe operation of the vessel in case of explosive or toxic atmosphere should occur due to blow-out or oil spill from offshore installations. Procedures should also include FRC launch/recovery, mechanical aid recovery, care of survivors, close standby etc. There should also be Guidance for CPA and TCPA for errant vessels and when to report these to the installation. There should also be a copy of any field sharing procedures. Operations manual should contain contingency plans for all credible scenarios, including assigned roles to individual crew members. Check that roles are understood by relevant crew members.

8.9.3 Is there a system for training and exercising against the scenarios in the contingency plan?

Check records for exercises and drills.

Evidence should be available of regular drills both with the assigned installation and independently. These drills should test all equipment associated with survivor recovery in realistic scenarios. Evidence should be provided that the whole crew is following an onboard training matrix and copies of their training records should be sighted. A copy of Field Exercise performance standards should be onboard and records should demonstrate they are being met.

8.9.4 Are rescue zones kept clear, properly maintained and are marks in good condition and clearly visible?

Rescue zones should be clear of thrusters and propellers. An area of low freeboard should be available to aid self recovery of survivors at the ships side. Note the maximum and minimum freeboard height at the rescue zone.

8.9.5 Is lighting in way of the rescue zone satisfactory?

Lighting should cover the FRC/DC stowage & launching areas, survivor reception, treatment & recovery areas, access routes to/from the survivor recovery area and the helicopter winching area.

8.9.6 Is access route from rescue zone to reception area free of any obstructions?

8.9.7 Are the daughter craft/FRCs maintained and in good order?

Maintenance of FRC/DC should be included in PMS. Check condition of spare fuel storage cans (where used) and storage location.

8.9.8 Is the launching equipment maintained in good order?

Includes davits, winches, motors, certification of wire, SWL, etc. Confirm the SWL is adequate for Fully Loaded FRC, annual inspection and 5 yearly load tests.

8.9.9 Is the equipment for recovering personnel from the sea in good working order?

All crew to be provided with sufficient PPE appropriate for normal and emergency duties including head protection for all FRC crew. Safety harnesses for use in rescue zones should have strops suitably sized. Scramble nets/cradles rigged and in good condition. Mechanical recovery devices should be in a state of continuous readiness and personnel should be familiar with their operation.

8.9.10 Does the company SMS contain Maximum weather parameters that the vessel can safely operate in while on station in the field?**8.9.11 Are additional lighting arrangements in good order?**

Deck lighting (main and 24 volt) to prove operational; Searchlights operational with range and radius to meet relevant guidelines standard; Internal emergency lighting in survivors accommodation to prove satisfactory.

8.9.12 Does vessel have additional medical facilities for the vessel's role as ERRV/SBV and is medical equipment according to any specific standard?

State which standard applies.

8.9.13 Are reception areas, treatment rooms for injured personnel, accommodation facilities for rescued personnel and sanitary facilities clean and tidy?

Check provision of decontamination area, survivor reception area, treatment area, recovery area (survivor bunks made-up ready for use) and sanitary area. Also check skin degreaser and soap available.

8.9.14 Is the area for helicopter winch zone clearly marked, free of obstacles and surface treated with non-slip coating?**8.9.15 Has the vessel undertaken exercises utilising oil spill response equipment and techniques within the last year?**

State date and equipment used in drill.

8.9.16 Is the communication equipment in good order?

Communication equipment may include the following:

- *mobile maritime VHF radio.*
- *aeromobile VHF radio equipment for communication with helicopter aero mobile radio beacon*
- *intercom equipment between bridge, reception, medical treatment room accommodation for rescued personnel, rescue zone and accommodation.*
- *radio compass for maritime and aero mobile VHF emergency frequencies.*
- *telephone with head set for communication with doctor in hospital ashore.*

8.9.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Accommodation/Flotel**8.10.1 Are there sufficient marine crew to operate mooring anchors, DP systems and gangway operations concurrently?**

Inspector should check whether there is any limitation on mustering marine qualified personnel to move vessel at short notice.

8.10.2 When vessel/unit is gangway connected to installation, are station keeping parameters well publicised and adhered to?

Notices should be placed at Gangway, Control Room and prominently in public areas to remind all personnel of limitations.

8.10.3 Are all cabins either single, two person or 'shift segregated' to ensure no out of hours disturbances?

Operational procedures should ensure that cross shift cabins are avoided and that there is an effective means of planning who is appointed to each cabin. Procedures should also be in place to ensure that male/female segregation is appropriate.

8.10.4 Is a person designated as being in charge of personnel welfare on board?

The identification and contact information should be well publicised to all.

8.10.5 Are mess rooms and common rooms clean and tidy with controls ensuring working gear is not worn?**8.10.6 Is there a fixed fire alarm and sprinkler system in accommodation areas?**

Verify if alarm and sprinkler systems are tested regularly and if they are included in the Vessel PMS.

8.10.7 Are additional regular fire rounds made by crew in all accommodation and service areas?

This should also include temporary accommodation modules.

8.10.8 Is the Flotel/Accommodation barge/vessel classed as accommodation barge/flotel or does the unit have a SPS Certificate/notation?

State class notation / certificate is provided. The industrial personnel (IP) Code applies to new cargo ships of 500 GT and over that are constructed after 1 July 2024. Existing ships prior to the entry into force date may continue to comply with SPS 2008, however, this is subject to formal agreement with the relevant flag administration.

8.10.9 Is a POB control system in place?

Are procedures in place to control the POB - registration of passengers upon arrival

8.10.10 Are procedures available to control personnel movements between the flotel and the installation if connected?**8.10.11 Is the person in charge for the POB control, trained for their task?**

State what training has been provided. E.g.: Offshore POB Management, Offshore Crisis Management, Crowd Management or equivalent.

8.10.12 If fitted, is there a FME(C)A for the automatic gangway system?

FME(C)A should be independent from the supplier or endorsed by a classification society or authority.

8.10.13 If fitted, has the automatic disconnect of the gangway system been tested to its full extent?

Verify if the system fully retracts/lifts/slews to its extents. State how frequently this is carried out and when it was last tested.

8.10.14 If fitted, is there a functional design document detailing the normal and emergency disconnect operating philosophy of the automatic gangway?

All automatic functions are defined through a logic diagram, or equivalent documentation.

8.10.15 If fitted, are the automatic gangway operating limits referenced against vessel motions and metocean conditions, and are they defined within an Activity or Site Specific Operating Guideline (ASOG/SSOG) which defines when gangway operations shall be suspended?

ASOG/SSOG defines in metocean conditions and vessel motion the time to close the gangway, perform a manual disconnect and when to move the defined safe standoff position.

8.10.16 If fitted, is the maintenance of the automatic gangway included in the planned maintenance system of the flotel/accommodation barge?

Verify if planned maintenance is carried out as per PMS system.

8.10.17 If fitted, are emergency procedures in place for the disconnection of the gangway?

When are these emergency procedures activated (weather limitations - loss of position - gas alarm) is the disconnection done by remote control or at the gangway? There is no initiation remote control reference of a gangway disconnect where it is automated.

8.10.18 Is a secondary muster station established in the event of the primary muster station being jeopardised, and are there records for associated drills?

Inspector to record an observation if no secondary muster station is available

8.10.19 Are specific changing rooms with lockers available in order to allow personnel changing work clothes prior entering the accommodation?

8.10.20 If fitted, is the garbage compactor and/or incinerator in good operational condition?

8.10.21 Are smoke/fire detection systems available in all cabins and common places?

Verify if alarm/detection systems are tested regularly and if they are included in the Vessel PMS.

8.10.22 Are public address and audio alarms operational inside the accommodation and common places?

Verify if systems are operational and regularly tested weekly - monthly.

8.10.23 Are the noise level in the accommodation and common areas tested and recorded?

Check if the company has establish procedures for noise level measurement. Measurements should be carried out for new building & after any major modification to the vessel. Ref: IMO resolution A.468(XII).

8.10.24 Is evidence available that all materials used in the accommodations and common place are fire retardant?

8.10.25 Is the available cabin space and layout in line with regulations?

Available space should be in function of the number of occupants of the room ILO 92 regulations.

8.10.26 If fitted are additional temporary accommodation modules connected to the central sewage system of the unit?

Verify if there is a connection to the central sewage system and if the additional units are included in the certification of the unit.

8.10.27 If unit is a DP flotel fitted with a connected gangway, confirm that the gangway is used as Positioning Reference System (PRS)?

Record an observation if gangway is not used as a PRS.

8.10.28 If the unit is a DP flotel operating on a turret moored FPSO or any moving asset with connected gangway, confirm that DP system is fitted with "follow target "mode option?

Record an observation if "follow target mode" is not available.

8.10.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Pipe lay

8.11.1 Does the vessel/unit have a competence/training matrix that addresses pipe laying and support operations?

Spot check training, experience and certification records carried by personnel/crew.

8.11.2 Does the vessel/unit have a competence/training matrix that addresses maintenance activities associated with the pipe laying equipment?

Spot check training, experience and certification records carried by personnel/crew.

8.11.3 Are the Abandonment and Recovery winch(es) fully operational and are wires certified?

Check inspection records and wire certification.

8.11.4 Are all load monitoring devices and alarm systems in good order and regularly tested?

Check test records and alarm panels for isolations.

8.11.5 Is pipe lay control system integrated/connected with vessel/unit's bridge?

Do navigators/DPOs have displays showing operational status in relation to vessel/unit's position, and do pipe lay ops personnel have full information on vessel/unit's track and propulsion status?

8.11.6 Are there voice communication systems available for the pipe lay system and are they in good order?

There should be at least two independent communication systems with bridge.

8.11.7 Are video monitoring facilities for critical positions/operations of the pipe lay system in good order?

Monitors should be at Lay Control and bridge conning position if vessel/unit's movement is critical.

8.11.8 Are local emergency stops for the pipe lay system available, in good order and regularly tested?

Check test records.

8.11.9 If fitted is the pipe lay system data logger operational and in good order?**8.11.10 Are all pipe laying operations formally risk assessed?****8.11.11 Does the vessel have project-specific contingency plans relating to pipe laying activities?**

Plans should include actions in case of pipe buckling or other damage during pipe laying.

8.11.12 Are all components of the pipe laying system included in the vessel/unit's planned maintenance system?

Inspector should verify that the specialised equipment, such as the Abandonment and Recovery Winch, the pipe tensioning equipment, the stinger, the firing line conveyor system and the ancillary make up facilities are included in the planned maintenance system. Ancillary make up facilities include welding stations, x-ray and NDT equipment and coating equipment.

8.11.13 Does the vessel carry a full set of operating and maintenance manuals for the specialised equipment required for pipe laying operations?

Check that manuals are in a language understood by the crew.

8.11.14 Are critical spare parts clearly identified and available on board or at short notice?**8.11.15 Are hang-off platforms and other working platforms in good order?**

If retro-fitted or a temporary arrangement, check whether Class approved.

8.11.16 Is personnel access along pipe-laying working deck accessible and in good order?

Access should be provided at key points, with good visibility, lighting, anti-skid flooring and protection from falls.

8.11.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Cable lay**8.12.1 Does the vessel/unit have a competence/training matrix that addresses cable laying and support operations?**

Spot check training, experience and certification records carried by personnel/crew

8.12.2 Does the vessel/unit have a competence/training matrix that addresses maintenance activities associated with the cable laying equipment?

Spot check training, experience and certification records carried by personnel/crew

8.12.3 Are all cable laying facilities and equipment properly maintained and in good order?

Relevant equipment includes:

- loading shutes

- *loading tensioners*
- *loading winches/back tension winches*
- *carousels/baskets/reels*
- *drive systems*
- *dividing/packing system*
- *pick-up arms and reeling controllers*
- *feeding shutes and radius controllers*
- *overboarding shutes/radius controllers*
- *laying tensioner systems.*

8.12.4 Are the Abandonment and Recovery winch(es) fully operational and are wires certified?

Check inspection records and wire certification/identification.

8.12.5 Are all load monitoring devices and alarm systems in good order and regularly tested?

Check test records and alarm panels for isolations

8.12.6 Are hang-off platforms and other working platforms in good order?

Note: if retro-fitted or a temporary arrangement, check whether Class approved.

8.12.7 Is personnel access along lay spread route and on carousel in good order?

Access should be provided at key points, with good visibility, lighting, anti-skid flooring and protection from falls.

8.12.8 Is cable lay control system integrated/connected with vessel/unit's bridge?

Do navigators/DPOs have displays showing operational status in relation to vessel/unit's position, and do cable Ops personnel have full information on vessel/unit's track and propulsion status?

8.12.9 Are there voice communication systems available for the cable lay system and are they in good order?

There should be in place at least two independent communication systems with bridge.

8.12.10 Are video monitoring facilities for critical positions/operations of the cable lay system in good order?

Monitors should be at Lay Control and bridge conning position if vessel/unit's movement is critical.

8.12.11 Are local emergency stops for the cable lay system available, in good order and regularly tested?

Check test records.

8.12.12 If fitted are remote reading draft gauges operating correctly?

8.12.13 Do the manuals contain a wide range of contingency procedures for credible scenarios?

These should include emergency situations and limited functionality situations (power generation; vessel manoeuvrability and cable lay equipment problems)

8.12.14 Are all cable lay operations formally risk assessed?

8.12.15 Do operational records contain structural failure and collapse sequence data in case of overloads, and do operational procedures demand these are analysed and known throughout the operation?

8.12.16 Are protective measures/barriers in place to ensure operator safety, in the event of system structural failure or collapse?

8.12.17 Are all components of the cable laying system included in the vessel/unit's planned maintenance system?

Check maintenance and test records.

8.12.18 Does the vessel carry a full set of operating and maintenance manuals for the specialised equipment required for cable laying operations?

Check that all maintenance instructions are current and in a language understood by the crew.

8.12.19 Are critical spare parts clearly identified and available on board or at short notice?

8.12.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Gravel/stone discharge

8.13.1 Are there documented procedures and general safety arrangements in place for activities on the exposed working decks, including access to cargo handling equipment and stowage areas?

Including requirements for PPE, lifejackets, lifebuoys. Check safety signage and availability of fall arrestor equipment for more than one person to use where open chutes, crane housings, or hose access areas may need to be accessed. Ensure safe walkway access between cargo holding areas. CCTV monitoring of working areas and remote equipment from bridge and/or instrument room should be available.

8.13.2 Are there documented procedures for the loading, carriage and discharge of material, and are they complied with?

Should be ship specific and also include limitations such as wind/wave height and vessel movement.

8.13.3 Are risk assessments carried out for all operations?

Check that assessments include deployment and recovery operations of equipment to direct cargo to seabed.

8.13.4 Are communications, including backup systems, suitable for operations on the working deck?

Check communication equipment (intercoms, telephones and UHF/VHF hand-held radios) including backup arrangements for:

- *Communications between the working deck, stone handling areas and the navigators/surveyors in the bridge/control room*
- *Communication between the bridge and surveyors*

8.13.5 Is all cargo handling equipment in good order and fully operational?

To include cargo stowage barriers; pushing blades and associated hydraulic power systems; grab cranes; fall-pipe systems including hoppers; fall-pipe ROV units and associated power supplies and heave compensation systems as appropriate.

8.13.6 Does the vessel/unit have a competence/training matrix that addresses gravel/stone operations?

Spot check training, experience and certification records carried by personnel/crew.

8.13.7 Does the vessel/unit have a competence/training matrix that addresses maintenance activities associated with the gravel/stone handling equipment?

Spot check training, experience and certification records carried by personnel/crew.

8.13.8 Does the vessel/unit have onboard a copy of the Class Approved Cargo Operations Manual?

Where OSVs carry MARPOL Annex II cargoes and trade internationally, they would be required to have an approved Procedures & Arrangements Manual. A Class approved Cargo Operation Manuals containing guidance for the safe operation of the vessel for both normal and emergency conditions may be provided.

8.13.9 Do the emergency procedures cover additional risks associated with the vessel's operations?

e.g. loss of stability/watertight integrity, loss of moorings/station keeping, discharge equipment failure or malfunction, helicopter accidents, severe weather, hydrodynamic events.

Procedures to be available onboard, evidence that personnel are familiar with them.

8.13.10 Is the stress and stability information included with the plan for current operations; have stability and stress calculations been performed for the current operation and do the cargo/ballast officers understand any limitations?

Inspectors should determine that prior to transfer of cargo, calculations have been made for stress and stability conditions

for the start, interim and completion of transfer conditions. Regular monitoring of stress and stability should be taking place throughout cargo transfer to ensure that the conditions have been maintained within design limits.

8.13.11 Is there an inclinometer located near the ballast control panel?

8.13.12 Is there a system of verifying and recording the quantity of stone/gravel in the cargo areas at any given time?

This should be aligned with ballast information to ensure that the vessel's stability can be readily verified in case of equipment malfunction.

8.13.13 Is the ballast control position attended continuously when load/discharge operations are underway?

Ballast station to be manned continuously to ensure prompt action can be taken when required.

8.13.14 Do ballast system valves fail to the closed position in the event of power failure?

To prevent migration of ballast that could occur if valves remain open.

8.13.15 Can ballast system valves be operated in the event of power failure?

Via manual valves, stored pressure accumulators or hand power packs.

8.13.16 Is there a process for ensuring sea chest valves are regularly inspected and kept free of leaks and debris?

8.13.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

ROV operations

8.14.1 Is there evidence that risk assessments are carried out for all specific tasks related to ROV operations?

8.14.2 If the vessel has been modified to carry out ROV Operations, have the additional weights been included in the vessel's stability information?

Inspector should review MOC provided ensuring changes to stability information to have Class approval and this should be evident in the vessel's stability booklet.

Check that any limitations have been documented and that key personnel are aware of them. Example limitations may include restrictions on the number of slack tanks and/or requirements to have tanks full or empty during ROV operations.

8.14.3 If obstructions exist that impact on the views of ongoing operations from the vessels bridge, have CCTV cameras been installed?

The CCTV cameras shall be positioned such that the area obstructed by the ROV or supporting equipment is now visible on a TV screen which is clearly visible from the conning positions.

Inspectors should make note in other comments section if recording functionality is not available.

8.14.4 Is there a system, including back-up, to ensure effective verbal communication between the navigating bridge and ROV control station?

Primary and back up communication systems must be independent of each other (a single VHF unit with a primary and back up channel does not meet this requirement)

8.14.5 Are protection rails fitted around the ROV work site?

8.14.6 Are operational procedures for ROV operations included in the vessel's SMS or specific operations manual?

Do these procedures specify minimum manning in all departments while conducting ROV operations?

Do these procedures specify maximum environmental limits for launching, recovery and operations?

Where the ROV is operated by a third party how are their operating procedures approved and included within the vessels operating procedures?

8.14.7 Does the vessel/unit have a crew competence/training matrix that addresses ROV operations?

Spot check training, experience and certification records carried by personnel/crew.

