



INTERTANKO

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**Vessels' Practical
Guide to Vetting**

TWENTY 18



INTERTANKO

Vessels' Practical Guide to Vetting

2nd Edition* 2018

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** This publication is the 2nd edition of the original "Seafarers' Guide to Vetting Inspections" – the series will take on the new title from here on in.*

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Acknowledgements

INTERTANKO extends its thanks to the members of its Vetting Committee for their comments and contributions that complement this guidance. Particular thanks go to Chairman Steve Hardy (NYK Line) for his efforts and dedication in helping write and check the publication.

Queries and omissions can be sent to **Marine@INTERTANKO.com**

Foreword

Risk management is an integral element of the vetting process and its importance cannot be overstated. Managing and mitigating any form of perceived risk is essential to ensuring that high standards of quality and safety are achieved, and ship vetting is a major part of the process that charterers follow when selecting ships for cargoes they are charged with. Ship inspections are, consequently, critical to the vetting process.

The importance of positive vetting is recognised by owners, managers and ship staff alike. Those involved in their company's safety and quality operations invest a large amount of time, training and financial resources to contribute to the efforts needed to successfully trade their vessels.

INTERTANKO has always supported the OCIMF SIRE inspection system and will continue to work closely with OCIMF to develop it further. The highest standards of ship safety and security and operational excellence is what everybody strives for and aims to achieve.

We all want the same thing in the end but some common sense is also needed along the way to achieving these goals.

Over the last 48 years, INTERTANKO has provided support and guidance to its Members who have all committed to maintaining high standards of ship operations. However, quality ship operations cannot be achieved without the complete commitment of the management team ashore and on board.

In addition to INTERTANKO's *Guide to the Vetting Process*, a consolidated reference of the requirements of all energy majors and Port State Control MoUs, this guide aims to share the knowledge needed by ships' crews to prepare for successful vetting inspections.

The "*Vessels' Practical Guide to Vetting*" (formerly *Seafarers' Guide to Vetting Inspections*) is the result of an INTERTANKO Vetting Committee initiative and has been written for all Officers and crew on board to enable them to better understand the content and requirements of the SIRE Vessel Inspection Questionnaire (VIQ).

My vision is that this publication will provide a greater understanding of the requirements of the SIRE VIQ and thereby make shipboard preparation for inspections second nature to all Officers and crew serving on board oil, chemical and gas tankers.

I believe it to be an essential addition to the library of every tanker.



Capt. Steve Hardy
Chairman,

INTERTANKO Vetting Committee

NB: While every effort has been made to ensure that the guidance and information in this publication is correct at the time of going to print, INTERTANKO welcomes any information on changes that may be made since the publication was issued.

Introduction

The purpose of this guide is to assist a vessel's staff to prepare both themselves and the vessel for a ship inspection.

The importance of consistently successful ship inspections cannot be understated, without these vessels will have extreme difficulties to trade.

Good and thorough preparations will not only show an Inspector the competency and professionalism of the crew, but also how well the vessel is managed.

This publication follows each chapter of the latest version of the SIRE Vessel Inspection Questionnaire (VIQ) and provides guidance on the responsibilities for each question in the VIQ. Each ship owner, ship management company/operator or technical manager, referred to from here on in this Guide as "the company" should, under their own Safety Management System (SMS), have their own allocations of such responsibilities on board.

The guidance notes

Those on board at the forefront of the inspection will usually be the Master, Chief Officer, Chief and 2nd Engineers, referred to from here on as "Senior Officers". It should be recognised that underperformance from any member of the crew could and, most often does, result in negative comments and such comments could result in the vessel potentially failing a vetting process.

The latest edition of the VIQ has introduced many "competence" questions whereby the Inspector will verify awareness and familiarity of any Officer and crew member on their knowledge and understanding of many vessel operations and procedures. It is thus recommended each VIQ Inspector guidance note is read thoroughly by the appropriate Officer or crew member to ensure full understanding of the requirements of each VIQ question.

Knowledge of the contents of legislation, documents and publications often identified in the guidance notes must be read in conjunction with the notes.

So, with this in mind all personnel on board have an important role to play during an inspection and to ensure that all perform their duties as part of a well-drilled ship-board team.

It is strongly recommended that all Senior Officers should make themselves familiar with Section 4, "Conduct of Inspections" of the OCIMF-SIRE VIQ. These contain the requirements that the Inspector must follow and in the event that the Inspector does not follow these guidelines/requirements then this should be discussed with the Inspector during the closing meeting. It does not serve any purpose to avoid such discussions with the Inspector and then complain to the company after the Inspector has left the vessel. Any valid comments or complaints against the Inspector must be brought to their attention in a professional manner so that the Inspector is aware that comments and/or complaints about his/her performance will be submitted.

There are many VIQ questions we consider "Competence" questions whereby inspectors are asking Officers and crew to demonstrate their knowledge of various procedures, operations and use of equipment etc.

We believe this can lead to misinterpretation by vessels' staff and Inspectors and we will try to clarify this overleaf.

The terms "Officers", "Deck Officers", "Cargo Watch Officers", personnel etc. as examples are used.

To avoid overcomplication and give clarity to these questions, such questions are directed to those Officers/ personnel with direct responsibility or involved in the operation/process being examined. As an example – a cargo operation which in general involves all Deck Officers, and at times on certain vessels an Engineering Officer or Gas Engineer, all of these Officers involved should be expected to be questioned and thus have knowledge of the VIQ question being asked.

Other examples include:

VIQ Chapter 4 – Navigation and Communications – where Officers are referred to, these are only expected to be Deck Officers keeping a navigational watch, with no Engineering Officers involved. Likewise VIQ Chapter 10 Engine and Steering Compartments would only expect Engineering Officers to be challenged and questioned – not Deck Officers.

There are also concerns over the use of the terms “aware of” and “familiar with”. Definitions are clearly different and Inspectors would expect Officers and crew to demonstrate clear answers to such questions.

It is easy for an Inspector to identify a lack of knowledge – as an example if an Officer is asked to demonstrate awareness of the procedures for the use of portable gas detectors – it is easy for the Officer to point out the instruments, procedures and guidance in place – but if then asked to demonstrate and explain how to calibrate such instruments and he is unable to do this, he is clearly not familiar with the process, this would very obviously identify a lack of knowledge and thus raise an observation.

This principle can be applied for all questions, e.g. you are aware of the emergency generator operation but can you demonstrate how to start it?

INTERTANKO has provided a means of reporting Inspector behaviour in a confidential manner, this to ensure continuous improvement of ship inspections and inspection procedures. The reporting system has been developed in an electronic format which allows the reports to be submitted directly into a database. In view of the confidential nature of this system, a username and password, which can be obtained from INTERTANKO, is required to upload reports – email **marine@INTERTANKO.com** to obtain your username and password.

Masters and operators should complete the form after each inspection and submit it to INTERTANKO. This will greatly assist INTERTANKO in its continued efforts to monitor inspector behaviour and their compliance with the various codes of practice. A printed version of the feedback form is provided at the rear of this publication as guidance only. More details can be found in the latest version of the INTERTANKO publication *A Guide to the Vetting Process*.

This Guide should be used in conjunction with the latest edition of the OCIMF-SIRE VIQ.

A well-prepared vessel will expedite any ship inspection.

A stylized graphic of a globe, composed of several overlapping circles and horizontal lines, creating a grid-like pattern. The lines are in shades of blue and grey, and the overall shape is a semi-circle on the right side.

Chapter 1.

General Information

The information required to prepare for this chapter will all be readily available and should be prepared by the Master.

To ensure flawless preparation, the Master should prepare a table using the same VIQ references in numerical order and use the table as a checklist. It is likely that some companies would have prepared and provided their ships with such a list.

There are questions in this chapter that can be completed by either the Inspector or the Master. The following is an example of how the table may appear and can be designed to suit the type of tanker.

General Information

- 1.1 Name of vessel** – will be readily known.
- 1.2 Vessel IMO Number** – will be readily known by the Master.
- 1.3 Date the inspection was completed** – will be completed by the Inspector.
- 1.4 Was a full inspection of the vessel completed?** – Will be completed by the Inspector.
- 1.5 Port of inspection** – will be completed by the Inspector.
- 1.6 Flag** – will be readily known by the Master.
- 1.7 Deadweight** – readily available and known by the Master. If the vessel has multiple load lines, the Master will provide the Inspector with each. Check the certification onboard is correct.
- 1.8 Date the vessel was delivered** – will be readily known by the Master.
- 1.9 Name of the OCIMF inspecting company** – no input required by the Master. Information will be available from the Inspector.
- 1.10 Date and time the Inspector boarded the vessel** – will be completed by the Inspector.
- 1.11 Date and time the Inspector departed the vessel** – will be completed by the Inspector.
- 1.12 Time taken for inspection** – will be completed by the Inspector.
- 1.13 Name of the Inspector** – will be completed by the Inspector.
- 1.14 Is an up to date OCIMF Harmonised Vessel Particulars Questionnaire (HVPQ) maintained and is it readily available?** Will be completed by the Inspector. A soft copy should be available onboard.
- 1.15 Vessel's operation at the time of inspection** – the Master shall confirm this to the Inspector.
- 1.16 Product(s) being handled** – the Master shall advise this to the Inspector.
- 1.17 Vessel type** – will be noted from the vessel's certificates.
- 1.18 Hull type** – will be identified from the IOPP Certificate Form B.

-
- 1.19 Name of the vessel's operator** – this is the name of the company that manages the vessel and whose name will appear on the Document of Compliance.
- 1.20 Date the current operator assumed responsibility for the vessel** – this is the date that the company named in VIQ 1.19 took over the day-to-day operations and management of the vessel.
- 1.21 Date of the last Port State Control inspection** – the Master will have evidence of these inspections in the vessel's files, which the Inspector will need to view. Ensure corrective and preventive actions have been complete and closed with the office.
- 1.22 Port of the last Port State Control inspection** – this will be stated on the PSC inspection report the Inspector will view as per 1.21. PSC inspection reports shall be retained on board for two years.
- 1.23 Name of Classification Society** – the Master shall advise the Inspector of this although such information should be clearly available from the statutory certificates.
- 1.24 Date of expiry of the Class Certificate** – this will be identified on the Class Survey Status that will need to be made available to the Inspector.
- 1.25 Date of departure from the last Class-credited drydock/repair period or in water survey** – if this was unscheduled, the Inspector will need to be advised of the date and the reason, e.g. grounding, collision, allision, etc.
- 1.26 Does the vessel have a recent Class Survey Status Report and are past Class Survey Records complete?** This will be stated on the Class survey status report the Inspector will view. This report should not be dated more than 15 days prior to the inspection. Class survey status reports shall be retained on board for five years.



Chapter 2. Certification and Documentation

Certification and Documentation

To ensure proper preparation for this chapter, the Master should have all certificates and documents readily available for the Inspector. Although inspections have become more focused on the performance of the crew and the conditions of the ship, it is important to ensure that all certificates and documents are available, up to date and in order.

Certification

2.1 Are all the statutory certificates listed below, where applicable, valid and have the annual and intermediate surveys been carried out within the required range dates?

For ease of the Inspector's reference, it is recommended that the Master arranges the vessel's certificates file in an orderly manner and preferably in the same order as the VIQ questions.

Vessel designation will be identified by the Inspector from the IOPP Certificate Form B.

- CSR – not later than 3 months after the date of any change
- DOC – annual verification +/- 3 months of the anniversary date

Electronic Certificates are acceptable providing they comply with the required features – see VIQ 2.1 notes.

ERROR: 2.1.13 CLC is not relevant to "Wreck removal" or "Crew Repatriations insurance"

CLC applies to:

1. International Convention on Civil Liability for Oil Pollution Damage 1969
2. International Convention on Civil Liability for Bunker Oil Pollution Damage 2001 i.e. CLC Certificate and Bunker CLC Certificate.

Wreck Removal Certificate applies under Nairobi International Convention on the Removal of Wrecks 2007.

Crew Repatriation insurance applies under MLC 2006.

2.2 Is the vessel's P&I Club a member of the International Group?

The Master will be required to provide the Inspector with documentation to identify the vessel's P&I Club.

Safety Management and the Operator's Procedures Manuals

2.3 Do the Operator's procedures manuals comply with ISM Code requirements?

The Master shall have a hard copy of the company SMS available. Increasingly, companies are providing an electronic version of their SMS; however, a hard copy may prove to be more advantageous to the Inspector. The Master shall be able to demonstrate familiarity with the system, be it in either hard copy or electronic versions, and as the inspection progresses others on board shall also be required to demonstrate their familiarisation of the SMS.

2.4 Does the Operator's representative visit the vessel at least bi-annually?

The Master will be responsible for providing a record of the company representatives' most recent visits by either a report left on board or from the gangway visitors' logbook. A tolerance of +/- 1 month each six (6) months is acceptable.

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

Both the audit report and the company close-out of any non-conformity can be shown to the Inspector. Intervals between audits is 12 months (+/- 3 months – *(ISM 12.1: +3 months in exceptional circumstances only – Master to make sure he has positive evidence available with the reason of the late audit if last audited period(s) is longer than 12 months)*).

Inspectors should only review records going back to last two audit reports or nine (9) months – whichever is the greater.

In the past, some Inspectors mistook this as a reason to record observations based on any non-conformities raised. This is NO LONGER ACCEPTED by OCIMF and the Inspectors are instructed accordingly.

If there is no evidence of a company close-out, it may be that this is due to the dates of the corrective action. The Master is advised to check a non-conformity close-out date against the date of the last audit report. It is also recommended to check previous SIRE observations are also closed out.

2.6 Does the Master review the safety management system, report to the Operator on any deficiencies and does the Operator respond to the Master's review?

The Master must review the SMS in accordance with company procedures, the important issue is whether the Master can provide written evidence that (a) a review has taken place and (b) the company has acknowledged receipt of the review – this feedback must indicate positive/negative feedback – not just a tick box exercise/email acknowledging receipt.

Survey and Repair History

2.7 Is the vessel free of Conditions of Class or Significant Recommendations, Memoranda or Notations?

The Inspector will note from the Class Survey Status if any Conditions of Class, Memoranda or Notations exists. Should they exist, then the Inspector will take note of each.

2.8 Has the vessel been enrolled in a Classification Society Condition Assessment Programme (CAP)?

In keeping with the guidance for preceding questions from 2.9 onwards, the voluntary CAP reports should be made available to the Inspector. It should be noted that CAP certificates are valid from the date of the last CAP survey date and validity is three years. To comply with the requirements of a majority of OCIMF SIRE members, CAP surveys are applicable to vessels of fifteen years of age and above. Vessels <15yrs old – the question should be answered 'N/A'.

2.9 Are procedures in place to carry out regular inspections of cargo and ballast tanks, void spaces, trunks and cofferdams by the vessel's personnel and are records maintained?

The company will decide the frequency at which cargo, ballast tanks, void spaces and cofferdams should be inspected. This will be outlined in the PMS. Records of the inspections of these spaces shall be made available to the Inspector.

Oil and chemical tankers – cargo spaces every 2.5 years +/- 6 months, ballast tanks every 12 months

Gas carriers – ballast tanks, void spaces, cofferdams, hold spaces – every 12 months.

The template for these records will be as provided by the company and they should accurately describe the condition of the internals of each particular space – please refer to the guidance notes which identify the details required.

The Inspector may cross reference the dates of the inspections of these spaces against the tank/enclosed space entry permits. The Inspector will use both the inspection records and permits to confirm the dates match, so check carefully all Enclosed Space Entry Permits.

Anti-Pollution

2.10 Are the Engine Room (Part I) and Cargo (Part II) Oil Record Books (ORBs) correctly completed, free of any pollution incidents, violations and are slop/waste oil disposal certificates provided?

Entries in the Oil Record Books (ORBs) are critical and when contentious these are usually the result of individual interpretation by either the Inspector or members of the ship staff that make the entries. Care must be taken when making ORB entries as errors can lead to the vessel, the person responsible and the company being severely penalised. The person responsible for making entries should carefully study the instructions stated in the beginning of the ORB and those identified in MEPC. 1/Circ 736.

A common error that occurs in the oil and cargo record books happens when the officer responsible for making entries has recently joined the ship and may follow his predecessor's style and interpretation of making entries, thereby repeating mistakes made in the past.

Therefore, it is imperative the instructions are both followed and fully understood before making any entry. If in doubt ask the office for assistance. The INTERTANKO *Guides on Correct Entries in the Oil Record Books* are an invaluable source of information and guidance.

The Inspector will look for entries that indicate that an incident may have taken place. If it transpires that there has been a pollution incident which has not been recorded in the ORB, the company will, more than likely, expect correspondence from the oil major carrying out the inspection questioning the absence of records. It is always beneficial, therefore, to be transparent and proactive by reporting any pollution incident in either of the ORBs.

The ship should always receive a receipt from the receiver stating the quantity received during the transfer, time and the date for any disposal to shore reception facilities of slop/wastes, irrespective of whether these are by road tankers or barges. This receipt or certificate of receipt should be maintained in a dedicated file or stapled to the ORB page that records the transfer to the reception facility.

Any failure of the Oil Discharge Monitoring Equipment (ODME) or Oily Water Separator (OWS) must be recorded in the appropriate ORB.

Records older than the last two internal audit reports or nine (9) months – whichever is greater – should only be reviewed.

If e-ORB's are in use, the vessel must have an approval letter from the Flag Administration.

2.11 If the disposal of engine room oily water or sludge to a cargo or slop tank has taken place, has the event been recorded in both Oil Record Books, was the receiving tank free of cargo and have the transfer arrangements been approved as per IOPP Form B?

Those tanks to which the engine room oily water or sludge transfers are made will be listed in Form B of the IOPP Certificate.

Flag approval is not deemed to be required for such a process. Class is acting on behalf of Flag and has issued the certification which will identify the means available and approved to carry out this operation.

2.12 Is the vessel in possession of an approved Volatile Organic Compounds (VOC) Management Plan and are Deck Officers aware of the general contents and requirements of the plan?

The VOC manual shall be for vessels that carry crude oil and be under control of the Master yet made readily available for cargo operations. The VOC manual will be approved by the Administration.

COMPETENCE

Deck Officers must be aware of the plan and its contents.

2.13 Is the vessel provided with an approved Ballast Water and Sediments Management Plan, are records maintained of all ballast water exchanges or treatment operations and are Officers aware of BWM requirements?

The vessel must be in possession of a Class-approved Ballast Water and Sediments Management plan, this should be in the possession of the Master. A working copy should be available for the Chief Officer.

All ballast water exchanges shall be recorded by the Chief Officer and all records made should be readily available to display for the Inspector.

COMPETENCE

Officers should be aware of the Ballast Water Management Plan (BWMP) and requirements.

2.14 Does the vessel have a Ship Energy Efficiency Management Plan (SEEMP) and are Officers aware of the general requirements relating to the plan?

The vessel will, where applicable, have an approved Ship Energy Efficiency Management Plan (SEEMP). This will be maintained under the responsibility of the Master.

COMPETENCE

Officers should be aware of the general requirements relating to the plan.

Structure

2.15 Is the vessel free of any documentary or visual evidence to indicate any structural concerns?

The Inspector would sight the Class record and conduct physical inspection. Any structural defects or deformation shall be reported to the company. In some cases, the vessel's Class Society may need to be involved. If this is the case, the Class surveyor should be politely advised not to write any comment, memorandum or Condition of Class (CoC) without communicating with the vessel's superintendent or manager in the first instance.

A memorandum or CoC, no matter how minor, may, in the view of some oil majors, result with the vessel being assessed as not acceptable until the CoC has been rectified to their satisfaction.

Evidence of hot work between yard repair periods must be kept on file. For example hot work permits may be required to be sighted which will identify such hot work repairs. These records must be complete in all respects.

2.16 If any cargo / ballast tanks, void or hold spaces were sighted from the deck, were they in good order, free from oil contamination and could the vessel easily check or sample segregated ballast prior to deballasting?

Unless there is prior agreement with the inspecting oil major and permission from the terminal, there must be NO tank entry.

During the Inspector's opening meeting a request may be made to prepare for a ballast or fore peak tank to be viewed from deck level. If this is agreed then, for safety reasons, the opening or removal of any hatches/manhole covers should be left until the Inspector is ready to view the internals.

Unless in a clean and safe condition, cargo tank hatches should not be opened for viewing from deck level.

In general, the Inspector will check the sighting and sampling ports. The Inspector will also be sighting ballast tank spaces to check for signs of excessive wastage on ladders, poor coating conditions and any oil sheen on the surface of ballast water, and any smell of cargo vapours.

Ensure the vessel has records (log book entries) confirming ballast tanks adjacent to cargo tanks have been sighted for oil prior to discharge.

There is always disagreement on the interpretation of how many nuts/bolts are considered too many when they have to be removed from manhole covers. It is recommended these nuts/bolts are frequently maintained/greased to be able to demonstrate the ease with which they can be removed.



Chapter 3.

Crew Management

Crew Management

This is a critical area of the inspection and, in most cases, observations in this chapter can result through no fault of the vessel's staff.

A main area of concern can be compliance with the requirements of the Officer's Matrix. These requirements vary from oil major to oil major and therefore, it is the company that should be aware of these requirements and ensure compliance.

The requirements for different oil companies can be obtained from the latest edition of the *INTERTANKO Guide to the Vetting Process*.

The Officer's Matrix is very simple to complete and its accuracy can on occasion decide whether the vessel will be accepted for business by any potential vetting department and charterer. It is recommended that the company sends the Master an up-to-date matrix prior to the inspection.

Should the Master be requested to complete the Officer's Matrix by their company or charterer, the following explanation and guideline shall be closely followed. It is a step-by-step process on how to calculate the required information to ensure that the Officer's Matrix is completed accurately:

- **Nationality** – the nationality of the Officer.
- **Certificate of competency** – sometimes referred to as a license, this should be the highest level of competency the Officer holds.
- **Issuing country** – the issuing country of the Officer's license may not necessarily be the same nationality as the Officer.
- **Administration acceptance** – the Officer's license MUST be acceptable to the vessel's Flag State Administration.
- **Tanker certification** – the Officers must have tanker training relative to the type of tanker they are serving on i.e. oil, chemical or gas.
- **STCW V paragraph** – Chapter V paragraph 1.1 refers to the specialised tanker training provided to junior Officers and ratings who have responsibilities during cargo operations. Chapter V paragraph 1.2 refers to specialised tanker training applicable to those Officers responsible for cargo transfer operations.
- **Radio qualification** – to the level of General Operator (GO) and not required for all of the Bridge Team but a minimum of two Officers is required.
- **Years with Operator** – the number of whole calendar years the officer has been employed by the vessel's management company (the company responsible for the day-to-day operating of the vessel).
- **Years in Rank** – refers to the Officer's "actual years of sea service served on board a ship" sailed in the current rank.
- **Years on this type of tanker** – refers solely to the Officer's "actual years of sea service served on board ship" sailed on the type of tanker the Officer is currently on. If the current vessel is an oil tanker, then it is "actual years of sea service" on oil tankers irrespective of its size. The same is true for Chemical and Gas tankers.
- **Years on all types of tanker** – refers to the total of "actual years of sea service" served on all tanker types. Number of years served on Oil+Chemical+Gas = years on all types of tanker.
- **Months on vessel this tour of duty** – the number of months on board since joining this current vessel.

It is suggested to add an additional line in the company's own Officer's Matrix to include the "actual years of sea service" as an Officer of the Watch (OOW). This is beneficial as some Vetting Departments choose to

evaluate the Junior Officers' experience levels in addition to the Senior Officers. For further explanation please consider the following but, always bear in mind that this is subject to the discretion of the vetting department:

- **Months of experience as OOW** – Irrespective of rank, this is the combined total of "actual months of sea service" served as an OOW i.e. for the Chief Officer's sea service as a watch keeping officer this is the total number of months served as Chief Officer + 2nd Officer + 3rd Officer. Similarly for the 2nd Officer, the total months served as 2nd + 3rd Officer. Also, this applies to the Engineers, the "actual months of sea service" as a watch keeping Engineer Officer i.e. for the 2nd Engineer is the total months of sea service as 2nd Engineer + 3rd Engineer + 4th Engineer; and 3rd. Engineer, the total months served as 3rd. Engineer + 4th Engineer.

The reasoning behind adding this extra line to the Officer's Matrix is, for example; the 2nd Officer may have just two months' actual sea service in rank but, as a 3rd Officer may have had 24 months. Therefore, instead of having what would appear just two months' experience in rank the Officer actually has a combined total of 26 months' of sea time as an OOW.

Some charterers do not wish to have too many newly promoted Officers at the same time on board and will look at the Officer's experience as OOW (cadet time excluded).

In such cases it is not unusual for these charterers to require that if the vessel is manned with two Junior Officers per department (Deck or Engine), the aggregated experience as Junior OOW should not be below 12 months and if one of the two Junior Officers has below six months' sea time as OOW then the other Junior Officer should have a minimum of 12 months.

Also, if the vessel is manned with three Junior Officers per department (Deck or Engine), the aggregated experience as Junior OOW should not be below 18 months. If one of the three Junior Officers has fewer than six months' sea time as OOW then one of the two other Officers should have a minimum of 12 months' sea time as OOW.

Time served as a cadet or apprentice does not count and cannot be added to an Officer's sea time.

Attitude

The Inspector will also be observing how well the Officers work amongst themselves as well as how the crew work together as a team. Issuing loud vocal instructions will not be seen as good management technique and instead be indicative of weak supervision.

Crew Management

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

The Inspector will compare the requirements of the vessel's Minimum Safe Manning Certificate against the vessel's crew list. The number of Officers and crew listed on the crew list should, as a minimum, satisfy the Safe Manning Certificate. In most cases the crew list will exceed the number of Officers and crew stated on the Safe Manning Certificate.

Generally, on smaller coastal vessels, the on-board manning should ensure that neither the Master nor Chief Engineer are required to keep a regular watch and the vessel is capable of operating with a three-man watch-keeping system. For vessels operating in the Unmanned Machinery Spaces (UMS) mode, reference should be made to the Safe Manning Certificate to ensure the vessel is in compliance and has the required number of Engineers serving on board.

The Inspector will be looking to report that the vessel is operated with adequate manning levels for normal sailing conditions, safely mooring the vessel, conducting safe cargo operations, security measures are satisfactorily maintained and hours of work and rest are not breached.

Watch-keeping schedules shall be posted on the bridge, the cargo control room and the engine control room. Schedules that include six (6) hours on and six (6) hours off do not comply with either STCW or MLC 2006.

Bridge watches should, in the hours of darkness, incorporate two men on duty, one Officer and one look-out.

3.2 Are the STCW and Flag Administration's regulations that control hours of work to minimise fatigue being followed and are all personnel maintaining hours of rest records in compliance with MLC or STCW requirements?

The STCW'95/MLC 2006 regulations on the hours of work and rest are well known. What is important, irrespective of the system that is used to record the hours of work and rest, is to ensure that all records should be updated daily, otherwise individuals trying to rely on memory will ultimately forget and make the wrong entries. The hours of work and rest shall be checked and monitored by the Chief Officer for the deck department and the 2nd Engineer for the engine room staff.

Incorrect or inaccurate recording of maintaining such records is very easy to identify and an observation will inevitably follow. The simplest method used to identify incorrect or inaccurate recording of hours of work or rest is by simply checking and cross referencing other work records and/or logbooks (such as Oil Record Books). The inspector can compare Hours of Work and Rest records with hours of bunkering, crude oil washing, tank cleaning operations, etc.

3.3 Are all personnel able to communicate effectively in a common language?

The bridge, engine room and GMDSS logbooks should each have written on the cover or first appropriate page the working language used on board, which, in most cases will be English. Therefore, it must be indicated on the aforementioned cover or page for example "Working Language is English".

Officers and crew of the same nationality will naturally tend to communicate in their mother tongue. When berthed alongside the language will be in English, unless of course the vessel calls to a country that shares the same mother language as the crew. The inspection will be carried out in English and the crew and in particular, the senior staff should be able to demonstrate their ability to converse in this language.

All posted Muster Lists and Contingency Plans, shall, as a minimum, be written in the vessel's working and official languages. Should these languages be the same e.g. English, then no translation will be necessary.

3.4 Has the Master attended a ship-handling course where applicable?

The Master with less than three (3) years' experience in rank, will need to be able to provide evidence that he/she has attended a ship-handling course either by ship simulator or has sufficient practical experience – with documented records available. Most companies have training officers/departments who should keep records of such training of Masters and thus be able to present such records. This question does not apply to Masters with more than ten (10) years' experience.

Crew Qualifications

3.5 Does the Officers' Matrix posted for the vessel on the SIRE website accurately reflect the information relating to the Officers on board at the time of the inspection?

Using the guidance provided at the start of this chapter for correct completion of the Officer's Matrix, the Master should confirm this information with the office as the Fleet Personnel Department may have additional information to complete the Matrix accurately. The person in the office responsible for completing the online matrix is strongly advised to forward the online version to the vessel.

The Inspector will cross reference the Matrix against the Officers' certification.

3.6 Are those Officers who have immediate responsibility for cargo transfer, in possession of the Certificates of Specialized Training as applicable to the type of cargo being carried?

The Master should have all Officers' certification and training evidence available that suits their current activities and responsibilities on board.

Very often pumpmen are assigned immediate responsibilities with regards to cargo operations – any person with such immediate responsibility should have an advanced training certificate.

Reference is also made to "ratings" which may have the same immediate responsibility. It is recommended to make it very clear to any Inspector – that this is not the case onboard by:

- Clearly stating in the deck log book, or explicitly stated in the job description of the rating, that they do not have immediate responsibility for loading, discharging, care in transit, handling of cargo tank cleaning or other cargo-related operations on oil, chemical or liquefied gas tankers. Only Masters, chief engineer officers, chief mates, second engineer officers and any person with immediate responsibility for loading, discharging, care in transit, handling of cargo tank cleaning or other cargo-related operations on oil, chemical or liquefied gas tankers shall hold a certificate in advanced training for oil, chemical or liquefied tanker cargo operations (STCW Reg V/1-1.3, 1.5 or 2.3).
- This should be used as objective evidence that they do not require the additional advanced training. So in the closure meeting if an observation is raised then this can be put forward.

3.7 If the vessel is equipped with an Electronic Chart Display and Information System (ECDIS) have the Master and Deck Officers undertaken both generic training and type-specific familiarisation on the system fitted onboard?

The Master and Deck Officers must have the generic training and type-specific ECDIS familiarisation on the system fitted onboard. Type-specific Familiarisation is acceptable using various methods which include:

- The use of the checklist provided in the publication "ECDIS – Industry Recommendations for ECDIS Familiarisation"
- Shore-based ship-specific training
- CBT followed by onboard type specific familiarisation
- E-learning followed by onboard type specific familiarisation
- Onboard training by appropriately trained crew or personnel
- Company bridge procedures and manuals
- Manufacturer-provided training mode followed by onboard type-specific familiarisation.

Drug and Alcohol Policy

3.8 Does the operator have measures in place to prevent Drug and Alcohol abuse in accordance with OCIMF guidelines?

The Master shall provide the Inspector with the company Drug and Alcohol (D&A) Policy. The Inspector will then review the policy to identify that it complies with the OCIMF guidelines.

The Master and Officers must be able to demonstrate to the Inspector their knowledge of the company's D&A Policy. The company D&A policy shall identify the maximum level of blood alcohol content. Some vessels have no alcohol on board at all and should this be the case, the Master should make the Inspector aware of this.

It is strongly suggested the company's D&A Policy is posted in conspicuous locations, for example:

- (i) The main accommodation cross alleyway
- (ii) The Officers' and crew mess rooms and smoke rooms
- (iii) The bridge
- (iv) Cargo control room
- (v) Engine control room.

The company procedure shall identify the frequency of unannounced drug and alcohol tests carried out by the ship staff. This frequency will be provided within the company D&A Policy or elsewhere in the SMS. The Master should also advise the Inspector that unannounced tests are carried out in the event of an incident or near miss.

The Master will be required to show the Inspector the records of unannounced drugs and alcohol tests, the records shall also be required to indicate the dates of all tests.

The procedure should include company arrangement for an independent agency to conduct an unannounced drug and alcohol test without prior knowledge of the Master and those on board. The Inspector will request to see evidence of this independent unannounced test which may be in the form of a certificate and should be in the possession of the Master.



Chapter 4.

Navigation and

Communications

Navigation and Communications

It is recognised that most navigation-related incidents at sea are, in the main, caused by human error or oversight. Over reliance on equipment plays a big part in this.

An Inspector may therefore tend to spend considerable time on the bridge during this phase of the inspection. Approximately 80% of SIRE and CDI Inspectors are either ex-Masters or Senior Deck Officers and, being experienced with navigation techniques, will look for the thoroughness of how navigation is practiced and executed on board.

It is strongly advised that the vessel's Navigation Officer, normally the 2nd Officer, be present throughout the inspection of all navigational activities and should be accompanied by the Master. The Navigation Officer should be well versed and practiced with the company procedures on all aspects of navigating the vessel.

There will be of course, Inspectors who have their own ideas of how navigation techniques should be practised, therefore it is particularly important for the Navigation Officer to be fully familiar with Chapter 4 of the latest edition of the SIRE VIQ.

Policies, Procedures and Documentation:

4.1 Are the Deck Officers familiar with the Company navigation procedures and instructions and are the Company navigation procedures comprehensive?

It would greatly assist the inspection process if the company navigational (manual) procedures are readily available on the bridge as the Inspector will verify references to the guidance provided within the manual.

COMPETENCE

The Navigation Officer must be fully conversant with the content of the navigational procedures.

If the company navigation procedures are in electronic form then there must be a backup system. In this case, a hard copy would fit this role. The important issue is that the Navigation Officer, supported by the Master, is fully conversant with its full content.

Comprehensive ECDIS procedures are expected to follow the publications, which MUST be onboard and deck officers familiar with: NP231,232,5012.

Emergency procedures that include the failure of "Key" equipment must be available in hard copy.

A bridge order book – often known as "Night Orders" – is expected to be completed on a daily basis.

COMPETENCE

All OOW's must be able to show they understand the company and Master's Standing Orders which have been signed by all and hard copy posted.

4.2 Is the vessel maintaining an adequate record of all navigational activities, both at sea and during pilotage?

Entries in the working Bridge Logbook and all other log and record books MUST be written in ink. All activities that are routine and non-routine should be recorded in the Bridge Logbook and these must be clearly written. On NO account should correction fluid be used should a mistake be made – any mistake or error should be crossed through once, initialled and the correct entry then written in.

Empty lines are not allowed – there is plenty of information that can be recorded during any watch period to fill all lines. Log entries must be full – they are records that will be used in the event of any legal action and need to be complete at all times.

As a minimum, reference must be made to the latest revision of the VIQ for the information required to be entered into the Bridge Logbook. In fact, all activities concerning navigational aspects during the watch must be recorded in full.

Electronic software, as long as it meets requirements of IMO, Marpol, SOLAS and Flag States may be an acceptable means of making log entries.

In addition to the navigational activities that have taken place throughout the watch, the Watch-keeping Officer will also be required to enter the effectiveness of the radar(s) in the appropriate logbook. The effectiveness is measured by one of the following means: numeric, by percentage or graphical – an entry stating ‘good’, ‘average’ or ‘poor’ is not an acceptable description.

4.3 Are procedures in place for the testing of bridge equipment before arrival / departure and checklists in effective use for pre-arrival, pre-departure, watch handover and Master-Pilot exchange?

Procedures must be in place for preparation on arrival into port and prior to departure. Most companies will have their own version of what systems they require to be checked prior arrival and departure. The content should, as a minimum, include those in the latest edition of the *ICS Bridge Procedures Guide* (BPG).

It is of the utmost importance that the steering gear is tested in all modes by the ship staff within twelve (12) hours of departure. Therefore, all bridge and engine room Watch-keepers shall be fully familiar with the operation of the steering gear testing process.

The pre-arrival and pre-departure checklists shall be available and completed in full. The acknowledgement of each question shall reflect the vessel’s trading area and current condition i.e. do not just check the boxes randomly.