8.14.8 Does the vessel/unit have a competence matrix that addresses maintenance activities associated with the ROV equipment?

Spot check training, experience and certification records carried by personnel/crew.

8.14.9 Does the vessel have contingency plans in place that address ROV operations?

The contingency plans may include for example, Loss of ROV, failure of communications or positioning, secondary recovery methods, recovery in adverse conditions, entanglement of ROV umbilical.

8.14.10 Are sea state limits clearly specified for the launching and recovery of ROV equipment?

Where more than one ROV is fitted limits may differ depending on type (work/observation) of ROV and whether launch and recovery is over the side or through a moonpool.

8.14.11 Do the operational procedures address ROV operations within anchor patterns, during diving operations or close to subsea obstructions?

8.14.12 Is the ROV system integrated and/or connected with vessel/unit's bridge to show the ROV position in relation to the vessel/unit?

Do navigators/DPOs have displays showing operational status in relation to vessel/unit's position, and do ROV personnel have full information on vessel/unit's track and propulsion status?

8.14.13 Are suitable safety arrangements in place on ROV spread around moving machinery and high voltage equipment?

This could include procedural barriers, physical barriers and signage

8.14.14 Are local emergency stops for the ROV system available, in good order and regularly tested?

Check test records.

8.14.15 Are ROV Umbilical excursion charts available on the bridge at the conning position, are they used within the risk assessment process of operational planning of vessel station keeping?

Inspections should review location ROV umbilical excursion charts, comment should be made if not available with vicinity of conning station.

8.14.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Icebreaker

8.15.1 Does the vessel carry out risk assessments for specific ice operations?

8.15.2 Is there documentation to show that calculations and/or tests have been conducted to demonstrate that the vessel can maintain sufficient positive stability when performing ice breaking operations within approved limits?

To take sufficient account of disturbances causing roll, pitch, heave or heel.

8.15.3 Are ice breaking operational procedures included in the vessel's SMS or specific operations manual?

Procedure should address safe speed in varying ice conditions and should clearly state the environmental limits for vessel operation.

8.15.4 Are the galley facilities outfitted for use by the crew during ice breaking operations?

Galley equipment should be arranged to cope with violent vessel movements.

8.15.5 Do the vessel's shower and washroom facilities have provisions to ensure the safety of personnel using the facilities during ice breaking operations?

Shower facilities should have non-slip decking, three rigid sides, handholds and insulation from exposed hot water pipes.

8.15.6 Does the vessel have on board line throwing apparatus in addition to that required for life-saving?

Ice breakers should have line throwing apparatus that is capable of delivering messenger lines for transfer of towing equipment. Such line throwing equipment should be intrinsically safe in order that it may be safely used to make a transfer to a tanker.

8.15.7 Are any additional design features such as azimuth thrusters, bubblers, water wash or heeling systems working and in good order?**8.15.8 Is the vessel fitted with additional searchlights for illumination of the ice lead behind?**

The searchlights should be capable of being operated from the bridge.

8.15.9 Is the vessel fitted with more than 1 propeller?

The icebreaker should have 2 or more propellers to ensure sufficient manoeuvrability during icebreaker operations.

8.15.10 Is the vessel capable of conducting close-coupled towing operations?

The icebreaker should have a notched stern, protected with fenders, for the close contact with the bow of the vessel to be towed. The icebreaker should also have a towing winch with necessary towing equipment for pulling into the notch and making fast the vessel to be towed during close-coupled towing.

8.15.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Well servicing and sub-sea operations

8.16.1 Are there documented procedures and general safety arrangements in place for activities on the exposed working decks, including moonpools if fitted?

Including requirements for PPE, lifejackets, lifebuoys. Check safety signage and availability of fall arrestor equipment for more than one person to use in exposed areas. CCTV monitoring of working areas should feed to bridge and operations control room.

8.16.2 Where a moonpool is fitted, is a gas detection system available to cover this area?

Gas detection systems should be function tested and records maintained. System should be calibrated on an annual basis

8.16.3 Are risk assessments carried out for all subsea operations?

Check that assessments include equipment deployment and recovery operations.

8.16.4 Are communications, including backup systems, suitable for operations on the working deck?

Check communication equipment (intercoms, telephones and UHV/VHF hand-held radios) including backup arrangements for:

- Communications between the working deck and the Operations Control Room operators
- Communication between the bridge and Operations Control Room

8.16.5 Does the vessel/unit have a competence/training matrix that addresses well servicing and sub-sea operations?

Spot check training, experience and certification records.

8.16.6 Does the vessel/unit have a competence/training matrix that addresses maintenance activities associated with the well servicing and sub-sea equipment?

Spot check training, experience and certification records.

8.16.7 Do the emergency procedures cover additional risks associated with the vessel/unit's operations?

e.g. loss of stability/watertight integrity, loss of moorings/station keeping, emergency disconnect, helicopter accidents, severe weather, tidal waves, tsunami, solitons. Procedures to be available onboard, evidence that personnel are familiar with them.

8.16.8 Do all overboard cable and umbilical chutes appear in good order and are they properly secured?**8.16.9 If carried, are deck generators and/or gas and chemical tanks secured on suitable decks with appropriate secondary containment in place?**

Decks should be assessed and have sufficient strength for specific equipment and should be surrounded by containment arrangements in case of leaks.

8.16.10 Is there a person in charge of ballast control and stability calculations?

Where applicable, person should be qualified under STCW95. All personnel involved in ballast control operations should be trained and certified in line with IMO Resolution A.1079(28), includes, Barge Supervisor and Ballast Control Operator.

8.16.11 Can the Ballast Control Operators (BCO's) demonstrate knowledge of the vessel/unit's ballast system, the control of free surface effects and the consequences of inadvertent ballast shift?

Demonstrated via induction and vessel specific training records. If semi-submersible, to be capable of taking unit to survival draft if required. BCO's should know the operating inclination limits of the ballast control system, this should be stated in onboard documentation.

8.16.12 Is the stress and stability information included with the plan for current operations; have stability and where applicable, stress calculations been performed for the current operation and do the BCO's understand any limitations?

Inspectors should determine that prior to specific operations involving the transfer of weights, calculations have been made for stress and stability conditions for the start, interim and completion of operations. Regular monitoring of stress and stability should be taking place throughout the operation to ensure that the conditions have been maintained within design limits.

8.16.13 Is there an inclinometer located near the ballast control panel?**8.16.14 If fitted, are draft gauges operating correctly?**

Procedure for calibration and cross reference to visual and loading computer values.

8.16.15 Is there a system for managing manual inputs into the stability programme?

System of cross checking should be in place to assure accurate weights and CoG of materials placed subsea or recovered from seabed, are manually input to keep stability model accurate.

Inspector to verify that sample inventories of variable weights appear reasonable and accurate.

8.16.16 Is there a system for recording changes to the vessel/unit's lightweight condition?

Documented procedure with record sheets showing additions/deletions since last inclining experiment conducted.

8.16.17 Are the ballast and bilge systems covered by an FME(C)A?**8.16.18 Is there a system for controlling the override of bilge and ballast system alarms?**

To be covered in procedures and documented.

8.16.19 Is access to the ballast control panel restricted?

System to be in place to prevent unauthorised operation of bilge and ballast system.

8.16.20 Is the ballast control position attended continuously during sub-sea operations?

Ballast station to be manned continuously to ensure prompt action can be taken when required.

8.16.21 Are all watertight doors, hatches and other openings in good order?

Seals, locking devices and remote indicators should be in good order and fully functional.

8.16.22 Is there a system for monitoring crane status during use and when stowed?

Crane should be regularly checked to see if slewing or rocking motions are controlled in a seaway; tension monitoring equipment should be operational

8.16.23 If Column Stabilised unit are there at least two ballast pumps available to pump out each ballast tank?

If column stabilised, the pumps should be physically separated so that loss or damage to one pump will not adversely affect the other pump. To be confirmed by FME(C)A.

8.16.24 Are pumproom emergency bilge suction valves clearly marked, fitted with a position indicator and capable of remote operation?**8.16.25 Is the vessel/unit equipped with service cranes covering all anticipated operations?**

Located to minimise blind sectors.

8.16.26 Are all cement silos and associated valves, pumps, vents and air supplies fully tested and in good order?**8.16.27 Are all mud and brine tanks, pumps, valves and pipeline systems in good order and fully tested?****8.16.28 Is all deck mounted equipment, control skids and storage containers in good order and provided with appropriate cautionary signage?**

Exhausts, dangerous chemicals, hot pipes, pressurised pipes, radioactive sources should all be identified and managed within the vessel/unit's SMS.

8.16.29 Are all connections and deck pipework for bulk products, such as water and fuel, colour coded and clearly marked at loading stations?

Includes all bulk products, both liquid and non-liquid.

8.16.30 If carried, are hydrocarbon and/or chemical hoses fitted with dry break couplings?

Best practice is to adhere to industry GOMO, i.e. do procedures exist for marine transfer operations including emergency stops?

8.16.31 Are Material Safety Data Sheets (MSDS) on board for all the products being carried and are all officers familiar with their content?**8.16.32 If carried, are the hoses and connections used for the transfer of bulk liquids free of defects?**

Focus on hydraulic fracture applications and other speciality services. Also applicable to OSV's which supply all or part of the hose string for transfer operations.

8.16.33 If carried, are all transfer hoses routinely tested?

Records to be sighted confirming regular tests for pressure.

Confirm there is a process of routine inspection of hoses. During operations, inspection of hoses is primarily by 'close visual inspection' of the entire hose length, paying particular attention to the end terminations.

Close visual inspection means a visual check of the entire external area of the flexible hose assembly paying particular attention to blisters, deep lacerations or abrasions exposing inner core or fabric, unravelling of the outer cover, surface cracking and misalignment of coupling paint marks.

Floation collars should be secure and in the correct position. Water should be used to carry out leak tests wherever possible. Leak testing should be conducted on the complete hose assembly wherever possible and should consist of:

- *hose assembly hung off or laid on deck*
- *blank end cap fitted at one end;*
- *hose filled with water;*
- *pressurise to circa five (5) bar sufficient to indicate a leak;*
- *hold for five minutes and visually inspect complete length;*
- *if all okay, drain assembly to oily drains system;*

- repair or replace as needed, re-test and return to service.

The use of compressed gas such as air or nitrogen for any form of leak or pressure test is not permissible because: large volumes of pressurised gases are dangerous; hoses are not designed for pressurised gas; leaks in hydrocarbon hoses can produce a flammable mist; pinhole leaks are not always detected.

8.16.34 Are transfer hoses fitted with lifting saddles and stowed in racks?

Bulk transfer hoses include hoses used for well servicing and sub sea operations. If bulk hoses are stored on reels, Inspector is to make a comment in this section. All hoses should be suspended in arrangements that avoid sharp bends and protrusions wherever possible.

Where fitted, the saddle and rack arrangement should be a permanent structure with appropriate foundations. All lifting gear used in the hose arrangement should be certified and inspected on a periodic basis.

Inspector to mark NO to the question if the hose saddles/lifting gear is rig fabricated and lacks a load test SWL certification. Reference: Step Change 'Bulk Hose Best Practice Guidelines'

Check for inclusion of the hose collar/hanging arrangement being included as an item of certified lifting equipment.

8.16.35 If carried on board, are transfer hoses fitted with flotation collars?

Bulk transfer hoses include hoses used for well servicing and sub sea operations.

Check also fitted with reflective tape. Number and distribution of floatation collars to be in accordance with guidance contained in GOMO.

8.16.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Trenching

8.17.1 Does the vessel/unit have a competence/training matrix that addresses trenching and support operations?

Spot check training, experience and certification records carried by personnel/crew.

8.17.2 Does the vessel/unit have a competence/training matrix that addresses maintenance activities associated with the trenching equipment?

Spot check training, experience and certification records carried by personnel/crew.

8.17.3 Are all cable and umbilical chutes on deck in good order?

8.17.4 Are sea state limits specified for the launching and recovery of sub-sea equipment?

8.17.5 Are operational procedures for trenching included in the vessel's SMS or specific operations manual?

Do these procedures specify minimum manning in all departments while operating the trenching system?

Do these procedures specify maximum environmental limits for launching, recovery and operations?

8.17.6 Are there quick release arrangements for the sub-sea equipment?

Check that the arrangements do not include the use of pelican hooks or senhouse slips.

8.17.7 Does the vessel/unit carry spare towline, lifting gear, and umbilical to recover the trencher and return it to service?

8.17.8 Are risk assessments conducted for each operation?

8.17.9 Are effective contingency plans in place for operational incidents?

These should include emergency situations and limited functionality situations (e.g. power generation; vessel manoeuvrability; trencher snagged on sea floor).

8.17.10 Is there a means in place to locate/track sub sea equipment effectively?

State means.

8.17.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Crew Transfer Vessel**8.18.1 Is the vessel registered as a High Speed Craft (HSC) as defined in SOLAS or other Code?**

State Code if not SOLAS and issuing authority. Inspector to comment if valid HSC Safety Certificate.

8.18.2 If registered as a High Speed Craft, does the vessel have a copy of the company's 'Permit to Operate High-Speed Craft'?

State HSC Code issuing authority.

8.18.3 Have noise levels been assessed?

The noise level in public spaces and crew accommodation should be kept as low as possible. A risk assessment of noise and vibration impact should be considered which should address passengers and crew.

8.18.4 Are crew specifically trained for crew boat operations?

For example, passenger transfer/control and evacuation. Additional STCW requirements for HSC. Induction and Safety Briefing videos.

8.18.5 Are effective security documented procedures in place?

Procedures are in line with ISPS requirements.

8.18.6 Do documented procedures exist for personnel transfer and transit operations and define safe access routes?

Including, for example, definition of safe access routes, segregation of passengers (ongoing and offgoing) and cargo, provision of handrails, deck marks, non-slip coatings, target area for frog/basket.

8.18.7 Is there a gated bulwark in way of personnel transfer areas?

Where there is no gated bulwark are there suitable provisions for safe personnel access?

8.18.8 Are there lifebuoys and a formal system to alert in case of man-overboard, on the personnel transfer deck?

Inspector to state when the man-overboard alarm last checked. If there is no man-overboard alarm available, there should be formal procedures in place to manage man-overboard situations during personnel transfer operations.

8.18.9 Are sufficient immersion suits or thermal protective aids carried?

Depends on location. Covering crew and passengers.

8.18.10 Are passengers given a pre-embarkation and pre-disembarkation briefing?

Passengers given specific briefing on do's and don'ts, signs posted, etc. Covering method of disembarkation, e.g. Surfer landing, Frog, Billy Pugh, pilot ladder etc.

8.18.11 If a Passenger Evacuation System is fitted, is it in good order?

Record date last serviced.

8.18.12 Has a passenger evacuation exercise been conducted?

Record date of last exercise.

8.18.13 Are emergency alarms audible in the passenger accommodation areas?**8.18.14 Do all crewmembers have dedicated bunks in the vessel accommodation cabins?**

If vessel is not fitted with dedicated accommodation, inspector to comment on what is in place for crew during rest periods.

8.18.15 Are passenger safety briefings carried out?

Safety briefings should be carried out on every voyage and cover safe boarding, disembarkation and general safety whilst onboard.

8.18.16 Are passenger areas clean and maintained in good order?

Passenger areas should be well maintained and provide a safe and comfortable environment for passenger transit. This includes air conditioning, toilet facilities, passenger seating, lighting, noise levels, etc. Seatbelts should be available, in good order, for all passenger seats.

8.18.17 Are searchlight(s) available and in good order?**8.18.99 Additional Comments**

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Barge**8.19.1 Are the towing bridle and/or tow pads in satisfactory condition, regularly inspected and certified?**

This includes bridle legs, apex (delta plate), shackles and intermediate pennant if provided. Connection to the barge should be by a two-legged bridle for raked bow barges; Model bow barges may use single tow pennant. This arrangement has proven to be the most efficient method for towing this type of barge.

Minimum Breaking Load (MBL) of each bridle leg or tow pennant should be at least 1.5 times that of the MBL of the main towing line. The angle formed by the two legs should not exceed 120 degrees. Bridles should be made of Grade 2 (or higher) welded stud link chain or IWRC (Independent Wire Rope Cores) wire rope. Bridle to be fitted with sufficient chaffing protection.

8.19.2 If fitted is the Surge Protection gear in Satisfactory condition?

Surge chains should be Grade 2 or higher welded stud link chain and should be of the same grade and type and at least as large as that in the towing bridle. A synthetic shock line may be used as surge gear if rated at 1.3 times the breaking strength of the primary tow wire or hawser.

8.19.3 Is an emergency towing gear rigged on the barge, is it regularly inspected and certified?

Emergency towing gear should be provided to cope with towline failure, bridle failure or inability to recover the bridle. Emergency towing wires where fitted should be in serviceable condition and correctly fitted.

If available, record the dates of installation or test.

Holding devices (clips) and wire sockets should be inspected for excessive corrosion. Towing lines should be inspected for signs of degradation, frayed fibres etc.

8.19.4 If fitted with a loading ramp is the ramp marked with a SWL?

There should be certification and a class approved calculation for the bow door arrangement.

8.19.5 If fitted, is the emergency anchoring equipment in good condition?

Acceptable arrangements for small barges include an anchor fitted on a slanted billboard (e.g., @ 60°) at the stern of the barge, secured for easy release. The cable should be secured and arranged so that it will payout unobstructed when the anchor is let go.

8.19.6 Is the barge fitted with at least four mooring bollards/stag horns on each side?**8.19.7 Are the Mooring fittings marked with SWL?****8.19.8 Is the vessel fitted with necessary Towing Navigation Lights for compliance with Collision Regulations?**

Navigation lights shall be independently powered. Spare bulbs should be carried even if the tow is unmanned. Radar reflectors should be considered if barge has low freeboard.

8.19.9 If fitted, is the bridle recovery winch and recovery line in good condition?

Record if winch is manually operated or powered.

8.19.10 Are towline connections capable of quick release under adverse conditions?

Brackets should allow a fouled bridle or towline to be cleared but should also be secured against premature release.

8.19.11 Where towing connections can be released from the brackets, does the fairlead design allow all the released parts to pass through the fairlead?**8.19.12 Are access ladders in good condition?**

All barges shall be provided with suitable access. Suitable arrangements should be in place to allow safe transfer from ladder to main deck. This may include stanchions, grab bars, etc. The ladder should be in contrasting colour to the hull for easy identification

8.19.13 Are towing brackets and fairleads part of planned maintenance system?

Non destructive tests (NDT) or Magnetic Particles Inspection (MPI) should be conducted on towing brackets, on an annual basis

8.19.14 Are there suitable handrails, or deck markings, in place to prevent personnel falling overboard?

Barges which are constructed without safety handrails, such as material barges, etc shall have the edge highlighted in a contrasting colour to the rest of the deck

8.19.15 Where fitted with generator or battery supply, is the power system properly functioning and in good condition?

Systems should be included within planned maintenance system and, where required, carry adequate reserve of fuel. Where appropriate, the Inspector should consider:

- *Fire fighting equipment*
- *Secondary containment*
- *Inlet and Exhaust arrangements*

8.19.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Landing Craft

8.20.1 Is the Bow door clearly marked with the SWL?

There should be certification and a class approved calculation for the bow door arrangement.

8.20.2 Is there good visibility from the bridge, unaffected by the bow door?

In event that visibility is obstructed by the ramp, there may be viewing windows fitted into the ramp. If visibility is obstructed, it may be that the ramp has been lengthened without notification and approval of Class or the Flag State. Check against the GA drawing for the vessel.

8.20.3 Is there a written procedure in the vessels SMS to cover deployment and stowing of the ramp?

Documented procedures should require visual verification locally to ensure that locking devices are engaged and secure.

8.20.4 If fitted, are audible and/or visible alarms during ramp deployment and stowing in good working condition?**8.20.5 If fitted, are the visible indication in the wheel house confirming that the ramp is secured for sea in good working condition?****8.20.6 Are secondary securing arrangements fitted to the ramp?**

Verify that there are robust secondary securing arrangements to lock the ramp in the closed position whilst in the seagoing mode.

8.20.7 Are the forecastle deck areas either side of the ramp fitted with safety rails?

The railing should be sufficient to permit personnel to safely operate the ramp and handle mooring lines.

8.20.8 Are the freeing ports clear and freely draining?

As a consequence of water being forced onto the deck, operators will sometimes fit hinging flaps, fixed rubber flaps or cowlings.

The Inspector should verify that such devices do not limit the ability to freely drain water from the deck. Loss of stability through the free surface effect is a concern with this vessel type.

8.20.9 Is the bow area free of any significant damage?

By the very nature of the vessel design, frequent beachings may result in damage above and below the waterline. It is recommended that the Inspector look carefully in this area.

8.20.10 Is the vessel fitted with cooling systems and machinery that will allow auxiliary systems to operate in shallow waters or whilst grounded?

Keel cooling systems, air cooling and other specialist design features may allow the vessel to maintain services whilst grounded.

8.20.11 Are air pipes, ventilators, hatches etc on the main deck protected by railings?

The inspector should verify that this equipment is not damaged through cargo operations.

8.20.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Dredging**8.21.1 Are operational procedures for dredging included in the vessel's SMS or specific operations manual?**

Do these procedures specify minimum manning in all departments while operating in the dredging mode?

Do these procedures specify maximum environmental limits for launching, recovery and operations of the dredging equipment?

8.21.2 Are sea state limits specified for the launching and recovery of dredging equipment?

Dependent on dredger type this could be lowering/recovery of cutter head or bucket, launching/recovery of the drag head/arm, lowering and recovery of water injection equipment.

8.21.3 Are there documented procedures and general safety arrangements in place for activities on the exposed working decks?

Including requirements for PPE, lifejackets, lifebuoys. Check safety signage and availability of fall arrestor equipment for more than one person to use where Piping, Davits, open chutes, crane housings, or hose access areas may need to be accessed. Ensure safe walkway access between cargo holding areas. CCTV monitoring of working areas and remote equipment from bridge and/or instrument room should be available.

8.21.4 Are there documented procedures for the dredging, carriage and discharge of material, and are they complied with?

Should be vessel specific and also include limitations such as wind/wave height and vessel movement.

8.21.5 Are risk assessments carried out for all operations?

Check that assessments include deployment and recovery operations of equipment to direct cargo to seabed.

8.21.6 Are communications, including backup systems, suitable for operations on the working deck?

Check communication equipment (intercoms, telephones and UHF/VHF hand-held radios) including backup arrangements for:

- *Communications between the working deck, spoil handling areas and the navigators/surveyors in the bridge/control room.*
- *Communication between the bridge and surveyors.*

8.21.7 Is all cargo dredge spoil handling equipment in good order and fully operational?

To include stowage barriers and associated hydraulic power systems; cranes; Dredging system (Cutter head, bucket or drag head/arm) and associated power supplies.

8.21.8 Does the vessel/unit have a crew competence/training matrix that addresses dredging operations?

Spot check training, experience and certification records carried by personnel/crew.

8.21.9 Does the vessel/unit have a competence matrix that addresses maintenance activities associated with the dredging handling equipment?

Spot check training, experience and certification records carried by personnel/crew.

8.21.10 Does the vessel/unit have onboard a copy of the Class Approved Cargo Operations Manual?

A Class approved Cargo Operation Manuals containing guidance for the safe operation of the vessel for both normal and emergency conditions should be provided.

8.21.11 Do the emergency procedures cover additional risks associated with the vessel's operations?

e.g. loss of stability/watertight integrity, loss of moorings/station keeping, discharge equipment failure or malfunction, severe weather, hydrodynamic events, recovery of injection system, recovery of cutter head or bucket, fluidization system, recovery of drag head system, degassing of spoils, dumping of spoils. Procedures to be available onboard, evidence that personnel are familiar with them.

8.21.12 For Trailing Suction Hopper dredgers is the stress and stability information included with the plan for current operations; have stability and stress calculations been performed for the current operation and do the dredging/ballast officers understand?

Inspectors should determine that prior to transfer of cargo, calculations have been made for stress and stability conditions for the start, interim and completion of transfer conditions. Regular monitoring of stress and stability should be taking place throughout cargo transfer to ensure that the conditions have been maintained within design limits.

8.21.13 Is there an inclinometer located near the dredging and/or ballast control panel?**8.21.14 For Trailing Suction Hopper dredge are remote reading draft gauges operating correctly?**

Procedure for calibration and cross reference to visual and loading computer values.

8.21.15 Is there a system of verifying and recording the water injection rate (If applicable), discharge rate (i.e., Cutter suction dredge) or the quantity of dredge spoils in the hoppers at any given time?

This should be aligned with ballast information to ensure that the vessel's stability can be readily verified in case of equipment malfunction.

8.21.16 Is the dredging and/or ballast control position attended continuously when dredge operations are underway?

Dredging and/or Ballast station to be manned continuously to ensure prompt action can be taken when required.

8.21.17 Do Dredging (Spoil discharge or hopper) and/or ballast system valves fail to the closed position in the event of power failure?

To prevent migration of ballast and/or spoils that could occur if valves creep open.

8.21.18 Can Dredging (Spoil discharge or hopper) and/or ballast system valves be operated in the event of power failure?

Via manual valves, stored pressure accumulators or hand power packs.

8.21.19 Is there a process for ensuring sea chest and any overboard valves are regularly inspected and kept free of leaks and debris?**8.21.20 Is there a means in place to track dredge equipment effectively when deployed?**

State means.

8.21.21 Are remote shut downs of dredge pumps included in the Vessel PMS and are they operating correctly?

State when last tested.

8.21.22 Is the primary means for deploying the dredge equipment/drag head to the sea bed in good working order?

8.21.23 If applicable are all permits and licences onboard in order for the dredger to carry-out operations (i.e., spoils transport etc.)?

8.21.24 Is there a documented process for updating software packages that are integrated into the dredging system?

8.21.25 If applicable, is the vessels fluidization of spoils equipment fully operational and in good order?

State what method they use i.e. water injection.

8.21.26 Are there documented procedures and general safety arrangements in place for personnel during dredging operations?

8.21.27 Is there a policy/procedure in place for pump room access?

8.21.28 Are effective procedures in place addressing the safety of High Pressure operations?

8.21.29 If applicable, are watertight securing arrangements fitted for the hoppers?

8.21.30 If applicable, are suitable measures in place on board the vessel to mitigate the overflow of hoppers?

e.g., free ports.

8.21.31 In the event of main lifting gear failure does the vessel/unit carry spare lifting gear to recover the dredge equipment and return it to service?

8.21.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Cargo Ship

8.22.1 Are the hatches and all associated equipment are included within the vessels PM system?

(SOLAS requirement), these checks should not just be statutory checks but should be set up to be proactive, i.e. regular weekly greasing and inspections leading through to more detailed monthly, annual and 5 yearly checks. The scope of the annual class inspection covers the structural parts of the coamings and the hatch covers, in addition to examination of closing, sealing and securing devices.

Look for any Conditions of Class.

8.22.2 Is regular hydrostatic leak testing carried out and are records available and in good order. Check the last records?

These are generally completed by the ship's crew prior to loading a more sensitive cargo, records should be made in the deck log book.

8.22.3 Is the vessel part of the “fitness for cargo programme”?

This will result in regular ultrasonic testing of the hatches accompanied with a certificate, check the last time it was done and comments. Also check who did the testing i.e. done by a shore based contractor.

Information Note: The ‘Fitness for Cargo Programme’ is designed for Bulk Carriers and General Cargo Carriers. In the programme, the ship is assessed relative to a set of minimum requirements for cargo fitness and safety by review of documents, visual inspection, function testing, and tightness testing. The tightness testing performed in the ‘Fitness for

Cargo Programme' is done by the ultrasonic method, and if the vessel is free of non-compliances, a 'Fitness for Cargo Statement' will be issued.

8.22.4 Are the hatch covers and securing arrangements fully functional and proven to be operational without any defects?

The inspector should ask to see the hatches opened and verify the status of all seals and the operational status of equipment. The following items should be checked:

- *Check for any steel-to-steel contact due to over compression of rubber*
- *Check for missing or damaged rubber gaskets (get these replaced immediately minimum length of replaced gasket should be one metre)*
- *Check retaining channels and compression bars in good condition*
- *Are hatch coaming tops clean, free of debris, and the drainage channels free of any obstructions*
- *Check cleats and wedges in serviceable conditions and correctly adjusted*
- *Are hauling wires and chains adjusted correctly*
- *Are wheels, cleats, hinge pins, haul wires and chain tension equipment well-greased*
- *Check hydraulic oil regularly tested for contamination and deterioration*
- *Is the hydraulic systems oil -tight*
- *Is the oil tank of the hydraulic system filled to the operating level and with the correct oil*
- *Any visible oil leaks*
- *Check hatch cover cleats when the panels are closed.*
- *Check for last chalk test or water test as per maintenance log*

8.22.5 Are the sea fastenings being used on board as per those in the cargo documentation?

Compare the actual sea fastenings in use with those contained in the documentation e.g. cargo securing manual, Loadout manual, etc.

8.22.6 Are the (Lifting equipment) certificate files correct and show that only approved lashings are being used?

8.22.7 Are all temporary sea fastenings and lashings in good physical condition?

Carry out a physical inspection of the sea fastening and verify if the acceptance criteria is defined and being followed.

8.22.8 Are permanent fastenings such as those fitted onto the ship, pad eyes, etc; subject to load testing on a regular basis?

Verify that permanent fittings if used have been surveyed and load tested within the last 12 months. Where appropriate, vessel should be able to provide evidence that the following has been completed;

- *Evaluation of strength and load distribution on deck with respect to the cargo*
- *Evaluation of sea fastening arrangement for the cargo with respect to dynamic loading from vessel movement*

8.22.9 Have the crew been trained in the correct use and fitting of the type of lashings found onboard?

Demonstrated via induction and vessel specific training records.

8.22.10 Have all sea fastening welds been subject to NDT and welds completed by an approved welder?

Inspect NDT records and any approved/coded welder certification.

8.22.11 Do the positions of all fastenings comply with the requirements in the Sea fastening plan?

Count the total number or check them off against those on the sea fastening diagram, any changes have to be subject to further approval, MOC.

8.22.12 Are there procedures for inspecting lashings on a regular basis and are they being followed?

Discuss with onboard crew and verify how often lashings will be checked and what procedure is in place should they require them to be tightened at sea (completed risk assessment and JHA sheets).

8.22.13 Has the deck area been marked to identify areas where cargo must not be loaded?

When loading deck cargoes care should be taken to avoid any obstruction to safety zones, freeing ports/drainage arrangements or doors and hatches.

8.22.14 If fitted, are the cargo hold bilge pumping out arrangements fully functional?

Are there records to indicate regular testing of the cargo hold bilge pumping out arrangements available on board.

8.22.15 If fitted, are non-return valves associated with the cargo hold bilge pumping system fully functional?

Are there records available to indicate regular testing and maintenance of the non-return valves associated with the cargo hold bilge pumping system.

8.22.16 Are records available for the regular sounding of cargo hold bilges and void spaces?**8.22.17 If fitted, is the water ingress detection system fully operational?****8.22.18 If fitted, is the hold firefighting system and associated piping fully operational and maintenance records available on board?****8.22.19 Is the condition of hold bulkheads and framing in a good condition?**

Do a spot check on hold condition, check for general condition, corrosion, condition of framing and any detached frames.

8.22.20 If fitted with cargo deck cranes are deflection records for slewing bearing available on board and are they within manufacturer limits?**8.22.21 Are there procedures for isolating cargo hold bilge systems from engine room bilge systems and vessel ballast systems?****8.22.22 Are there procedures in place for emergency pumping out of hold bilges in an emergency?****8.22.99 Additional Comments**

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Ship Assist Escort Tug

8.23.1 Does the vessel Operator have an adequate replacement policy with valid certificates for the towing line(s) in use?

Replacement policy should be based on Manufacturer's recommendation and periodic onboard line inspections. Independent third party testing results should be used to verify the length of service time.

8.23.2 If using HMPE, is the contact surface for the HMPE tow line clean and sufficiently smooth to avoid damage to tow line?

Contact surface should be clean and smooth with non-abrasive fittings to avoid damage. Surface maintenance should be part of routine inspection program.

8.23.3 Is the vessel's fendering in good condition and suitable for ship assist work?

All chains and hardware used to secure the fenders should be in good condition and the fendering placed in such a way as to avoiding steel to steel contact when working alongside a vessel.

8.23.4 Does the Operator have good visibility of the work area from the vessel's control station?

Operator refers to the vessel master or deck officer who is on watch and handling the vessel.

8.23.5 If there are visibility limitations caused by physical vessel design, are there risk mitigations employed to address them such as radios and talk back devices and are they in good working order?

If visibility is limited are there means such as radios or deck talk-back boxes used to communicate with crew. Inspectors shall ask crew to operate all such devices and note what the visibility restrictions are and how they are addressed by vessel crew.

Inspectors should determine if the vessel has a folding mast and if precautions are being taken to avoid the mast making contact while working alongside a vessel.

8.23.6 Does the operator have a procedure in place covering the use of recessed bitts?

A recessed bit is defined as a bitt inset into the ship's hull above the water line used to connect the tow line. Inspectors should look for a formal procedure that covers working with recessed hull bitts. These bitts usually have reduced SWL that the vessel operator should be aware of. Additionally, they require extra caution for the tug crew when connecting the vessel's line to.

8.23.7 If the vessel has a STAPLE, is the SWL for the staple and the angles of operability known to the vessel master and deck officers?

Inspectors shall list the SWL of the Staple. Staple may also be referred to as the fwd towing staple or towing fair lead.

8.23.8 Are the calculated indirect towing forces available to the Master and deck officers?

Indirect towing is a method used by tug to exert dynamic forces on the tow line substantially beyond its static bollard pull; e.g. using a tug's weight, bulk and underwater surface area or by turning obliquely to a tow line to produce additional forces to stop or turn a ship under way.

8.23.9 Are any operational limitations for towing arrangements (both fwd and aft) available and known to the master and officers?

Inspector to verify that all crew are aware of any limitations when utilising forward and aft towing arrangements

8.23.10 If fitted are the tension monitors calibrated and in good working order?

Inspectors shall sight and record the date of last calibration. Calibration may be a full calibration done during a bollard pull test or, in the case of older models, may be done by setting the tension monitor to zero when there is no tension on the winch.

8.23.11 Is there a document readily available that clearly states vessel stability criteria and limitations and is there evidence to suggest master is familiar with the document?

Interview Master on the topic and identify what document is referred to.

8.23.12 Are the vessel's winch(s) in good working order? List the type, bollard pull and any outstanding deficiencies.

Inspectors shall visibly inspect each winch. Mounting brackets should be in good condition with no obvious cracks or defects. Hydraulic and air hoses shall have all fittings tight and no leaks present. Winch controls should be in good working order with minimal wastage. If a hook is used in lieu of a winch describe details. Winches are to be lubricated per vessel's preventative maintenance schedule.

8.23.13 Is the ship assist winch fitted with an emergency release system and is it regularly tested?

Inspectors shall visibly inspect each emergency release system. Provide details of the last test.

8.23.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Security Escort Vessel**8.24.1 Is the vessel operating within the coastal state's laws and regulations? Does the vessel have documentation showing that it has been registered and approved for security use and covered by a MOU between the Coastal State and Company.**

Letter of Authority from coastal state to provide security services and embark armed guards should be available. Some coastal states set a minimum criteria for a Security Escort Vessel (SEV) and a Certificate of Clearance will be issued prior to deployment as a security vessel.

8.24.2 Has flag state approval been sought for the embarkation of security personnel onboard the vessel?

Letter of Authority from Flag State. Check Private Maritime Security Company (PMSC standard operating procedures and records). If the vessel is not under any security service contract then N/A is applicable with a comment.

8.24.3 Is the vessel capable of performing security tasks?

Is the vessel maintained to its operating specification and does this specification make it suitable for security tasks?

Does the vessel have documentation of the operational capabilities required to conduct security tasks. Specify the maximum speed and endurance of the vessel.

8.24.4 Is the vessel hardened or ballistically protected specifically for security duties?

Is a Vessel Hardening Plan (VHP) available or ships records to indicate additional protection. If necessary (eg: fixed weapon mounts) has this been approved by Class?

8.24.5 Have additional HSSE factors been accounted for when Host Nation Forces or Privately Contracted Security staff join the vessel?

Check the vessels standard operating procedures and safety equipment records. Is safety equipment and PPE (Overalls, Hard Hats, Ear & Eye Protection) issued.

8.24.6 Have the Rules on the use of Force (RUF)/Rules of Engagement (ROE) been documented, discussed with the Master and made available to armed security personnel?

Check Vessel and PMSC standard operating procedures and records. If the armed security personnel are from a coastal state (e.g.: navy) have national rules of engagement been issued.

If the inspector establishes RUF/ROE exist but cannot be disclosed, then N/A is applicable with the comment the RUF/ROE cannot be disclosed.

8.24.7 Is there documented evidence to show how the crew are made aware of their boundaries and jurisdiction in relation to the coastal state's requirements?

Check PMSC standard operating procedures and records. Employing companies may have a requirement to track vessels employed on security duties.

Does the vessel have an active AIS policy and is the master cognisant of laws & regulations of coastal states.

8.24.8 Does the vessel have an Emergency Response Plan to cover security related incidents?

Best Management Practise (BMP), PMSC standard operating procedures and records.