Also in evidence shall be company-supplied watch handover checklists, Pilot-Master exchange and Pilot Card. (See BPG) It is recommended the bridge Watch-keeping Officer is also involved in the Pilot-Master exchange of information so the bridge team is fully aware of the planned activities during entering, or the vessel’s departure from port. In addition, any defective equipment that may affect safe navigation should be brought to the attention of the Master, advised to the pilot via the Master/Pilot exchange of information checklist, and also recorded in the log book.

4.4 Are fire and safety rounds being completed after each watch, recorded in the deck log and are staff conducting the rounds aware of their duties here?

COMPETENCE

Staff conducting fire and safety rounds must be aware of their duties – see VIQ guidance. The bridge watch-keeping look-out shall not leave the bridge during their hours of duty on the bridge to perform fire and safety rounds. It is generally accepted that fire and safety rounds will be carried between the hours of 2200hrs and 0600hrs. Records of these rounds can be maintained in the Bridge Logbook or in another form of record book as provided by the company.

4.5 Are Deck Officers familiar with the operators Under Keel Clearance (UKC) policy, able to demonstrate satisfactory UKC calculations for the last voyage and is the policy comprehensive?

COMPETENCE

The Deck Officer (Navigation Officer) charged with preparing the passage plan will need to be familiar with the company’s policy for Under Keel Clearance (UKC) and accurately calculate the vessel’s UKC throughout all stages of the voyage with particular attention being paid during pilotage. All aspects of the vessel’s condition as well as factors such as the weather, tides, etc, MUST be taken into consideration. The company will have their own criteria to follow for calculating the UKC, which as a minimum should include that provided in the VIQ. UKC requirements are to be detailed for open ocean, shallows waters, within port limits and alongside.

Accurate calculating of the UKC is critical and not only should the Navigation Officer be aware of the locations of where the minimum UKC is that must also be indicated on the charts, but the Master and all Bridge Watch-keeping Officers must also be aware of this and this is best discussed during the Bridge Team pre-arrival and pre-departure meetings.

CATZOC is deemed to be a critical part of the UKC calculation – this is nothing new and has been available on paper charts for many years but never raised to the levels of concerns given today. CATZOC can either be a part of the UKC calculation or clearly stated within the company policies/procedures.

It is recommended where CATZOC D or U is identified, then a risk assessment is completed showing mitigating measures which may include contact with the office and approval sought as otherwise this will often indicate a vessel is breaching the UKC policy.

It is also advisable to maintain the papers on which the UKC calculations were made.

Further guidance on UKC and CATZOC can be found in the INTERTANKO publication *Guide to Safe Navigation (including ECDIS)*.

4.6 Has the Bridge been adequately manned at all stages of the voyage and at Anchor and were look-out arrangements adequate?

It is expected that the bridge is manned with the Bridge Watch-keeping Officer and a look-out through the voyage particularly during the hours of darkness and outside of normal daylight work hours.

It is imperative that the hours of work and rest are accurately maintained after each watch or at least daily.

The Bridge Watch-keeping Officers must ensure that a proper visual look-out is maintained at all times either by themselves or their dedicated look-out to fully assess that the situation is safe for navigation. In order not to contravene the requirements of STCW or SOLAS a look-out MUST NOT leave the bridge.

The Bridge Watch-keeping Officer must ensure a look-out is maintained through their watch. On those ships that have a separate chart room, the Bridge Watch-keeping Officer may, for essential navigation, visit for a very short period when it is totally safe to do so after an appraisal.

Navigation Equipment

4.7 Is navigation equipment appropriate for the size of the vessel and in good order?

All navigational equipment should be fully operational and each Bridge Watch-keeping Officer must be fully familiarised with both the purpose and its use.

Any out-of-use or obsolete equipment must be isolated and a notice posted on the item stating it is out of operation and not used for navigational purposes.

NOTE: BNWAS – ensure it is operational when the ship is underway and when at anchor. The reset function must not be in the chartroom or any area that is outside the area where a proper lookout can be maintained.

An Inspector may ask for the loss of mains power to be simulated to check it still operates but he is NOT required to ask for the back-up battery power to be “tripped”.

4.8 Are navigation lights in good order, the OOW aware of the procedures for testing the lights and actions in event of failure?

COMPETENCE

Each Bridge Watch-keeping Officer shall be aware of the procedure that is in place to check the navigation light alarm in the event of failure.

4.9 Are the Standard Magnetic compass and Gyro compasses in good order and is the OOW aware of the requirements for taking compass errors and is the compass error book maintained?

COMPETENCE

The Navigation Officer should ensure the magnetic compass is in good working order and immediately advise the Master of any suspected defects. The magnetic compass shall be adjusted if a period of two (2) years has elapsed since the last adjustment and a record of errors has not been maintained. If large deviations are continually recorded or physical defects identified, the compass must be adjusted.

Following each compass adjustment, a compass deviation card shall be prepared and posted on the bridge in an appropriate and visible location.

The binnacle lights need to be checked frequently to ensure that they are in full working condition and provide full illumination. Gyro repeaters on the bridge wings and in the steering gear compartment should be properly aligned with the main gyro. Where fitted, repeaters on the bridge wings need to have their respective lights routinely checked to ensure they are fully illuminated when required.

Each of the Bridge Watch-keeping Officers shall check and record compass errors using azimuth or transit bearings, when possible. Any error of the Gyro compass should also be identified by using celestial bearings. When compass errors cannot be taken it is not necessary to record this in the log book or compass error book.

Each of the Bridge Watch-keeping Officers shall check and record a comparison between the magnetic and gyro headings during each watch and after a large course alteration. The details are then entered in the Bridge Log or the compass error book.

4.10 Was the hand steering in use for the vessel's transit from pilotage to the berth as appropriate and are Deck Officers familiar with the changeover from hand steering to auto and vice versa?

COMPETENCE

Posted permanently on the bridge and in the steering gear compartment these shall be a simple line diagram and step-by-step instructions of how to change the steering from auto to manual and emergency. The respective bridge and engine room officers shall be fully familiar with the changeover of each mode of operation.

Changeover times/location must be recorded in the deck log book or bell book.

4.11 Are Deck Officers familiar with procedure to retain the VDR data in the event of an incident?

COMPETENCE

The Master and each Bridge Watch-keeping Officer shall be fully familiarised and knowledgeable on how to save and protect the data recorded on the VDR from being over written. Instructions on this should also be posted beside the unit.

It is recommended that all Deck Officers are aware of how to download the saved data – this is not required under the VIQ guidance notes but is considered good practice.

4.12 Is there an effective Chart and Publication (Paper and Electronic) Management System in place and are the Deck Officers familiar with the process including the effective management of Temporary and Preliminary (T&P) notices?

COMPETENCE

Generally, the company is responsible to make the appropriate arrangements to provide up-to-date nautical publications in a timely manner. Should the latest (current) edition of any chart or charts for the intended voyage not be available then every effort should be made to obtain these. This may mean the Master trying to obtain the missing publication or chart through the local agent.

The updating of electronic charts must be undertaken with care to ensure all updates are correctly incorporated. Clear records must be kept of the electronic updates.

Ensure SEC (Safety Equipment Certificate) Form E is correctly annotated if ECDIS is fitted and used as the primary means of navigation, and back up is correctly indicated.

If the approach charts for the forthcoming port are not available, then the Pilots can be provided (through the agent) with the required charts for these to be delivered upon boarding. It should be explained to an Inspector that every effort has been made to procure the required charts/publications by both the Master and the company.

All Deck Officers must be fully aware of some shortcoming re: ECDIS and T&Ps:

- ECDIS does not very effectively draw attention to T&P updates within ENC's.
- Not all Hydrographic Offices include T&P information in their ENC's.
- The UKHO has also recognised that the lack of consistent, worldwide, T&P information is a significant problem for mariners and, as an interim measure, is including all Admiralty T&P NMs in its 'Admiralty Information Overlay'. This allows the limits of the T&P NMs to be displayed as an overlay to ENC's in the Admiralty Vector Chart Service (AVCS) by compatible display systems.
- Other ECDIS manufacturers and ENC suppliers may have their own similar system. Inspectors should verify the system installed to ensure relevant notices are effectively managed.
- If T&P's are not in the overlay, they MUST be added to ECDIS as a Mariners Note.

Further guidance can be found in the INTERTANKO publication *Guide to Safe Navigation (Including ECDIS)*.

4.13 Are Deck Officers aware of the requirements for managing Navtex and Navarea Warnings and is there evidence of an effective system in place to monitor these warnings?

COMPETENCE

Navtex and Navarea Warnings should be filed and kept up to date and this will include removing out-of-date notices. In addition, the Navtex and Navarea warnings should be appropriately charted and brought to the attention of each Bridge Watch-keeping Officer: i.e. included within the passage plan. It must be remembered, the warnings must be immediately removed once they have each been cancelled.

It will also be beneficial to indicate to the Inspector that all available information is used to navigate safely; this will include attaching the reports to the appropriate chart in use and the areas being transited.

Where ECDIS is fitted and used, these warnings can often be automatically updated in the ENC. If not they will need to be included as a Mariners Note and MUST be managed effectively – i.e. removed when withdrawn.

4.14 Are the Master and Deck Officers familiar with the operation of the Electronic Chart Display and Information System (ECDIS) fitted on board?

COMPETENCE

The Inspector will pay very close attention to the use and operation of this new piece of equipment. Due to the large number of ECDIS units the Inspector may not be familiar with that particular model. Therefore, great care should be undertaken when demonstrating the equipment so that the Inspector can be confident that the Officer is fully familiar with the equipment.

As a minimum the Master and Deck Officers must be able to demonstrate the following:

- 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 – this is not possible on all types of ECDIS. Setting parallel index lines on the radar is more than adequate.
- 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.
- Understanding of limitations of operating in RCDS mode – some companies' procedures may not allow this mode of operation
- AIS and or Radar overlay if fitted
- Knowledge of SCAMIN (Scale Minimum) and how it is displayed
- Knowledge of CATZOCs (Category of zone of confidence in data)
- Familiarity of Deck Officers with contingency action in case of ECDIS failure – these should be detailed in your ECDIS operating procedures.

Even though the Master and Deck Officers should be able to undertake the above tasks, they must be comfortable and familiar with all the equipment. IHO presentation library Version 4 must be installed.

4.15 Are the Master and Deck Officers familiar with the safety parameter settings for the ECDIS and have the safety settings been correctly applied for the vessel's passage?

COMPETENCE

Safety settings are considered a critical part of the correct operation of ECDIS.

If safety parameters are not set correctly this may result in too many alarms being activated and thus the potential to ignore some alarms.

Alarms must be managed carefully and follow company requirements – during a voyage these are expected to change, and thus must be included in the voyage plan. ALL alarms settings MUST and checked during every watch handover procedure.

The Safety Contour must be carefully calculated and used to mark the division between safe and unsafe waters. If it cannot be shown to the exact value set by the OOW, it will default to the next contour depth on the ECDIS – this depends on the make of ECDIS installed.

Crossing a safety contour will raise an alarm and company procedures allowing for this must be followed.

The Safety Depth highlights individual soundings in bold that would appear where the sounding is less than the level set on the safety depth alarm. This is generally set the same as the safety contour.

Safety Frame or Safety Cone is equally as important as the Safety Contour, as this will provide early indication of the vessel running into danger or approaching an area of concern.

If the safety frame is set too large then the ECDIS is likely to provide alarm overload with the result that an essential alarm may possibly be ignored.

4.16 Were the charts used for the previous voyage appropriate?

The Inspector will check the charts are the latest editions and of the appropriate scale, and their respective corrections are up to date with the latest Notices to Mariners received on board.

The largest scale chart must be used during the voyage.

4.17 Are the Master and Deck Officers aware of the requirements of ECDIS and does the system fitted meet SOLAS and Flag State requirements?

The Master and each Bridge Watch-keeping Officer should be able to explain to the Inspector the ECDIS requirement which include the SOLAS and Flag State requirements.

COMPETENCE

ECDIS shall not be solely relied upon. The Master and Deck Officers shall check their position by other means such as radar ranges, parallel indexing/clearing bearings and visual bearings.

The data input from gyro compass, speed log, echo sounder and other sources of information must be monitored for accuracy. Records must be maintained to prove that monitoring of the ECDIS has been conducted.

ECDIS should store and be able to reproduce certain minimum elements required to reconstruct the navigation and verify the official database used during the previous 12 hours.

The following data shall be recorded at one-minute intervals:

1. to ensure a record of own ship's past track: time, position, heading, and speed; and
2. to ensure a record of official data used: ENC source, edition, date, cell and update history.

In addition, ECDIS should record the complete track for the entire voyage, with time marks at intervals not exceeding four (4) hours.

ECDIS should be connected to systems providing continuous position-fixing, heading and speed information. (Res A.817(19)12.2)

As long as the ECDIS meets the minimum performance standard, then observations should NOT be made even if the ECDIS cannot perform other features that maybe be additional to some ECDIS e.g. radar overlay, navtex connection etc.

Back up paper systems

The Navigation Officer must ensure all paper charts and nautical publications including and not limited to those listed below, are fully maintained and up to date. Any discrepancy with the latest cumulative list could be recorded as an observation.

- (i) Lists of Lights
- (ii) Tide Tables
- (iii) Sailing Directions
- (iv) Nautical Almanac
- (v) Annual Summary of Notice to Mariners
- (vi) Chart Catalogue.

4.18 Has the vessel been safely navigated in compliance with international regulations and are Deck Officers familiar with these requirements?

COMPETENCE

The Inspector will closely scrutinise the paper voyage charts/ECDIS to ensure that they are the latest editions, that they have been corrected and that they are up-to-date with the latest corrections received on board. The Inspector will also check the condition of any paper charts; i.e. they are clean, not torn and taped together.

While scrutinising the charts/ECDIS, the Inspector will also check to see that the Deck Officers are familiar with the international regulations and vessel has been navigated safely and has adhered to international ships' routing – any reason for any deviation from these by the Master must be recorded in the ship's log book. These could include traffic separation zones, periods between position fixes and the methods used to verify the vessel's position throughout the voyage.

Wrecks and prohibited areas shall be clearly indicated with a danger zone indicated around the hazard to safe navigation.

Remember ATBA's (Area To Be Avoided) and PSSAs (Particularly Sensitive Sea Areas) on ECDIS are not transited.

Safe distances from the coast will be checked – especially in bad weather. It will also be beneficial to indicate to the Inspector that all available information is used to navigate safely.

4.19 Are the Master and Deck Officers aware of the requirements for the echo sounder and is there evidence that it has been in use as appropriate during the voyage?

COMPETENCE

The echo sounder is a navigational aid that should be utilised fully by switching on when making landfall and during all coastal passages and pilotage.

The location of when the echo sounder is to be switched on should be clearly indicated on the charts to assist the Officer on Watch. Additionally, the echo sounder recorder paper shall be marked with the time and position the unit was switched on. Similarly, when leaving port the echo sounder shall be in use with the pertinent information marked on the echo sounder recorder paper as well as when passing prominent land and sea marks.

On some vessels, electronic echo sounders are in use and their memories, usually 24 hours, can be recalled. The Bridge Watch-keeping Officers should be aware of how to recall the memories of such echo sounding units.

It is important also to ensure that the clocks on all these electronic instruments are synchronised.

4.20 Was a comprehensive berth-to-berth passage plan available for the previous voyage and were the Deck Officers aware of position fixing requirements including the use of parallel indexing both at sea and during pilotage?

COMPETENCE

Many Inspectors are former Masters or Chief Officers and therefore, may have their own opinion and interpretation of what information should be included within the passage plan in addition to that described in the latest VIQ. Therefore, as a minimum, the criteria provided in the latest VIQ should be followed fully and any other information applicable to the voyage should be readily available i.e. methodology of how minimum UKC was calculated and should any bridges be passed, the calculations of the clearance between the vessel and the underside of the bridge. (for more guidance, reference is made to the INTERTANKO publication *Guide to Safe Navigation (including ECDIS)*)

If an inspection has been arranged on conclusion of the current voyage DO NOT erase the courses and relevant information from the charts used for the whole berth-to-berth passage until after the inspection has been concluded.

Vessels using paper charts should not overdo the marking of no-go areas; these markings should be prominent but should not overly clutter the charts.

All courses and information relevant to the voyage shall be indicated in pencil (type 2B) on the charts and any other information used to plan the passage must be readily available to demonstrate to the Inspector. This could include any information and/or communications regarding water depths from local knowledge sources such as the agents and pilot stations.

One single method of position fixing should not be relied upon. Alternate methods of position fixing should be used to cross reference each and relying solely on the GPS will certainly not be viewed as reliable method of position fixing. The GPS can be used provided it is backed up by the use of other conventional methods of position fixing such as visual, radar and celestial navigation techniques.

Position fixes should be clearly indicated on the charts and the methods used to cross reference for accuracy. Monitoring the ship's progress by using parallel indexing is a reliable means of avoiding one-man error. However, fixed points should be used for reference and the use of floating objects shall be avoided.

Communications

In the modern era of global and instant communication through phone and email, the SOLAS required equipment can often be seen as being old fashioned and too basic. However, this equipment will be vital in the event of an emergency and this is particularly true for the communication equipment in the LSA. Therefore, the equipment must be maintained in good order and proper records kept.

4.21 Are Deck Officers familiar with the preparation and transmission of distress and urgency messages on the GMDSS equipment, are instructions clearly displayed and equipment in good order?

COMPETENCE

Each Bridge Watch-keeping Officer must be able to demonstrate to the Inspector the preparation and transmission of distress and urgency messages on the GMDSS equipment in case of an emergency or distress.

Instructions to use the GMDSS equipment in an emergency situation should be clearly written and posted.

4.22 Are Officers aware of the function of the ship security alert system and how it operates?

COMPETENCE

Each Bridge Watch-keeping Officer must be able to explain the operation of, as well as their understanding of, the Ship Security Alert System (SSAS) as fitted on the bridge. No other details should be released to the Inspector.

4.23 Are Officers aware of the periodical test requirements for GMDSS equipment and is the radio logbook correctly maintained with entries of such tests?

COMPETENCE

The current GMDSS operator shall be listed within the GMDSS logbook and also carry out routine periodical testing of the GMDSS equipment. Records of the daily, weekly and monthly testing shall be entered in the GMDSS Logbook. To ease identification of these test records, the entry could be underlined in red ink or any other distinctive colour.

All entries in the GMDSS log shall be complete and in full. Any absence of an entry will result in an observation.

4.24 Is there a maintenance programme in place to ensure availability of the radio equipment?

A copy of the maintenance programme agreement should be posted in the vicinity of the GMDSS station. The designated GMDSS operator shall be aware of the maintenance service provider.

4.25 Is the satellite EPIRB fitted, armed and labelled correctly and inspected in accordance with the manufacturer's requirements?

The EPIRB should be installed in a location that allows it to "float free" easily and its position should be clearly indicated locally and on the Fire Plan. The designated GMDSS officer shall ensure that the vessel's name, serial number and Maritime Mobile Services Identity are clearly visible and the hydrostatic release is correctly connected and in date. The Inspector may ask the attending Officer to demonstrate manual removal of the EPIRB and the procedures for manual activation and self-test. It would be beneficial, therefore, if instructions for activation and self-test are posted either locally or at the GMDSS station or other prominent location.

Tests that are carried out on the EPIRB shall be entered in the GMDSS logbook.

4.26 Is the vessel equipped with sufficient intrinsically safe portable radios for use on deck?

There must be a suitable number of charged and intrinsically safe portable radios on board together with spare batteries. As a minimum there should be one each for the Master, Duty Deck Officer, pump man, deck watch and the cargo control room.

Portable radios should be carried in their dedicated carrying case.

4.27 Are survival craft portable VHF radios and Search and Rescue Locating Devices in good order and charged?

Placed in a prominent location on the bridge with the appropriate IMO reflective signs posted should be the three (3) portable survival craft VHF radios. The location and the use of these radios shall be known to all bridge watch keeping officers. They should each be located along with their spare batteries.

Primary battery shelf life should be at least two (2) years. Most products have a battery life of three (3) years, thus is considered in compliance with the guidance.

There will also be two Search and Rescue Transponders (SARTs) conveniently positioned with the appropriate IMO reflective signs, one each at the port and starboard bridge wing doors. These are each for use for those vessels provided with conventional port and starboard lifeboats. For vessels with a freefall lifeboat, one SART shall be positioned in the boat itself, the other available on the bridge for use in other survival craft.

The Inspector may request any attending Deck Officer to demonstrate its use in conjunction with the radar.

A large, stylized graphic of a globe or sphere, composed of several overlapping circles and horizontal lines, rendered in a light blue color, occupying the upper two-thirds of the page.

Chapter 5.

Safety Management

Safety Management

The safety management of the ship is of critical importance to the safety and security of the vessel and so it is an area on which the Inspector will focus in detail. All should ensure that safety equipment is well maintained, that drills are regularly undertaken and that enclosed space entry procedures are strictly followed.

5.1 Are Officers familiar with the process for conducting Risk Assessments (RA) for routine and non-routine tasks, do operators provide adequate procedures for conducting RA and is there sufficient evidence of this process undertaken?

COMPETENCE

Full knowledge and implementation of the company's Risk Assessment procedures should be known and implemented.

Two distinct types of Task Based Risk Assessment (TBRA) may be used.

First, a range of vessel-specific generic TBRA's that can be used for all routine and low-risk tasks can be developed. These should be periodically reviewed.

The second type of TBRA would be used for specific high-risk jobs that are not routine, such as working aloft or enclosed space entry. These should relate to the specific persons who will be involved in the work and valid only for the duration of that job.

The assessments should be carried out by a competent person or persons who understand the work being assessed.

It is recommended that seafarers who will be involved in the work should also be involved in the assessment process.

A toolbox talk is a form of risk assessment carried out in support of a TBRA and should be carried out. Its prime purpose is to talk through the procedures of the job in hand and the findings of the TBRA with the seafarers involved.

Inspectors will cross check work permits and associated risk assessments. High-risk tasks including lifeboat launching and mooring operations must always be risk assessed and discussed prior to carrying out the task.

5.2 Is there evidence of a permit to work system in place for hazardous activities, are the crew aware of these requirements and is there documented evidence of compliance?

COMPETENCE

Knowledge of the SMS procedures in place to instruct what permit to work for conducting hazardous activities is required. The crew shall be aware of the procedures and permit to work system in place for hazardous activities, which include the periods and approving authority.

Cross checks of tank entry for inspection is often cross-checked against the enclosed space entry permit and risk assessment.

With the enclosed space entry permit, ensure gas measurements and the types of gas measured for are identified – this includes knowing what the dangers of the last cargo was and to be tested for.

Ensure ALL permits are completed correctly and all information is included. This includes signatures, evidence of any permission from the company and close out correspondence. Always close the permits.

5.3 Is the appointed Safety Officer suitably trained and aware of his responsibilities, and is there evidence to show that the Safety Officer has been effectively performing duties associated with this role?

COMPETENCE

The vessel's Safety Officer shall have some form of evidence to prove that he has undergone a suitable training course to enable him to perform the duties associated with the role.

The Safety Officers must be knowledgeable of the following and be able to carry out as required:

- Safety committee meetings – tasks and management
- Risk assessments
- Accident and incident investigation – including root cause identification, corrective and preventive measures
- Near-miss reporting
- Identify hazards and implement preventive measures
- Promotion of a safe working environment
- Behavioural-based safety implementation if required.

Regular safety inspections, including with other Officers, must be carried out and defects identified, reported and corrected.

A Senior Engineer should be appointed to implement all the above requirements with regards to the engine room activities.

The Safety Officer shall have records available to demonstrate that safety rounds have been routinely carried out and evidence is available to show that findings from these rounds have been followed up or acted upon. This may include advising the company of any safety concerns raised or ideas for improvement; evidence must be available to indicate this, which may be in the form of records or correspondence to and from the office.

Safety rounds should not be considered as being part of routine maintenance rounds.

5.4 Are the ship's Officers able to demonstrate their familiarisation with the operation of fixed and portable firefighting, life saving and other emergency equipment?

COMPETENCE

Note: this refers to "Officers" only

Officers must be familiar with the operations of the following equipment and ensure notices of instruction are displayed locally and in a language/languages understood by all crew:

- emergency fire pumps
- lifeboat engines
- fixed firefighting systems
- emergency diesel generator
- emergency steering gear
- donning and use of breathing apparatus and oxygen resuscitating equipment.

The Inspector may ask a member of the ship staff to perform the starting process of one or more of these systems. Therefore, it is suggested that a competent Officer is in attendance to comply with the Inspector's requests.

An Inspector may also randomly request a member of the ship staff to don and demonstrate use of the breathing apparatus which forms part of the fireman's outfit and the use of the Oxygen (O₂) resuscitation equipment. It is therefore imperative that training is continually carried out on board so that all are confident and competent to comply with any Inspector's request.

A word of caution: The ship staff should ensure that the terminal will allow the starting of diesel-driven machinery such as lifeboat engines and emergency diesel generators. If the terminal does not allow the operation of this equipment, this instruction should be stated on the Ship/Shore Safety Checklist.

It is recommended ALL crew members should be familiar with the requirements – not just Officers.

5.5 Are crew aware of the requirements for wearing personal protective equipment such as boiler suits, safety footwear, eye and ear protection, safety harnesses, respiratory and chemical protective equipment?

COMPETENCE

Note: reference is made to ALL crew members

All Officers and crew should be able to explain to the Inspector of the various personal protective equipment that are available and the requirements for different spaces. This will also include where to find such information – such information is best displayed as a PPE matrix.

The entrances to machinery spaces and exit to the external areas shall have posted IMO reflective signs identifying what personal protective equipment (PPE) shall be worn when entering these areas. It is important to note that the PPE indicated is worn by all. For instance, the signs are meaningless if the Chief Engineer enters the machinery spaces while accompanying the Inspector and the appropriate PPE is not being worn.

As a guide the machinery spaces (engine room, fan rooms, emergency diesel generator room, cargo and ballast pump rooms, thruster room, etc.) should have posted at each entrance signs indicating that safety hats, hearing protection, full covering overalls and safety footwear is worn.

Any location that is used for storage of chemicals shall also have the appropriate signage posted to the effect that full face protection, chemical proof gloves and aprons are available and worn.

Very often spaces that are generally kept closed and contain gases e.g. CO₂ stores, enclosed lifeboats will require ventilation prior to entry. Wearing of personal gas detectors is considered a must for entry into such spaces and whenever a gas hazard could be deemed to exist.

The company may also provide additional signs to be posted and equipment to be worn. Signs indicating PPE is to be worn MUST be adhered to.

5.6 Is all electronic equipment in use in gas-hazardous areas intrinsically safe?

All electronic equipment in use in gas-hazardous areas must be intrinsically safe. No non-intrinsically safe equipment should be in use. Such equipment includes: mobile phones, pagers, digital cameras, electronic tablets (iPads, android etc).

The following equipment is NOT allowed in gas hazardous areas: smart watches/fitness bands.

Certificates or letters of approval confirming that the electronic equipment are intrinsically safe should be kept in a suitable location and presented to the Inspector if there is any doubt about the equipment's integrity in gas-hazardous areas.

All the intrinsically safe equipment must be kept free of damage such as cracks, broken seals and incomplete securing arrangements. The Inspector will raise an observation if there is no evidence that the electronic equipment used in gas-hazardous areas is not intrinsically safe or has a defect which affects the equipment's ability to be intrinsically safe.

Intrinsically safe torches must be provided on deck, in the engine room and supplied as part of the fireman's outfits.

5.7 Are crew members participating in safety meetings and is there evidence of effective discussions on safety related issues with shore management feedback?

COMPETENCE

The Safety Committee must consist of five or more seafarers. It MUST be chaired by the MASTER and the Safety Officer MUST attend.

The company will dictate the frequency of when Safety Committee Meetings are held on board. This can be either monthly or after a serious near miss or other serious incident, if the normal meeting is not due within a week. The meeting should not be related to the maintenance of safety equipment or training. It is recommended the minutes resulting from Safety Committee Meetings shall be posted prominently in the Officer and crew mess rooms and the main cross alleyway.

The company Safety Management System should identify members of the safety meeting and encourage participation and engagement from the crew members on safety-related matters.

There must be a method which allows those not present at the meeting to submit safety concerns to Safety Committee members.

It is recommended that the minutes are sent to the company and the response from the company shall be received on board with comments. The Inspector may ask to sight this correspondence. There is no specific guidance for this but it is generally thought of as best practice and carried out by most companies.

5.8 Are crew aware of the requirements for reporting of accidents, incidents, non-conformities and near misses and is there an effective system of reporting and follow up investigation in place?

COMPETENCE

The crew is fully aware of the reporting procedures for reporting of accidents, incidents, non-conformities and near misses.

It should be clearly noted that an Inspector will require to see evidence of such reports being made by all ranks onboard – not just the Master or Senior Officers, and not just from one department.

The Inspector will verify that there is a system in place to ensure that all accidents, incidents, non-conformities and near misses are satisfactorily tracked and closed out either by the vessel staff or with company involvement. The close-out process may include an investigation report or correspondence from the company that advises the situation has been resolved and closed out satisfactorily.

The Inspector must not raise an observation based on the content of the reports on any near miss, incident, accident or non-conformity. If the Inspector does raise an observation based on one of these situations the Master should object during the inspection close-out meeting. The Inspector should only raise an observation if the close-out process is not followed by either the vessel or the company.

5.9 Are Officers and ratings aware of the requirements of the ISGOTT Ship/Shore Safety Check List (SSSCL) and are the provisions of the check list being complied with?

COMPETENCE

The Officer completing the ISGOTT Ship/Shore Safety Checklist (SSSCL), or the terminal or company equivalent, with the terminal representative must be aware and ensure all checks are carried out as required and not simply acknowledged without carrying out physical checks. Both the Officer and terminal representative shall agree the intervals when those items with the code "R" (re-check) are re-checked i.e. four (4) hours and evidence is available that the checks have been carried out. Failure to add a time period for items "R" to be re-checked may result in an observation.

The vessel must NOT be penalised if the terminal has not carried out their checks and the vessel has completed its checks correctly.

Smoking areas must be selected based on the following criteria;

- Confined within the accommodation
- They must not have doors or windows/ports that can open directly on to open decks
- They must take account of current conditions, e.g. unusually high petroleum vapour concentrations, no wind, operations on adjacent tankers, which may cause an increased level of risk.

Smoking Areas – all ports must be kept closed as well as doors into passageways (except when in use).

Smoking Areas must always be used whenever the vessel is at the terminal.

Safety matches, or fixed (car type) electric lighters must be provided in designated smoking areas.

MATCHES must be of the safety type and NOT carried on tank deck or through terminals.

The use of mechanical lighters and portable lighters with electric ignition MUST be prohibited.

E-cigarettes have the same restrictions on their use as per normal cigarettes.

Ashtrays must be of a self-extinguishing type (honeycomb).

5.10 Are the crew aware of the requirements to keep external doors, ports and windows closed in port and is the accommodation space atmosphere maintained at a slightly higher pressure than that of the ambient air?

COMPETENCE

The crew must ensure all doors, ports and similar openings that open externally must be closed when in port and during all cargo operations.

External doors must be opened for access only and closed immediately thereafter. For both safety and security reasons, access to the accommodation should be through one designated door. All other doors shall remain closed but not locked when in port. The most appropriate method of securing doors is by the use of plastic seals. For safety reasons, the doors must not be locked and must allow access or exit in the event of an emergency.

During the process of receiving stores, doors will need to be opened. These should not remain open for extended periods and should be closed immediately on completion of receiving stores.

Areas of the world where there is high temperature and humidity cause discomfort to the personnel on board and in these regions the air conditioning must be in operation in the interests of safety and comfort. Should the air conditioning not be operational or ineffective this may result in an observation. If this condition exists there may be a temptation by the ship personnel to open ports and/or doors, which must be avoided.

On entering the accommodation it is very easy to identify the pressure differences and confirm the positive pressure inside and thus confirm air pressure within the accommodation is correctly set.

Careful setting of the air conditioning intakes is a must. They must not be set at 100% closed. There must not be a lower pressure inside the accommodation to that outside. Therefore, the air conditioning intakes must be set so that a slightly positive pressure exists within the accommodation – it is recommended this set up and check is done prior to the vessel's discharge and a prepared company checklist used to ensure this critical check is carried out.

5.11 Is all loose gear on deck, machinery rooms, stores and internal spaces properly secured?

All loose equipment must be secured and prevented from moving. The machinery spaces are areas where there can be a considerable amount of spares and materials than can shift at sea. These must all be properly lashed and securing devices properly fitted. Similarly, on deck and external spaces any loose gear such as spare pipes and other heavy objects must be firmly lashed and secured.

Lube/other oil drums are of particular concern:

- Stow tightly on pallets
- Lash to structure only (not to fire fighting pipes, air pipes, etc.) with wire/rope to secure
- Cover tops to prevent standing water
- If possible stow in a containment area.

Drills, Training and Familiarisation

The company will have SMS procedures in place to instruct what emergency drills must be carried out as a minimum and the periods at which they are to be held. The outcome of each emergency drill shall be documented and recorded including what improvements can be made for future drill scenarios.

5.12 Are the crew familiar with the location and operation of fire and safety equipment and have familiarisations been effectively completed for all staff?**COMPETENCE**

The company shall have a procedure in place to ensure that all ranks on board are properly familiarised with the vessel's life-saving and firefighting equipment as a minimum, and other equipment and features that will be applicable to their duties – not later than two weeks after joining, preferably earlier. This procedure may take the form of a checklist or other method that demonstrates that a full and proper familiarisation has been conducted. The records of familiarisation for all on board will need to be made available for the Inspector to view.

Very often checklists are used to records such familiarisation and once signed are evidence of completion and understanding. However – many occasions during inspection expose the lack of knowledge thus is it critical such checklists are used correctly.

The crew should be able to show and demonstrate to the Inspector the location and operation of fire and safety equipment onboard.

For visitors who board for 2-3 days, such familiarisation must be completed on boarding and within 24 hrs.

5.13 Are the crew familiar with their duties in the event of an emergency and are emergency drills being carried out as required?**COMPETENCE**

The company will provide emergency procedures that comply with the vessel's administration requirements and those laid out by the company. These will also include drills in the event oil or chemical spills and shall be in line with the requirements of the vessel's SOPEP, SMPEP and VRP (if applicable).

The crew should be able to demonstrate to the Inspector details of their duties during emergency.

Special note to be taken with regards to Enclosed Space Entry drills when the checking and use of the following must be included:

- personal protective equipment required for entry
- communications equipment and procedures

- instruments used to measure the atmosphere in the enclosed space
- rescue equipment and procedures
- instructions for first aid and rescue techniques.

For vessels receiving/using gas as bunker fuel, specific requirements must be drilled/exercised – refer to VIQ guidance notes.

5.14 Are the crew familiar with their duties during lifeboat and fire drills and are drills being performed effectively on a frequency meeting SOLAS and Flag State requirements?

COMPETENCE

Lifeboat drills, be they with conventional or free-fall lifeboats, shall be in accordance with the vessel's Flag State administration and/or SOLAS requirements. Lifeboat drills will need to be documented in the ship's logbook or similar record book and all on board must be aware of their duties in the event of abandoning ship.

During the course of an inspection, the Inspector will request the lifeboat engine to be started. The instructions for starting the lifeboat engine shall be prominently posted and all on board able to start and run the engine briefly ahead and astern. To prove this, the Inspector may select a member of the ship's personnel who is accompanying him on this part of the inspection.

All on board shall be fully familiar with the correct method of donning life-vests.

The ship's personnel shall be fully aware of their duties during fire drills and in the event of an actual incident. The ship's personnel should be aware of where all firefighting equipment is stowed and the correct donning of fireman's outfits.

The requirements for fire drills – refer to the guidance notes given in the VIQ.

All drills shall be recorded in the ship's logbook or similar record book and be available for the Inspector to sight.

Feedback from drills should be captured/recorded to verify the training is effective. Any corrective and preventive actions noted should be effectively followed up and closed.

5.15 Is there evidence of regular training in the use of life-saving equipment undertaken and are crew familiar with those requirements and the location / contents of the training manuals?

COMPETENCE

On board training must be regular and will likely be stipulated by the company and Flag Administration. All training carried out during drills shall be detailed and recorded in the ship's logbooks or similar and available for demonstrating to the Inspector. The Inspector may randomly question a member of the ship's personnel about the operation of life-saving appliances and good training will ensure all on board are aware of what is expected of them.