8.24.9 Does the vessel have an Emergency Response Plan to cover non security related incidents or contingencies in the event of a breakdown?

Check PMSC standard operating procedures and records ie: are extra lookouts provided in high risk areas (see BMP West Africa Section 5 Page 16).

8.24.10 Are up to date records including any operating licenses kept on all security related equipment and ancillaries (e.g. weapon mounts, ballistic helmets, body armour, night vision goggles)?

Check PMSC standard operating procedures and records.

8.24.11 Does the vessel have documented records of its maintenance and servicing schedules?

If the question has been covered in the OVIQ then N/A with a comment is applicable.

8.24.12 Does the vessel have records available documenting the training and seafaring competency of its crew?

Check crew records, how often do they changeover / get refresher training. If the question has been covered in the OVIQ then N/A with a comment is applicable.

Lift Boat

8.25.1 Are there sufficient and competent marine crew to operate the lift boat within the environment of the scope of work?

Inspector should check;

1. *Whether there is any limitation on mustering marine qualified personnel to move vessel at short notice.*
2. *liftboat experience including sufficient & competent personnel responsible for Jacking System operation and maintenance.*
3. *sufficient crew to enable 24-hour operation.*

8.25.2 Is a fit for purpose Boat Landing and/or a certified offshore gangway in place?

The crew boat landing shall be fit for purpose for the type of vessel to be used. Notices should be prominently placed at vessel landing area, Gangway, Control Room and in public areas to remind all personnel of operational limitations.

8.25.3 Are all cabins either single, two person or 'shift segregated' to ensure no out of hours disturbances?

Operational procedures should ensure that cross shift cabins are avoided and that there is an effective means of planning who is appointed to each cabin. Procedures should also be in place to ensure that male/female segregation as appropriate.

8.25.4 Are messrooms and common areas, clean and tidy with controls ensuring working gear is not worn?**8.25.5 Are smoke/fire detection systems available in all cabins and common places?**

Verify if alarm/detection systems are tested regularly and if they are included in the Vessel PMS. Inspector to note if there is an alarm control/monitoring panel.

8.25.6 Are public address and audio alarms operational inside the accommodation and common places?

Verify if systems are operational and regularly tested

8.25.7 Are regular fire rounds made by crew in all accommodation and service areas?

This should also include temporary accommodation modules.

8.25.8 Does unit hold a valid IACS Class Certificate?

Lift boats of >300GT shall be classed. If <300 GT, is a vessel integrity program in place? Check if the Class Status Report is current.

Review the Class Status report to determine if there are Conditions of Class that are pending and require immediate attention.

State class notation / certificate is provided.

8.25.9 Are procedures available to control personnel movements between the liftboat and offshore jacket/installation?

Check there is a procedure in place for personnel movements between the liftboat and installations. If applicable, review the procedure to determine if it incorporates safety measures to be taken whilst using a Gangway to prevent personnel falling.

Does the procedure include an inspection protocol for the Gangway?

8.25.10 Is the person in charge for the POB control, trained for their task?

State what training has been provided. E.g.: Offshore POB Management, Offshore Crisis Management, Crowd Management or equivalent.

8.25.11 Is a secondary muster station established in the event of the primary muster station being jeopardised, and are there records for associated drills?

Inspector to record an observation if no secondary muster station is available

8.25.12 Are specific changing rooms with lockers available in order to allow personnel changing work clothes prior entering the accommodation?**8.25.13 If fitted, is the garbage compactor and/or incinerator in good operational condition?****8.25.14 Are the noise level in the accommodation and common areas tested and recorded?**

Check if the company has establish procedures for noise level measurement. Measurements should be carried out for new building & after any major modification to the vessel. Reference: IMO resolution A.468(XII).

8.25.15 Is evidence available that all materials used in the accommodations and common place are fire retardant?

8.25.16 Does the vessel have a ship specific Marine Operations Manual on board?

The Marine Operations Manual as a minimum should include

1. *A broad description of the Liftboat including major dimensions, lightship characteristics – including a lightship weight changes log, General arrangements, Preload capacity, Allowable deck loadings, Description of the propulsion equipment, type and model of the engines and reduction gear, shaft line arrangement, bearings and seals, gear and propeller, Hydrostatic table or curves, Simplified electrical one line diagrams of main power and emergency power systems, Schematic diagrams of the bilge and preload system, Procedure for elevating, preloading, and lowering including preload requirements and maximum draft before elevating, maximum deadweight onboard, before lowering, to not immerse the load line. Loading and KG work sheets, sample calculations for, transit at maximum draft, elevating, preload, elevated, storm survival afloat and elevated. Blank loading forms and instructions for their use are also to be included. Procedures regarding cargo loading and securing, and limitations on height and weight.*
2. *Afloat Condition and details of applicable operational restrictions.*
3. *For all approved modes of operation (sailing/personnel transfer/cargo ops/jacking ops/preload):*
 - i. *Limiting environmental conditions that includes wave height and period, wind velocity, current velocity, minimum air and sea temperatures, soil penetration, air gap, and water depth;*
 - ii. *Design deck loadings, variable load, total elevated load, rated capacities of cranes and elevating systems, and types of helicopters for which the helideck is designed to accommodate;*
 - iii. *Draft or draft range, leg length, leg/footing position and whether buoyant or non-buoyant, disposition of movable equipment such as crane booms, limitations on the usage of cranes, etc.*

8.25.17 Does the marine operations manual clearly define environmental conditions limitations for jacking operations?

Inspectors should review to ensure environmental conditions are clearly defined for significant phases of marine operations including but not limited to:

- *Initial jacking*
- *Preload activities*
- *Emergency jacking*
- *Transitional activity displacement to non-displacement*
- *Open location*
- *Proximate to installation condition*

8.25.18 Are the Master and crew familiar with the contents of the Marine Operations manual?

Inspector to verify crew are;

1. *Aware of the jacking systems and design limitations?*
2. *Aware of actions to take in emergency situations?*
3. *Aware of the Environmental operation limits?*
4. *Familiar with the jacking/preload procedures?*

8.25.19 Do procedures cover actions in the event of an Air lock within the Hydraulic circuit of the Jacking System?

Inspector to note if the procedure has guidelines to involve shore-side management approval before any bleeding or freefall activity is conducted. Inspector to comment whether the crew are familiar with the procedure.

8.25.20 Do procedures cover actions in the event of the pad getting stuck in the seabed?

Inspector to comment whether the crew are familiar with the procedure.

8.25.21 Do unit procedures manage leg strength and integrity and does PMS include legs, jacking system and associated equipment as Safety Critical Elements/Safety Critical Equipment?

Inspector to review the procedures, determine if the legs, pads and jacking system are identified as Safety Critical Elements and how this is translated into the vessel/unit Maintenance System through Planned maintenance and Periodical inspections of legs, spud cans and jacking equipment by vessel, 3rd parties, Original Equipment Manufacturers and Class.

As a minimum the PMS must include the following:

1. *Legs, Leg Pads, Leg Racks and Tower Jacking System Maintenance - the following jacking system components*
2. *Key systems should be maintained in accordance with the OEM recommendations including:*
 - (a) *Fluids.*
 - (b) *Hydraulic piping and hoses.*

- (c) Pump drive shaft assembly.
 - (d) Jacking system controls.
 - (e) Jacking system pressure.
 - (f) Gearbox assembly; and Brakes
 - (g) Bearings.
 - (h) Planetary Gears & Pinions
3. Brakes – automatic holding capability test of the brakes in the event of power failure
 4. Gearboxes and Power-Take-Off (PTO) Systems
 5. Alarms and Indications of Low Hydraulic Oil Level Alarm test indicating a loss in hydraulic oil level in the main jacking system, Motor - overload, over temperature, over voltage, Unit out-of-level (elevated condition), Inclination of the unit.
 6. Directional Control Systems (Hydraulics/Electrical)

8.25.22 Is there a FME(C)A in place for the jacking system?

The FMECA must include but not limited to the following information:

- A description of all the systems associated with the jacking and holding operations of the Liftboat and a functional block diagram showing their interaction with each other.
- All significant failure modes
- Each predictable cause associated with each failure mode
- The method of detecting that the failure has occurred
- The effect of the failure upon the rest of the system's ability to jack the Liftboat, including time effects (i.e., if necessary, time is available for manual intervention)
- An analysis of possible common failure mode.

Review FMEA with the officers onboard the Liftboat to determine their fluency of its contents and with regards to the following: FMECA shall cover the jacking system and holding mechanism with the purpose of demonstrating that a single failure of any component will not cause an uncontrolled descent of the unit.

The FMEA methodology has to ensure that any predictable failure mode that are relevant to the purpose of the FMEA has been considered and is to be sufficiently detailed to cover all systems associated with the jacking and holding operations.

8.25.23 Is there evidence of routine inspection of legs by vessel staff, 3rd party Agencies and Class and has the report been endorsed by class?

Check previous leg inspection reports. There are 2 types of reports for leg inspection, annual and 5 yearly. 3rd party inspected legs and review and endorsed by Classification. When liftboat is at offshore location, inspection company may use ROV. When was this carried out. Check for damage, missing members etc.

Review the inspection report to determine if it was conducted by the OEM or a 3rd Party approved by the OEM. If applicable, check to confirm the approval certificate of the 3rd Party Inspector.

Check and record the date of inspection. Inspection conducted within the last 12 months will be an acceptable date.

Review the inspection report to determine if it comprises and not limited to the following:

- A detailed physical examination of the system components
 - o Electrical
 - o Hydraulic, including oil analysis reports.
 - o Mechanical (all accessible clearances should be taken and compared to OEM tolerances)
 - o Control & Safety Systems (all alarms and shutdowns to be tested)
- Supervise jacking trials under normal operational conditions in the field. OEM records should be used to identify performance deficiencies during jacking trials.
- Review of defect list and failure root cause investigations/recommendations.

8.25.24 Is there evidence of routine inspection of the leg tower by vessel staff, 3rd party Agencies and Class?

Check structural survey report for reference to leg towers. Leg towers are required to be inspected annually and 5 yearly. 3rd party inspected and endorsed by Classification.

Note date of last inspection.

Note date of last DD/UWILD

Inspect leg towers for damage.

8.25.25 Is there evidence of routine inspection of the leg pads by vessel staff, 3rd party agencies and Class?

Check structural survey report for leg pads.

When was this carried out.

Has NDT of weld between the leg and pad connections been carried out? This is conducted during the intermediate and renewal surveys.

Review reports for evidence of damage and repairs carried out to satisfaction of Class.

8.25.26 Are the legs free of evidence of damage/wear/repairs?

Visually inspect available area of legs including rack for wear, corrosion and marine growth.

8.25.27 Are the Jacking motor assemblies in good working order? Is there sufficient redundancy in the minimum number of planetaries required to prevent an uncontrolled descent of the liftboat? Is the Liftboat jacking mechanism designed and constructed with sufficient redundancy so that upon failure of any one component, the system will prevent an uncontrolled descent of the Liftboat?

Inspector to verify the number of jacking motor assemblies per leg, condition of hoses and connections. A note is to be made if any of the jacking motor assemblies are offline.

Review records to determine if there any gearboxes changed or repaired.

Does the company use facilities such as borescope inspections for the gear boxes.

8.25.28 Are jacking motor gearboxes subject to regular inspection and maintenance?

Are jacking gearboxes clearly numbered for maintenance purposes and oil analysis.

Review records of inspection and taking of oil samples. Oils sample records should be subject to analysis for water and metal content

8.25.29 Are the racks free of defects?

Inspector to note condition of the racks.

8.25.30 Is the Liftboat Jacking system incorporated with a suitable safety protection feature at the system controls to prevent uncontrolled jacking operations?

The Liftboat jacking system may incorporate a "dead man" feature at the system controls, which requires a physical force from the operator (through hand and or foot pedal) to be applied to the controls for the system to function. Once the applied force is removed, the vessel's jacking stops. Check to determine if the system is incorporated with a spring-loaded Foot Pedal or hand Toggle Switches.

Inspector to note type of safety feature.

8.25.31 Is lubrication of jacking systems and inspection part of periodical Routine Maintenance?

Inspector to verify if lubrication is carried out periodically between vessel moves when the unit is working on drilling location. Confirm if this is being performed at intervals other than during the vessel move itself.

8.25.32 Are jacking system spare parts considered critical spares, identified as such and stock levels being maintained on-board?

Review spare parts list and determine if minimum stock levels are in place for Jacking system parts on-board/onshore

Review the vessel's requisition data list and check if any critical items that have been requested are pending for a considerable period.

8.25.33 Is there evidence that Leg-To-Tower Clearance/Leg Ovality measurements are made and recorded?

Inspector to check that the Operator gauges clearances between the leg and tower in accordance with the manufacturer's guidelines. The clearances should be compared against the recommended range.

8.25.34 How is leg straightness/deflection measured and monitored during jacking operations?

Inspector to note method used such as laser. Exceeding this limiting value, whilst not necessarily representing a dangerous condition initially, should prompt the liftboat crew to contact the operator onshore support team for expert advice with respect to continuing jacking operations.

Inspector should seek evidence of same in jacking operations records.

8.25.35 Is there an emergency procedure that allows a remote or manual method to release the legs allowing the liftboat to free fall?

Inspector to verify approved procedures are in place to allow emergency lowering of the Liftboat.

Are the Master and other officers familiar with the process?

8.25.36 Is Jacking Control panel in good order?

Inspector to check lamp tests.

Inspector to request Barge Captain/Marine Section Lead to turn on the power to control panel and compare console gauges against visual marking.

8.25.37 Are jacking system parameter indicators such as pressure, temperature, oil levels, functional and available in the bridge and engine room?

Check if the Bridge and Engine room staff are aware of the various limits regarding pressures, oil levels, and temperatures of the various equipment as per OEM guidance.

8.25.38 Is there a system in place for indicating and monitoring leg penetration?

Methodologies of penetration depth include digital leg depth or checking leg markings.

Inspector should make comment on system deployed.

8.25.39 Is there a system in place to detect leg flooding?

Inspector to comment on how this is achieved.

8.25.40 Is there a system in place to detect leg pad flooding?

Inspector to comment on how this is achieved.

8.25.41 Is there a system in place to monitor tilt of the vessel?

Inspector to comment if the system has an alarm function to alert the crew in the event the tilt exceeds acceptable limits.

8.25.42 Are the legs able to be jacked up/down independently and simultaneously?

Inspector to witness and record outcome of the system test.

8.25.43 Is a weather decision matrix in place for both up and down current scenarios?

Check if the Weather Decision Matrix is in use. Review the Weather Decision Matrix to determine if the Deck Officers are fluent on how to use the Matrix.

8.25.44 Is the lift boat equipped with a wind sensor?

Inspector to comment if the wind sensor is offline.

8.25.45 Are punch through and other potential failings of the jack up system part of the emergency drill schedule/Drill Matrix? Are the scenarios adequate?

Review the vessel's Drill Matrix to determine if the schedules are adequate and check records of implementation are in place and up to date.

8.25.46 Are JSAs/RA specific to Liftboat operations in place and available?**8.25.47 How is the deck load capacity measured/calculated?**

Inspector to confirm if there is any reduction in deckload capacity on failure of jacking motor assembly units.

8.25.48 Are survey systems installed with up-to-date field data?**8.25.99 Additional Comments**

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the

Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Mooring

General

9.1.1 Are certificates available for all mooring ropes, wires, chains, shackles, etc.?

Test certificates for mooring lines and associated equipment should be kept in a file clearly indicating the location of each item.

9.1.2 Is there a maintenance system for the mooring equipment on board? Are there records of the inspection and maintenance of mooring ropes, wires and equipment and is there a documented changeout policy in place?

Records should be kept of date placed in use, inspections, and any maintenance. The SMS should have clear instructions on replacement of mooring lines. The changeout policy should be time and condition based

9.1.3 Are there sufficient marine crew to conduct safe mooring operations?

Crewing levels should take into account all mooring scenarios.

9.1.4 Is there a means of communication (primary and backup) to support mooring operations?

For example, UHF, VHF radios, telephones, tannoys, CCTV and talkback?

Mooring procedures

9.2.1 Are alongside (Jetty/Dock) mooring procedures available?

Verify through SMS that procedures exist for mooring operations. Including appropriate risk assessments.

9.2.2 Are mooring lines secured to bitts turned up correctly?

The recommended method of turning up a rope on bitts is to take one or two full turns around the leading post before figure of eighting.

Note: Mooring lines must not be secured to winch warping drums.

9.2.3 Are all powered mooring lines correctly reeled on drums?

A band brake is designed to work in one direction only, so the line must always be reeled correctly onto the drum. Each arrangement should be assessed on a case-by-case basis with reference to the manufacturer's guidance. With lines correctly reeled, tension on the line should be in a direction that causes the free end of the band to be forced towards the fixed end, thereby forcing the two halves of the band together.

9.2.4 If fitted are all powered mooring lines secured on brakes and are the winches out of gear?

Winches should never be left in gear with the mooring winch band brake on. Hydraulic or electric drives can suffer severe damage should the brake render. Mooring drums should always be left disconnected from the winch drive whenever the mooring line is tensioned and the band brake is fully applied.

9.2.5 Have mooring winches undergone periodic brake rendering test and suitably marked?

The Brake Rendering Test (BRT) should be completed at least every 5 years and when completion of major maintenance/repair or replacement of mooring lines with different criteria to that used in previous BRT. The winch should be clearly marked with required torque load/setting and means to adjust brakes to required torque should be available.

9.2.6 Are all mooring lines stowed neatly to minimise tripping hazards and are mooring areas clear and unobstructed?

Mooring ropes should be stowed on a grating away from chemicals and out of direct sunlight.

9.2.7 If the vessel/unit is equipped with fenders for mooring alongside, are they in good condition and properly secured?

Including the fender mooring pennants and pickup arrangements.

Equipment

9.3.1 If fitted, are all mooring winches and foundations in good order?

Winches fully operable, covered by planned maintenance system. Winch guards to be in place.

Check that winch foundations are in a satisfactory condition and that brake linings, drums and pins appear to be in good order.

9.3.2 Are mooring wires and ropes in good order?

Notes: Splicing of ropes is acceptable but reduces the strength of the rope by about 10%. Splices in eyes and for repairs should have a minimum of 5 tucks. Particular attention should be paid to the eyes of mooring wires.

If there are more than three broken wires in any strand, or five in any adjacent strands in a length of wire 10 times the diameter, the damaged part requires removal and the wire re-splicing. There should be a routine for the maintenance of wires and the lubrication of them using a preservative which will effectively penetrate the strands and wires.

9.3.3 If fitted are pedestal fairleads, roller fairleads and other rollers well greased and free to turn and are bitts and chocks free of grooving?

9.3.4 Are appropriate stoppers available and in good condition?

Stoppers to be of a material and size appropriate to the ropes in use.

Anchoring equipment

9.4.1 Are windlasses, anchors, locking bars and cables in a good order condition and operating effectively?

Note: The condition of the locking bars should be checked to ascertain that they function correctly by locking the chain when the vessel/unit is at anchor to prevent the brake having to take the full load of the cable.

9.4.2 If fitted, are spurling pipes normally secured to prevent water ingress?

Spread mooring

9.5.1 Does the vessel/unit have procedures for spread mooring with anchors?

To be available on board and include anchoring over or near to obstructions. Procedures should also include precautions to be taken during active mooring adjustments in adverse weather conditions.

9.5.2 Has an FME(C)A been carried out on spread moored systems?

FMEA should cover the reliability of spread mooring system (winch, power supply, availability of spares) to ensure that unit will move away, without assistance, from working to weather stand-by location whenever required by offshore installation.

9.5.3 Is certification available for mooring chains, wires and ancillaries for each leg?

Vessels equipped to perform spread moorings shall have accurate Chain/wiremaps of all mooring lines including details of all jewellery with certificate numbers marked on chains/wires.

9.5.4 Is there a system for monitoring and recording of mooring line tension and lineout/scope of spread moored systems and are records maintained?

Inspectors shall document if there is a requirement to monitor line tensions and document how line tensions are being monitored e.g. manual logs or electronic recording.

9.5.5 Is there a system for maintenance and calibration of lineout, scope and tension meters and are records maintained?

Inspectors shall check where records of calibration are maintained. It is recommended calibration interval should not exceed 12 months.

9.5.6 Are the controls for local and, if applicable, remote winch/windlass operation in good order?

Are there appropriate procedures in place to demonstrate how the system is operated under emergency conditions i.e. Remote vs local control.

Inspector to verify system has been operated in both local and remote modes and hence demonstrate operational awareness.

9.5.7 Are the emergency stops, if fitted, for winches/windlasses routinely tested and records maintained?

Record the date when the winch/windlass emergency release was last tested.

9.5.8 Is a defined contingency matrix in place to cover weather limits and the cessation of operations for spread moored vessels?

Inspector should check that procedures cover contingency operations and defined criteria to terminate operations.

9.5.9 Are crew familiar with spread mooring contingency plans and emergency operation of mooring equipment?

Inspector to record date of last drill.

Additional Comments**9.99 Additional Comments**

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Communications

General

10.1.1 Are instructions for operating the digital selective calling and satellite communications equipment in an emergency clearly displayed?

10.1.2 Can officers demonstrate a satisfactory understanding of how to operate communications equipment in an emergency?

10.1.3 Has the AIS been programmed with up-to-date voyage information?

10.1.4 Are periodical tests of communications equipment carried out and recorded as required?

The following tests should be carried out:

Daily:

- *the proper functioning of the DSC facilities without radiation of signals;*
- *battery voltage checks;*
- *printers.*

Weekly:

- *the proper function of the DSC facilities by means of a test call when within communication range of a coast station;*
- *where the reserve source of energy is not batteries, the reserve source to be tested.*

Monthly:

- *each Emergency Position Indicating Radio Beacon (EPIRB) to be tested to determine its capability to operate properly using the means provided on the device and without using the satellite system;*
- *each marine search and rescue transponder (SART) using the in-built test facility and checked for security and signs of damage;*
- *the security and condition of all batteries providing a source of energy for any part of the radio installation;*
- *the condition of all aerials and insulators;*
- *each survival craft two-way VHF equipment, on a frequency other than channel 16.*

10.1.5 Is the Radio Log being maintained correctly?

The following should be being recorded:

- *a summary of distress, urgency and safety communications;*
- *important incidents relating to the radio service;*
- *where appropriate, the position of the ship at least once per day;*
- *a summary of the condition of the radio equipment, including its sources of energy;*
- *personnel assigned responsibility for sending a distress alert instructed to operate properly all radio equipment on the ship;*
- *necessary instruction and information on the use of the radio equipment to relevant crew members;*
- *pre-sailing checks to ensure that all equipment is in an efficient working condition;*
- *the results of the testing of the DSC distress and safety radio equipment by means of a test call at least once a week;*
- *the results of the testing of the distress and safety radio equipment by means of a test at least once each day but without radiating any signal;*
- *the on-load and off-load daily test of the batteries;*
- *the results of the weekly hydrometer or load test of the batteries;*
- *the results of the monthly security check of each battery and its connections.*

10.1.6 If applicable, are radio emergency batteries in a satisfactory fully charged condition and the battery log completed up to date?

Where a reserve source of energy consists of rechargeable accumulator batteries, their capacity shall be checked, using an appropriate method, at intervals not exceeding 12 months, when the ship is not at sea. (SOLAS IV/13.6)

10.1.7 Are arrangements in place to ensure the availability of the radio equipment?

Inspector should make a comment if the vessel does not have duplication of equipment and is working to a Shore Based maintenance certificate only as indicated below.

On ships engaged on voyages in sea areas A1 and A2, the radio availability shall be ensured by using such methods as:

- duplication of equipment; or
- shore based maintenance (the requirement on GMDSS vessels to have shore based maintenance does not infer there should necessarily be a contract but that maintenance should be carried out annually by a shore-based i.e. 'expert' organisation); or
- at-sea electronic maintenance capability; or
- a combination of these as may be approved by the Administration. (SOLAS IV/15.6)

On ships engaged on voyages in sea areas A3 and A4, the radio availability shall be ensured by using a combination of at least two of the methods detailed above. (SOLAS IV/15.7)

Equipment

10.2.1 Is the communications equipment in good order?

Notes: The minimum requirements for radio equipment for the vessel/unit should be taken from the Radio Certificate and its attachment Form R or in Form C if the Safety Radio Certificate is combined in the Harmonised Certificate.

10.2.2 Is the satellite EPIRB fitted, armed and labelled correctly and inspected in accordance with the manufacturer's requirements?

The EPIRB shall be:

- capable of transmitting a distress alert through the polar orbiting satellite service operating in the 406 MHz band;"
- installed in an easily accessible position;
- ready to be manually released and capable of being carried by one person into a survival craft;
- capable of floating free if the ship sinks and of being automatically activated when afloat; and
- capable of being activated manually. (SOLAS IV/7.1.6) Satellite EPIRBs shall be annually tested within 3 months before the expiry date, or 3 months before or after the anniversary date, of the Cargo Ship Safety Radio Certificate. The test may be conducted on board the ship or at an approved testing station; and subject to maintenance at intervals not exceeding five years, (SOLAS IV/15.9)

Notes: The vessel/unit's name, the serial number and the maritime mobile services identity (MMSI or 15 Hex ID) should be clearly indicated on the EPIRB.

The inspection of EPIRBs should include:

- inspection of the housing to ensure it is undamaged;
- inspection of the hydrostatic release unit to ensure it is in good order and in date. Releases should be renewed after two years;
- inspection of the lanyard, which should be neatly stowed and not attached to the vessel/unit;
- ensuring that the markings remain clearly decipherable;
- checking the battery to ensure it is in good order and in date. The battery life for most EPIRBs is 5 years;
- carrying out a self test. Most EPIRBs have a self test facility which is usually a spring-loaded switch. When activated a light will indicate that the test circuits are operating correctly and sometimes this will also activate the strobe light. It is recommended that the self test switch be held for no more than 2 flashes of the strobe light, or no longer than 1 minute after the first self-test mode burst transmission. When the self-test is activated on a 406 Mhz EPIRB, the EPIRB is allowed to radiate a single burst which is specially coded so that it is ignored by the COSPAS-SARSAT system.

The EPIRB must never be tested by actual operation. The annual testing of 406 MHz satellite EPIRBs required by SOLAS IV/15.9 requires test equipment capable of performing all the relevant measurements detailed in MSC/Circ 1040.

10.2.3 Is the vessel/unit equipped with sufficient portable radios for use on deck?

Note: Sufficient portable radios should be available to allow communications between the bridge/control rooms and all operational personnel.

10.2.4 Are there documented procedures for the use of communications equipment within 500 m/ safety zones?

Check that intrinsically safe portable radios are available for operations inside a 500 m zone of producing installations. GMDSS radios should not be utilised for this purpose. Best practice is to utilise UHF, where possible.

Additional Comments

10.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Propulsion, power generation and machinery

Policies, procedures and documentation

11.1.1 Is the vessel/unit provided with operator's instructions and documented procedures?

Engineering procedures should include at least the following:

- engine room organisation and operation;
- unmanned machinery space (UMS) operation, when applicable;
- reporting equipment deficiencies;
- engine room emergency preparedness and actions in the event of an emergency;
- ensuring that all essential engine room equipment is available and fully operational;
- planned maintenance;
- the control of spare parts.

11.1.2 Are the duties of the watch-standing officers and ratings clearly defined?

STCW/ISM as applicable.

11.1.3 Is the engine logbook fully maintained?

In compliance with Flag State requirements. The inspector may accept logs in either written or electronic format where flag state permits electronic recording. Hand written logbooks should be entered in ink.

11.1.4 Is the unmanned operation system (E0) for the machinery space fully operational and certified?

11.1.5 If the machinery space is being operated manned, are there sufficient engineers on board?

If the machinery space is certified for unmanned operation, it will be likely that the Safe Manning Certificate will allow a reduced number of engineers to be carried. Ensure that the manning level, if operating manned, is not at that reduced level.

11.1.6 Are the engineers demonstrating knowledge and understanding of the chief engineers standing orders and instructions, and are the standing orders posted and signed by all engineers?

Standing orders should be written by the chief engineer to reflect the specific operator's requirements, as well as his own, particular to the vessel, the trade and the experience of the engineering officers aboard at the time. The orders should be updated and signed by each chief engineer as they join the vessel.

11.1.7 Are there procedures to prevent uncontrolled entry into the engine compartment and machinery spaces?

Is the engine room entrance marked with sign restricting access or is there a system for physical control?

11.1.8 Are there procedures in place to ensure the safety of engineers entering the engine compartment alone?

Check that procedure are in place to inform the bridge before carrying out final evening checks during unattended periods. There should be procedure in place to secure Engine Compartment and Machinery spaces when unattended without compromising safety. On vessels/units where a single engineer maintains a watch, there should be procedures as detailed above to regularly and frequently maintain contact with the bridge or cargo control room, unless a dead man alarm system is fitted.

11.1.9 Are there documented procedures to restart critical equipment?

Written procedures should be readily available within the Engine Compartment and should be specific to the particular vessel/unit in order to identify relevant controls.

11.1.10 Does the operator subscribe to a lubricating and hydraulic oil testing programme and is there a procedure in place to take into account the results?

Report which groups of oils (fuel oil excluded) are subject to testing programme and frequency of testing i.e Main engine lube oils, hydraulic oils, thermal oils.

11.1.11 Is there a system implemented to verify the quality of fuel oil?

This may be covered by onboard testing or laboratory tests. The SMS should give guidance towards testing of fuel oil.

11.1.12 Is there evidence that bunker transfer is done as per operator's procedures and best industry practices?

All bunkering operations should be carefully planned and executed. Records should include receipts for all fuels received. Samples should be drawn. Personnel involved in the bunkering operation onboard should have no other tasks and should remain at their workstations during topping off. This is particularly important when bunkers are being loaded concurrent with cargo operations, so that conflicts of interest for operational personnel are avoided. Planning of bunkering operations should include the following:

- *determining that there is space for the volume of bunkers to be loaded;*
- *the maximum filling volume;*
- *controls for the setting of bunker system valves;*
- *determining loading rates for the start of loading, bulk loading and topping off;*
- *arrangements of bunker tank ventilation;*
- *internal tank overflow arrangements;*
- *verification of gauging system operation and accuracy;*
- *alarm settings on overfill alarm units;*
- *communication with the supplier to establish when bunkering can be undertaken;*
- *method of determining the temperature of the bunkers during loading;*
- *communications procedure for the operation, including emergency stop;*
- *changing over tanks during loading;*
- *containment arrangements and clean-up equipment to be available;*
- *manning requirement to execute the operation safely.*
- *visual monitoring of gauges, hoses, fittings and the sea surface during the transfer*
- *hose checks prior to commencement of transfer*
- *verification of stability condition after bunkering operations*

An MSDS should be received and reviewed for each bunker consignment. It is preferable that a diagram of the fuel oil transfer piping be attached to the plan.

11.1.13 If the vessel use LNG as fuel, are specific procedures and training in place?

For LNG fuelled vessels check that:

- *the required operations and maintenance manual is on board;*
- *personnel have necessary skills for gas bunkering operations;*
- *a plan exists for system maintenance and testing;*
- *the monitoring system is functioning;*
- *high and low pressure alarms are functioning;*
- *gas detection systems have been function tested and records maintained;*
- *emergency drills related to bunkering and LNG storage have been undertaken;*
- *a spill tray is in position in way of bunker manifold to contain any liquid spill;*

11.1.14 Is the dead man alarm system, where fitted, in good order and used as required?

The personnel alarm should automatically give an alarm on the navigating bridge or in the officers' quarters as appropriate, if it is not reset from the machinery spaces in a period satisfactory to the Administration but not exceeding 30 minutes. (IMO International Codes on Alarms and Indicators, 1995. 7.1.1)

Policies, procedures and documentation (barges)

11.2.1 If the machinery space is certified for unmanned operation, is it being operated in that mode?

If the machinery space is certified for unmanned operation but is not being operated in that mode, record an Observation and describe the reason why.

11.2.2 In the case of UMS vessels, are machinery alarms and engineer's alarm systems regularly tested with results recorded?

11.2.3 Is the dead man alarm system, where fitted, in good order and used as required?

The personnel alarm should automatically give an alarm on the navigating bridge or in the officers' quarters as appropriate, if it is not reset from the machinery spaces in a period satisfactory to the Administration but not exceeding 30 minutes. (IMO International Codes on Alarms and Indicators, 1995. 7.1.1)

11.2.4 Has the chief engineer written his own standing orders and are night orders being completed?

Notes: Standing order and night order books should be checked to ascertain that all officers are instructed as to their responsibilities. Standing orders should be written by the chief engineer to reflect the specific operator's requirements, as well as his own, particular to the vessel/unit, the trade and the experience of the engineering officers aboard at the time. It should be updated and signed by each chief engineer as they join the vessel/unit. Night orders should be written as and when they are required to supplement the standing orders.

11.2.5 Have the watch engineers countersigned the chief engineer's standing and night orders as read and understood?

11.2.6 Are there procedures to prevent uncontrolled entry into the engine room?

Notes: Procedures should be in place to ensure that no-one enters the engine compartment alone, for example to carry out final evening checks during unattended periods, without first informing the bridge. Contact should be maintained at predetermined periods. Ratings should not be required to attend the engine room alone during unattended periods.

On vessels/units where a single engineer maintains a watch, there should be procedures as detailed above to regularly and frequently maintain contact with the bridge or cargo control room, unless a dead man alarm system is fitted.

11.2.7 Are there procedures to restart critical equipment?

Note: Written procedures should be readily available within the engine room which should be specific to the particular vessel/unit in order to identify relevant controls.

11.2.8 Are engineers familiar with restart procedures and are records available of exercises and drills?

11.2.9 Does the operator subscribe to a fuel, lubricating and hydraulic oil testing programme, and is there a procedure in place to take into account the results?

Report from which group of oils are subject to testing programme and frequency of testing (i.e. Fuel oils, main engine lube oils, hydraulic oils, thermal oils etc.

Verify the latest lube oil sample analysis is free from deficiencies. Record any deficiencies found.

11.2.10 Is there evidence that bunker transfer is done as per operator's procedures and best industry practices?

Notes: All bunkering operations should be carefully planned and executed.

Records should include receipts for all fuels received. Samples should be drawn. Personnel involved in the bunkering operation onboard should have no other tasks and should remain at their workstations during topping off. This is particularly important when bunkers are being loaded concurrent with cargo operations, so that conflicts of interest for operational personnel are avoided. Planning of bunkering operations should include the following:

- *determining that there is space for the volume of bunkers to be loaded;*
- *the maximum filling volume; Controls for the setting of bunker system valves;*
- *determining loading rates for the start of loading, bulk loading and topping off;*
- *arrangements of bunker tank ventilation;*
- *internal tank overflow arrangements;*
- *verification of gauging system operation and accuracy;*
- *alarm settings on overfill alarm units;*
- *communication with the supplier to establish when bunkering can be undertaken;*
- *method of determining the temperature of the bunkers during loading;*
- *communications procedure for the operation, including emergency stop;*
- *changing over tanks during loading;*
- *containment arrangements and cleanup equipment to be available;*
- *manning requirement to execute the operation safely.*
- *visual monitoring of gauges, hoses, fittings and the sea surface during the transfer*
- *hose checks prior to commencement of transfer*

An MSDS should be received and reviewed for each bunker consignment. It is preferable that a diagram of the fuel oil transfer piping be attached to the plan.

For LNG fuelled vessels check that:

- the required operations and maintenance manual is on board;
- personnel have necessary skills for gas bunkering operations;
- a plan exists for system maintenance and testing;
- the monitoring system is functioning;
- high and low pressure alarms are functioning;
- gas detection systems have been function tested and records maintained;
- emergency drills related to bunkering and LNG storage have been undertaken;
- a spill tray is in position in way of bunker manifold to contain any liquid spill.

Planned maintenance

11.3.1 Is a planned maintenance system in place, being followed and is it up to date?

Notes: Although there is no specific requirement for any particular computer or paper-based planned maintenance system (PMS) to be provided, the Company should establish procedures to ensure that the vessel/unit is maintained in conformity with the provisions of the relevant Regulations and with any additional requirements which may be established by the Company and specified in the ISM Code Section 10.1.

Inspectors must ascertain that a PMS is in place and that it is accurate, up to date, effective and maintained in accordance with the requirements of the ISM Code and the Operator's procedures. Responsible personnel should be able to demonstrate familiarity with the system. The planned maintenance programme should include:

- details of maintenance schedules whether carried out according to running hours or calendar period, or if condition monitoring is used as a substitute;
- details, referenced to equipment manufacturer's instructions or experience, of what maintenance is required;
- historical data on maintenance and repair work which has been carried out;
- spare parts inventory;
- any proposed major repairs or overhauls should have a completion schedule, with spare parts verified as being on board or on order.

11.3.2 Are items of critical equipment identified in the planned maintenance system?

SMS should provide guidance around the classification of critical equipment and these items should be listed in the planned maintenance system. Critical equipment as defined by ISM code.

11.3.3 Is an accurate and up to date inventory of spare parts being maintained?

The spare parts inventory should indicate minimum stock holdings and actual stock holdings.

The Inspector should verify that stock takes are periodically performed.

Are there spare parts for equipment specific to charter/contract obligations identified and carried onboard.