Such questions can be related to the following training/knowledge/drills:

- Use of ships inflatable liferafts
- Hypothermia, first aid treatment
- Use of equipment in severe weather/sea conditions
- Fire-extinguishing appliances
- Recovery from the water of persons and knowledge of the associated SOLAS required Recovery Plan.

If your vessel is fitted with davit-launched liferafts, remember that training in the use of such appliances is to be carried out at intervals of not more than four months.

All crew members must be familiar with the onboard Training Manual provided in each mess-room or individual cabins.

Enclosed Space and Pump Room Entry Procedures

There are very detailed guidance notes given within the VIQ – please refer to them. The following bullet points should be noted:

- The meaning of an enclosed space – its characteristics
- Known enclosed spaces
- Ship-specific list identifying all enclosed spaces
- How to determine if an enclosed space is suitable for entry
- Use of safety equipment
- Completion of a risk assessment prior to entry
- Completion of an entry permit
- Displaying of the entry permit at the entrance to the space
- Actions to be taken should ventilation stop.

Make sure your ship has a list of identified Enclosed Spaces available which might be required to be sighted by the attending inspector.

5.16 Are Officers aware of the industry requirements for enclosed space entry and have these been correctly followed?

COMPETENCE

The company will have established a tank entry or enclosed space entry permit and permit system, hereafter referred to as the permit. To demonstrate that effective and safe precautions have been strictly followed, a risk assessment will need to be evidenced along with the fully completed permit.

All checks as described on the permit must be fully followed and care must be taken to ensure that the details of timings and persons entering and those supervising the entry are accurate. The responsible Officer signing off the permit on completion of entry must also take note of the timings.

If the permit is completed on a computer, then this will perhaps indicate to the Inspector that safety checks were not carried out locally to the space being entered, but were instead completed in the comfort of the accommodation.

In the interests of safety, procedures and precautions for enclosed space entry must be fully followed and undertaken without any shortcuts.

It is strongly recommended to issue one permit per space to be entered, especially cargo tanks. It is acceptable to issue one permit for multiple cargo tank entries, however our advice is to issue one permit per tank/space.

Should one permit be issued that covers multiple tanks, the following must be implemented:

- only those cargo tanks measured and found safe to enter can be included on a single permit
- the permit must record the readings for each tank
- same entry procedures must be implemented for each tank
- each tank must be tagged to show which are safe to enter and which are not safe to enter
- there must be rigorous control to ensure tags are removed, and permits cancelled when entry has been completed.

It should be noted that at some point during the inspection portable meters used to assess enclosed spaces and allow entry will be randomly checked for zero and calibration. It is therefore, critical that all meters are fully operational and calibrated in line with the manufacturer's instructions. Records of calibration must be up to date and available.

5.17 Are the crew aware of safe entry procedures into the pump room, compressor rooms and trunk spaces as applicable and are safe entry procedures being followed?

COMPETENCE

Failure to follow full and proper procedures for entering the pump room, compressor rooms and trunk spaces as applicable will result in a high-risk observation.

Ensure notices are displayed at the pump room entrance prohibiting entrance without formal permission and the requirement to run the ventilation system.

The Inspector may request for pump room and/or compressor room inspection. The Officer accompanying the Inspector MUST be fully familiar with the company procedures and able to conduct full safety checks before entry by carrying out the following as a minimum and follow risk mitigating measures:

- (i) Ensure the cargo pump extraction fans are running;
- (ii) Ensure the fixed gas detections system is operational and reading 0%;
- (iii) Contact the Ch. Off. or Duty Watch-keeping Officer in the cargo control room (CCR) to advise the intentions of taking the Inspector into the pump room and check that it is agreed to;
- (iv) The Officer accompanying the Inspector shall also ensure a stand-by watchman is available equipped with a walkie-talkie radio;
- (v) Ensure communications are linked/tested between pump room, navigation bridge if manned, ECR, CCR;
- (vi) A gas meter, preferably a multimeter, is available at the pump room entrance along with a sample hose that can reach the lower levels of the pump room. The Officer then checks the meter is zeroed and then samples for the presence for gas at three positions in the pump room upper – middle – and lower levels for explosive gases;
- (vii) Once satisfied that the pump room is safe for entry, the accompanying Officer advises the Duty Officer in the CCR that entry will be made by both the Officer and Inspector, with the stand-by watchman remaining at the pump room entrance level;
- (viii) While descending the pump room, the Officer is to contact the CCR at each level until the pump room inspection has been completed;
- (ix) Pre agreed intervals for communication must be agreed and carried out
- (x) On completion of inspecting the lower levels and about to ascend the pump room inform the CCR;
- (xi) Upon exiting the pump room, the CCR must be advised that the pump room inspection is completed and the Inspector, Officer and stand-by watchman have left the space.

Either an entry permit type system can be used for pump room entry and /or a risk assessment based method can be employed by the company. It is of the utmost importance that full safety precautions are taken and it is strongly suggested that the Chief Officer accompanies the Inspector and also carries a personal gas meter. As an additional safety precaution, some Inspectors carry their own personal gas detector.

These precautions should also be followed for ballast and bunker transfer pump rooms.

5.18 Are pump room, compressor rooms and trunk spaces (as applicable) adequately ventilated?

All pump room extraction fans must be running prior to any form of entry and throughout all operations. Should the vessel only have one extraction fan installed then the company should provide either an alternative method to maintain the pump room in a ventilated state or a spare motor.

This alternative should also be provided for ballast and bunker transfer pump rooms.

Fans must be operating in the extraction mode – except for gas tankers where it works on a pressure differential.

5.19 Are Officers aware of the correct settings of pump room fire and flooding dampers and are the dampers clearly marked and in good order?**COMPETENCE**

The purpose of flooding dampers is not always fully understood. The extraction fan suction intakes are fitted at the lowermost levels of the pump room. Should the pump room become flooded the intakes will become covered and unable to draw in air, in this case the flooding dampers that are positioned at a higher level shall be opened to ensure ventilation – these are, under normal operating conditions, required to be closed. Flooding dampers must be kept in the closed position other than when their operation is being tested. Keeping flooding dampers open will not aid ventilation. The dampers and their open/close positions should be clearly marked. Those responsible for routine checking of the pump room should also check that the dampers are in the closed position.

5.20 Is the crew aware of the permanent arrangements provided for lifting an incapacitated person from the cargo and, if applicable, the ballast pump room, including provision of a suitable stretcher or harness and is the equipment in good order?**COMPETENCE**

The designated Safety Officer should routinely check the rescue harness or stretcher to ensure it is readily available for immediate use. There should also be familiarisation to all crew of how to operate the harness and associated equipment to ensure a safe and quick recovery.

Note – this also applies to a fuel oil transfer pump room. The requirements for the bow thruster compartment are covered by SOLAS Reg II-2/4.5.10.

Monitoring Non-Cargo Spaces

Regular and routine monitoring of ballast and void spaces should be carried out under the supervision of the Chief Officer. Procedures for this monitoring should be addressed within the company SMS. However, if it is not addressed then the Chief Officer should provide a system to ensure these checks are carried out regularly. These checks are put in place to detect any leakage from cargo tanks or a breach in the ship's hull and that ballast is not contaminated prior to its discharge.

5.21 Are spaces adjacent to cargo tanks, including pipe ducts, regularly monitored for accumulations of gas with an operable fixed and / or portable measuring equipment?

On many vessels, and as required by legislation, a fixed gas detection system is provided in the ballast tanks and this system should be running throughout all loaded passages. The readings shall be recorded at regular intervals; this will indicate to an Inspector that constant monitoring is being maintained. Vessels without a permanent detection system may have sampling lines installed that will enable a portable gas detection meter to be used. The Chief Officer will be responsible to ensure these readings are taken routinely.

Failure of the monitoring system will require manual measurements to be taken/recorded as detailed in the company procedures.

5.22 Where a fixed system to monitor flammable atmospheres in non-cargo spaces is fitted, are recorders and alarms in order?

When a fixed gas detection system is installed, the Chief Officer shall on a routine basis cross reference the fixed system against a portable meter to compare for accuracy. Evidence should also be available to produce to the Inspector that periodical calibration of the fixed system is carried out.

Failure of the monitoring system must result in manual reading to be taken and recorded at intervals as per company procedures.

Gas Analysing Equipment

To verify the knowledge and ability of ship's staff of the zeroing and calibrating of portable gas analysing meters, they may randomly be requested to demonstrate their ability to perform this fundamental task by the Inspector.

5.23 Does the vessel have appropriate duplicate portable gas detection equipment suitable for the cargoes carried, are the Officers familiar with the operation, calibration and is the equipment being maintained in accordance with manufacturer's and industry recommendations?

COMPETENCE

The Chief Officer will be responsible for ensuring availability of portable gas detection equipment suitable for the cargoes carried, provide/ensure familiarisation of the equipment by Officers and calibration of the equipment.

There should be at least two of each meter on board to measure LEL and oxygen. In some cases meters are able to provide a combination of oxygen, % volume hydrocarbon, LEL and hydrogen sulphide measurements. Whatever gas the meters are used for, there must be a minimum of two instruments available together with adequate minimum spares.

Vessels fitted with inert gas/nitrogen padding must carry two meters capable of measuring hydrocarbons in an inert atmosphere.

Two toxic gas detectors are required for vessels carrying noxious liquid cargoes with an adequate supply of tubes – these must be monitored/inventoried carefully for expiry dates and ordered in good time.

Personal oxygen and hydrocarbon analysers must be available for use in enclosed space entry, tank entry and pump room entry. *Note – they should also be used when entering an enclosed lifeboat or CO₂ room – this is often forgotten.*

The Chief Officer will need to ensure meters are sent ashore for servicing and calibration as required. This should be in line with the manufacturer's recommendations or more frequently should the company procedures require.

The Chief Officer is responsible for ensuring there are an adequate number of calibration gases available for each type of meter, fixed or portable that is onboard. The Chief Officer should also maintain a log of the calibration gases available on board to ensure that those that are expired or used are replaced.

The Inspector will randomly request a portable meter to be zeroed and calibrated using the appropriate sample gas. It is therefore, imperative the Chief Officer ensures all Officers are fully familiar with this process. To avoid any observations, it would be prudent that the ship's Officers frequently carry out the calibration of these analysers themselves.

Bunker fuel can and sometimes does contain H₂S or benzene – detection should be carried out to prove otherwise and use the MSDS provided.

It is recommended that H₂S personal detectors are also worn by those involved in cargo operations.

Hot Work Procedures

Any form of hot work must be well planned and executed. Any indication that hot work procedures are not fully followed or carried out in line with industry safe working practices will certainly result in high-risk observations with potentially serious consequences to the employment of the vessel.

5.24 Are Officers aware of the requirements for hot work and are hot work procedures in accordance with the recommendations of ISGOTT and OCIMF guidelines?

COMPETENCE

Remember – hot work is the last practical option.

- It should be delayed for a more suitable time
- Read and fully digest International Safety Guide for Oil Tankers and Terminals (ISGOTT) guidance and company procedures.

Any observation from an Inspector referring to a breach of procedures for safe hot work preparation and execution thereof will result in a high-risk observation.

It is of the utmost importance that risk assessments and hot work permits are available for an Inspector to sight. Both the risk assessments and hot work permits should be fully and correctly adhered to and completed in full.

It is recommended that hot work permits and risk assessments need written permission from the office to allow hot work to be carried out outside the designated space. Completion and close out messages should also be made and the communications will also be required for the Inspector to sight.

All Officers should be fully familiar with the company hot work procedures.

The company procedures for hot work must strictly be followed and practised; also the latest edition of the ISGOTT guidance should be checked for any additional precautions that may be deemed necessary.

5.25 Are Officers aware of safety guidelines for electric welding equipment and are written guidelines posted and equipment in good order?

COMPETENCE

Officers must be fully aware of the safety guidelines for electric welding equipment.

Electric welding equipment must be in good condition with well-insulated cables without any cuts or breaches. The connections must be neat and tidy without any being loose or damaged. There should also be a return lead so the job to be welded is properly earthed and NOT through the ship's hull.

The welding position, if in the engine room workshop, must be kept away from any fuel valve testing equipment, bags of rags and cotton waste, and any other flammable materials. It is desirable for a fireproof curtain to be fitted that surrounds the welding position to prevent the scattering of sparks. The safest approach to take after using the electrical welding plant is to disconnect the cables from the welding machine.

Appropriate safety/warning signs must be posted.

5.26 Is gas welding and burning equipment in good order and spare oxygen and acetylene cylinders stored apart in a well-ventilated location outside of the accommodation and engine room?

On completion of any work involving the use of the oxygen and acetylene gas welding equipment, ensure the hoses are disconnected from each bottle after first venting the pressure from each hose. Prior to any inspection, the 2nd Engineer should double check the fixed pipelines and hoses to the gas welding station are vented of any residual pressure and disconnected from the bottles.

Regulators must be inspected annually and replaced at five-yearly intervals.

The oxygen and acetylene bottles, both in use and spares, must be kept separately, well secured and with the valve caps in place in a well-ventilated location outside the accommodation and machinery space blocks. Spare bottles shall also have labels on them indicating if they are empty or full.

It is recommended that the separate oxygen and acetylene storage locations should be clearly marked as a hazardous area containing oxygen and/or acetylene.

Life Saving Equipment

5.27 Are Officers aware of the requirements of LSA, are there ship-specific life-saving equipment maintenance instructions available and are weekly and monthly inspections being carried out?

COMPETENCE

Officers must be aware of the LSA requirements for the ship.

The company should provide their vessels with a maintenance schedule for all life-saving appliances or equipment which may also be included in the Planned Maintenance System (PMS). These should also include instructions on how to conduct these tasks. Routine maintenance should be carried out on the various LSA. This would be done either weekly, monthly, quarterly or annually and all maintenance carried out, scheduled or unscheduled, must be recorded in hard copy or electronic company forms. The task of updating all maintenance records is likely to be carried out by the designated Safety Officer.

Monthly inspections should use a checklist to facilitate the inspection as detailed in SOLAS.

5.28 Are Officers aware of the maintenance requirements for lifeboat, liferaft, rescue boat release hooks and free-fall lifeboat release systems, where fitted, and are lifeboats, rescue boat and liferafts, including associated equipment, well maintained ready for use?

COMPETENCE

Officers should also be familiar with the maintenance requirement for the lifeboat, liferaft, rescue boat release systems and associated equipment.

The routine testing of the lifeboat, liferaft, rescue boat release hooks and free-fall lifeboat release systems (where fitted), will likely be included in the company's PMS or LSA maintenance schedules. Records must be kept up-to-date for the routine testing and maintenance of this gear to provide to the Inspector. The Safety Officer will need to ensure these records are updated as soon as possible after a test or any maintenance that has been conducted.

Lifeboats

Too many incidents occur with lifeboats and the apparent failure of the on-load release gear/hooks.

A thorough knowledge is required of the following:

- Attaching hooks and setting the release mechanism correctly
- Use of simulated launching gear for free-fall lifeboats
- Use of hanging off pennants
- Use of heavy weather recovery strops
- Lifeboat propellers should be fitted with a propeller guard.

The vessel's liferafts must be unobstructed and ready to be launched manually or hydrostatically. The Safety Officer shall ensure the launching instructions are posted. After liferafts have been received on board following their servicing, the Safety Officer shall ensure that any packaging or securing straps fitted around the liferaft casings are removed as this will prevent inflation.

The hydrostatic releases that allow the liferaft, or liferafts, to float free must be connected according to the manufacturer's instructions.

The forward liferaft does not require to be fitted with a hydrostatic release and this is launched manually. The Safety Officer shall routinely check that the liferafts' securing arrangement to their cradles can be readily released by hand.

5.29 Are lifeboats, including their equipment and launching mechanisms, in good order and have they been launched and manoeuvred in the water in accordance with SOLAS requirements?

There must be regular exercises, familiarisation and continual training for lifeboat and liferaft launching and embarkation. The vessel's Flag State will, as a minimum, dictate the frequency of drills to facilitate these.

Launching of lifeboats is considered a very hazardous task and very high risk. Assessments must be available and reviewed at regular intervals. Flag State requirements must be known and followed. Particularly hazardous is free-fall launching with crew onboard.

Risks are mitigated by allowing operators every three months to lower the free-fall lifeboat into the water with or without operating crews and then manoeuvred in the water. Access to/from the free-fall lifeboat should be made via the rescue boat which should be boarded by ladder.

It is still acceptable to launch a lifeboat by freefall with operating crews onboard should it be considered safe to do so.

At six-monthly intervals a simulated launch is acceptable if the free-fall lifeboat is designed for this.

Lifeboat and liferaft launching instructions should be posted in the vicinity of each survival craft and also under the nearest emergency light. The locations of the survival craft shall also be indicated with reflective IMO signs. The areas around the survival craft should be kept clear of any obstructions. The Safety Officer should routinely check that all instructions and signs are posted, in good condition and readable. The company PMS, if carried out diligently, will ensure that all lifeboats and liferafts are kept in a state of immediate readiness. The records of all maintenance, testing and exercises must be fully and correctly recorded as this will need to be displayed to the Inspector. Entries for the records must be accurate and true, it will be easy for the Inspector to note if the records are incorrectly maintained and will raise an observation accordingly.

5.30 Is the rescue boat, including its equipment and launching arrangement, in good order and are Officers familiar with the launch procedures?

COMPETENCE

Rescue boats must be maintained in a state of readiness and able to be launched in five minutes. The rescue boat is either a purpose-built boat or one of the lifeboats designated for this purpose. If the rescue boat is also a lifeboat, it is suggested the muster list identifies this purpose and the lifeboat itself. All maintenance and record keeping of the rescue boat shall be carried out in accordance with the PMS, the same as all the vessel's other LSA.

Note: Reference is made in the guidance notes to the fitting of propeller guards – it should be noted that this reference from CFR is made to lifeboats – not purpose built rescue boats.

However, for rescue boats not fitted with a guard it makes sense and best practice to identify this hazard to all crew members by way of a warning notice, a risk assessment, tool box talk and during any drills or training.

5.31 Are lifebuoys, associated equipment and pyrotechnics in good order, clearly marked and are there clear procedures in place to ensure that only intrinsically safe lights are located in the gas hazardous areas?

Regular and routine checking of lifebuoy lights shall be carried out by the Safety Officer and the lifeline connected to those without lights should also be checked for wear and tear and weathering damage. The lifebuoys should also be checked for ease of removing from their cradles. It should be remembered lifebuoys fitted with a light do not require a lifeline.

The Safety Officer shall ensure that only intrinsically safe lights are located in the gas hazardous areas and this should be addressed within the company SMS and clearly marked.

The Safety Officer shall ensure the pyrotechnics are in date and have a register that will include details of when they were put into service and when each expire and require renewing. The expiry dates are readily available on the containers of both the line throwing equipment and parachute flares.

There shall be four (4) line throwing apparatus and 12 rocket flares. Each should be maintained in the same stowage location on or very near the bridge and be ready for immediate use.

5.32 Are lifejackets in good order and correctly located?

The Safety Officer shall routinely check that all on board are provided with a lifejacket. Lifejackets are also required to be available on the bridge and the engine control room. In addition, lifejackets are required to be available for use with the forward liferaft. It is also advisable to indicate clearly where the lifejackets are stowed at each location.

The Safety Officer will also, during his routine inspections ensure that each lifejacket is complete with a whistle and self-igniting light.

5.33 Are immersion suits in good order, correctly positioned and Officers aware of maintenance and carriage requirements?

The respective Officers shall be fully familiar with the carriage and maintenance requirement of the immersion suits.

Every person on board will need to be provided with an immersion suit (SOLAS Ch.III-32). Immersion suits should also be readily available for use by the crew of the emergency rescue boat.

Immersion suits will be required to be periodically tested and records should be maintained accordingly by the Safety Officer for the Inspector to sight. Air pressure tests are required to be carried out at three-yearly intervals and more frequently if the suit is older than 10 years. The immersion suits will require stowage in a dry location.

The stowage location of the immersion suits shall be indicated with reflective IMO symbols. Should there be more than one item stowed in a single location, then the number of items should be indicated.

If the vessel is constantly trading in warm climates, the vessel's Flag Administration may not require immersion suits to be available.

Fire Fighting Equipment

The Safety Officer shall, where necessary, with the aid of Chief Engineer, ensure that firefighting equipment is routinely checked and inspected in accordance with the manufacturer's instructions or company PMS and be ready for immediate use. The Inspector will randomly check different items of firefighting equipment and any malfunctioning, defective or missing items will result with a high-risk observation. It is imperative the firefighting equipment is kept in a clean and well-maintained state.

Any firefighting equipment used for exercise and/or demonstration purposes shall be returned to its normal working state after such use i.e. discharged fire extinguishers shall be immediately recharged.

5.34 Are ship-specific fire training manuals and safety operational booklets available and is the crew aware of the general contents and location of the manuals?

COMPETENCE

The Safety Officer should ensure that vessel specific fire training manuals on board are kept up-to date with the details of ALL FIREFIGHTING EQUIPMENT and their use. Care should be taken to note that when any of the vessel's firefighting equipment is changed or renewed it may be of a different model or make from that previously supplied to the vessel and therefore, the fire training manuals will need to be updated.

Fire training manuals must be available for all on board to refer to, therefore copies shall be located in each of the Officers' and crew mess or recreation rooms. Some companies may prefer to provide a fire training manual in each cabin. Whatever the location, the Safety Officer must ensure they are fully up to date and maintained in a good condition.

Dedicated ship-specific fire-safety operational booklets should be made available and shall be kept in the same locations as the fire training manuals. Some companies may include the ship-specific fire-safety operational booklet within the fire training manual.

The Inspector shall check randomly if the crew fully aware of the general contents and location of the manuals.

5.35 Is the crew aware of the fixed firefighting equipment fitted, are ship-specific firefighting equipment maintenance instructions available and is maintenance being carried out?

COMPETENCE

The company should provide their vessels with a maintenance schedule for all firefighting equipment which may also be included in the PMS. These should also include instructions on how to conduct these tasks. Routine maintenance should be carried out on the various firefighting equipment. This would be done either weekly, monthly, quarterly or annually and all maintenance carried out, scheduled or unscheduled, must be recorded in hard copy or electronic company forms. The task of updating all maintenance records is likely to be carried out by the designated Safety Officer.

Both the maintenance system and records shall be made readily available for the Inspector to view. As stated previously, the Inspector will randomly check firefighting equipment so it will be very apparent whether regular maintenance and checks are carried out.

The Inspector may ask the crew familiarisation of the fixed firefighting equipment available onboard the ship – refer to the list of equipment identified in the VIQ guidance notes.

Note: Some newer types of CO₂ systems require the "pins" to be left in for the system to operate correctly – make sure you know how your system works and whether the "pins" should be in or out.

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

The date of foam tests should be indicated on the tank to identify the most recent test. It is also advisable to post locally a copy of the test certificate, although the Inspector will have previously noted the test dates during the checking of certificates and documents with the Master.

5.37 Is the crew aware of the location and use of the International Shore Connection, is it readily available externally, is a fire control plan exhibited within the accommodation, and is a copy available externally and equipment correctly marked on the plan?

COMPETENCE

It is very important that the Safety Officer checks the internal accommodation and external fire control plans against the actual locations of the firefighting equipment on board. The likelihood is that some firefighting equipment may have been relocated during the life of the vessel. Therefore, the fire control plan may not have been updated.

Particular attention should be made to items that are not fixed such as the International Ship/Shore Connection and fireman's outfits.

The location of the International Ship/Shore Connection should be known by all and suitably indicated with a reflective sign for ease of recognition. To ensure the connection is readily available the gasket, nuts and bolts, and correct sized spanners shall also be provided. To allow the International Ship/Shore Connection to be readily accessible, a suggested location is to keep it in the manifold area so it is then available to both sides of the vessel.

In addition to externally located fire plans, it is advisable to have a fire control plan close to the vessel's boarding and disembarking location. The locations of the plans shall be highlighted by reflective IMO symbols.

The Safety Officer is strongly advised to include with the external fire plans an up-to-date crew list and material data safety sheets for the cargo or cargoes being carried, as well as an up-to-date stowage plan.

5.38 Are fire mains, pumps, hoses, nozzles and isolating valves in good order, available for immediate use and clearly marked?

Random checks of fire hose nozzles will be made by the Inspector, if one or two nozzles are found to malfunction then the Inspector is likely to check all or most of them. In any event any malfunctioning firefighting equipment will definitely result in a high-risk observation. On occasion, fire hydrants may leak and if this is the case there will be a build-up of pressure behind the hydrant cap – these should be replaced with hydrant valves that are maintained and do not leak. A small hole in the cap will release any pressure.

Fire hose seals will be checked for deterioration. The fire hose boxes should also include a hose connection spanner.

The isolating valves on the foam and fire systems shall be clearly colour coded to the internationally recognised standard, i.e. red for the fire main and red/yellow for the foam line. The Inspector will randomly check the operation of some of the valves, for this reason always ensure a wheel key is available for use with the isolation valves. Be aware that after opening an isolation valve always close it (one quarter of a turn); never leave open the valve when it comes to its stop, this will prevent the valve from seizing in the open position. The operator will not know if the valve is open or shut and if forced could result in mechanical damage to the spindle and/or valve.

The Inspector is likely to ask the accompanying crew member to operate these valves freely.

5.39 Are Officers aware of the requirements for testing fixed fire-detection and alarm systems and are the systems in good order and tested regularly?

COMPETENCE

Safety Officers are to ensure that the fixed fire-detection and alarm system are tested regularly as per SOLAS and Flag State requirement and that Officers are familiar with the testing requirement and procedures.

Prior any inspection, the Safety Officer shall check the fire-detection system to ensure that it is armed and no loops are isolated. If any of the loops are isolated it may result in a high-risk observation. The most usual loop to be isolated is that of the engine room workshop. Various reasons are provided to explain why a loop may be isolated, however, the Inspector is more than likely expected to ignore these reasons. That is why it is important to ensure all loops are active BEFORE an inspection.

Spaces not covered by a fire-detection system should be monitored in the hours of darkness. Records of these rounds shall be maintained in a logbook or record book and these rounds should not be carried out during the watch-keeper's duty hours, rather after their watch.

Specific test equipment may be necessary to perform tests on detector heads. The officer accompanying the Inspector should be aware of the location of the specific test equipment (smoke / flame / heat – detectors test equipment) and should be able to demonstrate the correct use and designation of the equipment.

5.40 Is the crew familiar with the fixed fire extinguishing systems, where fitted, are they in good order and are clear operating instructions posted?

COMPETENCE

All spaces (paint lockers, emergency generator rooms, etc.) that are protected by fixed fire extinguishing systems shall have the operating instructions for these systems prominently posted at the location from where the system is activated.

Some fixed fire protection systems are able to be operated in either manual or automatic mode, if the selector switch is set to operate the system in the manual mode, this could result in an observation. Therefore, the Safety Officer or other responsible Officer should check that the selector switch is set to operate in the automatic mode before the inspection.

All on board should be able to demonstrate how to activate the fixed firefighting system.

5.41 Is the emergency fire pump in full operational condition, starting instructions clearly displayed and are Officers able to operate the pump?

COMPETENCE

If the emergency fire pump is diesel driven, the Safety Officer should ensure that the fuel tank is full. Depending on the vessel's Flag Administration, the fuel tank may have a quick closing fuel valve. Ensure that any quick closing valves are tested for positive closing before the inspection and are reset to the open position after testing.

Operating instructions for the emergency fire pump must be clearly written and posted at the location of the pump and at all locations from where the pump can be operated. The operating instructions must contain a step-by-step process of how to start and operate the pump.

It is expected that all Officers are able to demonstrate how to start and operate the pump.

The Inspector is expected to see the pump running and to attain the desired discharge pressure. In the event of a US Coast Guard inspection, the Inspector will require the demonstration of a minimum of two fire hoses to be operated with satisfactory water pressure, normally with the hoses located one forward and one on the bridge deck.

It is advisable to take/record pressure readings at these locations to prove the pump pressure.

Very often when a vessel is in the ballast condition, the test fails due to lack of pump priming so test the pump prior to arrival.

5.42 Are portable fire extinguishers in good order with operating instructions clearly marked and are crew members familiar with their operation?

COMPETENCE

If the vessel is provided with posters that display the identifying colours of the extinguishing mediums used in the fire extinguishers, then the fire extinguishers should each also carry the same colour code markings. The Safety Officer should routinely check all extinguishers in line with the company PMS and ensure that they are all fully charged and appropriately indicated with all details.

The minimum number of spares and spare charges that are to be carried onboard shall be as per the vessel's Flag Administration.

The mountings for each extinguisher should be secure and release mechanisms should work well to allow easy removal. Fire extinguishers should not be lashed in place. The location of each fire extinguisher shall be indicated with the appropriate IMO reflective symbol.

5.43 Are crew members familiar with donning breathing apparatus and are fireman's outfits in good order and ready for immediate use?

COMPETENCE

The locations of the fireman's outfits and associated equipment must be as described on the vessel's Fire Plans. In the event that the locations of any of the fireman's outfits have been changed then the Fire Plans must be revised to reflect these changes. This must be the case with all firefighting equipment.

The Safety Officer must ensure that all breathing apparatus bottles and all spare bottles are fully charged at all times and are not less than 10% of their full capacity. If, during demonstration of the operation of the breathing apparatus, it becomes apparent that the bottles are under charged then each unit will be checked.

The Safety Officer shall also ensure all equipment associated with the fireman's outfits are present and complete including: fireman's suits, breathing apparatus, non-conductive boots, helmet, explosive-proof hand torches, an axe with an insulated handle and a life line for each available breathing apparatus.

The straps on each breathing apparatus face mask should be checked to make sure they are not perished, cracked or broken. The mask visors need to be clean and the harness straps should be fully extended, while it should be made sure that the buckles are working freely.

Chemical and gas tankers must carry additional fireman outfits as per requirements of their Flag Administration.

All fireman outfits must be ready for immediate use and it is strongly suggested that fireman outfits are stowed in pairs.

The Master should have files of certificates for tests of air quality of the breathing air and for the hydrostatic test (min five-yearly) of the breathing air bottles.

An air compressor should be provided or sufficient spare bottles stored onboard.

Two intrinsically safe two-way portable radios per fire party team should be provided for all vessels after 1st survey after July 1st 2018.

5.44 Are crew members familiar with the donning of emergency escape breathing devices (EEBDs) located in the accommodation, engine room and pump room (as applicable) and are they in good order and ready for immediate use?

COMPETENCE

The Safety Officer will need to ensure that all EEBDs, including spares, are fully charged and their locations clearly indicated with appropriate IMO reflective signs. The number of EEBDs available on

board will be stipulated by the vessel's Flag Administration and they should be located in areas to facilitate ease of escape in the event of a fire.

EEBDs used for training purposes must be clearly marked.

EEBDs are NOT a substitute for fireman's breathing apparatus.

5.45 Are fire flaps clearly marked to indicate the spaces they serve and is there evidence of regular testing and maintenance?

COMPETENCE

The Inspector can randomly ask the crew to demonstrate the operation of the flaps providing it does not interfere with the vessels operations.

This frequently raises an observation either because of a lack of knowledge by the crew member or because the equipment does not work correctly due to poor maintenance.

Fire flaps in and around the accommodation shall be tested (opened/closed) routinely as described in the company PMS. Each fire flap must be clearly indicated with the space they each serve. This indication must be easily seen. Those provided by the vessel's builder are normally too small to identify clearly the spaces served and should not be relied upon otherwise an observation may be raised.

Material Safety Data Sheets (MSDS)

5.46 Are Material Safety Data Sheets (MSDS) on board for all the cargo, bunkers, chemicals, paints and other products being handled, and are all Officers familiar with their use?

COMPETENCE

The Chief Officer shall, at the loading port, ensure that the MSDSs for each cargo loaded on board are obtained from the terminal.

MSDSs for the cargo or cargoes being carried and handled shall be posted in a prominent location for all to refer to. One suggested location is the main cross alleyway where all on board and from shore will pass when they enter or exit the vessel.

It is also suggested that those vessel carrying cargoes containing high levels of H₂S should have a sign posted at the gangway advising "THIS CARGO CONTAINS HYDROGEN SULPHIDE (H₂S)".

MSDSs for the bunkers being carried and handled shall be available during loading and within the engine control room, and fuel-handling and transferring locations within the machinery spaces.

The paint locker shall also be provided with MSDSs with the paints and thinners stored there. These may also be provided on the containers by the manufacturer. However, it is always worthwhile to also have MSDSs posted or filed within the paint locker. Only MSDSs of the products actually carried on board need to be available.

The chemical locker or the location where chemicals and/or samples are stored shall also be provided with MSDSs; these may actually be provided on the containers as provided by the manufacturer. However, it is always worthwhile to also have MSDSs posted. Similarly, the locations where chemicals are handled for injection into various systems shall be provided with MSDSs and the appropriate PPE, such as full face protection, apron and gloves.

Access

5.47 Is the vessel provided with a safe means of access and are all available means of access (gangway/accommodation ladder/pilot ladder/transfer basket) in good order and well maintained?

COMPETENCE

If the gangway is to be provided by the vessel then the Chief Officer should ensure the gangway is ready for use, with the stanchions being properly and securely attached together with the handrails/hand ropes, which must be in good condition. The treads must all be firmly fitted and the safety net should be of a suitable size so that when attached, it will cover the full length of the rigged gangway.

On the vessel side, a pedestal with steps may be required to allow visitors and Inspectors to embark safely. The pedestal shall be firmly secured.

The Chief Officer should ensure that the accommodation ladders are clearly marked (by stencilling), or an information plate is provided at a location close to the embarkation and disembarkation positions with the maximum and minimum safe angles the ladder can be used along with the design load and maximum weight and/or number of persons that can be allowed on bottom end plate of the ladder.

It would also be prudent to indicate when the accommodation ladder wires were renewed or turned end-for-end.

A safety net must be provided to the gangway or accommodation ladder, covering the full length.

The safety net **MUST NOT** be wrapped around the ladder – this is poor seamanship – refer to the COSWP for the correct method of attachment of the net.

If the terminal provides the gangway and the handrails are fixed then a safety net is not required, however, if the shore-provided gangway has rope or chains as handrails then a safety net must be fitted.

Certificates of five-yearly load tests should be available for gangway and accommodation ladders/winch.

The Chief Officer shall refer to the IMO guidance on pilot boarding arrangements and ensure the boarding arrangements are secure and in a safe condition for the Pilot's embarkation and disembarkation. The Pilot Ladders shall also be checked for good condition. These checks will ensure the following:

- (i) All steps are evenly spaced
- (ii) All steps are intact and not broken or damaged
- (iii) The side ropes are intact and not damaged
- (iv) The side ropes do not have any splices along the full length
- (v) The bindings are all intact
- (vi) The securing arrangements i.e. shackles, eyelets, etc. are in good condition.

Transfer basket – the use of which must be clearly documented and controlled. This is generally used offshore and it is the company's responsibility to develop and implement procedures on when and how it is used. A specific risk assessment should be available for this operation.

IT IS THE MASTER'S RESPONSIBILITY TO ENSURE SAFE ACCESS TO AND FROM THE VESSEL.

A safety notice must be posted and be visible to those intending to board the vessel. The notice must state the following:

- (i) Unauthorised persons are not allowed
- (ii) All authorised visitors must provide ID
- (iii) Mobile phones and all electronic equipment must be switched off

- (iv) No smoking or naked lights
- (v) No lighters or matches allowed on board
- (vi) No unauthorised firearms.

Sample Arrangements

5.48 Is there a suitable means for storing of cargo and bunker samples – i.e. a cargo and bunker sample locker situated within the main cargo area, and is it in good order?

Dedicated sample lockers are located within the main cargo area and preferably in an area that is protected by a fixed firefighting system e.g. paint locker. Hazard warning sign are recommended to be posted.

The lockers must be kept tidy and properly arranged. All the sample bottles must be stowed inside the cell dividers.

The company should define the retention period of samples with the idea to keep the number to a minimum e.g. it is recommended that bunker samples are kept not less than 12 months, and cargo samples no longer than three months after the cargo was discharged.