Are there considerations given to the stowage of electronic componentry onboard with specific regard to vibration, humidity, heat etc.

Safety management

11.4.1 Is an engineer's call alarm fitted and is it in good order and tested regularly and the results recorded?

11.4.2 Are emergency escape routes clearly marked, unobstructed and lit?

Escape hatches should not have the means for external locking that cannot be released internally.

Check that emergency escapes from the E/R are clean, dry, well maintained, unobstructed, well lit and clearly marked.

11.4.3 Is the level of lighting in all areas of the machinery spaces satisfactory and are the lights covered?

Also ensure all lights in the engine compartment and machinery spaces are covered.

11.4.4 Are vessel/unit's engine/boiler exhausts fitted with spark arresters or are other means (e.g., built-in silencer) in place for safe operation?

Offshore Support Vessels should have engine exhaust outlets located as high as is practicable above the deck and are to be fitted with Spark Arresters (or other means like silencer or wet exhaust) to avoid sparks from funnel. Procedures should be in place for regular checking and cleaning of spark arresters, if fitted, from accumulated soot.

Where the vessel is not fitted with spark arrestors or other means to avoid sparks, is this clearly known, stated and managed through procedural process and operational limitations.

Check if all engines mounted onboard, including on deck, and may be running alongside an offshore installation, are equipped with spark arrestors or other means like silencer or wet exhaust. Where the vessel is not fitted with spark arrestors is this clearly known, stated and managed through procedural process and operational limitations.

11.4.5 Do records indicate the regular testing of emergency equipment?

Notes: Emergency equipment will include, where fitted, the, emergency air compressor, emergency generator, emergency generator switchboard, emergency steering, quick closing valves, emergency stops, engineers alarms and bilge ejectors.

Testing of the emergency generator should be carried out under load, but to do this may require the vessel to be blacked out. This testing is not to be conducted during the inspection.

Inspectors must establish that the operator has a requirement for this test and determine from records that it is carried out at least annually. Where fitted, the emergency air compressor should be regularly tested to the starting pressure of the diesel generator. The emergency air reservoir should be permanently maintained at the required pressure.

Check individual training records to verify that training is carried out for the above emergency equipment.

11.4.6 Are machinery emergency stops and shut offs clearly marked and do records indicate that they have been regularly tested?

Note: Emergency stops include ventilation fans, fuel pumps and the quick closing valves for fuel and lubricating oil tanks. (Not to include drilling related equipment)

11.4.7 Are diesel engine fuel delivery pipes adequately jacketed or screened, exhaust lines and hot surfaces protected from spray and surrounding areas free from fuel or lube oil leakage?

External high-pressure fuel delivery lines between the high-pressure fuel pumps and fuel injectors shall be protected with a jacketed piping system capable of containing fuel from a high-pressure line failure. A jacketed pipe incorporates an outer pipe into which the high-pressure fuel pipe is placed, forming a permanent assembly. The jacketed piping system shall include a means for collection of leakage and arrangements shall be provided for an alarm in the event of a fuel line failure. (SOLAS II/4.2.2.5.2)

Surfaces with temperatures above 220°C which may be impinged as a result of a leak from an oil system failure shall be properly insulated. (SOLAS II-2/4.2.2.6.1)

Precautions shall be taken to prevent any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces. (SOLAS II-2/4.2.2.6.2)

Lagging and insulation should be in good condition and free from oil.

11.4.8 Are fuel and lubricating oil handling areas, including purifier rooms, if applicable, ventilated and clean?

Note: A significant number of major incidents occur as a result of engine room fires. It is of particular importance that purifier rooms and oil handling areas are maintained in a clean condition.

11.4.9 Are main engine bearing temperature monitors, or the crankcase oil mist detector, in good order?

Internal combustion engines of 2,250 KW and above or having cylinders of more than 300 mm bore shall be provided with crankcase oil mist detectors, or engine bearing temperature monitors, or equivalent devices. (SOLAS II-1/47.2)

Note: Testing of the detector alarm can be carried out either electronically or by removing a cover and blocking the sensor path.

11.4.10 Where hydraulic aggregate pumps (hydraulic power units -HP/Hydraulic Power Packs-HPP) are located within the main engine compartment, is an oil mist detector fitted?

Note: In vessels/units fitted with hydraulic pressure packs, pressure in the transmission pipes can be very high. If the aggregate pumps are located within the engine compartment it is advisable that an oil mist detector be fitted.

Where the aggregate pumps are located within a dedicated, fully segregated compartment within the main engine compartment, the question should be answered N/A.

11.4.11 Are the main switchboard, alternators and other electrical equipment satisfactorily protected from water spray?

If the main switchboard is not located in the engine control room or other protected location, record in Other comments, the measures that have been taken to protect it from water spray.

Note: Risk due to water spray in the event of failure of sea water pipes, including fire mains and hydrants, should be assessed.

11.4.12 Is deck insulation provided to the front and rear of medium power (i.e. 220V to 1000V) electrical switchboards and is it in a satisfactory condition?

Where necessary non-conducting mats or gratings shall be provided at the front and rear of the switchboard. (SOLAS II-1/45. 2)

Non-conducting deck coverings, such as non-conducting mats or gratings, suitable for the specific switchboard voltage should be installed for personnel protection at the front and rear of the switchboard and should extend the entire length of and be of sufficient width to suit, the operating space. (USCG 46 CFR 111.30-11)

Notes: The USCG requirements apply to switchboards exceeding 250 volts. Some decks are made from insulating composite material and will not need extra insulation.

11.4.13 For vessel equipped with hybrid power solutions including energy storage systems (ESS), is the battery room dry, ventilated and clear of any indications from seawater ingress?**11.4.14 If fitted, are gauge glass closing devices on oil tanks of a self-closing, fail-safe type and not inhibited?****11.4.15 If fitted, are self-closing sounding devices to double bottom tanks in good order, closed and capped?****11.4.16 Are all items of moving machinery which may present a hazard provided with guards?**

Grinders, air compressor belt drives, vent fans, lathe, drill press etc.

11.4.17 Are workshop machine tools in a safe condition and is eye protection available?**11.4.18 Is all loose gear in the machinery spaces, stores and steering compartment properly secured?****11.4.19 Are machinery spaces and steering compartments (where applicable) clean and free from obvious leaks and is the overall standard of housekeeping and lagging maintenance satisfactory?**

Note: Machinery on deck, Workshops, compressor rooms, chemical stores, spare gear stores, electricians store/workshop should be checked. Safety notices and signs appropriate to the specific compartments should be posted.

11.4.20 Are all tripping hazards identified and managed?

Inspector should check overall tripping hazard management in the machinery spaces including if any loose gratings / plates.

11.4.21 Are bilge systems operational and bilges free of oil, rubbish and sediment?

Note: Oily areas indicate a lack of maintenance and cleanliness. However, a small amount of oil in savealls should not be considered unsatisfactory.

11.4.22 Are bilge high level alarm systems regularly tested and are records maintained?

Note: Inspectors should consider requesting that this critical alarm be tested in their presence. It should be borne in mind that most bilge alarms are fitted with time delays.

11.4.23 Are seawater pumps, sea chests and associated pipework in a satisfactory condition and free of hard rust and temporary repairs, particularly outboard of the ship-side valves?

Look for divers inspection records of sea chest strainers as well as PMS records of strainers being changed/inspected.

Check over boards and sea chest for back flushing lines and any records of back flushing sea chests.

Is there an 'exercise' program for the sea valves and how is the seal integrity assured?

The condition of sea chests, sea water lines, storm valves and hull penetrations should be carefully checked to ensure that they are in good condition.

Evidence of hard rust or deterioration should be recorded as an Observation.

11.4.24 Are valves and pipework marked or colour coded?

Machinery status

11.5.1 Are all items of main, auxiliary and emergency plant in good order and reported to be fully operational?

Items of machinery may include:

- *the main engine(s);*
- *auxiliary engines and generators;*
- *waste heat units;*
- *compressors, including main, instrument and emergency air compressors;*
- *purifiers and fuel oil handling equipment;*
- *sewage plant;*
- *bilge pumping arrangements and oily water separators;*
- *pipework, including steam, fuel, lubricating oil, seawater, sewage, drain and air pipes, etc;*
- *refrigeration and air conditioning machinery;*
- *hydraulic aggregate pumps;*
- *ventilation fans and trunking;*
- *stern tube and thruster sealing arrangements;*
- *burner, tubes, uptakes, exhaust manifolds and spark arrestors.*

11.5.2 If applicable is the Engine Room local Engine control station in good order and are engineers familiar with the procedure for taking control from the bridge in an emergency?

Procedures should be readily available for this method of operation and tested as per Operators SMS.

11.5.3 For vessel equipped with hybrid power solutions including energy storage systems (ESS), is the system fully operational without any warnings on the ESS monitoring system?

Reference: Norwegian Maritime Authority RSV 4 - 2022 CASE NUMBER: 2021/166378

11.5.4 Are concise starting instructions for the emergency generator, where fitted, clearly displayed?

Each emergency generating set arranged to be automatically started shall be equipped with starting devices approved by the Administration with a stored energy capability of at least three consecutive starts. A second source of energy shall be provided for an additional three starts within 30 minutes unless manual starting can be demonstrated to be effective. (SOLAS II-1/44.2)

Notes: These instructions are not for the use of the qualified engineering personnel, but for others who might be required to start the generator in an emergency. Where the emergency generator cannot be effectively started manually and the starting source relies on a single starter motor, then an alternative means of applying the "charge", such as a duplicate starting system or spare starter motor, should be available.

11.5.5 Where applicable, is the emergency generator fuel tank provided with sufficient fuel?

The generator should be capable of providing full load requirements for at least 18 hours. (SOLAS II-1/43.2)

Notes: This may not necessarily mean a full tank. A minimum quantity to provide sufficient fuel for this requirement should have been established. If necessary, the emergency generator fuel tank should be charged with fuel designed for use in sub-zero temperatures.

Every oil fuel pipe, which, if damaged, would allow oil to escape from a storage, settling or daily service tank situated above the double bottom, shall be fitted with a cock or valve directly on the tank capable of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such tanks are situated. (SOLAS 74 II-2/15.2.5)

Oil fuel pipes, which if damaged would allow oil to escape from a storage, settling or daily service tank having a capacity of 500 litres and above situated above the double bottom, shall be fitted with a cock or valve directly on the tank capable

of being closed from a safe position outside the space concerned in the event of a fire occurring in the space in which such the tanks are situated. (SOLAS 2004 II-2/4.2.2.3.4)

The controls for remote operation of the valve for the emergency generator fuel tank shall be in a separate location from the controls for remote operation of other valves for tanks located in machinery spaces. (SOLAS 2004 II-2/4.2.2.3.4)

11.5.6 Where an emergency generator is not fitted, are engine room emergency batteries in good order and fully charged?

The emergency batteries must supply the designed power load for up to 18 hours.

Check battery test/inspection records.

11.5.7 Is all electrical equipment including junction boxes and cable runs in good order?

11.5.8 Are switchboards free of significant earth faults?

Class rules require a minimum insulation resistance of 1 megaohm (1 million ohms).

Emergency steering

11.6.1 If applicable is the steering gear/steering compartment(s) free from defects?

Refer to 11.4.21 for recording housekeeping observations.

11.6.2 If applicable are emergency steering changeover procedures clearly displayed locally and in the wheelhouse?

11.6.3 If applicable are officers familiar with the operation of the steering arrangement in the emergency mode?

All ship's officers concerned with the operation and/or the maintenance of steering gear shall be familiar with the operation of the steering systems and with the procedures for changing from one system to another. (SOLAS V/26.3.2)

Note: The opportunity should be taken if possible to request that an officer demonstrates the operation of the emergency steering arrangement.

Inspector to consider type and method of steering when answering this question. For azimuth drive vessels, clear and concise operating instructions should be provided for the effective and controlled operation of azimuths regarding heading.

11.6.4 If applicable, is the steering gear emergency reserve tank fully charged?

For conventional steering gear: A fixed storage tank shall be provided having sufficient capacity to recharge at least one power actuating system including the reservoir. (SOLAS II-1/29.12.3)

Note: This may not necessarily mean a full tank. A minimum level to comply with these requirements should have been established.

11.6.5 If applicable are the arrangements for the provision of heading information adequate?

Ships with emergency steering positions shall at least be provided with a telephone or other means of communication for relaying heading information to such positions. (SOLAS 1974 V/12(f) and SOLAS 2004 V/19.2.1.9)

In addition, ships of 500 GT and upwards constructed after 1st February 1992 shall be provided with arrangements for supplying visual compass readings to the emergency steering position. (SOLAS 74 V/12(f) and SOLAS 2004 V/19.2.5.2)

11.6.6 If applicable are communication arrangements with the bridge satisfactory?

Check that the arrangements take into account noise levels within the space.

11.6.7 If applicable is there a means for indicating the rudder angle or thruster direction at the emergency steering position?

Thrusters include azimuth thrusters and water jets.

11.6.8 If applicable is access to the emergency steering controls unobstructed?

11.6.9 If applicable in steering compartments, are suitable handrails, gratings or other non-slip surfaces provided?

The steering gear compartment shall be provided with suitable arrangements to ensure working access to steering gear machinery and controls. These arrangements shall include handrails and gratings or other non-slip surfaces to ensure suitable working conditions in the event of hydraulic fluid leakage.

Additional Comments

11.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

General appearance and condition

Hull, superstructure and external weather decks

12.1.1 Is the general condition, visual appearance and cleanliness of the hull satisfactory?

Is the hull free of oil staining, extensive coating breakdown or excessive marine growth?

12.1.2 Is all loose gear on deck, in stores and in internal spaces properly secured?

Ensure escape routes and emergency exits are clear and available to use.

12.1.3 Are hull markings clearly indicated and correctly placed?

The ship's identification number shall be permanently marked:

- *in a visible place either on the stern of the ship or on either side of the hull, amidships port and starboard, above the deepest assigned load line or either side of the superstructure, port and starboard or on the front of the superstructure. The permanent marking shall be plainly visible, clear of any other markings on the hull and shall be painted in a contrasting colour. (SOLAS XI-1/3.5.1).*

The following should also be clearly indicated, where applicable:

- *the vessel/unit's name;*
- *loadlines;*
- *draft marks;*
- *thruster warnings;*
- *tug push points.*

12.1.4 Is the general condition, visual appearance and cleanliness of the external decks satisfactory including non-slip surfaces in working areas and access routes?

12.1.5 Does the structure include arrangements designed to minimise hazards associated with falls from heights?

e.g. rails, platforms, back-scratchers

12.1.6 Is the general condition of service pipework satisfactory and is it free from significant corrosion and pitting and soft patches or other temporary repairs?

Notes: The following deck pipework, should be examined, particularly on the underside, for external indications of corrosion and for patching or accelerated wear caused by rope abrasion:

- *hydraulic and pneumatic pipework;*
- *fire mains and associated fittings;*
- *compressed air lines;*
- *bulk cargo lines.*

Pipe securing arrangements should be intact and permit free movement of the pipes as necessary. Check the condition of pipe stands, clamps, supports and expansion arrangements?

12.1.7 Is all powered deck machinery (including mooring winches and deck cranes), free from obvious oil leaks?

Check that save-alls/driptrays are free from oil residues.

12.1.8 Are all deck openings (including watertight doors, weathertight doors and portholes), in a satisfactory condition and capable of being properly secured?

Are all watertight doors operating correctly, with seals in good condition?

Doors which are normally closed at sea, but are not provided with means of remote closure, should have notices fixed to both sides of the doors stating: "To be kept closed at sea". Doors which should be permanently closed at sea should have notices fixed to both sides stating: "Not to be opened at sea".

12.1.9 Are there documented procedures for the operation of powered watertight doors which require doors to be left in the normally closed position?

All personnel should have received instruction in the operation. Signs giving operating instructions should be posted on either side of the doorway.

12.1.10 Are records available to demonstrate that all personnel has received training / induction related to powered watertight door operation?

Inspector to check records of induction / training.

12.1.11 Are all watertight doors included in the planned maintenance system?

This includes powered and non-powered watertight doors.

12.1.12 If fitted are all watertight door position indicators operating correctly?

Indicators should be available at remote operating and control stations.

12.1.13 Are all cable transits and bulkhead penetrations correctly assembled?

Are there any open penetrations; or penetrations that appear to have been altered; or penetrations with packing that appears disturbed or insufficient? If the vessel/unit is DP3, cable transits should be double-glanded.

12.1.14 Is a programme in place that covers the periodic inspection of all tanks, void spaces, chain lockers and cofferdams, and their coatings?

e.g. bulk cargo tanks, bulk powder silos and tanks for cargo fresh water, drill water, mud, brine, fuel, Ballast, NLS and methanol.

12.1.15 Are fuel, ballast and other space vents and air pipes in a satisfactory condition, marked to indicate the spaces they serve and does visual evidence indicate regular maintenance?

Note: Vent heads should be regularly dismantled to prove that flame screens, where fitted are clean and in a satisfactory condition and that the closing device which prevents the ingress of water is also in good condition and operating correctly.

12.1.16 Is the general condition, visual appearance and cleanliness of the superstructure satisfactory?

Electrical equipment

12.2.1 Is deck lighting adequate?

Note: The level of deck lighting should be adequate to allow for:

- safe access to the various areas;
- the safe use of mooring equipment;
- monitoring of the deck area;
- monitoring of all deck areas and the adjacent surrounding areas to prevent unauthorised access.

12.2.2 Is the general condition of electrical equipment, including light fittings, conduits and wiring, satisfactory?

Internal spaces

12.3.1 Are internal spaces and storerooms clean and tidy?

Confirm company procedures address all issues, including segregation of area from work dress to rest/recreational dress; appropriate provision of toilet facilities; linen changes weekly or better; and that good health and hygiene practices are publicised and enforced.

12.3.2 Are the forecandle space, rope stores and after stores free of water?

Accommodation Areas

12.4.1 Is the accommodation clean and tidy?

Free of animal/insect infestation? Check procedures are in place to manage infestations?

Inspector should review cleaning schedule and log.

12.4.2 Are alleyways free of obstructions and exits clearly marked?

Marked with luminous strip indicators/lighting/signage.

12.4.3 Are public spaces, including smoke rooms, mess rooms, sanitary areas, food storerooms, food handling spaces, refrigerated spaces, galleys and pantries clean, tidy and in a hygienically satisfactory condition?

Notes: Unburned fuel or fatty deposits in galley ranges, within flue pipes and in the filters of galley extraction fans can cause fire and must be maintained in a clean condition. Oil and deep fat fryers should be fitted with thermostats to cut off the electrical power and prevent overheating and be fitted with suitable covers.

12.4.4 Are laundries and drying rooms free of accumulations of flammable materials that could constitute a fire hazard?

Dryers to be free from excessive lint build up.