Record of storage and disposal of samples must be maintained. Normally, samples that are more than one year old must be disposed of and the company shall provide procedures for safe disposal. Disposal is normally accepted to be into the slop tanks or terminals waste oil facilities ashore.

Non-compatible and reactive cargo samples must not be kept close to each other.

Sample lockers must be clearly indicated and ventilated.



Chapter 6.

Pollution Prevention

Pollution Prevention

Every care must be taken to ensure that there is no escape of oil or chemicals either on deck or overboard. Breaches of pollution control procedures (SOPEP, VRP etc) will more than likely result in a high-risk observation. Other areas which can give rise to high-risk observations are documentation, particularly entries in either the Oil Record (part 1 and 2) or Cargo Record Book, whichever is applicable. Discrepancies in the Oil or Cargo Record Books can, and do, lead to Port State Control detentions and are noted as high-risk observations by oil majors.

6.1 Are the ship's crew familiar with their duties in relation to the Shipboard Oil Pollution Emergency Plan (SOPEP) or Shipboard Marine Pollution Emergency Plan (SMPEP), is the plan maintained and updated with emergency contacts readily available?

COMPETENCE

SOPEP/SMPEP shall be approved by the vessel's administration and after any change of management.

The Coastal Contacts list of the authorised persons within the company should be up to date and provided by the company. In addition to this list, the IMO issues a port contacts list on a quarterly (three-monthly) basis. This too should be available for the areas the vessel is trading to and can be in either hard or electronic copy.

The list of National Operational Contact points shall be referred to for the area being traded in. It is strongly recommended this list is readily available when in port.

The latest up to date list is published every three months and is readily available online.

The vessel must post in the CCR and be available to the Master a list of contacts, this should include as a minimum:

- DPA and/or company emergency contact number
- Port authority
- P&I club
- Agent
- National pollution reporting centre as per coastal contact list
- It is also recommended to include the charterers emergency response contact name/number as per CP requirements.

Vessels that are certified to carry Noxious Liquid Substances (NLS) are required to have an administration approved Shipboard Marine Pollution Emergency Plan (SMPEP).

The scenarios for contingencies as stated in either the SOPEP or SMPEP shall be practised on a regular basis as required by the company to ensure that all on board are aware of their duties in the event of an incident.

6.2 Is the ship fitted with a main deck boundary coaming and scupper arrangement that is effectively plugged during operations?

The height of the deck boundary coaming is not under the control of the ship's staff as this will be dealt with by the company during dry dock or during the vessel's construction.

The fitting of scupper plugs should be double-checked during routine deck rounds. Scupper plugs must be fitted tightly and must be free of any leaks. When it is raining, a deck watch should ensure that any accumulated rain water is run off the deck through the scuppers. This watch should be maintained throughout, the reason being that if there was a cargo or hydraulic oil leak the deck watch would identify this and prevent oil from flowing overboard. It should be seen that the outflow of the rainwater is being monitored.

This question is not applicable to gas carriers unless the vessel is bunkering at the time.

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

A suitable amount of oil spill clean-up equipment should be made available at the manifolds, it is always preferred to have more to hand than necessary.

Portable, air-driven oil spill pumps shall be bonded to the ship structure by a fixed means. What is important is that the air to drive the pumps is readily available and the routine deck rounds should include running the pumps briefly to remove any condensation in the air lines. If the discharge line from the oil spill pumps leads to the slop or cargo tanks, the discharge connection from the pumps must be firmly secured. The discharge hose **MUST NOT** be inserted into a sighting or ullage port.

Most vessels will be fitted with dump valves at the aft end of the main deck. It should not be necessary to vent the tank pressure before opening the dump valves. The dump valves should have an underdeck U-bend arrangement that shall need to be checked to ensure that it has the correct liquid level. A wheel key should also be provided for use with the dump valves and regular opening and closing will allow freedom of movement.

COMPETENCE

The Inspector may question Deck Officers about the shortcomings of dump valves. These include the effects of the vessel's trim particularly if the ullage space is small when draining of any spill may not be possible. If this is the case air-driven oil spill pumps will be required to be used.

Cargo Operations and Deck Area Pollution Prevention**6.4 Are Annex 1 and 2 overboard valves and cargo system sea valves suitably secured, thoroughly checked closed prior to commencement of cargo transfer and where provided, sea valve-testing arrangements in order and regularly monitored for leakage?**

On those vessels fitted with sea-suction and overboard valves within the cargo system, the Chief Officer should ensure they are each firmly closed and secured, either lashed and locked or positively blanked before any cargo operation takes place. In most circumstances, these valves will be sealed by terminal operators. Throughout cargo transfer operations the duty Deck Officer should routinely check overboard for any cargo leakage.

It is strongly recommended that these checks are recorded in the Deck Logbook or other appropriate logbook for maintaining records.

6.5 If ballast lines pass through cargo and/or bunker tanks, are they tested regularly and the results recorded?

Although quite rare now, vessels that have ballast lines passing through cargo or bunker tanks shall have regular pressure tests carried out in line with the company PMS and records maintained. The test pressure shall not be in excess of the cargo head and should be carried out under the supervision of the Chief Officer.

6.6 Are adequate manifold spill containers and gratings in place under the cargo manifolds, fitted with suitable drainage arrangements and are they empty?

The cargo manifold spill container should be kept clean and dry and have provision (i.e. a hand pump) to drain to either a cargo or slop tank. The gratings should be firmly secured.

Those vessels not fitted with permanent manifold spill containers should have portable drums available. If plastic drums are used (not recommended) then there should be adequate provision for bonding (refer ISGOTT 24.7.4).

6.7 Have bunker pipelines been satisfactorily tested on an annual basis and is there suitable evidence of this test?

The responsibility of testing the bunker transfer systems belongs to the Chief Engineer. The bunker transfer system should be tested annually to 100% of the rated working pressure.

An "Oil transfer system" should be tested to 1.5 times its rated working pressure at least twice in a five-year period.

'Pressure tested' must mean hydraulic tests – air and inert gas tests are not acceptable. After testing the system to the appropriate pressures the test date and pressure shall be stencilled at an "easily visible" location. Pressure tests shall also be recorded in the ORB Part I under section (I) Additional operational procedures and general remarks.

Disposal of the hydraulic medium used in the system for testing will be considered contaminated if it is water and must be accounted for in the ORB.

6.8 Are unused cargo and bunker pipeline manifolds fully bolted and are all drains, vents and unused gauge stems, suitably blanked or capped?

The Chief Officer is responsible to ensure that all out of use manifolds are positively blanked off with all the bolts being used. The practice of removing cargo manifold blanks prior to berthing to "speed up" the connection process should be avoided until the vessel is securely moored and the loading arms are lined up. Out of use bunker manifolds must be treated in the same manner as cargo manifolds, i.e. they should be blanked with all the bolts in place.

Drain valves and vents fitted to manifolds should be positively closed and if appropriate, capped or plugged. The valves for all manifold pressure gauges, including those manifolds not in use, must be left in the open position. The purpose for this is to identify whether a closed manifold valve is leaking. Normally, the pressures of just the manifolds that are in use are recorded on a regular basis, however, it is also advisable to maintain a record of all pressure gauges that are not in use. The Inspector will see this as ship staff being proactive and as prudent monitoring. Don't forget the offshore manifolds.

Should a vessel be fitted with a stern discharge manifold that is not in use for the vessel's cargo transfer, the Chief Officer shall ensure that the line is blanked at the end and a spool piece is removed forward of the accommodation.

6.9 Is suitable spill containment fitted around all fuel, diesel and lubricating oil tank vents and hydraulic deck machinery?

Oil spill containers fitted around all oil tank vents should always be kept dry and free from any oil or other liquids. All drain plugs should be fitted. The Chief Officer will be responsible for ensuring that this is done. The capacity of the spill container shall also be stencilled or otherwise indicated in a visible position. Each vent shall also be appropriately identified.

Drain plugs shall be tightly fitted in the spill containers around hydraulic deck machinery. Care should be taken in the event of rain which may cause any accumulated water in the spill container to overflow, for this reason the spill containment area needs to be kept dry and clean from any oil. It is recommended such checks are included in a pre-discharge checklist to ensure a responsible Officer checks all spill containment.

6.10 Are the arrangements for the disposal of oily water in the forecastle and other internal spaces adequate and are Officers aware of these requirements?

COMPETENCE

The overboard valves from forecastle bilge system shall be kept lashed shut and a notice posted stating "NOT TO BE OPERATED WITHOUT THE CHIEF OFFICER'S PERMISSION".

Check bilge wells regularly – ensure they are kept dry. It is recommended bilge alarms are fitted, and if so tested and recorded at frequent intervals as defined by the vessel's SMS.

Pump Room and Oil Discharge Monitors

6.11 Are pump room/trunk space bilge high-level alarms fitted, regularly tested and the results recorded?

For ease of locating, the position of the pump room bilge alarms should be indicated. The bilge alarms will need to be tested in line with the requirements of the company PMS. Records of all pump room bilge alarm tests should be made available and in some circumstances the Inspector may wish to see the alarm tested.

It is suggested, for bilge alarms fitted with a float type arrangement, a light line should be attached to the bilge alarm float and led to the lower deck level so the float can be manually lifted for testing purposes. This would avoid personnel climbing down to the bilge level to activate the float.

6.12 Are adequate arrangements provided for pipeline draining and the disposal of pump room bilge accumulations?

Lines containing cargo shall not be drained to the pump room bilges. Alternative arrangements should be made for draining cargo lines in a safe manner. The Chief Officer or other Deck Officer may be asked what method is used to drain cargo lines. It is therefore necessary for each Officer to be aware what procedure is used for this task.

6.13 If Oil Discharge Monitoring Systems and Equipment (ODME) is fitted, is it in good order, well maintained and any operational downtime recorded in the ORB?

The ODME must be fully operational, well maintained and its use, routine testing and any maintenance must be entered into the ORB Part II. The Chief Officer shall visually check the ODME to ensure that the unit is complete and all pipelines are connected and the sample pump turns freely by hand.

Any operational downtime or malfunction of the ODME must be entered in the ORB part II. A malfunctioning ODME is a high-risk observation. Entries can include reference to any purchase/defect orders reported and any other mitigating measures implemented. Example of entry can be found in INTERTANKO's publication "A Guide for Correct Entries in the Oil Record Book". A defective ODME must be reported to USCG prior arrival.

There must be no evidence of tampering with this equipment and ORB entries must be correct and kept up to date. The Master signature means he has checked entries and confirmed they are correct – make sure these checks are done.

It is recommended regular checks of the recorded data from the ODME are carried out to verify it is correct in all respects.

It is also recommended flanges and overboard valves are sealed, a register of numbered seals maintained and comments recorded when seals are removed/replaced, for what purposes and if company permission is required to include message references from the company.

Engine and Steering Compartments

6.14 Are the engine room bilge oily water pumping and disposal arrangements in good order?

It is extremely important for the bilge pumping system to be in good order and operated correctly without exception. There MUST NOT be a direct connection from the bilge (or sludge) pump to overboard.

Suspensions of wrongdoings by the ship staff will be raised if any Inspector (SIRE, PSC or USCG) observes the following conditions:

- (i) Piping systems have been recently been painted
- (ii) Flanges that have been recently disturbed
- (iii) Any flexible hoses are stowed nearby – it is recommended such hoses are labelled, registered and use monitored and recorded – this is considered best practice
- (iv) Discharge from the Oily Water Separator (OWS) to overboard is fitted with any blank flanges
- (v) Oil staining or rundown around the overboard valve spindle and gland.

DO NOT give the Inspector any reason to suspect that one or more of the above conditions exist.

It is strongly recommended that all flanges from the OWS outlet to the overboard, bilge tank or waste oil tank are made tamper-proof by the use of numbered seals. A register should be maintained and removal requires permission from the company. Best practice would indicate that the vessel keeps a register of all loose flexible hoses maintained in the ER. All hoses should be tagged/identified and records of use kept. This is viewed positively by the USCG.

6.15 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?

On occasion, confusion may exist as to what the emergency bilge suction is. The emergency bilge suction is ONLY to be used if the safety of the vessel is at stake. In general, there are two types of emergency bilge suctions, one is the direct suction on the fire/wash-deck/general service pumps. This direct suction would be used in the event of a substantial leak within the machinery spaces. However, to act as a deterrent and prevent accidental opening the valve should be lashed shut using a lashing that has a numbered tag and is of a breakable single-use type. A sign should be placed on the direct suction valve stating "NOT TO BE OPERATED WITHOUT THE CHIEF ENGINEER'S PERMISSION".

The main emergency bilge suction is connected directly to the main seawater circulating pump and used in the event of a catastrophic intake of water. This valve should also be made easily visible and lashed closed with a breakable, numbered tag. A sign should be placed on the direct suction valve stating "NOT TO BE OPERATED WITHOUT THE CHIEF ENGINEER'S PERMISSION".

6.16 Have disposals of sludge and other machinery waste been conducted in accordance with MARPOL requirements?

Disposal of any sludge and other machinery waste to either a slop or cargo tank, must be recorded in both the ORB part I (Machinery Space) and ORB part II (Cargo).

Those tanks to which, or from where, transfers are made will be listed in Form B of the IOPP Certificate.

For emptying steering gear compartment bilges, it is preferable to empty the bilge wells by hand pump and dispose of contents manually to a waste-oil or sludge tank. In this case, the overboard valve should be lashed closed with a numbered tag and a notice posted stating "NOT TO BE OPENED WITHOUT THE CHIEF ENGINEER'S PERMISSION".

For disposal to reception facilities, the ship should always receive a receipt from the receiver stating the quantity received during the transfer, time and the date for any disposal to shore reception facilities of sludge wastes, tank washings, slops and other oily wastes irrespective of whether these are by road tankers or barges. This receipt or certificate of receipt should be maintained in a dedicated file or stapled to the ORB page that records the transfer to the reception facility.

The Inspector will also check to see the removable spool piece connecting the machinery spaces to the slop or cargo tank is removed, positively blanked off and its purpose clearly identified.

There MUST NOT be a connection between the sludge pump and any direct overboard outlet. Just as in 6.14 earlier – suspicions of wrongdoings will be raised if the following conditions are seen:

- (i) Piping systems have been recently been painted
- (ii) Flanges that have been recently disturbed
- (iii) Any flexible hoses are stowed nearby – it is recommended such hoses are labelled, registered and use monitored and recorded – this is considered best practice
- (iv) Discharge from the sludge pump is fitted with any blank flanges.

DO NOT give an Inspector any reason to suspect wrongdoing by ship staff, particularly where discharge of oil or oily water overboard is concerned.

It is strongly suggested that all flanges on the line connecting the sludge pump discharge to the sludge tanks, waste oil tank and deck are tamper-proof by the use of numbered seals. A register should be maintained and their removal should require permission from the company.

It is considered best practice to check the vessel's drawing against the actual fitted system. The IOPP Certificate must correctly represent the tanks/capacities onboard.

6.17 Is the OWS in good order, free from unauthorised modifications and are the Engineers well familiar with its operation and data recovery procedure where applicable?

COMPETENCE

Those vessels installed with an OWS shall ensure that the area around is clean and free of oil. A line diagram and operating instructions should be posted in the vicinity.

The items mentioned in 6.14 above should be used as guidance.

Any failure of the OWS will be required to be entered into the ORB Part I.

The Inspector will check for any sign of unauthorised modifications, the Inspector will require that the 15 ppm alarm and the operation of the three-way outlet valve are tested. Therefore, it is important that each of the Engineers should be able to demonstrate their knowledge of these functions and familiar with the data recovery procedure.

The 15 ppm Bilge Alarm data recorded remains available on board for 18 months.

The accuracy of the 15 ppm Bilge Alarms checked at IOPP Certificate renewal surveys.

6.18 Are specific warning notices posted to safeguard against the accidental opening of the overboard discharge valve from the OWS?

It must be ensured those OWS overboard valves that are of the screw lift type have the hand wheel securing nut secured tight with a split pin fitted through it. The overboard valve should be lashed closed, preferably with a number tag and a sign posted instructing "NOT TO BE OPERATED WITHOUT THE CHIEF ENGINEER'S AND MASTER'S PERMISSION".

6.19 If the OWS is not fitted with an automatic stopping device, do entries in the ORB Part I indicate that it has not been used in a Special Area?

To assist with ensuring those vessels fitted with an OWS that do not have an automatic stopping device are not used in special areas, a notice should be posted locally at the bilge pumping equipment and the ECR as well as a note made in the ORB Part I stating the locations of the Special Areas.

Garbage Management

6.20 Is the vessel correctly segregating garbage and able to store garbage in a safe hygienic manner onboard, is the garbage being handled in accordance with the vessel's Garbage Management Plan and is the Garbage Record Book being correctly maintained?

The vessel will have a garbage management plan and this should be included with the Master's files.

Care must be taken by the Environmental Officer (usually the Chief Officer) to ensure that entries are accurate and written correctly. The Master, when countersigning the Garbage Record Book, should check the entries prior to signing. It is not acceptable for the Master to sign without checking the entries first. If there are incorrect entries, it is not the fault of the Officer making the entries but that of the Master for not fully checking the Officer's entries.

Be aware that garbage kept in plastic sacks is considered as all plastic, even if it contains other garbage types. It is always preferable for garbage to be collected in heavy duty paper sacks rather than plastic.

The garbage should be stowed in colour-coded containers in line with the garbage plan to aid separation and to avoid mixing the various types of garbage. Care should be taken to ensure that the garbage containers are covered with non-flammable covers without risk of funnel sparks landing on the containers. The area containing garbage containers should be kept in a hygienic state.

The Inspector will check if the garbage has been correctly segregated and stored in a secure and hygienic manner and handled as per plan.

Ballast Water Management

6.21 If the vessel is provided with an approved Ballast Water Treatment System, is the system in good order, used where required and are Officers familiar with the safe operation of the same?

COMPETENCE

The Inspector will check if the vessel is required to have a Ballast Water Treatment System, and note the implementation status.

If the vessel is provided with the system, the Inspector will verify if the system is being approved by the IMO, Class and USCG. A Class-approved Ballast Water Management Plan should be in the possession of the Master. A working copy should be available for the Chief Officer.

All ballast water exchanges shall be recorded by the Chief Officer and all records made should be readily available to display for the Inspector.

If the system uses hazardous chemicals/additives, ensure safe handling and proper access controls are in place.

6.22 Where a Ballast Water Treatment Plant is fitted is it maintained in accordance with manufacturers and vessels planned maintenance requirements?

The company should provide their vessels with a maintenance schedule for the Ballast Water Treatment system with reference to the Maker's recommendation, which is to be included in the Planned Maintenance System (PMS).

These should also include instructions on how to conduct these tasks. Routine maintenance should be carried out either weekly, monthly, quarterly or annually and all maintenance carried out, scheduled or unscheduled, must be recorded in the PMS. The task of updating all maintenance records is likely to be carried out by the designated Engineers.

The Inspector will want to check if the maintenance of Ballast Water Treatment System follows a planned schedule i.e. a PMS. The upkeep of the PMS is the responsibility of the Chief Engineer. At some point during the inspection, generally after the Inspector has visited the plant, the Inspector will want to check the record and contingency measures. The Chief Engineer will be required to demonstrate how the vessel's Ballast Water Treatment System operates and if all procedures are being followed.



Chapter 7.

Maritime Security

Policies and Procedures

Maritime Security, including Cyber Security, to detect and deter acts which threaten the maritime industry, plays an ever-increasing role. It is therefore a natural process that Security is taken into consideration for Oil Majors within their risk assessment. This new VIQ Chapter 7 will refer mainly to the International Ship and Port Facility Security Code which came into force on 1st July 2004. Inspectors will not request to sight sensitive material, however they will verbally confirm with the Master/SSO that procedures or records are available and maintained.

7.1 Does the vessel have an approved Ship Security Plan?

The vessel shall have a Flag State approval letter or an endorsement stamp on the Ship Security Plan (SSP).

Note: It is recommend the company provides the vessel with a letter which confirms what parts of the SSP the SSO can reveal to Inspectors.

7.2 Are the Master and Crew aware of the name and contact details of the company security officer, and are these details posted?

COMPETENCE

The crew should know the name of the CSO or where details are posted.

7.3 Are ship security records related to port calls being maintained?

The Master will have maintained all security-based documentation and this shall include:

- The last ten ports called
- Certificate
- Current security level onboard
- Previous security level at port where ship/port interface
- Special additional security measures taken at previous port where ship/port interface
- Procedures maintained during any ship-to-ship activity
- Other practical security information – NOT detailed in the SSP.

The Inspector should not sight any sensitive documentation but simply note there is a system in place.

7.4 Are records of training and maintenance of equipment related to the ship security plan available?

The Master shall maintain all security records and maintenance relating to all issues concerning drills, training through to testing of security equipment. These should include:

- Training drills and exercises as per the SSP
- Changes in security level – changes should be recorded in the log book and any evidence of communications with the Flag State and CSO
- Communications relating to security threats or port facilities
- Date of internal audit and security reviews
- Date of review of SSP
- Maintenance, calibration and testing of security equipment onboard – this must include the testing of the Ship Security Alert System.

Other examples include:

- Razor wire
- Water cannons
- Locks/arrangements
- Lockable hatches/stairwells.

The Inspector should not sight any sensitive documentation but simply note there is a system in place to record all security activities.

7.5 Has the ship's security officer been trained to undertake this role and do they understand their responsibilities?

COMPETENCE

The Ship Security Officer (SSO) must have a full working knowledge of the SSP, its practice and content. The SSO must be able to demonstrate that a suitable training course has been attended to ensure he/she understands the responsibilities and is able to fulfill the duties of this role.

Duties include but are not limited to:

- Regular security inspections
- Maintain and implement the SSP including amendments
- Procedure to change the SSP
- Reporting to the CSO – deficiencies, NCNs, reviews, inspections, corrective and preventive actions.
- Enhance security awareness e.g. posters, training
- Onboard training carried out
- Report security incidents
- Liaising with the PFSO.

7.6 If fitted, is the vessel's dedicated standalone security communications equipment regularly tested?

Records of testing should be maintained according to ISPS Code Part A/10.1.5.

Inspectors are not required to check the details of any communications equipment but should verify with the Master whether there is a record of testing and maintenance.

7.7 Does the vessel have a routine to regularly test the ship security alert system?

Inspectors are not required to sight the records of testing and/or maintenance but verify with the Master of its existence.

7.8 Does the Passage Plan include security-related information for each leg of the voyage?

The security-related information on the passage plan should include but not be limited to:

- Changes to security levels
- Changes in bridge manning levels (e.g. extra lookouts)
- Points where the vessel should be hardened (refer OCIMF Guidelines for vessel hardening – it is recommended this paper is carried onboard).

7.9 Does the vessel have a voyage/transit security risk assessment?

The voyage/transit security risk assessment should be reviewed and updated prior to entering an area which requires an increased state of readiness and vigilance.

7.10 Does the vessel have procedures for vessel hardening?

The OCIMF information paper “Ship Security – Guidelines to Harden Vessels” provides guidance on establishing procedures and implementing a vessel hardening plan – this should be supplied onboard.

The ship should maintain records to demonstrate implementation, when required through risk assessment, of hardening procedures such as entries in log book or work plans.

7.11 Does the Master/SSO have a clear understanding of the procedures for voluntary security reporting?**COMPETENCE**

Check evidence of participation in voluntary security reporting e.g. to UKMTO when passing through the Indian Ocean and to MDAT-GoG for calls to West Africa.

7.12 Is an adequate deck watch being maintained to prevent unauthorised access in port?

The gangway must be manned at all times and the watch must not be distracted to perform other duties. It may be necessary to check visitor's bags but this activity will depend on the security level the vessel is operating under and as defined in the SSP.

The gangway watch will need to brief the Duty Officer of the Inspector's (and all visitors) boarding. All visitors must be escorted to the accommodation to either the Master's or the ship's office. On no account must the Inspector (or visitor) be left alone.

During the boarding of the Inspector (or other visitors) the gangway watch must also be able to provide a safety brief on what actions the Inspector/visitor must follow in the event of an incident.

Remote monitoring of different areas on ships is increasingly being used. Where technology such as CCTV is employed to monitor potential access points to the ship this should be noted in comments.

7.13 Has the company provided a list of security charts, publications and guidelines to the ship?

Such security charts, publications and guidelines' may include:

- Relevant UKHO security charts
- Industry best management practice guidance
- Any other company specific guidance.

Cyber Security**7.14 Are Cyber Security Policy and Procedures part of the Safety Management System and is there a Cyber Response Plan onboard?**

The procedures include a risk assessment of issues such as:

- Threats such as from malware; phishing attacks, etc.
- Identification and protection of Vulnerable systems (ECDIS etc)
- Mitigation measures, (USB control etc)
- Identify key personnel within the company (including who the Master reports suspected incidents to)
- Hard copy of key contacts (e.g. DPA; CSO etc).

- Password management/record
- Contractor compliance.

Note: Does the Cyber Response plan contain guidance on:

- What 'symptoms' to look for
- Immediate actions to be taken and
- Name, position, phone number and email for the Responsible Person to be contacted?

It is not considered correct for any inspector to demand to see all the contents of this plan – in a similar way to only being able to sight certain sections of the SSP. To resolve what can and what cannot be seen, best practice is for companies to specify clearly by way of a procedures of letter to all vessels stating what can be viewed. Inspectors then cannot and should not challenge this. The SSO to ensure that clear instructions from the CSO are available on board accordingly.

7.15 Is the crew aware of the company policy on the control of physical access to all shipboard IT/OT systems?

Inspectors should observe if access to USB ports on 'Shipboard IT/OT' terminals are controlled (i.e. there are measures in place to block/lock USB/RJ-45 ports on these terminals.) Procedures should include the protection of critical equipment such as ECDIS from malware and virus attacks. Procedures should include the control of access to all shipboard IT/OT terminals including access to Servers, which should be in a secure location. The procedures should also include access by any third-party contractors and technicians.

7.16 Does the company have a policy or guidance on the use of personal devices onboard?

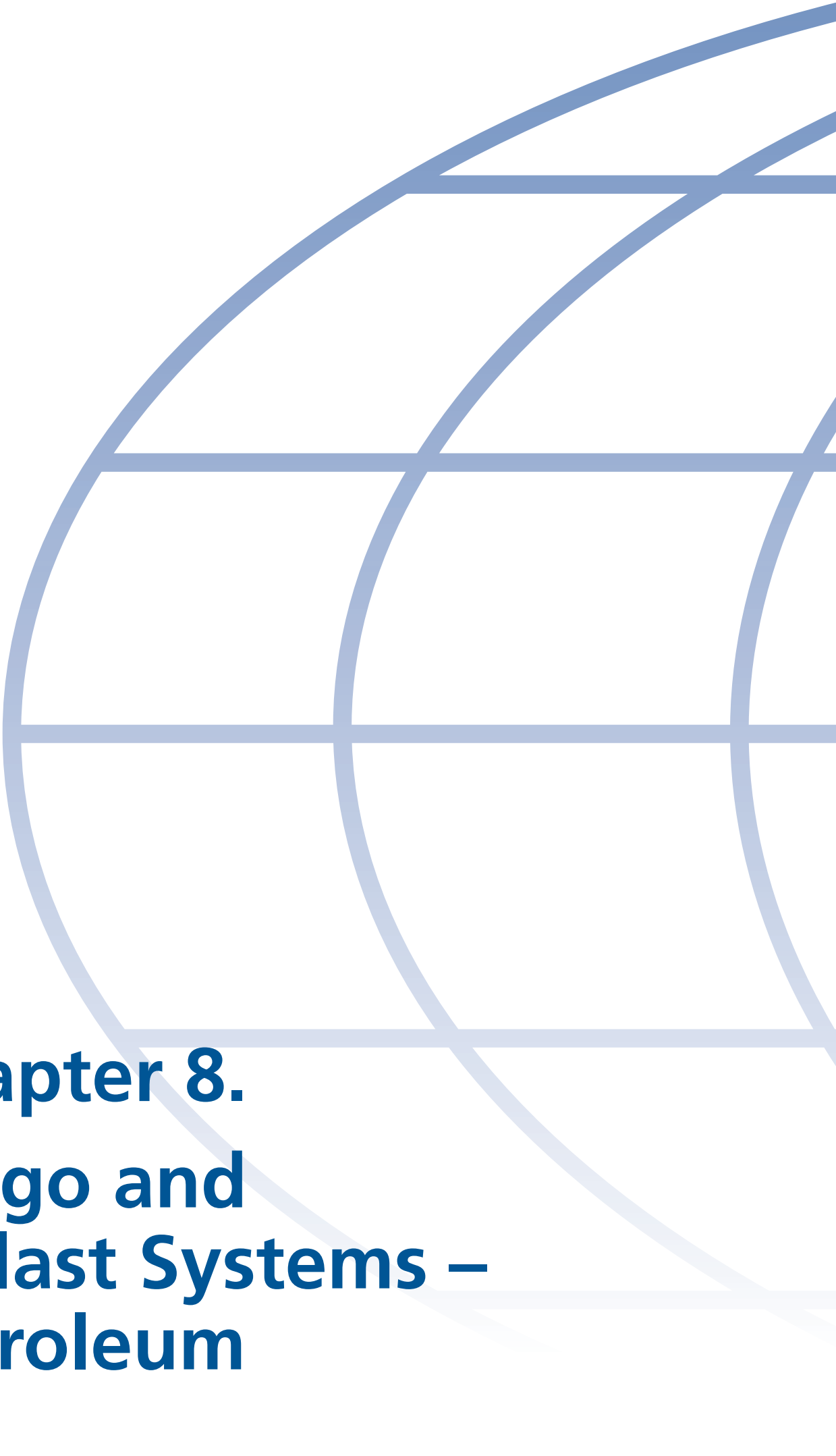
Personal devices include phone/tablets, etc, and storage devices such as USB sticks.

Check if the policy is implemented by both crew and visitors, e.g. all third-party contractors and technicians.

7.17 Is Cyber Security awareness actively promoted by the company and onboard?

Active promotion might include:

- 'Cyber Awareness Material' displayed by all IT terminals and in crew rest rooms
- Training films shown to crew
- Crew-specific training
- Instruction on safeguarding of passwords
- Responsible use of social media. Guidance can be found in INTERTANKO's leaflet "Social Media Guidance for Seafarers"
- Policy on the use of personal devices and its inclusion in shipboard joining familiarisation checklists.
- May include companies own employee/contractor Authorised User Policy (AUP) agreements.
- Company certified as per ISO 27001.

A stylized graphic of a globe, composed of several concentric blue arcs and horizontal lines, creating a grid-like pattern that represents the Earth's curvature. The graphic is positioned in the upper right and middle sections of the page, partially overlapping the text.

Chapter 8.

Cargo and Ballast Systems – Petroleum

Cargo and Ballast Systems – Petroleum

In general, the Chief Officer or the Cargo Officer will be responsible for the majority of this Chapter that includes the planning and execution of the cargo and ballast transfer.

Nevertheless, all Deck Watch-keeping Officers should also be fully aware of the operations taking place at the time of the inspection. The Inspector WILL direct questions at the Deck Watch-keeping Officers to assess if they have an understanding of the cargo transfer taking place and to assess their familiarity with the vessel's cargo, ballast and inert gas systems. This chapter applies to vessels carrying Oil.

8.1 Are Officers aware of the operator's policy statements, guidance and procedures, including information on maximum loading rates and venting capacities with regard to safe cargo operations?

COMPETENCE

The Chief Officer should have a hard copy of the company SMS available in the CCR or his office. Increasingly, companies are providing electronic versions of their SMS, however, a hard copy being made available may prove to be more advantageous to assist the Inspector when references need to be verified. The Chief Officer should be able to demonstrate familiarity with the SMS, irrespective of whether it is in hard copy or electronic version. Furthermore, as the inspection progresses other Officers and watch keepers on board shall also be required to demonstrate their knowledge of and familiarisation of the SMS.

The vessel's maximum loading rates and venting capacities for each tank and the vessel as a whole (if loading a single grade) shall be posted or made readily available in the cargo control room and those involved with cargo transfer operations should be able to display knowledge of these to the Inspector.

8.2 Are legible and up-to-date pipeline and/or mimic diagrams of cargo, inert gas and venting systems, as applicable, available in the pump room(s) and cargo control area and Deck Officers familiar with the systems?

COMPETENCE

The line diagrams, in general, are those indicated on the cargo control console and this is an acceptable method on the cargo and venting system. The inert gas system (IGS) may also have its own mimic panel and this, too, is acceptable. Should mimic panels not be fitted to the vessel's cargo control console then the line diagrams should be posted.

The cargo system piping diagram shall also be posted at the bottom of the pump room.

If any modifications have been made to the vessel's cargo and ballast system in the past then these should be appropriately indicated on the mimic panel/ship's drawings.

8.3 Are cargo pump performance curves available, are Deck Officers aware of the test requirements for the cargo lines, vapour lines and inert gas lines in good order and is there recorded evidence of regular testing where applicable?

COMPETENCE

The Chief Officer must be able to demonstrate full understanding and familiarity with the cargo pump's performance curves and that these are posted in the cargo control room.

All Deck Officers must have knowledge of testing requirements, intervals, inspections/record and markings of oil pipelines.

Pressure tests should be done hydraulically, 100% of MAWP annually and 1.5 times of MAWP twice within any five-year period.

Stability and Cargo Loading Limitations

8.4 If a loading computer or program is in use, is it Class approved, regularly tested and are Officers aware of the test requirements including damage stability?

COMPETENCE

If the vessel is fitted with a loading computer there will need to be evidence that the unit and/or program is Class approved. There may be a separate certificate held by the Master or a Class approval stamp will be available within the loading computer's manual.

If the vessel is not fitted with a loading computer, the Inspector will need to know and will check how the Chief Officer calculates stresses and stability. The Chief Officer, therefore, will need to maintain records of stress and stability calculations for all voyages.

Stability conditions will be endorsed by the vessel's Class at each Annual and Special Survey. The loading instrument should be tested for accuracy and the approved loading guidance information (stability information booklet) should be confirmed as being available on board. The test, carried out at each Annual and Special Survey, should involve physically entering the data for each tank into the computer and verifying the result. It is not acceptable to simply retrieve a stored test condition from the computer and compare this against the official conditions. In addition, regular on-board testing (as per the company's SMS) should also be carried out and records attesting to this should be maintained.

Inspectors often ask to see a certificate for this "calibration" – this is not necessary as it is confirmed by Class as per their endorsed certificates – it is part of the Class survey.

Company procedures generally require calibration tests to be carried out by entering conditions from the approved stability book and records maintained. A normal interval is three months. It is recommended that ALL Deck Officers are able to do this.

8.5 Has a cargo plan been prepared and followed with a detailed sequence of cargo and ballast transfers documented, stress, intact and damage stability and are any limitations, where applicable understood by the Cargo Watch Officers and clearly documented?

COMPETENCE

The Master and Chief Officer must be aware of the worst-case damage condition for the existing cargo onboard.

The Chief Officer, during the planning phase of the cargo transfer operation, should include the stress and stability calculations at various stages throughout the transfer operation, e.g. at 25%, 50%, 75% and on completion. These ought to be attached to, or included within, the cargo plan.

All Deck Officers should review and sign the plan as evidence of their understanding.

Refer to the VIQ guidance notes, which give the minimum number of items that should be in a plan.

The plan must be agreed with the terminal at the pre-discharge meeting and documented.

Evidence of cargo and vent line set up and checks must be available.

Load and discharge records in the log books are often minimal and inadequate – you should include as much information in the cargo log book as possible – it must include times of stopping/starting pumps – both cargo and ballast, times of opening and closing tank valves, completion of discharge or filling of each tank and any other event during operations e.g. weather, tidal changes, terminal instructions, stripping, purging, hoses connection/disconnection etc.

Any deviation from the original cargo plan must be recorded with the reason why.

8.6 Is the vessel free of inherent intact stability problems? Are Officers aware of these problems or risks of structural damage due to sloshing, and actions required if the vessel takes on unstable condition and/or angle of loll

COMPETENCE

See comments in 8.5. The Master and Chief Officer should be familiar with the loading and stability information booklet which should be readily available for the Inspector to view.