12.4.5 Is the level of accommodation lighting satisfactory?

Check whether a lighting survey has been undertaken and randomly test emergency lights.

12.4.6 Is the condition of electrical equipment in the accommodation satisfactory?

No accommodation space or jury rigged electrical appliances or overloaded sockets.

12.4.7 Are personnel alarms in refrigerated spaces in good order and regularly tested?

State frequency of testing (e.g. monthly).

12.4.8 Do the food storage areas appear to be kept in good order?

Dry food kept > 6 inches from deck. Stored away from direct sunlight. No obvious signs of pest infestation. Sufficient lighting and ventilation. Evidence of regular cleaning/inspection.

12.4.9 Are food handlers wearing correct clothing?

Aprons should be worn in food preparation area, non-slip safety shoes and hair nets/restraints should be worn. Food handlers should be in clean clothing (Ref: OGP Report 397)

12.4.10 Are fridge, freezer and dry store areas being maintained at suitable temperature?

Fridge (less than 5°C), Freezer (less than -18°C), Dry Store (around 10°C). Temperatures should be checked and recorded daily. If defrosting is not an automatic process, equipment should be defrosted regularly to maintain its efficiency. (Ref: OGP Report 397)

12.4.11 Are tests undertaken of the potable water system and is regular maintenance carried out and recorded for both domestic and supplied potable water?

Check that documented procedures are in place and records are maintained. May include UV treatment and/or super chlorination. If there is evidence and a policy in place for Drinking water and cooking water to be supplied by Bottled water, and that all other water tanks come from a municipal supply then this question should be answered NA.

Additional Comments

12.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Ice operations

General

13.1.1 Is the vessel classed/certified for Ice operations or have a valid winterisation certificate?

State Certifying authority and type notation.

13.1.2 Are procedures available for operations in ice?

Verify that procedures for operating in ice are available that will typically include the following information:

- Risk management and risk mitigation measures when preparing for and operating in ice
- Principal particulars of the vessel
- Operating limitations of the vessel, if applicable, based on the ice classification
- Maximum load condition and distribution and stability criteria
- Contingency Plans and evacuation procedures
- Spill response procedures
- Procedures for checking hull integrity
- Procedures for passage assisted by an ice breaker or in ice convoy
- Procedures for towing operations in ice
- Guidance on passage planning
- Guidance on operating machinery and systems
- Guidance on manning e.g. bridge watchkeeping requirements
- Personnel safety while working in snow/ice conditions
- Deicing tools and procedures.
- Protection and safe operations of LSA and FFA
- Protection and safe operation of critical equipment
- Safe operation of vents and hatches
- Handling of ballast and potable water.

13.1.3 Does the vessel/unit's stability booklet take into consideration the effects of ice accretion?

13.1.4 If applicable, are ICE Class draft marks clearly marked and understood and is there evidence of compliance?

Winterisation

13.2.1 Is the vessel/unit provided with anti-icing and de-icing equipment and/or heat tracing and are these systems in good order?

De-icing equipment includes steam generators, steam hosing, hot water. Pumps used for de-icing should be provided with redundant arrangements. Manual equipment should also be available such as mallets, shovels, axes or even a snow blower. Storage of de-icing equipment should be easily accessible and if in exterior compartments protected from freezing.

Anti-icing methods may include covers with or without heating, electric trace wiring, heating coils, steam generators, ice repellent coatings or self draining piping.

13.2.2 Is all mooring and anchoring equipment protected?

Winches, wires and ropes should have canvas covers to stop ice accretion. The clutches and engaging gears of winches should be well protected by substantial coatings of grease.

13.2.3 Is ancillary deck machinery, including cranes, protected?

Procedures for checking on sheave icing.

13.2.4 Are all fluid systems (e.g. fire main, fresh water lines) that are prone to freezing capable of being fully drained?

Care should be exercised in the design of such systems to avoid fluid traps and to ensure that drain plugs are fitted and readily accessible.

Check that procedures are in place to readily return drained systems to operating status.

13.2.5 Are there supplies of salt/sand on board to spread on walkways/gangways?

Needed to protect crew from slips and falls on icy deck.

HSE and safety equipment

13.3.1 Are adequate supplies of protective clothing and thermal insulating materials provided for all persons on board?

Adequate thermal protection shall be provided for all persons on board, taking into account the intended voyage, the anticipated weather conditions (cold and wind) And the potential for immersion in Polar water. This should include appropriate gloves/mittens, cold weather coveralls, head protection to reduce loss of body heat, safety glasses that are tinted for protection from sun & ice reflection, foot protection which is slip-resistant and insulated.

13.3.2 Are appropriate immersion suits provided for all personnel on board?

Immersion suits should be insulated for Artic use.

13.3.3 Are all means of escape from the accommodation or interior working spaces free from being rendered inoperable by ice accretion or by malfunction due to low external ambient air temperatures?

Are hatches and doors designed to be operated by personnel wearing heavy winter clothing including thick mittens?

Ships shall have means to ensure safe evacuation of persons, including safe deployment of survival equipment directly onto ice. When this is achieved by means of adding devices requiring a source of power this source shall be able to operate independently of the ship's main source of power.

13.3.4 Are all escape routes built to dimensions to allow for persons wearing suitable protective clothing to pass unhindered?

13.3.5 Is the temperature rating of the liferafts consistent with the minimum temperature the vessel/unit is capable of operating in?

Life rafts need to be able to be launched in cold conditions. Release mechanisms should be heat traced or assured of operation down to min temp the vessel is operating in.

13.3.6 Are the lifeboats and quick release gear suitable for the extremes of temperature that the vessel/unit is capable of operating in?

Lifeboats should be enclosed and heated.

13.3.7 Are survival craft engines equipped with means to ensure the engines start readily when required at the minimum anticipated operating temperature and have fuel suitable for use at the anticipated operating temperature?

Lifesaving appliances and associated equipment shall take account of the potential of operation in long periods of darkness, taking into account the intended voyage.

For ships intended to operate in extended periods of darkness searchlights suitable for continuous use to facilitate identification of ice shall be provided for each lifeboat.

13.3.8 Are fire extinguishing systems designed and located so that they are not made inaccessible or inoperable by ice or snow accumulation or low temperature?

Precautions should be taken to prevent nozzles, piping and valves of any fire-extinguishing system from becoming clogged by impurities, corrosion or ice build-up. Portable and semi-portable extinguishers and firefighter's outfits shall be located in positions protected from freezing temperatures as far as practical. Locations subject to freezing are to be provided with extinguishers capable of operating under the Polar Service temperature.

Unprotected water and foam extinguishers are rated for safe operations to +1C. If protected with ethylene glycol they are rate downward to -10C; if the additive "Kerrol" or equivalent is used they are rated for use down to -20C.

13.3.9 Are fire hydrants and isolating valves for the fire mains accessible and, if exposed to the weather, protected from freezing spray and icing?

13.3.10 Are the closing apparatus for ventilation inlets and outlets designed and located to protect from ice or snow accumulation that could interfere with the effective closure of such systems?

Crew experience

13.4.1 Do documented procedures require the crew to receive familiarisation training prior to operations in severe sub-zero temperatures?

13.4.2 Are ice operating and training manuals available onboard including documented procedures in place detailing operations with ice breakers?

13.4.3 Does the vessel have a minimum of at least one Ice Navigator?

Ice Navigator is an individual that is in addition to being qualified under the STCW Convention, is specially trained and otherwise qualified to direct the movement of a ship in ice-covered waters. This should include documented evidence of having completed on the job training and may include simulation training.

IMO recommends at least one be on board when operating in Polar Waters. OCIMF briefing paper for sub-zero regions recommends 4 years of ice experience at a minimum.

Bridge equipment

13.5.1 Does the vessel have sufficient heated wheelhouse windows?

In cold weather need to be able to prevent build up of ice on windows.

13.5.2 Are the bridge windows fitted with sun screens or protection from the glare of the sun?

13.5.3 Are bridge wings enclosed or protected to facilitate watchkeeping and conning?

State whether bridge wings are enclosed or protected.

13.5.4 Does the vessel have searchlights that are suitable for operation in ice and snow?

Searchlights need to be powerful enough to observe ice around the vessel/unit.

13.5.5 Does the vessel have an operational ice radar?

Ice radar is a 3 cm radar with software that processes the image so that the ice is displayed with higher definition.

13.5.6 Does the vessel have equipment for receiving ice data?

Vessel should have INMARSAT equipment capable to receive ice charts. Check that the vessel is capable of receiving NAVAREAS/METAREAS 17-21 via INMARSAT

Hull, machinery and engine room

13.6.1 Are there alternative sea chests designed for use under differing drafts or operations in ice?

Ensure vessel sea chest configuration will allow for adequate cooling water when operating in ice, particularly preventing blockage of cooling water by brash or slush ice.

13.6.2 Are all sea chests provided with steam heating and back flushing to deal with blockages/ice slurry?

Sea chests should incorporate a back flush arrangement (inclusive of re-circ of hot water) or similar to deal with blockages/ice slurry.

13.6.3 Is there a back up heating system or protective measures in all areas that contain essential equipment or systems required for the safe operation of the vessel?

Upon failure of the primary heating system there should either be an independent heat source or the equipment should be fabricated from materials that will not make it susceptible to brittle fractures under the anticipated loads and temperatures.

13.6.4 Are the emergency batteries for communications equipment and those stored in deck boxes properly stored, secured and protected from freezing conditions?

Emergency batteries should be protected from extreme low temperatures and they should be secured so that they do not have excessive movement caused during ice-transiting operations.

Vents to battery lockers should be designed so that ventilation is not restricted by the accumulation of ice or snow.

13.6.5 Does the vessel/unit have a means of preventing ballast, potable water and drill fluids from freezing?

This may include heating coils in ballast tanks, bubblers, or location away from exposure to extreme cold.

13.6.6 Can vessel ensure bunkers are kept at a suitable temperature at all times?

This may include the ability to heat bunkers or configuration of bunker tanks such that they are not exposed to extreme cold.

13.6.7 Do engineering documented procedures clearly define the diesel oil specification for use in sub zero environment?

13.6.8 Are main machinery air intakes protected from clogging by snow/ice?

Machinery installations and associated equipment shall be protected against the effect of ice accretion and/or snow accumulation, ice ingestion from sea water, freezing and increased viscosity of liquids, seawater intake temperature and snow/ingestion.

13.6.9 Are means provided to ensure that combustion air for internal combustion engines driving essential machinery is maintained at a temperature in compliance with the criteria provided by the engine manufacturer?

Polar Code

13.7.1 Does the Vessel have a valid Polar Ship Certificate?

State certifying authority and date of certificate.

- *Record Polar Service temperature.*
- *Record Operational Limitations*
- *Record Maximum Expected Time of Rescue Operational Limitations*
- *Record Ice Condition limitations.*
- *Record Temperature limitations*
- *Record High Latitudes limitations*

13.7.2 Is a Polar Water Operational Manual available? If so, state who has approved it on behalf of the Flag State.

Confirm that the PWOM contains information on the following:

- *Procedures to be followed in normal operations in order to avoid encountering conditions that exceed the ship's capabilities.*
- *Specific procedures to be followed in the event of an incident in Polar Waters.*
- *Procedures to be followed in the event that conditions are encountered which exceed the ship's specific capabilities and limitations.*
- *Procedures to be followed when using icebreaker assistance.*
- *Details of the methodology used to determine capabilities and limitations in ice (i.e. Polaris or similar system). Risk based procedures for:*
- *Voyage planning to avoid ice and/or temperatures that exceed the ship's design capabilities or limitations.*
- *Forecasting arrangements*
- *Limitations of hydrographic, meteorological and navigational information available.*
- *Maintaining equipment systems and functionality under low temperatures, topside icing and the presence of sea ice.*
- *Contacting emergency response providers.*
- *Maintaining life support and ship integrity in the event of prolonged entrapment by ice (applicable for ice strengthened vessels).*
- *Maximum load condition and distribution and stability criteria.*

13.7.3 Check that Stability book addresses the following

The following ice allowances should be taken into account in the stability calculations:

- *30kg/m² on exposed weather decks and gangways*
- *7.5kg/m² for the projected lateral area of each side of the ship above the waterplane*
- *The projected lateral area of discontinuous surfaces of rail, sundry booms, spars and rigging shall be computed by increasing the total projected area of continuous surfaces by 5% and the static moments of this area by 10%.*

- *Ships of Cat A and B constructed on or after 1/1/17 shall be able to withstand flooding resulting from hull penetration due to ice impact. The residual stability following ice damage shall be such that the factor S_i is equal to one.*

Damage assumed when demonstrating compliance shall be such that:

- *longitudinal extent is 4.5% of upper ice waterline length if centred forward and of the maximum breadth on the upper ice waterline, and 1.5% of upper ice waterline length otherwise Transverse penetration damage is 760mm*
- *Vertical extent is the lesser of 20% of the upper ice waterline draft or the longitudinal extent, and shall be assumed at any vertical position between the keel and 120% of the upper ice waterline draft.*

13.7.4 Are resources provided to support survival following abandoning of the ship, whether to ice or land, for the maximum expected time of rescue in the form of Personal Survival Kits (PSK) and Group Survival Kits (GSK)?

Resources to provide:

- *Habitable environment Protection from cold, wind and sun*
- *Space to accommodate persons equipped with thermal protection*
- *Means to provide sustenance*
- *Safe access and exit points*
- *Means to communicate with rescue assets*

GSKs shall be designed to be easily movable over ice and be floatable.

13.7.5 Do the vessel navigation officers have training in operating in Polar Waters?

Masters, Chief mates and officers in charge of a navigational watch to be trained as follows:

- *Open waters- Basic training*
- *Other waters - Advanced training for Master and Chief Mate, basic training for officers in charge of a navigational watch.*

All crew members to be familiar with the PWOM procedures and equipment relevant to their assigned duties.

13.7.6 Is adequate means of navigation provided for high latitudes?

Ships to have two non-magnetic means to determine and display their heading. Ships proceeding to latitudes over 80 degrees shall be fitted with at least one GNSS compass connected to main and emergency sources of power. Ships involved with icebreaker escort to have a manually activated red flashing light visible from astern to indicate when the ship is stopped.

Ships constructed after 1/1/17 and ice strengthened shall have either two independent echo sounding devices or one echo sounding device with two independent transducers. Ships with the exception of those solely operating in areas with 24hrs daylight, shall be equipped with two remotely rotatable narrow beam searchlights controllable from the bridge to provide lighting over an arc of 360 Deg, or other means to visually detect ice.

13.7.7 Are adequate means of communication provided?

Means for two way on-scene and SAR coordination including aeronautical frequencies shall be provided along with appropriate communication equipment to enable tele-medical assistance in Polar areas.

All rescue boats and lifeboats shall maintain capability for distress alerting, locating and on-scene communication. This equipment should be capable of operation during the maximum expected time of rescue.

13.7.8 Does the vessel comply with Polar Code restrictions on the discharges of garbage and sewage in Polar Waters?

Discharge of food wastes only allowed when ship is as far as practicable away from areas of ice concentration exceeding 1/10th but in any case not less than 12Nm from the nearest land, nearest ice shelf or nearest fast ice.

Food waste shall not be discharged onto ice, all food wastes to be comminuted to no greater than 25mm.

Discharges of sewage are prohibited in Polar waters except:

- *If vessel is discharging comminuted and disinfected at more than 3NM from any ice shelf or fast ice and as far as practicable away from areas of ice concentration exceeding 1/10th.*
- *If discharging sewage that is not comminuted or disinfected and is more than 12NM from any ice shelf or fast ice and as far as practicable from areas of ice concentration exceeding 1/10th.*

- *If the ship has an approved sewage treatment plant and discharges sewage as far as practicable from the nearest land, any ice shelf, fast ice or areas of ice concentration exceeding 1/10th.*

Additional Comments

13.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Helicopter operations

General

14.1.1 Is there documentary evidence to confirm that the helideck meets the requirements of CAP437?

Helideck is usually Approved/Certificated by CAA; FAA; or equivalent. Specify applicable jurisdiction/region for certification in Comments.

Add regions/jurisdictions previously worked as a Comment.

Helidecks may be issued a letter from its classification society attesting to construction in conformance to CAP437. In such cases has an audit been conducted to confirm continued conformance to CAP437?

Are the results of that audit available for review and have the findings been actioned.

14.1.2 If the vessel/unit has re-fuelling facilities, are they certified?

Inspector to identify the body/company issuing the certification and date of issue of certification. Records of inspection and certification should be checked to determine if recommendations made at the time of survey have been completed.

14.1.3 Are appropriate publications for helicopter operations available on board?

These may include, for example:

- CAP 437; (Inspector to comment if not on-board)
- IATA/ICAO IAMSAR Manual;
- IATA Regulations;
- ICAO Heliport Manual;
- ICAO Convention on International Civil Aviation
- Annex 14 Vol II (Heliports) and Annex 6 Part III (International Operations - Helicopters);
- IMO Resolution A.855(20) Standards for On-board Helicopter Facilities

Operational procedures

14.2.1 Do on-board marine operations procedures address helicopter operations?

The operations procedures should include strict controls on work authorisation/management and communication protocols between crane drivers, deck workers, helideck staff, navigators, engine room staff and any other groups whose work may affect equipment moves, atmosphere changes, or personnel proximity to helideck. Normally, the HLO should have working authority to control.

Procedures should also include specifying control of heliops when meteorological conditions change substantially.

14.2.2 Do helideck crew have appropriate PPE?

Appropriate PPE and identification tabards should be provided and used. This would normally include HLO and HDAs wearing flame retardant overalls or proximity suits with safety helmet/visor or goggles, and the fire monitor crew with the same dress.

14.2.3 Are documented procedures in place for checking helideck, net tension, and inspecting helideck for debris prior to aircraft arriving?

Procedures should include issues such as:

- checking that helideck is taut (not possible to lift any part more than 250mm clear of deck, with a vertical pull by hand);
- all lighting should be functioning (perimeter and floodlights);
- perimeter nets should not be taut;
- helideck needs to be checked for loose objects and any such items removed.

14.2.4 Are documented procedures in place for controlling passenger access/egress at helideck?

All passenger routes to/from helideck should be well marked and final access to helideck should be positively controlled by helideck crew (e.g. gate or traffic light).

Crew training

14.3.1 Are formally qualified Helicopter Landing Officers (HLOs) available on board as required?

Formal training/certification should be available on board.

14.3.2 Are formally qualified Helideck Assistants (HDAs) available on board as required?

Formal training/certification should be available on board.

14.3.3 Are all heli-ops radio users trained and appropriately certificated?

All personnel involved in transmitting or receiving radio messages from helicopters shall carry appropriate radio licence as issued by Local NCAA for area of operation e.g. UK Restricted Radio operators certificate of competency (ROCC)

14.3.4 Is the helideck monitoring system fully operational?

Weather observing, report assessment, movement monitoring should be conducted by trained and experienced personnel, in most cases the navigating officers on the vessel/unit.