Should the vessel suffer from inherent intact stability conditions then procedures mitigating the risks that arise from these conditions must be available for the Chief Officer to use and demonstrate to the Inspector. The Deck Officers must be well versed with the procedures and should be able to explain these to the Inspector.

Cargo Operations and Related Safety Management

8.7 Are all Officers and ratings aware of the carriage requirements including emergency procedures for the specific cargo onboard and are the Officers familiar with the vessel's cargo system, including emergency discharge arrangements?

COMPETENCE

The Chief Officer will need to ensure that all Deck Officers are fully familiar with the cargo system. If a Deck Officer (other than the Chief Officer) is escorting the Inspector around the deck, the Officer must be able to describe at what stage the cargo transfer is and what tanks are being loaded/discharged. The Chief Officer should also ensure that all Deck Officers and ratings are aware of what steps to take should be taken if there is any failure of the cargo discharging equipment i.e. in the event of failure of a cargo pumps. The use of portable emergency deep well pumps, if available should be understood as well as the effect on, and use of, the inert gas system. It is recommended that a meeting is held with all responsible Deck Officers and crew to advise regarding all emergency procedures

All Officers and crew involved with cargo transfer operations shall be required to have a good knowledge of the carriage requirements for the cargoes being carried and of guidance that may be provided in industry publications for this vessel type.

The Chief Officer should ensure that all Deck Watch-keeping Officers and crew are well versed with the carriage requirements and as well as with each stage of the cargo transfer plan as described:

Officers should be able to demonstrate a basic knowledge of the following:

- Shipboard operations and cargo handling
- Closed loading/discharge and sampling
- Medical treatment if exposed to hazardous cargoes
- Spill response
- Communications with shore and emergency stop procedures.

As required (see ISGOTT for assistance)

- Effects of high-density cargoes
- Hazards associated with toxic cargoes
- Hazards of electrostatic generation.

8.8 Are the cargo, ballast and stripping pumps, eductors and their associated instrumentation and controls including temperature monitoring, in good order and is there recorded evidence of regular testing?

The Chief Officer will be asked by the Inspector if all equipment is fully operational. This should be answered honestly and accurately. If the answer is given as 'yes' and the Inspector notes any faulty equipment then the trust built up between the vessel and the Inspector may be lost. The Inspector will then start looking more deeply into the status of the equipment to identify whether any additional faults exist and this may result in additional observations.

Records of instrumentation (pressure gauges, temp gauges, etc.) testing and emergency trips will need to be made available to the Inspector. Temperatures must be recorded hourly.

8.9 Are Officers aware of the column/cofferdam purging routines where deep well pumps are fitted and is the pump leakage within tolerable limits?

COMPETENCE

Regular cofferdam purging routines must be in place, and records must be maintained as per the company's SMS or as per recommendations in deep well maker's instruction manual. If excessive leakage of cargo or hydraulic oil is noted, then this would indicate worn/deteriorated seals and the company must be notified.

Normal cargo leakage rate is approx. 0.5ltrs per day, seals do leak and can average in normal operations 0.25ltrs/day and for short periods of time this can be higher. The Inspector must be guided by the manufacturer's recommendations.

8.10 Are the Officers and ratings aware of the location of the cargo pump emergency stops, is the emergency cargo pump shutdown system in good order and is there recorded evidence of regular testing?

COMPETENCE

The Chief Officer shall maintain records of the testing of cargo pump trips and alarms, and cargo tank level alarms.

All Officers and crew shall be aware of the location of the cargo pump emergency stops and actions to be taken in line with the emergency procedures.

Cargo pump trips must be tested before cargo discharge operations commence and an entry should be made in the logbook or other record book.

8.11 Are the cargo and ballast system valves in good order and is there recorded evidence of regular testing?

The Inspector will visually inspect areas of the cargo and ballast systems; clean and well-painted equipment will provide a good impression. The Inspector will also wish to sight pressure testing records that should be maintained by the Chief Officer.

Remote operation of cargo and ballast valves shall be carried out in accordance with the PMS, or three (3) monthly intervals and appropriate records maintained. The timing of the opening/closing of valves shall be checked/recorded against the manufacturer's recommended times.

8.12 Are the cargo system ullage gauges, vapour locks and UTI tapes in good order and is there recorded evidence of regular testing?

The Inspector will ask if the gauging systems are operational, how many portable gauging tapes (UTI or MMC) are available and if there is a closed sampling device. Evidence must be available to demonstrate to the Inspector that regular tests are carried out.

Comparison checks between the fixed ullage system and the portable gauging tape (UTI or MMC) shall be carried out under the supervision of the Chief Officer and a record of these comparisons shall be made available to the Inspector.

It is advisable that all portable gauging tapes (UTI or MMC) are sent ashore for servicing and calibration annually, either on a rotation or if sent as a job lot then replacement tapes should be placed on board. Calibration certificates for each tape should be retained by either the Master or Chief Officer.

It is considered acceptable for one MMC tape that has been calibrated ashore to be used to calibrate others onboard.

All vapour locks must be leak free, if not an observation will result.

8.13 Are the remote and local temperature and pressure sensors and gauges in good order and is there recorded evidence of regular testing?

Records of regular testing and calibration of the cargo monitoring equipment shall be maintained by the Chief Officer. Pressure sensors must be tested against a calibrated referenced pressure gauge onboard periodically.

8.14 Are the cargo tank high-level and overfill alarms in good order and is there recorded evidence of regular testing?

While on deck, the Inspector will randomly request cargo tank high and high/high level alarms to be tested. Prior to testing the high-level alarms, permission should be obtained from the cargo control room and the terminal should be advised of the test.

The Inspector may want to test an alarm and ask the cargo control room what tank alarm was tested.

The high-level alarms should be tested in preparation for the inspection to ensure all systems are fully operational and results should be recorded. Check the alarms 24 hours before cargo transfer operations are due to start. Regular testing should be included and recorded as required by the PMS.

8.15 Where fitted, is the condition of the cargo tank heating system satisfactory, is it regularly tested and is any observation tank free of oil?

The Inspector will visually check the pipework for any leakage. For steam heating systems, visual checks will be made of the steam inlet and outlet manifolds, and any leakage will be recorded as an observation.

Steam heating returns are collected in either a hot well or observation tank that is generally located in the machinery spaces. The Inspector will check the hot well or observation tank for any oil. Any presence of oil will indicate leakage of heating coils.

A small amount of oil can be considered acceptable but not when seen as a layer covering the whole surface.

Records of the results of pressure tests of cargo heating systems will be maintained by the Chief Officer.

Ullaging, Sampling and Closed Operations

8.16 If the vessel is handling volatile or toxic cargoes, is it operating in a closed condition?

The safest way of handling volatile or toxic cargoes is by operating in the closed mode. Therefore, all those engaged with gauging tanks must be fully familiar with the safe use of portable gauging tapes, including their bonding wires.

All cargo tank openings and hatches MUST be closed.

8.17 Is the vessel provided with an approved vapour control system?

If the vessel is provided with a vapour collection system, it must be approved by the vessel's Administration.

8.18 Do tank hatches, tank cleaning apertures and sighting ports appear to be liquid and gas tight?

Any form or signs of leakage from these features will result in an observation. Should there be several signs of leakage, this may well result with an observation deemed to be high risk.

Walk round the deck when tanks are pressurised and listen and look to identify leaks.

Venting Arrangements

8.19 Are Officers aware of the primary and secondary cargo tank venting systems and are the system functioning correctly?**COMPETENCE**

The Inspector will visually check the venting systems for temporary repairs, leakages and secure clamping arrangements. The Inspector may request a P/V valve to be tested; this may only be allowed if safe to do so with the Chief Officer's permission but, definitely avoided if the cargo has high levels of H₂S. Any leaking P/V valves will result in an observation that is likely to be considered high risk. Flame screens will also be checked.

If pressure sensors are fitted as secondary means – ensure setting is 10% over the actual pressure setting. Low pressure sensors must activate above zero in the case of inerted vessels.

It is recommended settings are clearly identified in the cargo control room.

8.20 If stop valves are fitted which permit isolation of individual tanks from the common venting system, are they provided with positive locking arrangements and are the keys under the control of the person in overall charge of the cargo transfer?

The open and closed positions of the cargo tanks' inert gas inlet valves (stop valves) shall be indicated. During routine cargo operations these stop valves must be positively locked in the open position to avoid them being mistakenly shut. The most positive means is for the stop valves to be locked with a padlock. The keys must be kept in a secure location in the cargo control room under the responsibility of the Chief Officer or Officer of the Watch. On no account should the keys be in an Officer's pocket. It is advisable also to post a sign in the cargo control room stating "Cargo Tanks Inert Gas Inlet Valves (stop valves) must only be operated with the Chief Officer's permission. Those operating these valves must maintain walkie-talkie contact with the Chief Officer at all times".

An indicator board in the cargo control room shall be in place to indicate the status of the stop valves, i.e. whether they are open or shut.

8.21 Are the P/V valves in good order, inspected and cleaned as part of a regular planned maintenance routine and are there records to support this?

Maintenance of the P/V valves shall be in line with the company PMS and records should be available for the Inspector. Further guidance is provided in 8.19. They must be checked prior to cargo operations and checks recorded.

Inert Gas System (IGS)

8.22 Was the inert gas system in use and operating satisfactorily at the time of the inspection?

The IGS should be in operation throughout cargo discharge and should be operated in accordance with the procedures and guidance in the vessel specific IGS Manual.

8.23 Is there evidence to show that regular maintenance has been conducted on the inert gas system, including the overhaul of the non-return valve(s)?

Records of maintenance carried out in compliance with the maker's instructions or the company PMS shall be made available to the Inspector. The date on which the non-return valve was last overhauled should be stencilled on the valve or adjacent pipework.

8.24 Are the Deck Officers aware of required actions in the event of the inert gas failure and are all cargo tanks maintained under positive pressure throughout?

COMPETENCE

The company must provide the vessel with procedures to follow should the IGS fail. All cargo tanks should be maintained under positive pressure throughout.

The Inspector will check the Chief Officer's and other Deck Watch-keepers' familiarity with this procedure. If the vessel is carrying crude oil, the cargo transfer must be stopped until the system can be reinstated.

If the vessel is not able to restart the IGS then cargo discharge may only be resumed if an external supply of inert gas is connected.

If products are being carried it is preferable that an external source of IG is provided. However, if it is not, then provided certain conditions are met as per Emergency conditions laid down in IMO Guidelines on Inert Gas Systems, cargo discharge may be resumed. (Deck Officers should know these, refer also to this VIQ Inspectors' guidance notes).

8.25 Is the inert gas system including instrumentation, alarms, trips and pressure and oxygen recorders, in good order?

It is of the utmost importance that all IGS instrumentation is fully operational. The Inspector will easily note from the IGS alarm panel or control panel if there is a malfunction of any component of the instrumentation. Should there be any component fault with the IGS, this will result in an observation which will be viewed as high risk.

8.26 Was the fixed oxygen analyser calibrated immediately prior to use of the inert gas system and do local and remote oxygen and pressure recorders, where fitted, agree?

It is not prudent to check the calibration of the fixed O₂ analyser too far in advance of starting the IGS and certainly not more than 24 hours before.

The calibration checks shall be carried out as close as possible to commencing cargo transfer. It is strongly suggested that the record of calibration is entered in the engine room logbook. The time that the calibration was carried out along with the results should be posted in the vicinity of the analyser. The Chief Engineer should also ensure the calibration gas (nitrogen) is in date.

Routine checks of the remote IGS pressure gauges and recorders need to be carried out to ensure that they are all providing similar readings. Most vessels will have an IGS pressure gauge or equivalent on the Bridge and the IG pressure should be recorded in the Bridge Logbook at the end of each Bridge watch.

It is recommended the vessel has a spare IGS O₂ analyser in stock.

8.27 Is the liquid level in the deck seal at the correct level, clearly visible and are Officers aware of the requirements to periodically check the level?

The deck seal water level must be clearly visible so ensure the sight glasses are kept clean.

Some vessels may be fitted with a “dry type” deck seal, if this is the case then some oil majors may not accept the vessel until an alternative type is installed.

Officers shall be aware of requirements to periodically check the level.

8.28 Does the P/V breaker appear to be in good order?

The sight glass must be clean. The P/V breaker liquid level must be checked against the pressure as indicated on the cargo control room IGS panel display. The liquid should have the correct water/anti-freeze mix in the ratio which is in accordance with the manufacturer's instruction.

8.29 If the vessel is provided with a nitrogen generator/bottle manifold system, are the Officers and crew aware of the specific hazards associated with nitrogen gas?**COMPETENCE**

All Officers and crew shall be required to have a good knowledge of the specific hazards associated with the handling and use of nitrogen gas – especially that human senses cannot detect it – i.e. lack of smell and risk re: enclosed space entry.

The Chief Officer should ensure that all Deck Watch-keeping Officers are well versed with the handling and operation of the nitrogen generator/bottle manifold system.

8.30 Are Officers and ratings aware of safe entry requirements for the inert gas room(s), are these procedures being followed and where applicable, is fixed oxygen detection provided?**COMPETENCE**

Any detection sensors must be checked at frequent intervals and checks recorded. Hazard warning signs must be posted detailing the risk of asphyxiation.

Wearing of personal gas detection analysers should be a standard practice onboard.

8.31 Are the Officers familiar with the dangers associated with over pressurisation of the cargo tanks and are procedures implemented to avoid over pressure due to purging, blowing and pigging with nitrogen?**COMPETENCE**

- Structural damage can occur if not controlled
- Risk assessment must be carried out and mitigating measures in place
- Compressed air must not be used for these operations
- Flow rate of nitrogen must be less than the venting capacity of the ships P/V valves or shore vapour return system
- Manifold gauges should be fitted and monitored
- Use of as small hose or reducer prior to the manifold is recommended
- Pressure MUST be controlled by the terminal and communications must be agreed and tested to confirm effectiveness.

Crude Oil Washing

8.32 Is the Crude Oil Washing (COW) system approved and are Officers aware of the requirements within the COW manual?

COMPETENCE

A Class-approved COW manual will be provided onboard and should be in the possession of either the Master or the Chief Officer in the cargo control room.

8.33 Are Officers aware of the IMO requirements for COW and is the vessel complying with such requirements?

COMPETENCE

All checklists for COW operations, including pre-arrival checklists must be completed.

Before departure on a ballast voyage:

- In addition to the heavy-weather ballast tanks, a minimum of 25% of the total number of cargo tanks must be crude oil washed on a rotational basis to ensure effective sludge control. No cargo tank requires being crude oil washed more than once in every four months.
- The number of tanks required to be washed must take into account the vessel's anticipated ballast voyage and potential weather conditions.
- A record of all COW operations should be maintained in the ORB Part II (Deck).

8.34 If the vessel is Crude Oil Washing, has the COW system been tested for integrity, appropriate checks complete and all associated COW equipment in good operational order?

The approved checklist, as provided in the COW manual (unless provided separately by the company), shall be followed in full and used for each COW operation. It is also advisable to ensure that all checklists are maintained for a minimum period of 12 months or for a period as stated in the company's SMS.

The person in charge of COW operations is generally the Chief or Cargo Officer and shall be named in the COW plan.

The person in charge of COW should have attended the appropriate COW training course and course certificates should be kept on the individual's file held by the Master.

Prior to use, the COW system shall be pressure tested to confirm equipment and pipelines are in order. Records to show that the COW system has been pressure tested shall be maintained, the ORB Part II will also need to have an entry attesting that the pressure in the system was tested.

On completion of testing, the COW lines should be drained.

There must be a written record of the oxygen content readings taken from each tank to be crude oil washed. Proforma record sheets should be provided by the company. The approved COW manual will indicate the permissible limits of oxygen in the tanks which should normally be no greater than 8%.

Normally there will be pressure gauges fitted at points as far forward and aft on the main COW line, these should be checked during the pre-COW pressure testing and regularly during the COW operation to ensure that tanks are being washed at the correct pressures.

8.35 Is the tank cleaning heater, where fitted, effectively isolated from the crude oil washing line and any hydrant-type connections on the crude oil washing lines securely sealed?

The tank cleaning heater must be positively isolated using blanks or valves with caps, the Inspector will check that the blanks or valves with caps are fitted correctly.

8.36 Are records maintained of previous COW operations?

A record shall be maintained of all COW operations carried out. These records will identify that all tanks have been crude oil washed once over a four-month period. The ORB Part II will also act as a record of those tanks crude oil washed. Records should include as a minimum:

- Tanks washed
- Number of machines used
- Time start/finish washing
- Washing pattern used
- Washing line pressure
- Method used to check tanks are dry.

Static Electricity Precautions

Note: Questions 8.37 to 8.40 only apply when vessels are carrying static accumulator cargoes in non-inert tanks

8.37 Are Deck Officers aware of the precautions necessary to avoid static discharge including maximum flow rates and settling periods for flammable cargoes in non-inert tanks?**COMPETENCE**

The start of loading must be at a reduced rate to minimise static electricity – max 1m/s. When the cargo tank inlet is covered the loading rate can be gradually increased to a flow rate agreed with the terminal. This reduced loading rate shall be included within the cargo plan.

ISGOTT recommends allowing 30 minutes settling time on completion of loading and before commencing any manual dipping, ullaging and sampling with metallic equipment. This instruction should be included within the cargo plan.

8.38 Are Officers aware if the vessel is fitted with full depth sounding pipes, is this information clearly displayed and are Officers aware of the additional precautions relating to cargo tanks that are not fitted with full depth pipes?**COMPETENCE**

All Officers must be aware if the vessel is fitted with full depth-sounding pipes and information clearly displayed.

When using portable gauging tapes (UTI or MMC) through vapour locks which do not have full depth sounding pipes, bonding wires must be connected before using this equipment.

8.39 Are precautions followed for metal tapes, gauging or sampling devices and portable tank cleaning equipment (as applicable) before being introduced into tanks?

Follow the guidance in 8.38.

It should be noted some portable gauging tapes (UTI or MMC) that have quick connect couplings may not require to be fitted with a bonding wire. Therefore, it is prudent to check the maker's instructions before using this equipment. Should the portable gauging tapes (UTI or MMC) not require bonding wires, they should be labelled accordingly to avoid any misinterpretation by the Inspector and the user.

Internal bonding must be checked every six months or as per manufacturer's recommendations.

All tank cleaning hoses must have bonding wires incorporated in them. Hoses must be indelibly marked to allow identification.

Records should be kept showing date and result of continuity tests – intervals as determined by the PMS.

8.40 Are Deck Officers aware of the hazards associated with tank cleaning after the carriage of volatile products and the need to avoid the free fall of liquid into tanks?

COMPETENCE

The Chief Officer shall supervise those involved with tank cleaning operations in line with the recommendations in the latest edition of ISGOTT 11.3 – which MUST be followed.

All Deck Officers shall be aware of the hazards associated with tank cleaning after the carriage of volatile products and the need to avoid the free fall of liquid into tanks.

Ballasting from the top can cause a charged mist and an increase in petroleum gas concentrations.

Restrictions of loading or ballasting in this manner are provided in the latest edition of ISGOTT. This method is rare and only used in extreme cases.

Manifold Arrangements

8.41 Are the manifolds and associated valves in good order, blank flanges of an equivalent rating to that of the pipelines and pressure gauges fitted outboard of the manifold valves on both sides and monitored for leakage?

There is little the ship staff can do should the construction of the cargo manifolds not be in compliance with the *OCIMF Recommendations for Oil Tanker Manifolds and Associated Equipment*. Any non-compliance with these recommendations will result in an observation.

The pressure gauges on both port and starboard side manifolds must be fitted outboard of the manifold valves on both sides of the manifold, kept uncovered and the stop cocks should be open at all times. Each pressure gauge should be fitted with a shut off valve or cock and be calibrated in accordance with the company PMS.

The Chief Officer's Standing Orders should require the regular checking of all pressure gauges and that written records of these checks are maintained.

Manifold blanks should be the same thickness as the manifold presentation flanges. If the blanks are of another material to steel, such as titanium, they may be of a thinner construction. If this is the case, the Inspector will need to sight documentation to identify that pressure ratings of the manifold flange and the blank are compatible.

8.42 If the vessel is fitted with vapour return manifolds, are they in good order including those for SBM use as appropriate?

The vapour return manifolds shall be painted in the correct colours (red and yellow bands) and should be stencilled as per the latest edition of ISGOTT (reference shall be made to the latest edition of the *OCIMF Recommendations for Oil Tanker Manifolds and Associated Equipment*). The presentation flanges should be checked to ensure that there is a locating pin (or stud) fitted in the 12 o'clock position.

There is little the ship staff can do should the construction of the vapour return manifolds prove non-compliant.

If these return manifolds are not compliant or are not designed for use at single buoy moorings then this will be recorded as an observation. The company should be advised if the manifolds are found to be not compliant.

8.43 Does the vessel's piping system appear to be free of unauthorised inter-connections between cargo, bunker and ballast systems?

There should be NO connections between these systems. If there are and these are noted by the Inspector then an observation will be recorded.

Pump Rooms

Note: Questions 8.44 to 8.48 only apply to vessels fitted with a cargo pump room.

8.44 On vessels with pump rooms and trunk spaces, are they free of evidence of significant leaks from machinery, pipework, valve glands and instrumentation and bilges clean?

Before any entry is made into the pump room, with the Inspector, full entry precautions must be carried out. Do not enter or allow the Inspector to enter without this process being carried out. If full entry procedures are not carried then this will result in an observation.

The Inspector will visually check all the piping systems in the pump room as well as the cargo pump seals for any signs of leakage, any leaks noted will result in an observation.

Where cargo pumps are concerned, there must be no temporary arrangements for cooling the bearings as this will result in a high-risk observation.

The bilge alarms should be indicated and some Inspectors may wish to test the alarm. The cargo control room must be informed before any alarms are tested.

All firefighting equipment shall be in place.

The Inspector will check that each pump room fan is operating in the extraction mode and the high-level emergency suction flaps are closed. The location and operating direction of these flaps, normally also operable from outside the pump room at the main deck level, should be indicated and tested regularly. Test results should be recorded.

A safety harness should be maintained rigged and ready for immediate use. It is advisable to have a logbook to complete every time the inspection rounds are carried out.

Keeping a logbook at the bottom of the pump room provides a positive record of the pump room being inspected all the way down to the bottom.

The Inspector may also wish to check the pump room communications with the cargo control room so this system should be routinely tested, preferably during the inspection rounds.

Trunk spaces must be free from leaks and the bilges clean.

8.45 Are bulkhead seals gas tight and, if required, well lubricated?

Bulkhead seals must be maintained in good condition and well lubricated, these should be checked during regular pump room inspections during cargo transfer when the pumps are running.

Maintenance records of bulkhead seals will be checked against the manufacturer's instructions

8.46 Is the pump room gas monitoring system in good order, regularly checked and are Officers aware of the alarm settings?

COMPETENCE

The gas detection system should be able to monitor for the presence of H₂S and hydrocarbon gases. The system must be switched on at all times and particularly during all cargo transfer operations.

Records indicating that the detector heads have been calibrated and tested as per the manufacturer's instructions or as per the company's SMS should be maintained. Sample points could be installed in the trunking of the extraction fans alternately these gas sampling points should always be located at the lower levels of the pump room. All sample points in the pump room should be labelled/stencilled.

The above applies if vessel fitted with trunk spaces and ballast pump rooms where fitted with fixed gas detections.

8.47 Is the bilge pump in good order and can it be operated from a position outside the pump room?

The pump room must be clean and well painted and the bilges must generally be kept dry. Any excessive water in the bilges will result in an observation. There must be NO signs of any cargo in the bilges.

Any rags or other such materials must never be left in the pump room.

Operation from outside the space must be identified and tested prior to inspection. Best practice would recommend a risk assessment to be available identifying hazards and mitigating measures to be in place should pumproom bilge system operation not be as per guidance notes. This then indicates to any inspector awareness of the crew and that an issue has been identified and addressed.

8.48 Is all lighting in the pump room or trunk space operational and does it appear adequate to illuminate the space?

All lights must be clean. Light fixtures must be Ex-rated and with all securing arrangements intact and complete. Protection covers to guard against accidental breakage must be intact.

Cracks are not acceptable. Same wattage bulbs must be used throughout when replacing.

Special keys are used for isolating the pump room lights; these switches are generally located in the accommodation. The Inspector may check if the location of the switches is known to all the Deck Officers.

Records of regular checks, normally by the ship's electrician, must be made and recorded.

Cargo Hoses

8.49 If the vessel uses its own cargo hoses, are they in good order, pressure tested annually and is a record of all hose tests and inspections maintained on board?

An annual inspection of cargo hoses in service must be documented and include:

- pressure tested at least annually, to 1.5 times their rated working pressure to check for leakages and elongation
- visually checked for deterioration and damage
- electrical continuity test.

The test pressure and date shall be indicated on each length of hose either by stencilling or by a securely fitted label.

Each hose must be individually numbered for identification purposes.

Any hose not in service and not regularly inspected/tested must be clearly marked – “NOT FOR USE” and quarantined if possible away from hoses in service.

The Chief Officer will be responsible for conducting and maintaining records of these tests.

Cargo Lifting Equipment

8.50 Are all cranes and other lifting equipment properly marked, regularly inspected, tested and are the vessels crew aware of maintenance requirements?

COMPETENCE

All cargo gear must be load tested every five (5) years and this must be recorded in the cargo gear register, maintained by the Master. All lifting gear must be certified and the certificates must be on file. All lifting gear must be properly marked with their SWL and certificate numbers to ensure proper identification.

The SWL and the load test date should be stencilled in a visible location on the cargo crane. A record of monthly inspection of loose gear must also be maintained.

Single cargo-handling cranes must be supplied with spare hydraulic hoses for all those fitted. If the crane is fitted with two identical hoses, only 50% of these hoses are required as spares.

Slewing bearing wear must be regularly inspected – two methods are possible:

1. grease sampling to measure metallic content
2. rocking test to measure the wear between inner and out bearing races.

Ship to Ship Transfer Operations – Petroleum

8.51 Are the Officers and crew familiar with the requirements and risks during ship-to-ship operations?

COMPETENCE

The Inspector will look at the company's SMS for procedures and guidance provided by the company on ship-to-ship (STS) operations. The officers and crew should be familiar with the requirement and risk during STS, and be able to locate the company procedures on STS operations within the SMS.

Procedures should include risk assessments prior any STS operations.

If a vessel is equipped with fendering and hoses, there must be a procedure in place to monitor and assess the condition of this equipment.

8.52 Does the POAC have the necessary qualifications and experience and are Officers aware of these requirements?

COMPETENCE

POAC – "Person in Overall Advisory Control"

Minimum qualifications are required for this position – see Inspectors' guidance notes in the VIQ.

It is clear there will be occasions due to operational areas that the POAC or company providing the POAC is not able to provide evidence of qualifications or experience. However, it is recommended as best practice that best efforts are made by the Master to obtain this e.g. messages to the agents, STS operator etc, which can then be demonstrated to the inspector.

8.53 Are closed fairleads and mooring bitts provided?

This will be as per the mooring arrangements plan provided to the ship and should generally satisfy the guidance provided in the STS operations guide.

All fairleads used during STS transfer operations should be of an enclosed type and be strong enough to take the anticipated mooring loads and large enough to allow the mooring line (plus any soft rope and tackle) to pass through comfortably.

8.54 Are Officers aware of the requirements of the ship-to-ship transfer checklists and are there records of STS operations maintained?

COMPETENCE

The Chief Officer should have all checklists involved with any ongoing STS operations, or past operations, completed and suitably filed.

The checklists should be provided by the company as part of their SMS and if not, then those provided in the latest edition of the *OCIMF Ship-to-Ship Transfer Guide* should be copied and used.

They should be available for:

- Pre fixture information
- Prior operations commence
- Before run-in and mooring
- Prior cargo transfer
- Before unmooring.

Each question in the checklist must be answered correctly as errors will result in an observation.

Additional STS records as listed in the VIQ should be readily available for verification by the inspector.

8.55 If a ship-to-ship transfer was in progress during the inspection, was it conducted in accordance with the recommendations of the OCIMF/ICS STS Transfer Guide?

The Chief Officer shall ensure that the cargo transfer plan covers all aspects of the operation and that it is in accordance with the guidance in the latest edition of the *OCIMF Ship to Ship Transfer Guide*.

The Chief Officer must also ensure that all Deck Officers are fully briefed and supervised in accordance with the plan. It is also strongly suggested that a copy of the latest edition of the *OCIMF Ship to Ship Transfer Guide* is available in the cargo control room.

Care should be taken to prevent static issues and that the correct insulation is in place.

Synthetic ropes in use should be protected from chafing which can be lubricated from time to time to prevent said chafing.

Combination Carriers

Combination carriers will normally only be inspected when operating in the “wet mode”.

8.56 Are operator’s procedures provided and are records maintained for changing between the wet and dry modes?

Preferably, the Chief Officer shall have a hard copy of the company SMS available. Increasingly companies are providing ships with only an electronic version of their SMS. However, a hard copy may be more advantageous to assist the Inspector when references need to be verified. The Chief Officer shall be able to demonstrate familiarity with the SMS, irrespective of whether it is in hard copy or electronic version.

The Inspector will verify that the procedures being followed when changing from the “dry mode” to the “wet mode” and again back to the “dry mode” are in accordance with the company’s SMS.

Records should be available showing tank inspection results – especially any damage identified when changing from dry to wet cargo.

8.57 Have the Senior Deck Officers had at least one year’s experience operating in wet service?

The Inspector will wish to identify if each of the Senior Deck Officers have at least one year’s experience of operating on this vessel type in the wet mode. If the Senior Deck Officers not have served for this period of time in the “wet mode” an observation will be raised.

8.58 Are hatch covers of the dual seal type, are they seated correctly and are they sealed and gas tight?

With the IGS in operation, leaks from the hatch coamings will be very apparent and will be identified by sight and sound of IG gases blowing past the hatch coaming seals.

Under the supervision of the Chief Officer, every effort should be made to firmly secure the hatch coamings to prevent leakage. Any leaks noted by the Inspector will definitely result in an observation and if there are a number of leaks then this will be seen as a high-risk observation.

8.59 Are hatch covers free of visible evidence of damage and are the corners of hatch coamings and adjacent decks free of visible cracks?

Hatch covers, particularly corners of hatch coamings and adjacent decks are susceptible to cracks and damage. If cracks have been identified by the ship staff then the office must be advised. Correspondence between the vessel and the office will need to be shown to the Inspector. Cracks will result in observations however, if correspondence between the vessel and the company and evidence of any mitigating actions are provided then this indicates a transparent and proactive approach by the ship and company.

8.60 Do records indicate that the pipe tunnel is clean and free of evidence of leakage?

The company will have provided a logbook to maintain records of regular pipe tunnel (or duct keel) inspections. If the company has not provided a specific format for a logbook, it would be prudent for the ship staff to maintain their own log of routine pipe tunnel inspections.

8.61 Are bilge pumping systems for forward spaces in good order?

Evidence of regular soundings and inspections of the spaces forward of the collision bulkhead shall be maintained along with records of any bilge pumping operations that may have taken place. In addition to operating instructions, any remote start/stop positions for the forward space bilge pumping arrangements will need to be clearly indicated.

8.62 Is the vessel equipped with bilge alarms in the forward spaces and holds?

The Inspector will need to identify that the vessel has bilge alarms fitted within the cargo holds, void spaces forward of the forward most cargo hold (not including the chain locker) and ballast tanks forward of the collision bulkhead. The alarm system (visual and audible) will be located on the navigation bridge so all Bridge Watch-keeping Officers will need to be aware of the system and its purpose. Records of tests carried out on the alarm system should be made available to the Inspector.

8.63 If the vessel uses portable hoses for crude oil washing, are these in good order and do records support that they have been regularly tested?

Portable hoses used for COW will be visually checked by the Inspector for any signs of obvious damage. Records of continuity tests, inspections and pressure testing of the portable hoses will need to be maintained by the Electrician; the Chief Officer may also have a copy and these should be available for the Inspector.

Shuttle Tankers

The Inspector has been issued with the following guidance, and this section will only be completed if the vessel is provided with specialist equipment for operations at deep water terminals and FPSOs:

"These questions address issues associated with tankers that are provided with specialist equipment for operations at deep water terminals and FPSOs. This section should only be completed when the vessel has such equipment. Unless the inspection is taking place at an offshore installation it may not be possible for the Inspector to provide detailed responses relating to these vessels, or to answer some of the questions. Within the Inspector's software, the Inspector can select two inspection options, 'Inspection at an Offshore Loading Oilfield' or 'Inspection at a Discharge Terminal'."

"For an 'Inspection at an Offshore Loading Terminal' all questions from 8.64 to 8.127 will be addressed.

"For an 'Inspection at a Discharge Terminal' the questions 8.65 to 8.127 will be addressed with the exception of the following 8.80, 8.86, 8.89, 8.90, 8.91, 8.97, 8.101, 8.105, 8.106, 8.108, 8.109, 8.110, 8.112, 8.114, 8.118, 8.119."

Personnel Management

8.64 Do all key personnel on board involved in Dynamic Positioning (DP) operations comply with the IMCA and UKOOA minimum requirements for experience and training?

During the Certification and Documentation process with the Master, the Inspector will inspect the training records of all officers to ensure that they have the appropriate training and experience to operate in the DP mode.

8.65 Do DP personnel undergo assessed refresher training e.g. DP CAP?

Guidance and comments as described in 8.64.

8.66 Record the DP manning arrangements.

The Inspector will need to identify how many qualified DP Officers (DPOs) and Masters are on board and this will be identified as described in 8.64.

8.67 Record the Engine Room manning arrangements during shuttle tanker operations.

The Inspector will look for the engine room watch-keepers' schedules that have been posted and will, from this information, make a record of the watch-keeping levels.

8.68 Is there an Electronic Technician onboard with approved training on the maintenance of the DP system?

In addition to the Guidance and comments as described in 8.64, DP training should be in accordance with IMCA M 117 Rev 1 (The Training and Experience of Key DP Personnel) which has been referenced and reproduced by the IMO as MSC/Circ.738

8.69 Have Officers and ratings had shore-based training in helicopter handling operations?

This will be identified as described in 8.64.

Dynamic Positioning and Navigation Equipment

All documentation in this section shall be available and with the Master.

8.70 Does the vessel have on board a copy of the most recent FME(C)A?

This is a report of a systematic analysis of the systems to whatever level of detail that may be required to demonstrate that no single failure of equipment will cause an undesired event. This is usually conducted by class and a copy of this report should be available for the Inspector. The Inspector will also make a note of the Class notation of the DP system.

8.71 Do the failure modes meet IMO MSC Circ.645 with 'fail as set, or fail to zero'?

The Master and DPOs should be aware of the failure modes.

8.72 Is a record of the DP proving trials available on board?

These records should be available from the Master and should be available for the Inspector to sight.

8.73 Have the recommendations (if any) from the DP proving trials been addressed?

The Inspector will note the recommendations, if any, that may have been made in the report from the DP trials and will check if these have been addressed. If the recommendations have not been addressed then this will result in an observation.

8.74 Does the vessel have on board a copy of the most recent annual DP trial report (if required)?

If required, a copy of report of the most recent DP trial should be available on board, and should be available for the Inspector to sight.

8.75 Have recommendations from the DP annual trial report been addressed and closed out as required?

As in 8.73 above, the Inspector will check if any recommendations were made in the report from the DP annual trials and will check for evidence of corrective action taken to close out the recommendations.

8.76 Are all personnel involved in DP operations familiar with the FME(C)A?

The Inspector may randomly ask Officers if they are aware of this of the FME(C)A process. The Master and Chief Engineer should ensure that all staff are familiar with this process.

8.77 If modifications have been undertaken, has the FME(C)A been updated and the modifications proven by testing?

If any significant systems modifications have been carried out then the FME(C)A analysis should be updated and records shall be made available along with any class approvals that may be necessary.

Dynamic Positioning (DP) Operations

8.78 Have DP operations been incident-free in the last 12 months?

The Inspector will note if any incidents have occurred in the last 12 months and if any have occurred, the Inspector should be advised accordingly and incidents reports offered to support close out.

8.79 Does the vessel have a DP Incident reporting system?

DP vessels should be provided with and operate appropriate DP incident reporting, investigation and closing out procedures. This should be in accordance with vessel owner or operators' and, if applicable, clients' processes.

The company's incident reporting system should be presented to the Inspector. Guidance is also provided in IMCA M 103 Rev1. (International Marine Contractors Association (IMCA) is the international trade association representing offshore, marine and underwater engineering companies.)

8.80 Does the vessel review the risk assessments for shuttle tanker operations prior to DP operations?

The Inspector will wish to view past risk assessments to verify that these are carried out for each operation. These should include changes to operating location, position reference sensors and Joint Operational Manuals (where appropriate).

8.81 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?

The Inspector will assess the location of the DP Control Console with respect to the visibility of the external environment and the working operations of the vessel. If the answer to this is “NO” then the provision of CCTV is considered as an alternate.

8.82 Are manual controls and emergency stops located within easy reach?

Emergency stops will need to be protected against accidental operation by a simple means that should not prevent its operation in the event of a real emergency. The Inspector will also check if dates for testing the emergency stops are clearly indicated.

8.83 What level of power/thrust can be achieved from the main propellers when going astern?

This information should be prominently posted. Reverse thrust should be indicated as a percentage of normal ahead thrust.

8.84 Can the controls for position reference systems be accessed within easy reach of the DP control station?

The position reference systems should be within easy reach of the DP control system and the Inspector will verify this.

8.85 Does the vessel have a comprehensive DP operating manual on board?

The vessel will need to have its DP operating manual available for the Inspector. The manual should be in accordance with the guidance in IMO Res.645, in a language that is understood by all DP operators and should be approved by Class.

8.86 Are all personnel involved in DP operations familiar with the manual and demonstrate an understanding of its contents?

COMPETENCE

The Inspector will ask questions of some or all personnel involved in DP operations to verify that they are familiar with the DP operating manual.

8.87 Are checklists in place to cover bridge, engine room and electrical systems prior to DP operations?

The company should provide the vessel with specific checklists to cover all aspects of the DP operations for both deck and the engine room. A record from past DP operations should be available for the Inspector.

8.88 Are DP Capability Plots in place to cover the normal and expected operations?

DP capability defines a DP vessel's station-keeping ability under given environmental and operational conditions. The Inspector will wish to see where these are located and that they are used.

Dynamic Positioning Equipment

8.89 Are all the thrusters in good order?

The Inspector shall be shown the records of the calibration of the thrusters either in the vessel's PMS or from reports of annual DP trials.

8.90 Is the Dynamic Positioning equipment on board in good order?

The Inspector will wish to sight the latest records of the last maintenance visit so these should be readily available. The Inspector will wish to verify that any recommendations have been addressed.

8.91 Are all position reference systems in good order?

The Inspector will check this with the Master or DPO and will cross check with other records/documentation and/or maintenance reports.

8.92 Are the offsets adequately filed?

Offset files will need to be readily available to the DPO.

8.93 Does vessel have a data recorder that records all DP parameters?

Demonstrate what the parameters are and how they are recorded on either the data recorder or logbook. These should be in accordance with the guidance in IMCA M 103 Rev 1-1.6.

8.94 Is there a procedure for checking of the secure power supply systems prior to DP operations?

The SMS should have procedures to ensure that these checks are carried out prior DP operations. These checks should be part of the specific checklist or if separate, should be recorded in the logbook.

8.95 If vessel is DP class 2 (or equivalent), does the DP system have a continuous analysis function checking that in terms of thrust and power the vessel can maintain position after the worst case failure?

The DPO should be able to demonstrate this function to the Inspector. This should be in accordance with the guidance in IMCA M 103 Rev 1-1.6.

8.96 Do the operational procedures include guidance on number of generators to be running at different power loads and are DPOs and engineers familiar with them?**COMPETENCE**

The Inspector will check the operating procedures in the SMS to see if there is guidance on the number of generators that should be running and whether there is a policy on standby generators. The DPO and the Watch-keeping Engineers should be able to locate this guidance within the SMS and should ensure that the recommended numbers of generators are in operation during different modes of operation.

8.97 Are consequence analysis alarms used as input to the contingency matrix?

The Inspector will check if the SMS/operations manual provides policy in this regard and whether consequence analysis (through software) is run to ensure that the vessel is able to maintain position and heading under the prevailing environmental conditions in the event of predefined worst case failure. This should not affect actual operations.

8.98 Is the DP system included within the Planned Maintenance System (PMS)?

The Chief Engineer should be able to demonstrate the full content of the PMS and this should include all position referencing system, UPS's and sensors.

Cargo Operations

8.99 Are the appropriate loading terminal procedures manuals on board for each offshore terminal to which the vessel trades?

These are primarily applicable to joint operations and manuals covering joint operations should be made available by the company for each facility the vessel calls at. The manuals should be readily available on the bridge and the cargo control room.

All of the terminal's requirements and/or regulations must be closely followed.

In addition to the information required as described in the guidance notes to VIQ 8.99, instructions should be posted on the bridge stating:

- The speed of approach,
- Emergency contacts,
- Duties of all involved with operations,
- Emergency procedures and responsibilities.

8.100 Are Deck Officers familiar with the appropriate loading terminal procedures manuals on board for each offshore terminal to which the vessel trades?

COMPETENCE

The Watch-keeping Deck Officers should be able to locate the terminal regulations manual and be very familiar with its contents.

8.101 Are weather forecasts received and assessed before commencing offshore operations?

Prior to commencing and cargo transfer operation, the Master and terminal shall confirm with each other that they are satisfied that the existing and forecast weather conditions are conducive to conducting safe operations.

8.102 Are records of regular communications checks with the installation maintained?

The Watch-keeping Deck Officers shall maintain a logbook of all communications and checks with the terminal.

8.103 Is there a checklist for bridge or bow control station instrumentation and control systems and has it been correctly completed?

There should be a pre-arrival checklist to ensure that all systems have been checked for correct operations prior any mooring and cargo operations.

8.104 Is there a checklist for engine room machinery and has it been correctly completed?

As per 8.103, there should be a company provided pre-arrival checklist to ensure all engine room machinery and systems are checked for correct operation and that stand by machinery is ready for use.

8.105 Does the vessel apply the same practices when loading from the offshore terminal as for an onshore terminal?

The company should provide processes for each type of facility (onshore or offshore) at which the vessel operates.

The Master and/or Chief Officer should be able to provide these procedures to the Inspector.

8.106 Are green line interlocks working satisfactorily?

A “green line” signal enables the transfer and is supplied by the Bow Loading System’s (BLS) interlocking system which ensures that all valves and couplers on board the tanker are in correction position and that the mooring system and hose connections are properly secured. If the status of any interlock supplying the ‘Green line’ status is altered for any reason during loading, a shutdown of the transfer would be initiated.

The Inspector will want to check that all the “green line” interlocks are working satisfactorily. If not then this will prevent cargo transfer and will result in an observation.

8.107 Is there a service report available for the tension load cells?

The Inspector will want to note the dates of these service reports which should be made available to the Inspector.

8.108 Is the deluge system in good order and is it pressurised during loading?

The Inspector will visually check the deluge system for any leakages and to see if there are any temporary repairs – should any be observed by the Inspector, these will result in an observation.

The date of the last test must be recorded.

8.109 Are the emergency shut-down systems in good order and tested regularly?

Records of routine tests of emergency shut-down systems will need to be provided to the Inspector either in hard copy form or within the PMS.

8.110 Is the telemetry system in good order?

This will be observed by the Inspector and the Chief Officer may be asked to comment on the standard of performance of the vessel’s telemetry systems.

Bow Loading Systems (BLS) and Submerged Turret Loading (STL) Operations

8.111 Has the BLS been subject to an FME(C)A process?

The Inspector will want to check whether the BLS has been put through an FEM(C)A analysis to demonstrate that no single failure of equipment will cause an undesired event.

This is usually conducted by class and a copy of this report should be available for the Inspector.

8.112 Are the BLS and/or STL systems in good order?

The Inspector will visually check for any obvious signs of leakages or deformation and will base his comments on physical as well as checks of records of maintenance and operations, etc.

8.113 Are checklists for the operation of the BLS and/or STL systems available and is there evidence of their consistent use?

The Chief Officer is the most appropriate person to maintain records of these checklists and these should be available for the Inspector. All checklists shall be fully and correctly completed as required by the company SMS.

8.114 Are seals on the STL buoy hatch and the STL room watertight door in good order?

The Inspector will visually check the hatch and/or door seals, any significant deterioration may result with an observation. Test records may also be checked.

8.115 Is the alarm for the STL room watertight door in good order and tested regularly?

The Chief Officer is the most appropriate person to maintain a record of the tests of the watertight door alarm. If possible and without causing any disruption to the crew and operations, the alarm may be tested in the presence of the Inspector.

8.116 Are indicators for closing devices in good order?

This will be noted by the Inspector. These should be maintained as per the company's SMS and test dates recorded.

8.117 Are BLS and/or STL areas fitted with detection/extinguishing systems and are they in good order?

Any monitoring or extinguishing systems installed must be maintained in good visual and operational condition.

Safety Management at Offshore Installations

8.118 Have communications been established and is there a back-up communication system?

If the vessel is not at an offshore facility then this will be answered as "not applicable".

If at an offshore facility, the Inspector will note whether communications have been established as well as any "back-up" communication that has been established.

8.119 Have communications been established with the field standby vessel?

If the vessel is not at an offshore facility then this will be answered as "not applicable". See guidance as provided in 8.118 above.

8.120 Are written emergency procedures for offshore loading provided?

The company's procedures will be inspected and the Inspector will also check records to see if these procedures are drilled regularly.

The offshore loading facility may provide their own to the vessel, if this is the situation the procedures will need to be explained to the Inspector.

8.121 Are drills pertaining to these procedures held regularly?

Evidence of drills having been carried out in accordance with the procedures in 8.120 will need to be provided to the Inspector. The Master must retain all records of the vessel's emergency drills and exercises.

8.122 Is there a procedure for emergency towing?

The Master will need to be familiar with the emergency towing procedures and be able to show these to the Inspector.

8.123 Are emergency towing trials carried out?

The Inspector will check the records of these trials and will note the frequency of trials and date of the last exercise as well as the details of any lessons learned that may have been assimilated by the crew.

Pollution Prevention Specific to Offshore Installations

8.124 Does the SOPEP address procedures specific to shuttle tanker operation?

The Inspector will check the SOPEP to see if the procedures are specific to shuttle tanker operations.

8.125 Are BLS and/or STL spaces free of oil?

Check these areas prior to inspection. The Inspector will make an observation if the BLS and/or STL spaces are found not free of oil.

8.126 If an oil discharge monitor is fitted in the STL room, is it in good order?

The Inspector will look at the system physically and will also check records to ensure that the system is working and in good order.

8.127 Is the vessel equipped with an appropriate system for draining the BLS and/or STL spaces?

Any system for draining the BLS and/or the STL space will be inspected and should be kept in proper working condition. Records of tests and or operation will be checked.

A stylized graphic of a globe, composed of several concentric blue circles and horizontal lines, creating a grid-like pattern. The graphic is positioned on the left side of the page, with the text overlaid on its lower portion.

Chapter 8.

Cargo and Ballast Systems – Chemical

Cargo and Ballast Systems – Chemical

In general, the Chief Officer or Cargo Officer will be responsible for a majority of this Chapter that will include the planning and execution of the cargo and ballast transfer. However, all Deck Watch-keeping Officers should also be familiar with the operations taking place at the time of the inspection. The Inspector will ask questions to the Deck Watch-keeping Officers to assess if they have an understanding of the cargo transfer operation taking place as well as their familiarity with the vessel's cargo, ballast and inert gas systems. This chapter applies to vessels carrying Chemicals.

Many of the questions are similar in each Chapter 8 section so reference to Chapter 8 Petroleum is recommended.

Policies, Procedures and Documentation

8.1 Are Officers aware of the operator's policy statements, guidance and procedures, including information on maximum loading rates and venting capacities with regard to safe cargo operations?

COMPETENCE

The Chief Officer should have a hard copy of the company's SMS readily available. Increasingly, companies are providing ships with an electronic version of their SMS. However, a hard copy may prove to be more advantageous to assist the Inspector when references need to be verified. The Chief Officer should be able to demonstrate familiarity with the SMS, irrespective of whether it is in hard copy or an electronic version. As the inspection progresses other Officers and Watch-keepers on board shall also be required to display their knowledge of and familiarisation with the SMS including information on maximum loading rates and venting capacities.

The vessel's maximum loading rates and venting capacities for each tank shall be posted or made readily available in the cargo control room and those involved with cargo transfer operations shall be able to display these to the Inspector.

8.2 Are legible and up-to-date pipeline and/or mimic diagrams of cargo, inert gas and venting systems, as applicable, available in the pump room(s) and cargo control area and Deck Officers familiar with the system?

COMPETENCE

The line diagrams, in general are those indicated on the cargo control console and this is an acceptable method for the cargo and venting system. The inert gas system (IGS) or the nitrogen generating system may also have its own mimic panel and this too is acceptable. Should mimic panels not be fitted to the vessel's cargo control console then the line diagrams should be posted.

Deck Officers should be familiar with the piping systems including in the pump room.

The cargo system piping diagram shall also be posted at the bottom of the pump room.

If any modifications have been made to the vessel's cargo and ballast system then the mimic diagrams and the ship's relevant plans should be appropriately updated.

8.3 Are cargo pump performance curves available, are Deck Officers aware of the test requirements for cargo lines, vapour and inert gas lines on the system?

COMPETENCE

Cargo pipelines should be pressure tested hydraulically, 100% of MAWP annually and 1.5 times of MAWP twice within any five-year period and be marked with the date of test and the pressure. This test should NOT be carried out using cargo, it is preferable to carry out this test using water. Correct entries of water/liquid disposal must be made in the appropriate ORB.

Vapour Lines and IG Lines can be tested using regulated compressed air. The Chief Officer should maintain records of each pressure test.

All Deck Officers must have knowledge of testing requirements, intervals, inspections/record and markings of oil pipelines.

8.4 Are Officers familiar with the information contained within the Procedures and Arrangements Manual available, and is the manual accessible onboard?

COMPETENCE

Too often Deck Officers are not as familiar as they should be with the P&A manual – this has to improve.

A Class-approved P&A Manual must be available on board if the vessel is Classed to carry MARPOL Annex II Cargoes. A copy of the P&A Manual should be available with both the Master and the Chief Officer. All officers should be familiar with the information contained within the P&A Manual and accessibility on board.

Knowledge of the cargoes the vessel is able to carry is contained on the Certificate of Fitness. This is not required to be attached to the P&A manual

8.5 Is the Cargo Record Book correctly completed and up to date?

All entries related to loading, discharging and tank cleaning must be entered in this book immediately after the operation is carried out.

It is imperative that the instructions on making entries in the cargo record book are followed and fully understood before making any entry. If in doubt ask the office for assistance. Writing all information is key, such that it is easy for any reader to follow the exact sequence of events during any cargo operations.

Often Officers responsible for making entries into the Cargo Record Book may follow the format of entries made by the previous Officer, thereby repeating any errors that may have been made by the previous Officer.

8.6 Are Officers aware of the hazards of tank cleaning where flammable and/or toxic products have been carried, the controlled use of chemicals and solvents, gas freeing and steaming of cargo tanks?

COMPETENCE

The company shall provide specific guidelines for these hazardous operations. Both Master and Chief Officer should be familiar with the contents of the procedure and be able to demonstrate a full knowledge of them to the Inspector.

The use of solvents by manually spraying to clean tanks has a history of accidents and is generally accepted to be a hazard with the risk of fires and explosions and is, therefore, as per best practice, not approved (ref ISGOTT and ICS TSG-C).

The Chief Officer should also have the latest MEPC.2/Circ. that is updated at the end of every year readily available. The Master and Chief Officer must be able to prove that any tank cleaning materials used for cleaning the tanks are included in this list.

Steaming only in inerted tanks or those that have been washed and are gas-free.

Great care is to be taken when using chemical cleaners – MSDS should be available as well as detection tubes. Any cleaning chemical likely to produce a flammable atmosphere should only be used in inerted tanks.

Officers must be aware of any coating restrictions re: temperatures or other restrictions when cleaning tanks.

Stability and Cargo Loading Limitations

8.7 If a loading computer or program is in use, is it Class approved, regularly tested and are Officers aware of the test requirements including damage stability?

COMPETENCE

If the vessel is fitted with a loading computer there will need to be evidence that the unit and/or program is Class approved. There may be a separate certificate held by the Master or a Class-approval stamp will be available within the loading computer's manual.

If the vessel is not fitted with a loading computer, the Inspector will need to know and will check how the Chief Officer calculates stresses and stability. The Chief Officer will need to maintain records of stress and stability calculations for all voyages.

Stability conditions will be endorsed by the vessel's Class at each Annual and Special Survey.

Inspectors often ask to see a certificate for this "calibration" – this is not necessary as it is confirmed by Class as per their endorsed certificates – it is part of the Class survey.

The loading instruments should be checked for accuracy on a three-monthly basis and the approved loading guidance information (stability information booklet) confirmed as being available on board. The test, carried out at each Annual and Special Survey, should involve physically entering the data for each tank into the computer and verifying the result. It is not acceptable to simply retrieve a stored test condition from the computer and compare this against the official conditions. In addition, regular on-board testing (as per the company's SMS) should also be carried out and records attesting to this should be maintained.

Officers should be aware of the loading computer test requirements including damage stability.

8.8 Has a cargo plan been prepared and followed with a detailed sequence of cargo and ballast transfers documented, stress, intact and damage stability and are any limitations, where applicable, understood by the cargo watch officers, clearly documented and signed?

COMPETENCE

The Chief Officer, during the planning phase of the cargo transfer operations, includes the stress and stability calculations at different stages throughout the transfer operations; at the start and end of each grade if pumping one grade at a time or at regular intervals if pumping concurrently and on completion. These should be attached to or included within the cargo plan.

During the Chief Officer's preparations of the cargo-handling plan, the following information must be included as a minimum and the plan should cover all stages of the transfer operations:

- Quantity and grade of each parcel
- Density, temperature and other relevant properties
- A plan of the distribution, lines and pumps to be used
- Transfer rates and maximum allowable pressures
- Critical stages of the operation
- Notices of change of rates
- Venting requirements
- Stability and stress information
- Drafts and trims
- Ballast operations
- Emergency stop procedures

- Hazards of the particular cargoes.

And also, as required or applicable:

- Inhibitor requirements
- Inerting and padding
- Initial start up rates
- Precautions against static generation
- Control of cargo heating systems
- Crude oil washing procedures
- Line clearing
- Under keel clearance limitations
- Bunkering, and
- Special precautions required for the particular operation.
- Stability calculation showing the conditions at start and completion of cargo operation, and during at least three more intermediate stages must be printed out and kept along with the Cargo Plan.
- The SF/BM of the vessel must be monitored regularly by the OOW during cargo operations, and this should be recorded in the logbook.
- If there are stability limitations related to the cargo being loaded (for example – when loading high-density cargoes), then all Deck Officers must be aware of this.

The cargo plan will be completed by the Chief/Cargo Officer and the Master should verify and approve the plan. All Watch-keeping Deck Officers involved with cargo operations should be familiar with the plan.

The Watch-keeping Deck Officers should sign the plan stating that they have “read and understood” it.

The Chief Officer is responsible to ensure that all entries in the cargo logbook include all activities as they occur e.g. starting and stopping cargo and ballast pumps; changing over cargo tanks, opening/closing valves; pump room rounds; manifold pressure checks etc.

Any deviation from the cargo plan and what tanks are being loaded/discharged should be with the permission/knowledge of the Chief Officer and should be logged.

The entries in the deck logbook should allow the reader to recreate the whole operation from start to finish.

8.9 Is the vessel free of inherent intact stability problems, are Officers aware of these problems or risks of structural damage from sloshing, and actions required if the vessel takes on an unstable condition and/or angle of loll?

COMPETENCE

Both the Master and Chief Officer should be familiar with the P&A Manual and the stability information booklet and these should be readily available for the Inspector to sight.

Should the vessel suffer from inherent intact stability problems, these must be highlighted in the manual and a procedure must be available for the Chief Officer to use and demonstrate familiarity with to the Inspector. The Chief Officer must be well versed with the procedure and be able to explain to the Inspector its purpose.

The Master and Chief Officer should be fully aware of any restrictions related to filling limits in any of the cargo tanks. These restrictions should be included in the cargo plan so the Watch-keeping Officers are also aware of any restrictions.

The Master and Chief Officer should be fully aware of the dangers and the effects that free surface can have, e.g. negative GM, structural damage, list etc. It is the Master and Chief Officer's responsibility to ensure that the all Deck Watch-keeping Officers are also aware of, and familiar with, the dangers of these conditions as the Inspector will check on their knowledge.

The Master and Chief Officer should ensure that the SMS includes procedures for restoring stability in case of unstable conditions developing during cargo operations, where applicable. If they do not then the company should be advised immediately. If these procedures are established within the SMS, then the Master and Chief Officer should be able to demonstrate them to the Inspector. It would also be prudent for this procedure or procedures to be readily available in the cargo control room.

Stability/trim records either manual or electronic used to verify damage stability requirements should be maintained for a period recommended for minimum three (3) years.

8.10 Are all Officers and ratings aware of the carriage requirements, including emergency procedures, for the specific cargo onboard and chemicals in general and are Officers familiar with the vessel's cargo system, including emergency discharge arrangements?

COMPETENCE

All officers involved with cargo transfer operations shall be required to have a good knowledge of the carriage requirements for the cargoes being carried and of any guidance that may be provided in industry publications for this vessel type, including emergency discharge arrangements.

The Chief Officer should ensure that all Deck-watch Keeping Officers are well versed with the carriage requirements and with each stage of the cargo transfer as described as follows:

- Properties of the cargo on board with reference to pollution and health hazards.
- Requirements of closed loading, discharging and sampling.
- Marpol Category(ies) of the cargo(oes) on board and the meaning of Category X, Y, Z and OS cargoes.
- IBC BCH codes where applicable - general knowledge by junior officers is generally poor and should be improved.

and

- Medical treatment required in case of exposure to cargo.
- Action needed in case of a spill.
- Emergency stop procedures and emergency communication in place for contacting terminal.
- Precautions needed while handling reactive, corrosive, high density cargoes, toxic, and electrostatic charge generating cargoes.
- Handling solidifying and high viscosity cargoes.
- The meaning/methods of drying, padding and inerting and associated hazards (Nitrogen).
- Pre-wash requirements.

The cargo operation plan must include the information above as may be applicable for the cargo on board.

Particular care must be taken for each chemical carried. A review of the carriage requirements must include reference to:

- IBC code Ch.17
- MEPC/Circ 12 when applicable
- CoF
- P and A manual
- MS DS

The Chief Officer will need to ensure that all Officers and ratings are fully familiar with the cargo system. If a Deck Officer (other than the Chief Officer) is escorting the Inspector around the deck, the Officer must be able to describe at what stage the cargo transfer is and what tanks are being loaded/discharged.

The Chief Officer should also ensure that all Officers and ratings are aware of what steps should be taken if there is any failure of the cargo discharging equipment; e.g. in the event of failure of a deep well pump. The use of portable emergency deep well pumps, if available, should be understood by all.

8.11 Can the Deck Officers demonstrate familiarity with the use of cargo compatibility chart and are dangers of co-mingling non-compatible cargoes considered?

COMPETENCE

Cargo compatibility charts are required to ensure that the cargo can be stowed safely. There are a number of different charts available. The USCG Cargo Compatibility can be found in USCG 46 CFR part 150. The Cargo Compatibility Chart should be easily available to the Chief Officer. If this is used, then App.1 (b) must be in use and referenced.

If the vessel is carrying different grades of cargo that are not compatible with each other, then precautions need to be taken to ensure that they do not mix in manifold drip trays, slop tanks, pipelines, etc.

The dangers and risks associated with such co-mingling should be clearly outlined in the Cargo Plan and indicate the potential areas.

Cargo Operations and Related Safety Management

8.12 Are Officers aware of the documentation and handling requirements for cargoes with inhibitors, and if the cargo carried is required to be inhibited, is the required information available?

COMPETENCE

Cargoes with reference to Ch. 15.13 in column “o” of Ch.17 IBC code require additives to prevent polymerisation, decomposition, oxidation and other chemical changes – Officers must know the meaning of these terms.

If any cargo requires the addition of an inhibitor, then the Master and Chief Officer must have instructions readily available. They should also be provided with certificate by the shipper.

The certificate must have the following information as minimum and be available for the Inspector:

- The name and amount of additive present
- Whether the additive is oxygen dependent – if so then the limits of the oxygen needed to maintain its effectiveness

- Date the additive was put in the product and the duration of its effectiveness
- Any temperature limitations qualifying the additive's effective lifetime
- The action to be taken should the length of the voyage exceed the effective lifetime of the additives.

8.13 Are Officers aware of the dangers associated with tank cleaning and ventilation after the carriage of volatile or toxic products and is a comprehensive tank cleaning plan established and followed prior to each operation?

COMPETENCE

The Chief Officer is responsible to prepare a tank cleaning plan that should be agreed and verified by the Master. All Deck Officers involved in tank cleaning must be fully briefed and sign the plan to indicate full understanding. The plan must clean ALL areas where the previous cargo has been in contact. As a minimum, the plan should include the following:

- The previous and following cargoes
- The condition of the cargo tank to be cleaned and whether toxic or flammable vapour is present, or whether lack of oxygen should be suspected
- Any precautions necessary with respect to the condition of the tank
- The cleaning method; using butterworth machines, recirculation, rinsing, steaming, ventilating, or drying
- The cleaning medium; sea, fresh, treated or de-mineralised water, or a chemical or solvent
- Which cleaning chemicals, if any, are to be used, its concentration and whether it is to be injected, recirculated, locally cleaned or hand wiped
- The temperature of wash water required to be maintained
- The length of cleaning time required
- Slop disposal requirements
- Wall wash test requirements, if any
- Any relevant additional instructions, including protective equipment requirements, and
- The action to be taken in the event of an emergency.

It is likely that, based on both the Master and Chief Officer's experience, additional instructions will be included.

If cargo tanks require to be entered to ensure cleanliness then full tank entry procedures must be followed. The Inspector will refer to the records of tank cleaning operations against the used tank entry permit to ensure matching dates and times. It will be the Chief or Safety Officer's responsibility to ensure safe entry procedures are followed and permits are fully completed and filed.

Risk assessments must address where some non-toxic/non-flammable cargoes can produce high levels of carbon monoxide e.g. vegetable oils. Tanks MUST be tested for this gas prior to entry and personal gas detectors used.

8.14 Are Officers aware of the column/cofferdam purging routines where deep well pumps are fitted and is any pump leakage within tolerable limits?

COMPETENCE

Regular cofferdam purging routines must be in place, and records must be maintained as per the company's SMS or as per recommendations in deep well maker's instruction manual. If excessive leakage of cargo or hydraulic oil is noted, then this would indicate worn/deteriorated seals and the company must be notified.

Normal cargo leakage rate is approx. 0.5ltrs per day, seals do leak and can average in normal operations 0.25ltrs/day and for short periods of time this can be higher. The Inspector must be guided by the manufacturer's recommendations.

8.15 Are Deck Officers familiar with the requirements for passivation and pickling of stainless steel cargo tanks, are passivity tests performed as required and are there clear procedures available for the process?

COMPETENCE

What is passivation and pickling? These are acid treatments applied to stainless steel tanks to aid the formation of a continuous passive film of chromium oxide to protect the steel from aggressive acids.

A passivity test should be carried out at intervals (frequency dependent of carriage) using palladium chloride.

The pickling or passivation acid must be thoroughly removed, otherwise pitting can occur due to residual hydrofluoric acid.

The company should provide procedures for passivation and pickling of stainless steel tanks. Those involved with this work must make themselves familiar with these procedures and the Chief Officer should retain records of all passivation and pickling operations.

Wearing of correct PPE is critical.

8.16 If the vessel is provided with wall wash test equipment, are the Officers familiar with the wall wash test procedures and are the procedures comprehensive and consider the safety aspects of the process?

COMPETENCE

Wall wash tests are many, but all must be carried out correctly and carefully, thus:

- All wall wash equipment must be chemically cleaned
- Bulkheads that have not been tested must not be touched
- Personnel must wear correct PPE – safety glasses, latex gloves, boot covers
- Wet bulkheads must never be wall washed
- Samples should be taken from several locations.

The Chief or Safety Officer is responsible to ensure that the correct PPE is worn throughout testing as required by the procedures. The Inspector will check these procedures.

8.17 Are cargo samples safely stored within the main cargo area, and are officers and crew aware of safe handling procedures?

COMPETENCE

Dedicated sample lockers are located within the main cargo area and in an area that is protected by a fixed firefighting system e.g. paint locker. *(Note – smaller lockers are allowed to be protected by a portable CO₂ extinguisher that is able to be activated into the space from a location outside of the space).*

Hazard warning signs are recommended to be posted.

The lockers must be kept tidy and properly arranged. All the sample bottles must be stowed inside the cell dividers and made of material resistance to the chemicals.

The company should define the retention period of samples with the idea to keep the number to a minimum, e.g. it is recommended that bunker samples are kept not less than 12 months and cargo samples no longer than three months after the cargo was discharged.

Record of storage and disposal of samples must be maintained. Normally, samples that are more than one year old must be disposed of and the company shall provide procedures for safe disposal. Disposal is normally accepted to be into the slop tanks or terminals waste oil facilities ashore.

Non-compatible and reactive cargo samples must not be kept close to each other.

Sample lockers must be clearly indicated and ventilated (they need not be mechanically ventilated).

8.18 Are the cargo, ballast and stripping pumps, eductors and their associated instrumentation and controls, in good order and is there recorded evidence of regular testing?

The requirement is to have an alarm. If temperature readings are possible, hourly records must be maintained.

The Chief Officer will be asked by the Inspector if all equipment is fully operational. This should be answered honestly and accurately, if the answer is given as 'yes' and the Inspector notes any faulty equipment then any trust built up between the vessel and the Inspector may be lost. The Inspector will then start looking more deeply into the status of the equipment to identify whether any additional faults exist and this may result in additional observations.

The Chief Officer or Chief Engineer should ensure that records of all testing are up to date.

All cargo pipework and valve systems should be indicated with the systems that they service. In addition, all records of instrumentation (pressure gauges, etc.) testing and emergency trips will need to be made available to the Inspector.

8.19 Are the cargo and ballast pump bearing, casing and shaft gland temperature monitoring sensors in good order and is there evidence of regular testing?

The Chief Officer and/or the Chief Engineer will maintain records of the testing of all monitoring equipment, carried out in line with the company PMS. Malfunction of any of the monitoring equipment will be noted by the Inspector as an observation. However, any correspondence regarding the ordering of spares should be made available to the Inspector. If the vessel receives an observation, the ordering of spares should also be noted and will provide assurance that the situation is being dealt with and is under control.

If temperature monitoring equipment is malfunctioning and spares are on order, temporary arrangements for monitoring temperature may be used to ensure that safe operating parameters are maintained. Regular temperature readings should be taken and recorded in the appropriate logbook.

8.20 Are Officers and ratings aware of the location of the cargo pump emergency stops, is the emergency cargo pump shutdown system in good order and is there recorded evidence of regular testing?

COMPETENCE

All Officers and ratings involved in cargo operations should be aware of the location of the cargo pump emergency stops.

Emergency stops of cargo pumps must be tried out before every discharge operation, and records of these tests should be maintained by the Chief Officer. The emergency stops should be tested from all locations.

8.21 Are the cargo and ballast system valves in good order and is there recorded evidence of regular testing?

The Inspector will visually inspect areas of the cargo and ballast systems, clean and well painted equipment will provide a good impression. The Inspector will also wish to sight pressure testing records that should be maintained by the Chief Officer.

Testing of remote operation of cargo and ballast valves should be carried out in accordance with the PMS, or three (3) monthly intervals and records maintained. The timing of the closing valves shall be checked against the manufacturer's recommended times.

8.22 Are the cargo system ullage gauges, vapour locks and UTI tapes in good order and are there recorded evidence of regular testing?

Comparison of remote gauging system (ullage and temperature) with portable (UTI or MMC) tapes must be carried out at least once every three months.

If a fixed gauging system is not fitted or is unreliable, then portable tapes (UTIs or MMCs) will be used to gauge the tanks under closed conditions. If vapour locks have been retrofitted, calibration certificates for each fitting, issued by a Classification Society-recognised body, should be made available to the Inspector.

If portable gauging tapes (UTIs or MMCs) are the main means of gauging, there must be a suitable number available for use plus two spares. The portable gauging tapes (UTIs or MMCs) should be serviced annually and the calibration certificate of each shall be maintained on board.

Other UTIs can be calibrated against a recently shore-calibrated gauge.

8.23 Are the remote and local temperature and pressure sensors and gauges in good order and is there recorded evidence of regular testing?

Comparison checks between remote gauging system and portable tapes (UTI or MMC) should be carried out in accordance with the company PMS or at least once every three months. Additionally, there should be records available to demonstrate the calibration of cargo tank pressure sensors as well as tests of high- and low-pressure alarms. A calibrated reference pressure gauge should be used to test local gauges.

Records of all regular testing and calibration of the cargo monitoring equipment should be maintained by the Chief Officer.

8.24 Are the cargo tank high-level and overflow alarms in good order, independent of both the gauging devices and the overflow-control alarm system and is there recorded evidence of regular testing?

Prepare a Risk Assessment if any of these are defective. If high-level alarms are not fitted or are not operational then an observation will be made.

The audible and visual alarms must be operational, and the audible alarm should be loud enough to be heard from all parts of the deck. High-level alarms must be in operation throughout both loading and discharging operations. These must be tested prior to the start of every loading and discharging operation.

The cargo tank high-level alarm system must be independent of both the gauging devices and the overflow-control alarm system. An observation will be recorded if the high-level alarm system is not

independent of the fixed gauging system. The company should be advised if this is the case. Guidance in 8.22 should be followed if no fixed system is fitted.

8.25 Are pipeline drains and stub pieces valved and capped and are cargo line drains suitably positioned to preclude liquid remaining in the line after draining?

The ship's staff, under the supervision of the Chief Officer, should thoroughly check that all drain lines that are fitted to cargo lines have shut off valves and that their caps are in place and not loose. When these drains are used for taking samples they should be closed and capped on completion of sampling.

Flanges at the load/discharge manifolds must be provided with shields to prevent cargo sprayed (portable ones are acceptable).

Drains meant for draining the liquid in the cargo line should be fitted at the lowest point in the line which will enable thorough drainage. When this is not the case, the ship's staff should advise the company.

8.26 Are Officers aware of the requirements for calibration of key cargo instrumentation, including temperature and pressure gauges, and are records onboard to verify this being performed?

COMPETENCE

Records of regular testing and calibration of the cargo monitoring equipment including cargo tank pressure sensors as well as the testing of high- and low-pressure alarms shall be maintained by the Chief Officer.

Calibration of temp and pressure gauges is expected at intervals not more than 30 months.

However, it is expected the vessel maintains comparison records of local and remote temperature gauges. Inspectors will request to see the records onboard for verification.

8.27 Where fitted, is the condition of the cargo tank heating system satisfactory, is it regularly tested and is any observation tank free of oil?

General appearance of the steam piping for the cargo heating system must be in good condition, free of any temporary repairs and leaks. There should be no rust patches visible on steam lines. Similarly, if heat exchangers are fitted, temporary repairs or any significant leaks will result in observations. The Inspector will visually check the pipework for any leakage. For steam heating systems, visual checks will be made of the steam inlet and outlet manifolds and any leakage will be recorded as an observation.

Steam heating returns are collected in either a hot well or observation tank that is generally located in the machinery spaces. The Inspector will check the hot well or observation tank for any oil. Any presence of oil will indicate leakage of heating coils.

A small amount of oil can be considered acceptable but not when seen as a layer covering the whole surface.

Records of the results of pressure tests of cargo heating systems will be maintained by the Chief Officer.

Ullaging, Sampling and Closed Operations

8.28 If fixed tank gauges are not fitted, are sufficient portable tapes provided to simultaneously gauge each tank being worked?

If portable gauging tapes (UTIs or MMCs) are the main means of gauging, there must be a suitable number available for use plus two spares. All portable tapes (UTIs or MMCs) will require servicing annually and the calibration certificate of each shall be maintained on board.