Where used, state details of Helideck Monitoring System (HMS). Inspector should note approving civil aviation authority for HMS system

Emergency response

14.4.1 Is the vessel/unit equipped with dedicated airband transceivers?

Must allow both operating frequency spacing required use for normal communicating with the aircraft and watch/emergency frequencies for flight watch and following. E.g. 8.33 Khz spacing.

14.4.2 Does the vessel/unit have dedicated flight following/watch personnel & procedures?

Qualified radio operating personnel should be available. Formal flightwatch/following instructions and records should be confirmed in place and correctly logged.

Where this performed by an onshore organisation the inspector is requested to identify who performs this role.

14.4.3 Is the helideck firefighting and emergency equipment in good order and available for immediate use?

Equipment should include an AFFF foam system to helideck and foam monitors designed to knock out a fire within 30 seconds of activation; fireman's outfits (including breathing apparatus); crash box (hammers, bolt-croppers, hatchets, etc.); powder and CO2 extinguishers (including a unit with lance to reach engine intakes, should that be required by pilot).

Passenger/cargo management

14.5.1 Is there a formal documented procedure for briefing passengers?

Briefing details/CD's of helicopter types should be available to include danger areas; boarding/exiting procedure; emergency procedures; use of seat belts; no loose objects/clothing; prohibited goods; documentation needs, etc.

14.5.2 Are baggage scales formally calibrated and fully operational?

Check calibration records for consistency.

Sample freight/baggage manifests for completeness, calibration should be undertaken by on shore 3rd party independent vendor at intervals not exceeding manufacturer's recommended practice.

14.5.3 Is there a secure area for handling/storing checked freight/baggage?

Should be under the direct control of one appointed person - aspects of this may come under the vessel/unit's Security Plan, which the Inspector should be made aware of, but review of the SSP is not permitted.

14.5.4 Are all helideck lights functioning?

14.5.5 Are wind sock(s) provided?

Wind sock(s) shall be illuminated and installed in sufficient number or location so that the air flow through at least one wind sock is not obstructed by MO(D)U structure.

Additional Comments

14.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

DP operations

General

15.1.1 Does the vessel have on board a copy of the most recent DP FMEA (DP FMEA Desktop analysis)?

Record the date of the report and the name of the issuing company.

15.1.2 Is the latest DP FMEA revision less than 5 years old and/or has there been a third party gap analysis been completed within the last 5 years stating the DP FMEA is still valid?

Both IMO and IMCA guidance state that formal review of the DP FMEA shall be completed within a 5-year period.

Reference: IMO MSC.1/Circ.1580, IMCA M 166, IMCA Information Note 1605

15.1.3 Have any modifications been sighted/reported to the DP mission critical equipment since the last DP FMEA revision. If applicable, have any modifications been proven by testing?

IMCA M 166, Guidance on Failure Mode Effects Analysis Guidance, Chapter 2.7 Updating of an FMEA states: "The FMEA will become out of date if it is not maintained regularly and systematically, due to changes in operating procedures, modifications to DP hardware and software, to confirm compliance with the latest industry guidance, etc., over the life cycle of the vessel. If this happens, it is likely that another FMEA revision will be incurred later. A systematic FMEA review through the vessel's life cycle should be an ongoing process which should be formally completed at least once every five years."

15.1.4 Is a copy of the latest DP FMEA Proving Trials (5-yearly DP FMEA verification trials) available on board and is it less than 5 years old?

15.1.5 Are the latest revisions of the FMEA Report and DP FMEA Proving Trials approved by class?

15.1.6 Have the findings (if any) from the latest DP FMEA Proving Trials been addressed?

Record the date and issuing company of the DP FMEA proving trials.

15.1.7 Does the vessel have on board a copy of the most recent DP Annual Trials report?

Record the date of the report, issuing company and specify if the DP annual trials were performed remotely, semi-remotely or as an on-board trial. The DP annual trials should be conducted as per IMCA M190.

15.1.8 Have the latest DP Trials been completed within the window?

If there has been no DP Annual trials and or proving trials within the last 15 months, leave an observation.

If there has not been DP trials in the last 12 months please comment.

The Annual DP trials and or DP Proving trials should be carried out within three (3) months before or after each anniversary date of the Dynamic Positioning Verification Acceptance Document (previously Flag State Verification Acceptance Document) Reference: IMCA M190, IMCA M103.

15.1.9 Have recommendations from the annual DP trial report been addressed and closed out as required?

If there are any outstanding A/B findings, record it as an observation and provide detail.

15.1.10 Have all personnel involved in DP operations read and understood the DP FMEA?

Confirm that the DPO's have signed an acknowledgement form.

15.1.11 Is there a valid software maintenance agreement(s) in place?

The following systems to be covered:

- DP control system
- Power system
- Thruster system

The software maintenance agreement should cover safety and security patches, obsolescence management, incident reporting and response handling, software change handling and software asset inventory. for example. A statement of product status and maintainability may be accepted as an alternative. Reference: DNV-RP-0582 and IMCA M 103

15.1.12 Do the vessel procedures require a minimum of two DP operators to be on duty during DP operations?

Check that there is sufficient qualified DPOs to provide rest/meal relief (if applicable).

15.1.13 Is the bridge access restricted to only essential personnel during DP operations?

Check that bridge restrictions are implemented - i.e. by sign, procedures or standing orders.

Operations

15.2.1 In the last 12 months has the vessel operated without experiencing any loss of position incidents?

If the vessel has recorded any Yellow or Red condition DP alarms. Inspector to note and record all such incidents.

15.2.2 Is the vessel without any defects which result in a reduction of DP Capability and/or redundancy?

Record any DP mission critical equipment which is not operating as expected.

15.2.3 Does the vessel use the IMCA Incident reporting system?

Both Members and non-Members of IMCA are asked to submit reports on the following:

- DP Incident
- DP Undesired Event
- DP Observation

The submission process involves completing a form and providing detailed information regarding the incident and leading factors ideally with supplementary items such as sketches and actions taken. If recent reports are not available check that the vessel's management system requires IMCA DP incident reporting.

15.2.4 Does the vessel carry out risk assessments for specific operations (as listed in guidance)?

- SIMOPS
- External loads such as tuggers
- Weather related contingencies, etc.
- Weather side working
- Environmental / Shallow water operation
- Heavy lift operation

15.2.5 Are Manual thruster control levers and emergency stops located within easy reach of the DPO and are each emergency stop well protected against inadvertent operation?

For vessels build after June 2017, IMO MSC.1 Circ. 1580, Section 3.3.6 states that "individual thruster emergency stop systems should be arranged in the DP control station".

Regardless of above guidance, inspector should write an observation if each thruster does not have an individual emergency stop and/or emergency stops / control levers are not within easy reach of DPO

15.2.6 Can the health of the position reference systems be monitored by the DPO, independently of the DP control station?

Inspector to comment if DPO needs to leave the immediate vicinity of the DP desk to view health information.

15.2.7 Does the vessel have a vessel specific DP Operation manual on board and is there evidence that relevant DP personnel has read the document?

Reference: IMCA M109, IMO Resolution 645 (Operational Requirement) and IMO MSC.1/Circ. 1580

15.2.8 Does the DP operations procedure include specific guidance for any DP specific operations that the vessel will conduct, e.g. Anchor Handling, Towing, Heavy Lift, Diving, Pipelay, etc?

Procedure should address when and where DP is used and the checks required prior to use. Reference: OCIMF Dynamic Positioning Assurance Framework Information paper.

15.2.9 Is there a competence scheme for key DP personnel onboard?

This could be a in-house training scheme.

15.2.10 Are DP checklists in place to cover bridge, engine room and electrical systems for DP operations?

Checklists can include DP setup (Bridge and engine) / 500 m safety zone entry (Bridge and engine) / Field arrival / DPO and engine room periodical handovers.

15.2.11 Are DP Capability Plots in place to cover the normal and expected operations, and worst case failure?

Guidance is provided in IMCA M 140 "Specification for DP Capability Plots" and Marine Technology Society DP Operations Guidance.

15.2.12 Are DP footprints regularly recorded and compared against previous footprints and the DP Capability Plots?

Check that the operator has guidance for recording DP footprints and specifies frequency of recording. Reference: IMCA M 140 - Specification for DP Capability Plots and MTS Operations Guidance DP Footprint Plots.

15.2.13 Depending on vessel activity and if required, are Activity Specific Operating Guidelines (ASOG) or Well Specific Operations Guidelines (WSOG) or Field Specific Operations Guidelines (FSOG) in place and utilised?

- *Are all relevant parties aware of the specific operating guidelines (ASOG, CAMO, TAM etc)?*
- *Are there defined limits set for Green, yellow and red DP operations? Confirm these are read and understood by relevant parties within the operations team including, if applicable, dive control, drill foreman etc.*
- *Are DP cessation triggers clearly defined within specific operating guidelines? Cessation of operations may be required for a whole host of reasons for example degraded equipment availability, weather limits, reduction in available redundancy, etc*
- *Check that consequence analysis alarms is used as an input to the specific operating guidelines.*

Inspector to record an observation if specific operating guidelines are not readably available at DP control station.

15.2.14 Is the DP control console located so that the DPO can also observe the controls, the external environment and the working operations of the vessel/unit?

If 'No', state whether CCTV is utilised. Reference: IMCA M 103

15.2.15 Is the DP alert triggering system in immediate reach of the DPO at console?

The DP Alert System is used during critical operations such as diving, drilling, pipelaying, walk-to-work or other critical operations and includes traffic lights.

Equipment

15.3.1 Is the Dynamic Positioning control systems in good order?

Note any recommendations/deficiencies reported

15.3.2 Are all position reference systems in good order and are both relative and absolute position references available on the vessel for the applicable operations vessel likely to conduct?

IMCA M 252, Guidance on position reference systems and sensors for DP operations, summarises best practice for the selection and use of position reference systems (PRS) and sensors in dynamic positioning (DP) control systems.

15.3.3 If a DP data recorder is not fitted, confirm that procedures are in place for securing relevant data in the event of a DP incident?

Reference: IMCA M 103

15.3.4 Is there a procedure and evidence of the regular checking of the secure power supply systems (UPS Battery systems)?

Planned maintenance routines should exist for the UPS/s Reference IMCA M 190

15.3.5 Does the DP system have a continuous analysis function checking that in terms of thruster and power can maintain position after the worst case failure (consequence analysis function)?

Reference: IMCA M 103

15.3.6 Is the DP control system fitted with real time DP capability envelopes or does the vessel have procedure to do a drift off test prior to DP operation?

Inspector to record in comments if active monitoring or drift off test is used.

15.3.7 Is the actual bus bar configuration in accordance with the FMEA and the last DP trials performed?

Inspector should state whether the bus ties are open or closed configuration for each mode of DP operation (i.e. Mode 1, 2 etc)

15.3.8 Is the DP control system included within the Planned Maintenance System?

Including all position reference systems, UPSs and sensors.

15.3.9 If unit is a DP flotel fitted with a connected gangway, confirm that the gangway is used as Positioning Reference System (PRS)?

Record an observation if gangway is not used as a PRS.

15.3.10 If the unit is a DP flotel operating on a turret moored FPSO or any moving asset with connected gangway, confirm that DP system is fitted with "follow target "mode option?

Record an observation if "follow target mode" is not available.

Competence

15.4.1 Are the vessels crew suitably qualified for DP Operations?

All key DP personnel (including Engineer and/or Electro-technical personnel) onboard should comply with the IMCA minimum requirements for experience and training. Confirm DP certification been issued by a recognised body, such as the Nautical Institute. Experience should be recorded in DP log books. Reference: IMCA M 117

15.4.2 Is there an Engineer and or Electronic Technician on-board with approved training on the DP system?

Confirm that Engineers and ETOs have appropriate training/guidance on how to operate/maintain plant when in DP mode. Ref IMCA M117 section 6. Sight certificates / records of DP system training from system manufacturer.

15.4.3 Are DP drills included in the vessel drill matrix and performed regularly?

Inspector to check drill record and record date of last DP drill.

Additional Comments

15.99 Additional Comments

If the Inspector has comments in respect of the subject matter covered by the Chapter additional to those which the Inspector may make in response to the specific questions in the Chapter, the Inspector should include such additional comments in this section.

Jack Up Operations

Leg and Jacking system integrity

16.1.1 Do vessel procedures recognise leg strength/integrity and integrity as Safety Critical Elements/Safety Critical Equipment?

Review the procedures, determine if the legs, spud cans and jacking system are identified as Safety Critical Elements and how this is translated into the vessel/unit Maintenance System through Planned maintenance and Periodical inspections of legs, spud cans and jacking equipment by vessel, 3rd parties, Original Equipment Manufacturers and Class.

16.1.2 Does the vessel maintenance system address the self elevating system in its entirety?

Review the vessel maintenance procedures for the legs, jacking systems preloading pumps, dump valves and jetting systems.

Does the vessel have inspection procedures for the individual jacking units. Review these procedures.

16.1.3 Is there evidence of routine inspection of legs by vessel staff, 3rd party Agencies and Class and has the report been endorsed by class?

Check previous leg inspection reports. There are 2 types of reports for leg inspection, annual and 5 yearly. 3rd party inspected legs and review and endorsed by Classification. When rig at offshore location, inspection company used ROV. When was this carried out.

Check for damage, missing members etc.

16.1.4 Is there evidence of routine inspection of Jacking Houses by vessel staff, 3rd party Agencies and Class?

Check structural survey report for reference to jacking houses. Jacking houses required to be inspected annually and 5 yearly. 3rd party inspected and endorsed by Classification.

Note date of last inspection.

Inspect jacking houses for damage.

16.1.5 Is there evidence of routine internal inspection of spud cans by vessel staff, 3rd party agencies and Class?

Check structural survey report for spud cans. When was this carried out.

Review reports for evidence of damage and repairs carried out to satisfaction of Class.

16.1.6 Are the legs free of evidence of damage/wear/repairs?

Visually inspect available area of leg cords for wear, corrosion and marine growth. Are anodes in place and in satisfactory condition.

16.1.7 Are jacking motor insulation resistance readings recorded?

Review records of jacking system electric motor insulation testing.

16.1.8 Are jacking motor gearboxes subject to regular inspection and maintenance?

Are jacking gearboxes clearly numbered for maintenance purposes and oil analysis.

Review records of inspection and taking of oil samples. Oils sample records should be subject to analysis for water and metal content.

16.1.9 If fitted, are rack chock systems free of defects?

Inspector can note condition testing.

16.1.10 Is there a gearbox change-out policy?

Review records to determine if there any gearboxes changed or repaired. Does the company use facilities such as borescope inspections for the gear boxes.

16.1.11 Is lubrication of jacking systems and inspection part of periodical Routine Maintenance?

Inspector to verify if lubrication is carried out periodically between vessel moves when the unit is working on drilling location. Confirm if this is being performed at intervals other than during the vessel move itself.

16.1.12 Are jacking system spare parts considered critical spares, identified as such and stock levels being maintained on-board?

Review spare parts list with PMS/Warehouseman and determine if min stock levels are in place for Jacking system parts on-board/onshore.

16.1.13 Is there evidence that Rack Phase Values (RPV) measurements are made as part of jacking operations?

Gauging the vertical offset between corresponding rack teeth on adjacent chords conveniently provides a means for taking suitable measurements. The vertical distance from a reference datum on the hull to the specified rack tooth position is termed Rack Phase Value (RPV).

16.1.14 Is the Rack Phase Difference (RPD) value monitored as part of jacking operations? Is the maximum allowed RPD clearly documented and complied with?

A limiting RPD value should be calculated being the maximum acceptable value for use during normal jacking operations. Exceeding this limiting value, whilst not necessarily representing a dangerous condition initially, should prompt the jack-up crew to contact the operator onshore support team for expert advice with respect to continuing jacking operations.

Inspector should seek evidence of same in jacking operations records.

16.1.15 Is Jacking Control panel in good order?

Inspector to check lamp tests.

Inspector to request Barge Captain/Marine Section Lead to turn on the power to control panel and compare console gauges against visual marking.

16.1.16 Is there a system in place for indicating and monitoring leg penetration?

Methodologies of penetration depth include digital leg depth or checking leg markings. Inspector should make comment on system deployed

16.1.17 Does the operations manual clearly define environmental conditions limitations for jacking operations?

Inspectors should review to ensure environmental conditions are clearly defined for significant phases of marine operations including but not limited to:

- *Initial jacking*
- *Preload activities*
- *Emergency jacking*
- *Transitional activity displacement to non-displacement*
- *Open location*
- *Proximate to installation condition*

16.1.18 Is the direction of rotation clearly marked on the Jacking motors?**Preloading pumps and systems****16.2.1 Is the vessel equipped with dedicated pumps for ballasting/ preloading?**

Check the systems description in the MoM or similar for the description of the system and validate that the pumps described are the pumps being utilised for the operations.

16.2.2 Is the capacity of the preload pumps documented?

Inspector to state capacity of pumps and time taken for pumps to ballast vessel to full preload. Validate these figures with procedures and the times stated in technical data.

16.2.3 Are the preload pumps and dump valves identified as Safety Critical Elements/Equipment?

Review maintenance records of preload pumps and dump valves. Verify condition where possible by physical inspection and witness operation of equipment if operations permit.

16.2.4 Are there procedures detailing the maintenance of the Preload dump valves?

Verify operation/testing schedule, and establish time needed to discharge preload

16.2.5 Has there been any modifications to the rig that have affected the variable deck load?

Inspector to detail any MOC and Class approval records were in place if weight is more than 5% of previous deck weight. Check current stability calculation is valid for deck load.

Jetting Systems pumps and piping**16.3.1 Is there a procedure for jetting operations which defines maximum allowable over pull and inclination during leg extraction?**

Inspector to review Marine Operations Manual move procedures

16.3.2 Are Jetting systems documented and plans available?

Inspector to review Marine Operations Manual or the MO(D)U rig move procedures/jacking procedures

16.3.3 Is there evidence of recent use of the jetting system?

View previous vessel move records to validate if the jetting system was used. Inspector to make comment if jetting system is not operational.

16.3.4 Are there procedures in place for the safe handling and connection of jetting hoses?

Inspector to comment on safe access points to jetting hose connections and support of the hose during connection.

16.3.5 Is the jetting system capable of being fed from other sources e.g. mud pumps, fire pumps etc.?

Record alternative means of running jetting system and confirm if this is documented in Marine Operations Manual or Procedures.

16.3.6 Is the maximum working pressure of the Jetting system known and documented and is the system fitted with a pressure relief valve?

Record the pressure values.

Additional Comments**16.99 Additional Comments**

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