8.29 Are the Officers aware of what is considered a volatile or toxic cargo, is the vessel operating in a closed condition where a volatile or toxic cargo is carried and do tank hatches, tank-cleaning apertures and sighting ports appear to be liquid and gas tight?

COMPETENCE

The fixed gauging system must be in good operational condition and readings should be visible in CCR. Only closed ullaging and sampling is to be carried out when handling volatile and/or toxic cargoes. These UTI tapes are not same as the ones being used in oil tankers.

All Officers shall be aware what the volatile and toxic cargoes are.

The safest way of handling volatile or toxic cargoes is to operate in the closed mode. Therefore, all those engaged with gauging tanks must be familiar with the safe use of portable gauging tapes including the use of their bonding wires.

Any form or signs of leakage from these fittings will result with an observation. Should there be several signs of leakage, this may well result with a high-risk observation. Therefore, there should not be any evidence of leakage of vapour or liquid from any closed cargo tank openings.

Inert Gas Systems

8.30 Was the inert gas system in use and operating satisfactorily at the time of the inspection?

The IGS should be in operation throughout cargo discharge and should be operated in accordance with the procedures and guidance in the vessel specific IGS Manual.

8.31 Is there evidence to show that regular maintenance has been conducted on the inert gas system, including the overhaul of the non-return valve(s)?

Records of maintenance carried out in compliance with the maker's instructions or the company PMS shall be made available to the Inspector. The date on which the non-return valve was last overhauled should be stencilled on the valve or adjacent pipework.

8.32 Are the Deck Officers aware of required actions in the event of the inert gas failure and are all cargo tanks maintained under positive pressure throughout?

COMPETENCE

The company must provide the vessel with procedures to follow should the IGS fail. All cargo tanks maintained under positive pressure throughout.

The Inspector will check the Chief Officer's and other Deck Watch-keepers' familiarity with this procedure. In the event that the inert gas system fails to deliver the required quality and quantity of inert gas, or to maintain a positive pressure in the cargo tanks and slop tanks, the cargo transfer must be stopped until the system can be reinstated.

If the vessel is not able to restart the IGS then cargo discharge may only be resumed if an external supply of inert gas is connected.

If products are being carried it is preferable that an external source of IG is provided, however if it is not possible to repair the IGS, certain conditions are met as per emergency conditions laid down in *IMO Guidelines on Inert Gas Systems*. (Deck Officers should know these, refer also to the VIQ Inspector's guidance notes.)

These precautions include:

- Approved devices, or flame screens are fitted and inspected to ensure they are in good condition
- Valves on the mast riser is open

- No free fall of water is permitted
- No dipping, ullaging, sampling etc should be allowed until a period of five (5) hours since the IGS stopped. If essential to safe operations, 30 mins must elapse before lowering equipment into tanks and metallic components must be earthed.

8.33 Is the inert gas system including instrumentation, alarms, trips and pressure and oxygen recorders, in good order?

It is of the utmost importance that all IGS instrumentation is fully operational. The Inspector will easily note from the IGS alarm panel or control panel if there is a malfunction of any component of the instrumentation. Should there be any component fault with the IGS, this will result in an observation which will be viewed as high risk.

8.34 Was the fixed oxygen analyser calibrated immediately prior to use of the inert gas system and do local and remote oxygen and pressure recorders, where fitted, agree?

It is not prudent to check the calibration of the fixed O₂ analyser too far in advance of starting the IGS and certainly not more than 24 hours before. The calibration checks shall be carried out as close as possible to commencing cargo transfer.

It is strongly suggested that the record of calibration is entered in the engine room logbook. The time that the calibration was carried out along with the results should be posted in the vicinity of the analyser. The Chief Engineer should also ensure the calibration gas (nitrogen) is in date.

Routine checks of the remote IGS pressure gauges and recorders need to be carried out to ensure that they are all providing similar readings. Vessels will have an IGS pressure gauge or equivalent on the bridge and the IG pressure should be recorded in the Bridge Logbook at the end of each bridge watch.

In the ECR or engine space must be an indication of the O₂ content of the supplied IG.

It is recommended the vessel has a spare IGS O₂ analyser in stock.

8.35 Is the liquid level in the deck seal at the correct level, clearly visible and are officers aware of the requirements to periodically check the level?

The deck seal water level must be clearly visible so ensure the sight glasses are kept clean.

Some vessels may be fitted with a "dry type" deck seal, if this is the case then some oil majors may not accept the vessel until an alternative type is installed.

Officers shall be aware of requirements to periodically check the level.

8.36 Does the P/V breaker appear to be in good order?

The sight glass must be clean. The P/V breaker liquid level must be checked against the pressure as indicated on the cargo control room IGS panel display. The liquid should have the correct water/anti-freeze mix in the ratio which is in accordance with the manufacturer's instruction.

It must not be set to a level lower than the secondary venting system.

8.37 If the vessel is provided with a nitrogen generator/bottle manifold system, are the Officers and crew aware of the specific hazards associated with nitrogen gas?

All Officers and crew shall be required to have a good knowledge of the specific hazards associated with handling and the use of nitrogen gas. Reference to ISGOTT will assist in this.

The Chief Officer should ensure that all Deck Watch-keeping Officers are well versed with the handling and operation of the nitrogen generator / bottle manifold system.

8.38 Are Officers and ratings aware of safe entry requirements for the inert gas room(s), are these procedures being followed and where applicable, is fixed oxygen detection provided?

COMPETENCE

Two oxygen sensors will be installed on vessels delivered on or after 1 Jan 2016. Visual and audible sensors located inside and outside the space will activate if the O₂ level falls below 19%.

Spaces containing nitrogen systems MUST be clearly marked with warning notices showing the dangers of asphyxiation. Wearing personal gas detection monitors must be considered standard practice when entering such spaces.

8.39 Are the Officers familiar with the dangers associated with over-pressurisation of the cargo tanks and are procedures implemented to avoid over pressure due to purging, blowing and pigging with nitrogen?

COMPETENCE

- Structural damage can occur if not controlled.
- Risk assessment must be carried out and mitigating measures in place.
- Compressed air must not be used for these operations.
- Flow rate of nitrogen must be less than venting capacity of the ships P/V valves or shore vapour return system.
- Manifold gauges should be fitted and monitored.
- Use of as small hose or reducer prior to the manifold is recommended.
- Pressure MUST be controlled by the terminal and communications must be agreed and tested to confirm effectiveness.

Venting Arrangements

8.40 Are Officers aware of the primary and secondary cargo tank venting systems and are the systems functioning correctly?

COMPETENCE

The Inspector will visually check the venting systems for temporary repairs, leakages and secure clamping arrangements. The Inspector may request a P/V valve to be tested; this may only be allowed if safe to do so with the Chief Officer's permission but, definitely avoided if the cargo has high levels of H₂S. Any leaking P/V valves will result an observation that is likely to be considered high risk. Flame screens will also be checked.

It is recommended settings are clearly identified in the cargo control room.

The P/V valves must NOT be kept in the open position during cargo operations and must be operated as per the carriage requirements assigned for the cargo.

The Master and Chief Officer should be able to identify and explain the means of secondary venting. On occasion, even the Inspector may misinterpret the understanding of secondary venting. Therefore, it is extremely important the Master and Chief Officer are totally familiar with the vessel's secondary means of venting. The most reliable method of proving the vessel has a secondary means will be for the company to obtain an attestation by the vessel's Class Society.

The alarms of cargo tank pressure sensors must be set in the following way:

When tanks are inerted and no vapour return line connected: The high-pressure alarm settings for the pressure sensors must be set to actuate when the tank pressure reaches 10% greater than the normal actuation settings of the pressure valves themselves. In the case of the low-pressure settings,

the pressure in a tank should never be permitted to fall below zero and the pressure sensors should be set to raise alarm above zero. Since the requirement is to set the alarm at any pressure above zero, this alarm should be set at +100 mmwg. With the set point set in this manner the alarm activates before vacuum condition in the tank are reached.

When tanks are not inerted and no vapour return line connected: The high-pressure alarm settings for the pressure sensors must be set to actuate when the tank pressure reaches 10% greater than the normal actuation settings of the pressure valves themselves. In the case of the low-pressure settings, the alarm should be set at a vacuum 10% greater than the normal actuation settings of the vacuum valves.

When tanks are inerted and vapour return line connected: The high-pressure alarm settings for the pressure sensors must be set to actuate at not more than 90% of the lowest pressure relief valve setting in the cargo tank venting system to prevent toxic vapours being released to the atmosphere. In the case of the low-pressure settings, the alarm should be set at a low pressure of not less +100 mmwg to avoid air being drawn into the tanks.

When tanks are not inerted and vapour return line connected: The high-pressure alarm settings for the pressure sensors must be set to actuate at not more than 90% of the lowest pressure relief valve setting in the cargo tank venting system. In the case of the low-pressure settings, the alarm should be set at lowest vacuum relief valve setting in the cargo tank venting system.

8.41 Are the P/V valves in good order, inspected and cleaned as part of a regular planned maintenance routine and are there records to support this?

Maintenance of the P/V valves shall be in line with the company PMS and records of should be available if requested by the Inspector. If safe to do so, P/V valves should be checked for free movement prior to the commencement of each cargo operation, and this should be recorded.

Records of inspections of flame arrestors (wire mesh) of the P/V valves conducted at least once every three months should be available.

8.42 Are Officers aware of the additional precautions operating with a vapour return line connected and are appropriate transfer procedures in place?

COMPETENCE

When tanks are inerted and vapour return line connected, then the high pressure alarm settings for the cargo tank pressure sensors must be set to actuate at not more than 90% of the lowest pressure relief valve setting in the cargo tank venting system.

In the case of the low-pressure settings, the alarm should be set at a low pressure of not less than four inches (100 mm) water gauge or 1 KPa. The same alarm settings must be set in the alarm sensors of the vapour return line.

The maximum initial transfer rate and maximum allowable transfer rates should be agreed with the terminal, documented and known by the Watch-keeping Deck Officers.

Officers should be aware of the additional precautions operating with a vapour return line connected.

If the vessel is operating with the vapour return line not connected, the Inspector will still ask what the pressure alarm is set at.

It is strongly recommended to have the alarm settings posted in the cargo control room. Pre-operational tests and checks must be carried out and documented on the P/V valves, ullaging system and level alarms.

Static Electricity Precautions

Also for this section, a good working knowledge of ISGOTT Chapters 3 and 11 is recommended to have a full knowledge of static accumulator cargoes and their associated hazards.

Questions 8.63 to 8.71 will only be completed for vessels carrying static accumulator cargoes in non inerted tanks.

Static accumulator petroleum cargoes are all those except crude oils, residual fuel oils, black diesel oils and asphalts.

Examples of chemical static accumulator cargoes are: Cumene, Cyclohexane, Diethylether, Heptanes, MTBE, Nonene, Octenes, Styrene, Toluene and Xylene.

8.43 Are Deck Officers aware of the precautions necessary to avoid static discharge including maximum flow rates and settling periods for flammable cargoes in non-inert tanks?

COMPETENCE

The start of loading must be at a reduced rate generally accepted as 1 m/s (applies at the branch line to individual cargo tanks) to reduce any electrostatic generation. Once the cargo tank inlet is covered the loading rates can be gradually increased to an acceptable flow rate agreed with the terminal. The reduced loading rates shall be included within the cargo plan.

Deck Officers should aware of the precautions necessary to avoid static discharge including maximum flow rates and settling periods for flammable cargoes in non-inert tanks

For non-inerted tanks a 30-minute settling period must be allowed on completion of loading to commence any manual dipping, ullaging and sampling. This instruction shall also be included within the cargo plan.

8.44 Are Officers aware if the vessel is fitted with full depth sounding pipes, is this information clearly displayed and are Officers aware of the additional precautions relating to cargo tanks that are not fitted with full depth pipes?

COMPETENCE

All Officers must know if the vessel is fitted with full depth sounding pipes and information clearly displayed. Additional precautions if not fitted with full depth pipes include those identified in 8.45.

8.45 Are precautions followed for metal tapes, gauging or sampling devices and portable tank cleaning equipment (as applicable) before being introduced into tanks?

When using portable tapes (UTIs or MMC) through the vapour locks, the bonding wires must be connected before any attempt is made to use this equipment.

It should be noted that some portable tapes (UTIs or MMCs) have quick connect couplings that may not require to be fitted with a bonding wire. It is prudent to check with the maker's instructions before using this equipment. Should the portable tapes (UTIs or MMCs) not require bonding wires, they should be labelled accordingly to avoid any misunderstanding by the Inspector and/or ship's staff.

Portable tank cleaning equipment

All tank cleaning hoses must have bonding wires incorporated in them. Hoses must be indelibly marked to allow identification.

Records should be kept showing date and result of continuity tests – intervals as determined by the PMS, carried out by the Electrician (or equivalent position) in line with the maker's instructions or company PMS and before use.

8.46 Are Deck Officers aware of the hazards associated with tank cleaning after the carriage of volatile products and the need to avoid the free fall of liquid into tanks?

COMPETENCE

The Chief Officer shall supervise those involved with tank cleaning operations in line with the recommendations as stated in the latest edition of ISGOTT 11.3, the *ICS Chemical Tanker Guide* and other appropriate industry guidance.

Officers need to be aware of the risk of static generation from small droplets formed from falling water in tanks and the possible generation of hydrocarbon gases.

Restrictions of loading or ballasting using free fall of liquid into tanks are provided in the latest edition of ISGOTT. However, this method is rare and only practised in rare cases such as non-flammable vegetable oils.

8.47 Are personnel aware of the hazards associated with steaming cargo tanks after the carriage of volatile products?

COMPETENCE

Steam should never be injected into a tank that may contain a flammable cargo. In case steaming is required, then the tank must first be cleaned and gas freed to LEL below 1% before introducing steam in the tank.

8.48 Are cargo pipe joints bonded?

The Chief Officer shall supervise checks on all cargo pipe joints fitted with gaskets and ensure that each are electrically bonded. Any disconnected or broken bonding wires must be replaced or repaired prior to any cargo transfer.

Officers should know if the gaskets fitted are electrically conductive and bonding therefore not required.

Manifold Arrangements

8.49 Are the manifolds and associated valves in good order, blank flanges of an equivalent rating to that of the pipelines and pressure gauges fitted outboard of the manifold valves on both sides and monitored for leakage?

There is little the ship staff can do should the construction of the cargo manifolds not be in compliance with the *OCIMF Recommendations for Oil Tanker Manifolds and Associated Equipment*. The Inspector will record an observation if any non-compliance with these recommendations is noted.

General appearance of manifolds should be good and without any leaks or rags kept in the area.

The pressure gauges on both port and starboard side manifolds must be kept uncovered, open at all times and fitted outboard of the manifold valves. Each pressure gauge will need to be fitted with a shut off valve or cock and should be calibrated in accordance with the company's PMS.

The Chief Officer's Standing Orders shall include requirements for offshore pressure gauges and those gauges on onshore manifolds that are not in use, are checked at regular intervals (hourly). A written record of these additional checks shall be maintained to identify if there is any manifold valve leakage.

The manifold pressure gauges must each be fitted with a shut-off valve or cock.

All manifold valves as well as any hose connections that are blanked must have all their bolts fully tightened. The length of the bolt should be such that at least two (2) to three (3) threads are visible after tightening the nuts. Any missing bolts will be recorded as an observation by the Inspector. The Chief Officer shall ensure that those assisting with manifold hose connections are fully briefed to ensure that all bolts are securely fitted.

Blanks used on manifolds should be of the same thickness as the manifold presentation flanges. If the blanks that are used are of a material other than steel, such as titanium, they may then be of a thinner construction. If this is the case, the Inspector will need to sight documentation to identify that pressure ratings of the manifold flange and the blank are compatible. Manifold spool pieces fitted must be the same rating as the manifold lines they are fitted to. Certificates must be onboard to attest to this.

Each manifold valve and associated pipelines should be stencilled with the tank, or tanks, that they serve.

The Chief Officer shall ensure that drain lines of each manifold are fitted with a shut-off valve and are kept capped.

8.50 Is the vessel free of unauthorised inter-connections between cargo, bunker and ballast systems?

There should be NO unauthorised connections between these systems, if there are and they are noted by the Inspector this will be recorded as an observation.

Cargo Pump Room

8.51 On vessels with pump rooms and trunk spaces, are they free of evidence of significant leaks from machinery, pipework, valve glands and instrumentation and are bilges clean?

Before any entry is made into the pump room with the Inspector, full entry procedures must be followed. Do not enter or allow the Inspector to enter without this process being carried out. An observation will be recorded if full entry procedures are not followed.

The Inspector will visually check all the piping systems in the pump room, cargo pump and seals for any signs of leakage; any leaks noted will be recorded as an observation.

Where cargo pumps are concerned, there must be no temporary means of cooling as this will result in a high-risk observation. Pump discharge pressure gauges must be available outside the pump room.

The trunk spaces should be free from leaks and bilges clean.

The bilge pumping system shall be operable from outside the pump room.

The bilge alarms should be labelled and some Inspectors may wish to test the alarm. All firefighting equipment shall be in place.

The Inspector will also check to see that each pump room fan is operating in the extraction mode and the high-level emergency suction flaps are closed. The location and operating direction of these flaps, normally located at outside the pump room at main deck level, should be indicated and these should be tested regularly and results recorded.

A safety harness should be rigged and ready for immediate use.

It is advisable to maintain a logbook to record every time the inspection rounds are carried out.

The Inspector may also wish to check the pump room communications with the cargo control room so this system should also be routinely tested, preferably during the inspection rounds.

8.52 Are bulkhead seals gas tight and, if required, well lubricated?

Bulkhead seals must be maintained in good condition and should be well lubricated; these should be checked during the regular pump room inspections during cargo transfer.

8.53 Is the pump room gas monitoring system in good order, regularly checked and are Officers aware of the alarm settings?

COMPETENCE

The gas monitoring system must be kept switched on throughout all cargo transfer operations. Records should be available to demonstrate to the Inspector that each detector head has been calibrated and tested. Each sample point in the pump room should be labelled. Sample points could be installed in the trunking of the extraction fans alternately; these gas sampling points should always be located at the lower levels of the pump room.

All Officers must be aware of the alarm settings.

8.54 Is the bilge pump in good order and can it be operated from a position outside the pump room?

The pump room bilge pumping system valves shall be clearly indicated and should be kept “lined up” so that the bilge pumping could be started without any pump room entry.

Safety Equipment

8.55 Are the Officers aware of the requirements for the provision of protective equipment, is there adequate protective equipment onboard and in effective use?

COMPETENCE

PPE as per IBC or BCH Codes must be available on board. The location of where the PPE is stowed shall be clearly indicated and should not be within the accommodation spaces, unless the PPE is new and unused.

Any storage room within the accommodation if used for such PPE must be adequately segregated from the living spaces such as cabins, messrooms, passageways, dining rooms and bathrooms. They have to be approved by the Administration.

8.56 Are Officers familiar with the safety equipment requirements of the IBC or BCH Codes and is the safety equipment provided in accordance with the code in good order?

COMPETENCE

The Inspector will check the equipment as per the requirements in the IBC/BCH Code and as per the guidance notes in VIQ 8.56. Any non-compliance will be recorded as an observation.

Ships carrying toxic cargoes shall have on board sufficient but not less than three complete sets of safety equipment, each permitting personnel to enter a gas-filled compartment and work there for at least 20 minutes (IBC 14.2.1). The location of equipment (as listed below) shall be clearly indicated and maintenance records maintained and made available for the Inspector to sight.

One complete set of safety equipment shall consist of:

- One self-contained air-breathing apparatus (NOT oxygen),
- Protective clothing, boots, gloves and tight-fitting goggles,
- Fireproof line with belt resistant to the cargoes carried, and
- Explosion-proof lamp (IBC 14.2.2).

For the safety equipment required in IBC 14.2.1, all ships shall carry either:

- One set of fully charged spare air bottles for each breathing apparatus,
- A special air compressor suitable for the supply of high-pressure air of the required purity,

- A charging manifold capable of dealing with sufficient spare air bottles for the breathing apparatus, or,
- Fully charged spare air bottles with a total free air capacity of at least 6,000 l for each breathing apparatus on board in excess of the requirements of SOLAS regulation II-2/10.10 (IBC 14.2.3).

For vessels carrying toxic cargoes, the safety equipment referred to above should provide full protection. The suits themselves shall be capable of providing adequate protection against the product as indicated in the appropriate resistance table that is provided by the manufacturer, and fitted with integral gloves and boots. All Officers should be aware of these limitations as they relate to the cargoes being carried. Such suits are not required if the vessel does not carry toxic cargoes.

8.57 Are the Officers aware of the safe stowage requirements of the safety equipment and are these requirements being followed?

COMPETENCE

At least one set of safety equipment shall be kept in a suitable, clearly marked location and should be readily accessible near the cargo pump room.

The Safety Officer must ensure that this equipment is maintained for immediate use and all records of routine maintenance are available.

All Officers should be aware of these safe stowage requirements.

8.58 Has the breathing apparatus required by the IBC or BCH Codes been examined by an expert agency annually, are the Officers familiar with the onboard inspection requirements and is this logged accordingly?

COMPETENCE

All breathing apparatus shall be routinely inspected at least once a month by the Safety Officer, and annually by a shore-based agency.

Records of servicing by a shore-based agency and of inspections by the Safety Officer shall be maintained in the log book and available for the Inspector to sight.

All Officers should be familiar with the onboard inspection requirements.

8.59 Are the Officers and ratings familiar with donning of the emergency escape sets where provided and are these sets in good order?

COMPETENCE

IBC-compliant vessels shall, in line with IBC 14.3.1) carry an emergency escape set for each person on board plus a spare number of sets.

The Safety Officer shall check the pressures in each monthly or as required by the PMS and records maintained.

Emergency escape sets shall be able to be used for a duration of at least 15 minutes. Emergency escape sets MUST NOT be used for any other purpose than their intended use. Filter type masks are not acceptable.

All Officers and ratings should be familiar with donning of the emergency escape sets.

8.60 Does the Company preclude the use of filter-type respirators onboard and are Officers and ratings aware of these requirements?

COMPETENCE

The use of filter type respirators is not encouraged and the company should provide self-contained emergency escape sets.

If, however, filter type respirators are provided then they should be indicated with the type of chemicals they can be used for. There should be a procedure for controlling the spare cartridges and these should never be used for toxic products. Observations in this regard will usually be deemed as high-risk.

THEY ARE NOT A SUBSTITUTE FOR BREATHING APPARATUS.

8.61 Are the crew aware of the locations and operation of the decontamination showers and eye-wash, and are the showers in good operational order in suitably marked locations?

COMPETENCE

Emergency eye-wash and showers must be properly stencilled, and should be in good working condition. It is recommended as best practice that during deck rounds the eye-wash and showers are tested – they must be tested prior to all cargo operations and records maintained. A recirculation system or fully heat trace line must be installed to ensure they operate in all ambient conditions.

Cargo Hoses

8.62 If the vessel uses its own cargo hoses, are they in good order, pressure tested annually and is a record of all hose tests and inspections maintained on board?

An annual inspection of cargo hoses in service must be documented and include:

- pressure tested at least annually to 1.5 times their rated working pressure to check for leakages and elongation
- visually checked for deterioration and damage
- electrical continuity test.

The test pressure and date shall be indicated on each length of hose either by stencilling or by a securely fitted label.

Each hose must be individually numbered for identification purposes

Any hose not in service and not regularly inspected/tested must be clearly marked – “NOT FOR USE” and quarantined if possible away from hoses in service.

The Chief Officer will be responsible for conducting and maintaining records of these tests.

Cargo Lifting Equipment

8.63 Are all cranes and other lifting equipment properly marked, regularly inspected, tested and are the vessel's crew aware of maintenance requirements?

COMPETENCE

All cargo gear must be load tested every five (5) years and this must be recorded in the cargo gear register, maintained by the Master.

All lifting gear must be certified and the certificates must be on file. All lifting gear must be properly marked with their SWL and certificate numbers to ensure proper identification.


The SWL and the load test date should be stencilled in a visible location on the cargo crane. A record of monthly inspection of loose gear must also be maintained.

Single cargo handling cranes must be supplied with spare hydraulic hoses for all those fitted. If the crane is fitted with two identical hoses, only 50% of these hoses are required as spares.

Slewing bearing wear must be regularly inspected – two methods are possible:

1. grease sampling to measure metallic content
2. rocking test to measure the wear between inner and out bearing races.

Crew should aware of crane and lifting equipment maintenance requirements.



Chapter 8.

Cargo and Ballast Systems – LPG

Cargo and Ballast Systems – LPG

In general, the Chief Officer or Cargo Officer will be responsible for a majority of this Chapter that will include the planning and execution of the cargo and ballast transfer operations. However, all Deck-watch Keeping Officers must be fully aware of the operations taking place at the time of the inspection. The Inspector will direct questions at the Deck-watch Keeping Officers to assess if they have an understanding of the cargo transfer taking place and their familiarity with the vessel's cargo, ballast and inert gas systems and associated procedures. This chapter applies to vessels carrying LPG.

The main document/legislation all must have a working knowledge of is the IGC Code. Other codes such as GC and EGC applies to older vessels.

Policies, Procedures and Documentation

8.1 Are Officers aware of the operator's policy statements, guidance and procedures, including information on maximum loading rates and instructions with regard to safe cargo operations?

COMPETENCE

The Chief Officer should have a hard copy of the company SMS available.

Increasingly, companies are providing electronic versions of their SMS. However, a hard copy may prove to be more advantageous to assist the Inspector when references need to be verified.

The Officers should be able to demonstrate familiarity with the SMS irrespective of whether it is in hard copy or an electronic version.

The vessel's maximum loading rates should be posted or be readily available in the cargo control room and those involved with cargo transfer operations should be able to display these to the Inspector.

8.2 Are Officers aware of any loading limitations for the vessel and are these limitations, if applicable, clearly posted in the cargo control area?

COMPETENCE

Any limitations on cargo loading shall be made readily available and clearly posted in the cargo control room and those involved with cargo transfer operations should be able to display these to the Inspector.

The Chief Officer and Deck Watch-keeping Officers should have a good working knowledge of these limitations and be able to describe these to the Inspector.

8.3 Are legible and up-to-date pipeline and/or mimic diagrams of the cargo, inert gas and venting systems, as applicable, available in the cargo control area and are Deck Officers familiar with the systems?

COMPETENCE

In most cases, vessels will have mimic panels on the cargo control room console. Should the console not be constructed in this manner, the diagrams for each system shall either be posted or be readily available in the cargo control room.

All Officers involved with cargo transfer operations shall be required to have a good working knowledge of the pipeline systems. The Chief Officer will need to ensure that the Junior Deck-watch Keeping Officers are well familiarised with the pipeline systems.

8.4 Are Officers familiar with the information contained within the Procedures and Arrangements Manual, and is the manual accessible onboard?**COMPETENCE**

The Chief Officer should be aware that a "P&A" Manual is required when there is an IOPPC NLS Certificate.

Officers' should be familiar with the information contained within the P&A manual.

8.5 Is the Cargo Record Book correctly completed and up to date?

The Chief Officer should be aware that the Cargo Record Book is only required when carrying dual code cargoes under either a Certificate of Fitness or a NLS Certificate. Entries should be made in the Cargo Record Book as and when they occur and not at some later point in time.

Records of events must be detailed enough to allow any person to re-construct the history of cargo operations at any time in the future.

Stability and Cargo Loading Limitations**8.6 Has a cargo plan been prepared and followed with a detailed sequence of cargo and ballast transfers documented, stress, intact and damage stability and are any limitations, where applicable, understood by the Cargo Watch Officers and clearly documented?****COMPETENCE**

The vessel should be supplied with an approved loading and stability information booklet. The Chief Officer will need to have this or an approved copy of this booklet available in the cargo control room.

The Chief Officer, during the planning phase of the cargo transfer operation, should include the stress and stability calculations at equal stages throughout the transfer operation at say 25%, 50%, 75% and on completion. These should be attached to or included within the cargo plan.

The Master and cargo watch officers must be familiar with the loading and stability information booklet which should be readily available for the Inspector.

The Master will need to be aware of the minimum GZ criteria that should be used for deciding the worst damage stability condition.

The cargo plan should be prepared by the Chief Officer. During the Chief Officer's preparations of the cargo-handling plan, the following information must be included as a minimum and should cover all stages of the transfer operations:

- Total Quantities of cargo to be transferred
- Order of loading or discharging
- The sequence of discharging and receiving tanks
- Use of the vapour return line
- Density, temperature and other relevant conditions, including the reference temperature which determines the filling limits
- A plan of the distribution, quantities, innages, lines and pumps to be used
- Transfer rates and maximum allowable pressures
- Critical stages of the operation
- Notice of rate changes
- Stability and stress information
- Drafts and trims

- Emergency stop procedures
- Action to be taken in the event of a spill
- Flammability and toxicity with references to cargo data sheets
- Ballast operations
- Protective equipment requirements
- Hazards of the particular cargoes.

And, as required, the requirements for:

- Cargo pollution category
- Cooling requirements including rates of cool-down
- Use of the cargo heater or vapouriser
- Heel requirements after discharge
- Under keel clearance limitations
- Bunkering; and
- Any special precautions required for the particular operation.

The plan should be user friendly and understood by all Deck Watch-keeping Officers.

The plan must be agreed, approved and signed by the Master. Similarly, the plan must be signed by all Deck Watch-keeping Officers indicating that they have each read and understood the plan.

8.7 If a loading computer or program is in use, is it Class approved, regularly tested and are Officers aware of the test requirements including damage stability?

COMPETENCE

Ensure that the Class approval certificate is kept with the Master's certificate files; it would be prudent to post a copy in the cargo control room.

Stability conditions will be endorsed by the vessel's Class at each Annual and Special Survey. The loading instrument is to be checked for accuracy and the approved loading guidance information confirmed as being available on board.

In addition, regular on-board testing (as per the company's SMS) should also be carried out and records of these tests should be maintained. The test should involve physically entering the data for each tank into the computer and verifying the result. It is not acceptable to simply retrieve a stored test condition from the computer and compare this against the official conditions.

Calibration by Class is part of normal survey requirements and thus verified by the issue/stamping of the certificate. Individual certificates attesting to this is unnecessary and may sometimes be requested by the Inspector – it is not, however, required.

8.8 Is the vessel free of inherent intact stability problems, are Officers aware of these problems or risks of structural damage from sloshing, and actions required if the vessel takes on an unstable condition and/or angle of loll?

COMPETENCE

The Master/Chief Officer should check intermediate conditions in addition to arrival/departure conditions for any reductions of intact stability due to free surface effect. If such conditions exist, all Officers should be familiar with any operational restrictions and any instructions that are posted describing action to take if stability concerns are suspected or experienced. If cargo tanks are fitted with centre-line bulkhead valves, these should normally be kept closed and only used for levelling. No more than 50% of the valves should be open at any one time.

The Master and Cargo Officers should be aware of these limitations and should be able to explain what these are to the Inspector.

Any restrictions should be posted in the CCR along with any advice that may be provided.

Records must be maintained for at least three years detailing the checks made to verify damage stability requirements for each load/discharging operation.

The Master and Chief Officer should be fully aware of the dangers of the free surface effects and possible effects on tank structures. It is the Master and Chief Officer's responsibility to ensure that all Deck Watch-keeping Officers are also familiar with these conditions.

The Master or Chief Officer should ensure that the company's SMS includes verification of compliance with damage stability requirements. If they don't, then the company should be immediately advised. If procedures are established within the SMS, the Master and Chief Officer should be able to demonstrate these to the Inspector. It would also be prudent for this procedure to be readily available in the cargo control room.

Cargo Operations and Related Safety Management

8.9 Are all Officers and ratings aware of the carriage requirements including emergency procedures for the specific cargo onboard and gases in general and are Officers familiar with the vessels cargo system, including emergency discharge arrangements?

COMPETENCE

All Officers and ratings involved with cargo transfer operations should have a good working knowledge of the requirements for the cargoes being carried and should be able to reference relevant industry publications for this vessel type. The Chief Officer will need to ensure that all Deck Watch-keeping Officers are well practiced with these requirements as listed below:

- Shipboard operations and cargo handling
- IGC, GC and EGC codes where applicable (due to vessels age, generally only IGC code is applicable – it depends when the vessel was built and which Code was in force at the time)
- SIGTTO and ICS guides
- Cargo reliquefaction procedures
- Cargo atmosphere control procedures during gas freeing or gassing up
- Hazards when cooling down re: thermal loads
- Min cargo temperature
- Medical treatment requirements for exposure to cargo
- Spill response
- Communications procedures with the shore
- Emergency stop procedures, and know which systems are affected by the ESD.

As required:

- Meaning of CAT X,Y,Z and OS cargoes
- Precautions with reactive and self-reactive cargoes
- Limitations when loading high density cargoes
- Effects of sloshing loads
- Toxic cargo hazards (use MSDS).

For each gas carried, a review of the cargo carriage requirements must be carried out and must reference:

- IGC Code Chapter 19
- CoF
- P and A Manual
- MSDS.

The company's SMS must, as a minimum, include emergency procedures for these situations. The actions to be taken in these situations must be practised and exercised in line with the periods stated in the emergency procedures.

Records of the exercises must be maintained and be available for the Inspector.

8.10 Is the Chief Officer familiar with the term 'reference temperature' and is he/she aware of the reference temperature for the existing cargo?

COMPETENCE

The Chief Officer should be fully aware of this term, for additional supporting information section 15.1.4 of the IGC Code should be referred to.

In addition to the Chief Officer, all deck officers should also be familiar with this term – for definition, refer to Inspector guidance notes related to this VIQ question.

The Chief Officer should be aware of the reference temperature for the existing cargo.

8.11 Is a cargo compatibility chart available?

Charterer's instructions are to be understood and followed.

The Chief Officer should be able to guide the Inspector to the data sheets and compatibility charts found in the SIGTTO and ICS guides. For example, pages 21 to 23 of 'Liquefied Gas Handling Principles'.

If more than one grade is to be carried, special attention is to be paid to any requirements to change lubricating oil in cargo compressors. Refrigerants used in liquefaction must be compatible with the cargoes loaded.

8.12 Are cargo operations being carried out and logged in accordance with the plan?

Each step of the cargo transfer operation should be recorded as and when they occur. These records should include but not be limited to the starting and stopping of cargo and ballast pumps, the tanks being worked, suspension of cargo operations, etc.

8.13 Are Officers aware of the documentation and handling requirements for cargoes with inhibitors, and if the cargo carried is required to be inhibited, is the required information available?

COMPETENCE

The Master, Chief Officer and cargo officers must know in advance if the cargo requires to be inhibited.

Should this be required, a separate file shall be maintained of all relevant information, including the inhibitor certificate, stating:

- Name and amount of inhibitor added
- Date added and normal expected duration of its effectiveness
- Any temperature limitations
- Action to take if the voyage exceeds effectiveness of the inhibitor and records to support when it has been added.

The Master and Chief Officer must be aware that if the vessel has not been issued with an inhibitor certificate, the transfer of the product must be refused.

8.14 Are all Officers aware of the emergency procedures for dealing with leakage, spillage or fire involving the cargo?

COMPETENCE

All Officers should be able to demonstrate to the Inspector, that they are trained and familiar with the company's emergency procedures for dealing with leakage, spillage or fire involving the cargo. Records of exercises for these scenarios will need to be available.

Cargo Handling and Monitoring Equipment

8.15 Are the cargo, booster, ballast and stripping pumps, eductors and their associated instrumentation and controls, where fitted, in good order, free of leaks and is there evidence of regular testing?

COMPETENCE

The Chief Officer will be asked by the Inspector if all equipment is fully operational. The question should be answered accurately. If the answer is yes and the Inspector notes any faulty equipment then the trust built up between the vessel and the Inspector may be lost. The Inspector will then start looking more deeply into the status of different equipment to identify any additional faults which may result in additional observations.

All cargo pipework and valve systems should be indicated with the service that they provide. In addition, all records of instrumentation (pressure gauges, etc.) testing will need to be made available to the Inspector.

Officers must be aware and understand the higher manifold pressures involved when operating deepwell pumps in series with booster pumps

8.16 Are Officers aware of the operational requirements for the cargo heater and/or vaporiser, where fitted, are they in good order and is there evidence of regular testing?

COMPETENCE

The Inspector will enquire as to how many (if any) tubes are plugged. If more than 25% are plugged then this will create an observation.

8.17 Are cargo pump performance curves available, are Deck Officers aware of the requirements for the cargo lines, vapour lines and inert gas lines on the system?

COMPETENCE

It is strongly suggested that all Officers are able to demonstrate full understanding and familiarity with the cargo pump's performance curves and that these are posted in the cargo control room.

Cargo, vapour and inert gas lines must be inspected as per vessel PMS and records kept up to date. Inspections must address any visible damage, corrosion or leakage from glands and flanges. Insulation must be intact.

Routine pressure testing of these lines is NOT required.

8.18 Are the cargo and ballast system valves in good order and is there evidence of regular testing?

The Inspector will inspect the visible elements of cargo and ballast system and will also wish to sight any associated valve closing times records that will be maintained by the Chief Officer.

8.19 Are the Officers aware of the test requirements for cargo system remote and local tank pressure, temperature, and level sensors and gauges, and are these in good order with evidence of regular testing?

COMPETENCE

Records of regular testing and calibration of the cargo monitoring equipment shall be maintained by the Chief Officer.

These will also include dates of testing and comparisons with secondary tank level gauges. The Inspector will also look to see if the temperature monitoring equipment is indicated with the lowest temperature (as approved by the Flag State) that the cargo tank can be subjected to.

Records of the dates of testing and comparisons with secondary temperature and/or pressure gauges should be maintained.

Max and min pressures must be marked in the CCR, as should the lowest temperature the cargo tank has been designed to which should be marked close to the temperature indicating devices.

8.20 Are the Officers aware of the test requirements for the cargo tank high-level and overflow alarms, and are they in good order with evidence of regular testing and in use for both cargo loading and discharging?

COMPETENCE

In preparation, and prior to cargo transfer, the high-level alarms shall be tested and records of the dates of such testing should be maintained.

After delivery or dry docking, testing of these high-level alarms must be done by raising the cargo level to the alarm point.

Note: Test requirements for LPG vessels are determined in document CCC4 UI (GTC paper).

8.21 Are tank domes and associated fittings in good order, free from corrosion and leaks?

All tank domes and associated fittings should be clean and well painted with the identification of all systems stencilled or indicated in a clear manner.

All systems should be thoroughly checked for leakages well before any inspection takes place. Any leaks noted will need to be repaired otherwise observations will be raised and depending on the amount and type of leakage, (air, gas, water, etc) can result in a high-risk observation.

8.22 Are Officers aware of safe cargo sampling procedures and are sample lines with double valve arrangements on the liquid line and capped when not in use?

COMPETENCE

Ensure that the ship connection is a G1/2 female parallel threaded connector. Any screwed fittings shall be locked to prevent inadvertently unscrewing during connection/disconnection while sampling is taking place.

The most secure method is to have a valve fitted before the capped connection.

All sample connections must be clearly marked.

If the Inspector is on board during any sampling, ensure all safety precautions are implemented which includes using the correct sampling equipment for the cargo being sampled, correctly connected and that all involved are wearing the correct PPE.

8.23 Where any cargo or vapour lines are insulated, is the insulation in good order and inspection routines in place?

Liquid and vapour lines are not required to be insulated. However, if insulation is fitted, the ship staff under the supervision of the Chief Officer should thoroughly check the insulation for all low temperature piping. Any damaged or missing insulation should be repaired or replaced.

Evidence of regular sample checks under the insulation should be carried out and documented at convenient repair periods. It is recommended such records are available to be shown to the Inspector if requested.

Corrosion under insulation (CUI) inspections

Note: It is appreciated that records of such inspections may not be available to satisfy this new item, however, records of a visual inspection can be readily recorded. Revisions to the SMS/PMS indicating these inspections and checks will identify that the company and vessel is aware of these requirements and will be complied with during future repair periods or drydocks.

8.24 Where cargo or vapour lines are isolated from the structure, are joints electrically bonded?

The ship staff, under the supervision of the Chief Officer, should check that all bonding wires are intact and any found broken should be renewed well in advance of any inspection. Some gaskets are electrically conductive and bonding is not required, should this be the case then evidence to support this will need to be produced for the Inspector to sight.

8.25 Are cargo and vapour line expansion arrangements in good order?

Check that all expansion arrangements are in good condition, not under strain and are free to move.

8.26 Are liquid and vapour lines free to move inside their clamps?

Visually check that all liquid and vapour lines are not secured or restricted within the pipe clamps and can freely move to compensate for any thermal movement.

8.27 Are pipeline drains and stub pieces valved and capped and in good order?

The ship staff, under the supervision of the Chief Officer, should check that all drain lines are fitted with a shut off valve and that the caps are securely fitted in place.

8.28 Are cargo line and system relief valves in good order and Officers aware of the requirements?**COMPETENCE**

Relief valves must not discharge into the atmosphere but back into the cargo system. Alternatively, they may discharge into the vent mast as long as there are means available to detect and dispose of any liquid cargo that may flow into the vent system.

Dates of overhaul and testing of the relief valves shall be maintained and records kept up to date by the Chief Officer.

8.29 Are cargo pipelines free of screwed-in connections?

Where applicable, any screwed couplings into the cargo lines that are acceptable to the Administration can only be used for accessory and instrumentation lines with external diameters of 25mm or less.

8.30 Is the cargo tank high-level alarm system independent of both the gauging devices system and, in the case of IGC vessels, also independent of the high level shut-down (overflow-control) system and are Officers aware of the override procedures where provided?

COMPETENCE

If the vessel does not have independent high-level alarm systems then there is little the ship staff can do but accept an observation for this. Records of regular testing of the high-level alarms should be maintained by the Chief Officer.

If the vessel is fitted with an override key switch for both the high-level cargo tank and/or shut-down systems, the company's SMS must have procedures that specify the circumstances under which these systems can be overridden, including the persons that are authorised to override the systems: e.g. the Master or Chief Officer. These written procedures should also be posted next to the key switch.

There must be arrangements in place to prevent inadvertent operation of the overriding system. Overriding should only be done in exceptional circumstances, e.g. tank is overloaded and there is the need to bypass the tank overflow control system.

8.31 Are there records of the calibration of key cargo instrumentation, including temperature and pressure gauges?

Records of regular testing and calibration of the cargo monitoring equipment shall be maintained by the Chief Officer. These will include dates of testing carried out in accordance with the vessel's PMS. As a minimum, calibration shall be carried out at intervals not exceeding thirty six (36) months.

Comparisons between local and remote thermometer readings should be maintained during every cargo watch.

8.32 Are the Officers aware of the dangers of using slip tubes where fitted and do procedures preclude their use except for emergencies?

COMPETENCE

Slip tubes are generally used only in cases of emergency but, if this is the only method of gauging an observation will be raised and this will more than likely be a high-risk observation.

If slip gauges are the only method of gauging, permission to use these must be given by the terminal and the charterer. The Inspector will require to see this written permission. Verbal permission or agreements will not be acceptable.

Cargo Compressor and Motor Rooms

8.33 Are Officers familiar with the operation of the cargo conditioning (reliquefaction) plant and associated machinery and is instrumentation in good order?

COMPETENCE

The cargo conditioning plant shall be maintained in accordance with the maker's instructions and the company's PMS. Maintenance records of pressure testing of the cargo condensers and the calibration of cargo system instrumentation shall be made readily available for the Inspector to sight and include all tests carried out on the system.

8.34 Are the crew aware of the hazards of the cargo compressor and motor rooms and are they clean and free of combustible material?**COMPETENCE**

These machinery spaces must be kept clean, well painted and clear of any waste debris. Poor housekeeping does not give a good impression of the vessel.

8.35 Are the bulkhead seals between the compressor room and the motor room gas tight and well lubricated?

Those bulkhead seals fitted with lubricator reservoirs should be checked to ensure they contain sufficient oil. Checks to ensure the seals are tight are necessary.

8.36 Is the compressor room free of gas leaks?

There must NOT be any gas leaks apparent in the compressor room. Any sign of a gas leak will indicate an unsafe environment and will result in a high-risk observation.

8.37 Is the compressor room well lit and are electrical fittings suitable for use in gas-hazardous areas and in good order?

It is the Chief Engineer's/Electrician's responsibility to ensure the integrity of all cable and light fittings. Regular checks of "Ex" lights must be carried out and recorded – normally by the electrician onboard.

The cables and light fittings must be "Ex" rated, clean, intact, gas tight and all lights should be working.

Any loose or damaged insulation, cracked glass, loose bolts etc will result in a high-risk observation.

8.38 Are Officers aware of the requirements for the compressor room ventilation system and is the system maintaining negative pressure?**COMPETENCE**

The first indication the Inspector will have if the compressor room is operating under a negative pressure will be the resistance of the door when opening it.

8.39 Are Officers aware of the requirements for the motor room ventilation system and is the system maintaining relative positive pressure and operating satisfactorily?**COMPETENCE**

The first indication the Inspector will have if the motor room is operating under a relative positive pressure will be the lack of resistance when opening the door.

8.40 Are Officers aware of the requirements for airlocks, are the alarms in good order and in the event of pressure in the air-lock lost, will the shutdown system operate correctly?**COMPETENCE**

The Chief Officer should routinely check the alarm system in compliance with routines established in the company's PMS and certainly before cargo transfer operations.

The Chief Officer should ensure that shutdown tests activate audio and visual alarms for any airlocks and are done as per the PMS routines with records maintained. Doors should be air/gastight, be self-closing with no hold back arrangements. The airlock must be artificially ventilated and positive pressure maintained.

The Chief Officer should ensure that all Deck Watch-keeping Officers are aware of this shutdown feature.

8.41 Are Officers familiar with the operation and requirements of the fixed gas detection equipment and is the equipment in good order?

COMPETENCE

The Chief Officer should test all gas detection systems in accordance with routines outlined in the maker's instructions and/or the company PMS.

All officers should know where the sampling points are located/fitted – see VIQ 8.41 guidance notes on expected fittings.

Records should be maintained and should clearly indicate the type of span gas used, the results obtained and any calibration that may have been carried out.

8.42 Are Officers aware of the requirements for setting fixed gas detector sample points and, where applicable are they fitted at the appropriate level for the cargo being carried?

COMPETENCE

Where it is possible to manually choose whether upper or lower level sampling points should be in use, lower level sampling heads should be in use for all cargoes except Ammonia, Ethylene and LNG. Officers should be aware of the requirements for setting fixed gas detector sample points.

The Chief Officer shall supervise those Officers taking samples to ensure that these are taken from the correct location in compliance with the properties of the cargo being carried. It is considered best practice to have a diagram showing the locations of the sensors and details on which to use for different cargoes carried in the CCR.

8.43 Where Ethylene Oxide and Propylene Oxide cargoes may be carried, are Officers aware of the isolation requirements for the compressors and, if applicable, are the compressors isolated at the time?

COMPETENCE

Should the vessel be carrying Ethylene Oxide or Propylene Oxide, approved procedures must be followed to isolate the cargo compressors by using blanks or by the removal of spool pieces between the cargo compressors and the cargo containment area.

Officers should also be aware that various materials/metals are not compatible with the carriage of Ethylene Oxide e.g. cast iron, mercury, copper and its alloys, aluminium alloy, magnesium and some stainless steels.

Void Spaces and Seals – Type C Cargo Tanks

Note: This section applies to Type C cargo tanks which do not require secondary barriers.

8.44 Are Officers aware of the environmental control of the void spaces and are void space seals where fitted, in good order? Is the environmental control of void spaces satisfactory?

COMPETENCE

The Chief Officer should supervise the inspection of each void space seal and should repair any seals whose integrity cannot be ensured.

The Chief Officer and other Officers should be aware of and should be able to advise the Inspector about the atmosphere (inert gas or dry air) in the spaces surrounding Type C refrigerated cargo tanks. He should also be able to demonstrate to the Inspector that there are adequate storage or production facilities on board to maintain these spaces in this condition.

8.45 Are Officers familiar with the inspection requirements for the cargo tank insulation, where fitted, and is the insulation reported to be in good condition?

COMPETENCE

The Inspector will question the Chief Officer or other Deck Watch-keeping Officers if all the cargo tank insulation is intact. If the insulation is perlite, then the Inspector will need to know if there is a suitable amount available on board. The Inspector will also check if the perlite has been “topped up” and that records are available to prove this.

The Inspector will also ask for the six-monthly inspection records.

8.46 Are Officers aware of the setting requirements for relief valves for void spaces, hold spaces and primary and secondary barriers and where fitted, in good order?

COMPETENCE

All Officers should be aware of the setting requirements for relief valves.

The Inspector will visually check these relief valves to see if they appear well maintained and operational. Records should be available to demonstrate when they were last tested.

Hold spaces without open connection to the atmosphere should be provided with pressure gauges – records of calibration of these gauges should be available at intervals required by the SMS/PMS.

Void and Interbarrier Spaces and Seals – other cargo tank types

Note: This section should be completed for all types of cargo containment other than Type C cargo tanks. These include types A and B cargo tanks.

8.47 Are the Officers familiar with the monitoring requirements of the interbarrier spaces and are these regularly monitored and the results recorded?

COMPETENCE

Officers should be familiar with the monitoring requirements.

Gas detection equipment equipped with audible and visual alarms should be capable of monitoring these spaces from each sampling point location sequentially and at intervals not exceeding 30 minutes. All sampling points must be working correctly and should be calibrated in accordance with the maker's maintenance instructions or with the company's PMS routines.

Records of calibration checks must be readily available for the Inspector to view. If any sampling points/heads are malfunctioning and no spares are available on board, a high-risk observation will be raised.

Spares must be ordered and the order form should be available for the Inspector to prove that that action is being taken to correct/renew any faulty sampling point/head.

8.48 Are the relief valves for the hold spaces and primary and secondary barriers in good order?

A visual check of the relief valves should be made to ensure that the external condition is in keeping with the valves being regularly maintained.

Certificates or records of maintenance and testing, including indication of operating pressures, will need to be readily available for the Inspector.

Hold spaces without open connection to the atmosphere should be provided with pressure gauges – records of calibration of these gauges should be available at intervals required by the SMS/PMS.

8.49 Is there a means to sample for ingress of water into the interbarrier spaces provided and are checks being recorded?

Records should be available for the Inspector to demonstrate that all interbarrier spaces are being checked for leakages. The records should also outline the method that is used to check these spaces.

Inert Gas Systems

8.50 Is the inert gas system and/or storage and associated pipework, where fitted, in good order?

The Inspector will visually check the vessel's inert gas system where fitted and/or other means used for inerting purposes.

Any rust scaling, corrosion or temporary repairs noted will result in an observation.

Where a space is continually supplied with an inert gas as part of a leak detection system, a means of monitoring the amount of gas used must be fitted and records maintained.

8.51 Are Officers aware of the arrangements to prevent the backflow of cargo vapour into the inert gas system and is this arrangement in place?

COMPETENCE

Ensure that inspection records for the non-return valves are maintained and available. Also ensure that the spool piece is removed and stowed in a location with its purpose indicated unless the inert gas system is in use.

The Chief Officer should also ensure that the Deck Watch-keeping Officers are aware of the purpose of the non-return valves and that the reason for the spool piece being removed is to prevent the back flow of cargo vapours into the inert gas system.

Pressure Relief and Venting Systems

8.52 Are the Officers aware of the requirements for setting the relief valves, are certificates of test available and clear procedures for changing the MARVS as applicable?

COMPETENCE

The Master or Chief Officer should have the safety relief valve test certificates available.

All those involved with cargo operations should be fully aware of the procedures re: operating pressures of the relief valves. The Chief Officer should check that all Deck Officers are aware of these pressures and change procedures.

Any changes of the set pressure must be carried out under the supervision of the Master, recorded in the log book and signs posted in the CCR and at each relief valve, stating the set pressure.

The Inspector will wish to sight the procedures for adjusting relief valve settings and records of any alterations made to the set pressures.

Information should be made available by the Chief Officer to demonstrate that relief valves are correctly set for the cargoes being carried.

8.53 Are Officers familiar with the vent outlet arrangements and, as fitted, are protective or flame screens in good order and regularly inspected?

COMPETENCE

The venting system will be visually checked by the Inspector for any temporary repairs and excessive wastage. The general appearance and condition of the venting system should reflect it being well maintained and intact.

Flame screens must be checked regularly and kept clean of any residue from freezing cargo vapours or icing up due to adverse weather conditions.

The Chief Officer is responsible to ensure that suitable protection screens are fitted on vent outlets to prevent the ingress of foreign objects.

Flame screens shall be suitable for the cargoes being carried.

8.54 Is there a liquid sensor in the liquid pressure relief valve collecting tank or, if not fitted, in the vent mast?

Where fitted, the liquid sensor in the collecting tank will need to be checked in line with the routines outlined in the PMS and adequate records maintained.

Similarly, if no collecting tank is fitted and instead a sensor is fitted in the venting system, this should be routinely tested and adequate records maintained by the Chief Officer.

8.55 Are Officers familiar with the operation of any fixed fire extinguishing systems on the vent masts, where fitted, and are the systems in good order and operational?

COMPETENCE

If fitted (it is not mandatory), the Chief Officer shall ensure that all Deck Watch-keeping Officers are aware of this safety system and of the extinguishing medium. The Inspector will visually check the condition of the system.

Records of any maintenance carried out should also be kept.

Emergency Shutdown System

8.56 Are Officers familiar with the operation of the Emergency Shut Down (ESD) system, and is the system regularly tested and operational?

COMPETENCE

The Chief Officer should ensure that all Deck Watch-keeping Officers are fully aware of the sequence of operation of the ESD.

The Chief and Deck Watch-keeping Officer should be able to explain to the Inspector the operation and sequence of the fail-closed (closed on loss of power) type ESD system and be capable of local manual closing.

It is good operational practice for the Chief Officer to test the ESD before each cargo operation from all remote locations. It is not acceptable to operate the ESD from the cargo control room only.

Records of testing the ESD must be maintained and should include the location from where each test was made from.

The Chief Officer should be maintaining records of the testing of ESD valves fitted in liquid piping systems – the records must include times of closing and characteristics (closing time no more than 30s).

The emergency closing times of the valves should be posted in the cargo control room along with information concerning the shutdown of the cargo pumps and compressors.

It is extremely important the Chief Officer maintains records of all tests and any maintenance carried out on the ESD.

8.57 Are personnel aware of the locations of ESD points, and auxiliary equipment shut-down requirements?

COMPETENCE

The remote locations from where the ESD can be manually operated should be clearly identified with their purpose and written instructions posted.

8.58 Are Officers aware of the requirements of fusible plugs, and are they fitted on the liquid domes, in the vicinity of the manifolds and in good order?

COMPETENCE

Where fusible plugs are fitted, they should not be painted over. They are designed to melt at 98–104°C

If fitted, the temperature at which the fusible plugs melt should also be posted and made available in the cargo control room. The Chief Officer should ensure that all Deck Watch-keeping Officers are aware of the purpose of the fusible plugs that are fitted at the tank domes and loading stations.

Manifold Arrangements

8.59 Are cargo and vapour manifold arrangements satisfactory?

There is nothing the ship staff can do should the arrangements not meet the requirements of the Manifold Recommendations for Liquefied Gas Carriers 1st Ed (2011). Manifolds should be marked with the loads they have been designed to withstand.

The path of the hard arm must be clear of any item that may obstruct its travel. In the interests of personnel safety, the Deck Watch must be made aware of the hazards that exist when loading arms have automatic releases and they should stand clear of the line of travel when on duty.

The access area around the manifolds must be kept clear of any obstructions or loose items. Manifold gratings, where fitted, should be fully secured and should not cause a tripping hazard during the connecting and disconnecting process.

8.60 Are the manifolds and associated valves in good order, blank flanges of an equivalent rating to that of the pipelines and pressure gauges securely fitted outboard of the manifold valves on both sides and monitored for leakage?

The manifold pressure gauges will need to be fully operational, readable and properly secured. The pressure gauges fitted to the manifolds that are not in use, should have their shut-off valves/ cocks open throughout cargo transfer.

Pressure gauges fitted to offshore manifolds must remain active throughout cargo transfer operations to identify any manifold leakages. The Chief Officer's Standing Orders should include instructions requiring offshore pressure gauges to be checked at regular intervals (hourly).

A written record of these checks must be maintained.

The Chief Officer should ensure that manifold pressure gauges, fitted with shut-off valves or cocks, are checked and prevented from being mistakenly unscrewed.

The Chief Officer shall ensure that checks are carried out before commencement of cargo transfer confirming that all flanges including blanks are fully bolted and secure.

Missing bolts from any flanges or blanks is not acceptable and will result in an observation.

Manifold blanks should be the same thickness as the manifold presentation flanges. If the blanks are of another, stronger, material, such as titanium, they may be of a thinner construction. If this is the case, the Inspector will need to sight documentation to identify that pressure ratings of the manifold presentation flange and the blank are compatible.

8.61 Are the manifold valves and lines clearly marked as to whether they are liquid or vapour and are drains and purge pipes where fitted valved and capped?

All cargo lines and manifold valves must be identified as being either liquid or vapour. In fact, all lines on deck should be indicated with the purpose that they each serve.

The Chief Officer should ensure that all drain and purge lines are fitted with double valve shut-off arrangements or when these are of single valve arrangements then they are capped.

8.62 Are Officers aware of the procedures for the use of manifold strainers, and where fitted, are the strainers not being by-passed?

COMPETENCE

There is no mandatory requirement to fit strainers, however – If the cargo manifolds are constructed with strainers, these should not be by-passed. The by-pass valves must have a sign on them indicating that they are not to be opened.

They are used to protect cargo handling equipment for damage from foreign objects, are often designed for one-way flow and must be inspected and kept clean at regular intervals – records should be maintained.

8.63 Are liquid spill arrangements adequate, taking into account the lowest temperature cargoes which the vessel is certified to carry?

During operations the drip trays should as far as is practical be dry. With the exception of Ammonia transfers, the bottom of the drip tray should be covered with water.

Safety Equipment

8.64 Are crew members aware of the requirements for the use of protective equipment and is there suitable protective equipment available and in use for all crew members engaged in cargo operations?

COMPETENCE

The safety culture on board should be such that all those on deck involved with cargo transfer operations are provided with and wear the correct PPE at all times. The gangway watch should question the Inspector to ensure he/she has the correct PPE to conduct the inspection. If not, then the vessel should provide the Inspector with the appropriate PPE.

The Master should consult the Safety Equipment Certificate to ensure the vessel is in compliance.

8.65 Are Officers familiar with the requirements for provision of safety equipment on board, is the safety equipment in good order and are Officers capable of donning the equipment satisfactorily?

COMPETENCE

The Safety Officer shall ensure that safety equipment is readily available at ALL times and all officers familiar with the availability requirement and capable of donning the equipment satisfactorily. All breathing apparatus air bottles and ALL spare bottles must be fully charged.

Not less than three (3) sets should be provided and are in addition to the normal firefighting outfits required.

All PPE shall be dry, in good condition and ready for immediate use.

If the vessel is equipped with a dedicated air compressor to charge the breathing air bottles, a certificate indicating the air quality or purity of the compressor delivery should be available.

This certificate should be in the possession of the Master and posted in the vicinity of the compressor. Air quality tests are generally carried out on an annual basis.

This equipment must be inspected monthly by a competent officer and logged in the vessels records.

8.66 Are crew members familiar with the requirements for personal protection for toxic products and donning of the emergency escape sets where provided?

COMPETENCE

This is only applicable to vessels carrying products for which those paragraphs are identified in column “I” of chapter 19 of the IGC code.

The Safety Officer shall check the requirements of safety equipment on board as per the ship’s Safety Equipment Certificate against the actual amount held on the vessel.

All on board must be provided with an emergency escape set. It is important that ALL on board are aware that the emergency escape sets are NOT to be used for fire-fighting or cargo-handling purposes.

The Safety Officer should ensure that two additional emergency escape sets are available for use on the bridge.

It should be remembered that filter type respiratory protection is NOT acceptable and all Deck Watch-keeping Officers and deck ratings must be aware of this.

The Safety Officer should ensure the breathing apparatus and emergency escape sets are inspected as a minimum on a monthly basis. The inspection of this equipment must be recorded in the appropriate logbook or similar.

The company should arrange for an annual inspection by a shore technician unless there is a member of the ship staff who has conducted the relevant training. If a member of the ship staff has undergone this training, they must have relevant supporting certification.

8.67 Are decontamination showers and an eye-wash, where required, provided in suitably marked locations and operating correctly?

The Safety Officer should ensure that the decontamination showers and the eye-wash stations are clearly identified. All those involved with cargo operations and Deck Watch-keepers must be aware of each location and be familiar with their operation.

The decontamination showers and eye-wash facilities must be able to be operated in all ambient weather conditions (they will generally be expected to have a heat traced line or fully recirculation system installed) /and the Chief Officer’s Standing Orders should include instructions that each watch tests the operation of these facilities.

Note: this requirement is only applicable if certain cargoes can be carried as identified in column “I” chapter 19 of the IGC code – see list in VIQ 8.67.

8.68 Are Officers aware of the operation of the chemical dry powder system, and is the system in good order?

COMPETENCE

On vessels fitted with chemical dry powder extinguishing systems, records should be available to show when the powder has been agitated in accordance with the maker’s instructions or company PMS.

Annual maintenance must include agitation using nitrogen in accordance with the manufacturer’s instructions. This gas must be moisture free.

Every two years the dry powder must be tested for moisture. Records must be onboard.

8.69 Are the Officers aware of the maintenance requirements for the water spray system and is the system in good order?

COMPETENCE

The system should be tested in line with the instructions and schedule outlined in the company's PMS with the date and results recorded. If constructed of mild steel, small rust particles can block the system – records must verify the system's operation.

The Inspector will make a visual check of the pipelines and will look for any temporary repairs, excessive corrosion and wastage.

The pipelines should be kept clean and well painted. All valves for operating the system should be clearly indicated.

8.70 Are the Officers familiar with the fixed fire extinguishing systems installed within enclosed spaces containing cargo-handling equipment?

COMPETENCE

On vessels fitted with smothering systems for enclosed spaces containing cargo-handling equipment, the Safety Officer should ensure that they are in accordance with the routines outlined in the company's PMS and a record of these checks are maintained. Cargo compressor rooms will be protected by Carbon Dioxide (CO₂) systems and hydro-test certificates of all CO₂ bottles should be available.

It should be noted, however, that not all administrations require hydro tests to be carried out at five-yearly intervals.

8.71 Is the safety equipment inspected on board monthly and are records available?

The Safety Officer is responsible for checking the compressed air equipment monthly. These checks and any form of servicing, such as topping up the bottles, shall be recorded in a logbook dedicated for this purpose. Spare sets and bottles are also included within this monthly schedule.

Annual tests must be carried out by an expert and records kept.

Cargo Hoses

8.72 If the vessel uses its own cargo hoses, are they in good order, pressure tested annually to their design working pressure and is a record of all hose tests and inspections maintained on board?

Before being placed into service, vessels provided with their new cargo hoses should hydraulically pressure test them to not less than 1.5 times its specified maximum working pressure, but not less than two fifths of its bursting pressure.

The hose must be stencilled or marked with:

- Date of test
- Max working pressure
- Max/min service temp (if used in service other than ambient).

Annual pressure tests will be carried out as per above.

Any hose not tested must be clearly marked not for use and if possible placed in a quarantine area as best practice.

Original hose certificates must be onboard which shows all test data and compatibility data re: cargoes to be used with.

Cargo Lifting Equipment

8.73 Are all cranes and other lifting equipment properly marked, regularly inspected, tested and are the vessels crew aware of maintenance requirements?

All certification for the deck lifting equipment will be maintained by the Master. All lifting equipment must be clearly indicated with their SWL and test dates.

Certification and evidence of all testing of other of the vessel's lifting equipment shall be maintained by either the Master or Chief Engineer and should be readily available for the Inspector.

Load tests and a thorough examination are to be carried out every five years and thoroughly examined annually by a competent person.

A chain register is not required but documents/certification must be maintained.

If a single hose crane is installed, a spare set of hydraulic hoses are to be maintained onboard. Where more than one hose is identical, only 50% of these hoses need be maintained.

Wear of the slew bearing must be measured and recorded as per manufacturer's recommendation – normally done by a rocking test where the gap is measured between inner and outer bearing races or by grease sampling and analysis of metallic content. Records are to be onboard to view as required.

Ship-to-Ship Transfer Operations

8.74 Are operator's procedures provided for ship-to-ship operations?

The Inspector will check the company's procedures to see if procedures are provided.

8.75 Are Officers and crew familiar with the requirements and risks during ship-to-ship operations?

COMPETENCE

The Master or Chief Officer should be familiar with and should be able to locate the company procedures within the SMS. There must be an STS plan onboard, approved by the administration.

Risk assessments must be carried out for:

- Suitability of STS location
- STS operation

Any vessel equipped with STS fenders and hoses – inspection/maintenance must be carried out and recorded as per manufacturer's guidelines.

8.76 Does the POAC have the necessary qualifications and experience and are Officers aware of these requirements?

COMPETENCE

The POAC must have a level of qualification or experience as detailed in the VIQ 8.76 Inspectors guidance notes – Deck Officers please refer to these.

It is clear there will be occasions due to operational areas that the POAC or company providing the POAC is not able to provide evidence of qualifications or experience. However, it is recommended as best practice that best efforts are made by the Master to obtain this e.g. messages to the agents, STS operator etc. which can then be demonstrated to the inspector.

8.77 Are sufficient closed fairleads and mooring bitts provided?

These should be in accordance with the guidance provided by the company.

All fairleads used during STS transfer operations should be of an enclosed type and be strong enough to take the anticipated mooring loads and large enough to allow the mooring line (plus any soft rope and tackle) to pass through comfortably.

The company should be informed if there are insufficient closed fairleads and mooring bitts for STS operations.

8.78 Are Officers aware of the requirements of the ship-to-ship (STS) transfer checklists and are there records of STS operations maintained?**COMPETENCE**

The Chief Officer should have all checklists involved with any ongoing STS operations, or past operations, completed and suitably filed.

The checklists should either be provided by the company as part of their SMS and if not, then those provided in the latest edition of the *OCIMF Ship to Ship Transfer Guide* should be copied and used.

They should be available for:

- Pre fixture information
- Prior operations commence
- Before run-in and mooring
- Prior cargo transfer
- Before unmooring.

Each question in the checklist must be answered correctly as errors will result in an observation.

8.79 If an STS transfer was in progress during the inspection, was it conducted in accordance with the recommendations of the OCIMF/ICS STS Transfer Guide?

The Chief Officer must ensure that the cargo transfer plan covers all aspects of the operation and is in line with the latest edition of the *OCIMF Ship to Ship Transfer Guide*.

The Chief Officer should also ensure that all Deck Officers are fully briefed and supervised in accordance with the plan. It is also strongly suggested the latest edition of the *OCIMF Ship to Ship Transfer Guide* is available in the cargo control room.



Chapter 8.

Cargo and Ballast Systems – LNG

Cargo and Ballast Systems – LNG

In general, the Chief Officer or Cargo Officer will be responsible for a majority of this chapter that will include the planning and execution of the cargo and ballast transfer. However, the Deck Watch-keeping Officers should also be fully aware of the operations taking place at the time of the inspection. The Inspector will direct questions at the Deck Watch-keeping Officers to assess if they have an understanding of the cargo transfer taking place and their familiarity with the vessel's cargo, ballast and inert gas systems.

The ship should have a valid International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk and although amendments to the IGC and GC Codes introduced after vessels were delivered may not necessarily apply. The following codes apply:

- The mandatory IGC Code applies only to those vessels the keel of which was laid on or after 1st July 1986
- The mandatory GC Code applies to vessels delivered after 30th June 1980; and
- The non-mandatory EGC Code applies to those vessels delivered on or before the 31st October 1976.

This chapter applies to vessels carrying LNG.

Policies, Procedures and Documentation

8.1 Are Officers aware of the operator's policy statements, guidance and procedures, including information on maximum loading rates and instructions with regard to safe cargo operations?

COMPETENCE

The Chief Officer should have a hard copy of the company SMS and/or the cargo handling procedures available. Increasingly, companies are providing an electronic version of their SMS. However, a hard copy may prove to be more advantageous to assist the Inspector when references need to be verified.

Officers should be able to demonstrate familiarity with the system, irrespective of whether it is in hard copy or an electronic version.

The vessel's maximum loading rates shall be posted or should be readily available in the cargo control room and those involved with cargo transfer operation should have full knowledge of these.

The displayed information should include the maximum loading rate for each manifold line and the maximum rates for each tank. The ongoing cargo operation should be in line with this information.

8.2 Are the Officers aware of any loading limitations for the vessel and are these limitations, if applicable clearly posted in the cargo control area?

COMPETENCE

Any loading limitations for each tank should be posted or should be readily available in the cargo control room and those involved with cargo transfer operations should have full knowledge of these limitations.

A list must be available in the CCR and a copy with the Master as required by IGC code 15.2 detailing the following:

- Max allowable loading limits for each cargo tank indicated for:
 - each product
 - each loading temperature
 - applicable max reference temperature
 - relief valve pressure settings.

The loading limitations shall relate to the existing loading/temperature conditions and should not be for cargoes at any reference temperature.

The Chief Officer shall be able to demonstrate familiarity with loading limitations under existing loading conditions. Clarification on the meaning of reference temperature can be found in IGC 15.1.4 and VIQ 8.2.

8.3 Are legible and up-to-date pipeline and/or mimic diagrams of the cargo, inert gas and venting systems as applicable, available in the cargo control area and Deck Officers familiar with the systems?

COMPETENCE

The line diagrams in general are those indicated on the cargo control console and this is an acceptable method to display the cargo and venting systems. The inert gas system (IGS) may also have its own mimic panel and this too is acceptable. Should mimic panels not be fitted to the vessel's cargo control console then line diagrams should be posted.

If any modifications have been made to the vessel's cargo and/or ballast systems then the mimic diagrams and the relevant ship's plans should be updated.

Officers will be expected to show the planned operation and that it is following planned sequence of events.

8.4 Has a cargo plan been prepared and followed with a detailed sequence of cargo and ballast transfers documented, stress, intact and damage stability and are any limitations, where applicable, understood by the Cargo Watch Officers and clearly documented?

COMPETENCE

The Master and Chief Officer should ensure that a cargo-handling plan covering all stages of the transfer operations is prepared and that all personnel involved with the operation are appropriately briefed. As a minimum the plan must include:

- The order of loading or discharging
- The total quantities of cargo to be transferred
- The sequence of discharging and receiving tanks
- The intended transfer rates
- The transfer temperatures and pressure to be expected, and
- The use of the vapour return line.

Additional points should be referred to from the Inspector guidance notes in this VIQ item.

The Chief Officer, during the planning phase of the cargo transfer operation, shall include the stress and stability calculations at equal stages throughout the transfer operation at say 25%, 50%, 75% and finally on completion. These should be attached to or included within the cargo plan.

Deck Watch-keeping Officers shall demonstrate familiarity with stability and stress calculation data.

The Chief Officer should be aware of any damage stability guidelines specific to the ship. Deck Watch-keeping Officers should also be aware of these damage stability guidelines.

The Master shall be aware of the worst damage stability condition as outlined in the Stability Information Book.

The Master and Chief Officer should ensure that all Deck Watch-keeping Officers are fully familiar with the cargo plan for each stage of the cargo transfer operations. All those involved with the cargo operations should sign the plan confirming that they have "read and understood" its contents.

A complete log of all cargo operations is to be maintained, detailing all the major events including stopping, starting times of cargo and ballast pumps, tanks being worked and any deviation from the original plan.

Stability and Cargo Loading Limitations

8.5 If a loading computer or program is in use, is it Class approved, regularly tested and are officers aware of the test requirements including damage stability?

COMPETENCE

If the vessel is fitted with a loading computer there will need to be evidence that the unit and/or the program is Class-approved. There may be a separate certificate held by the Master or an approval stamp by the Classification Society will be available within the loading computer's manual.

A copy of the Class approval should be attached to the stability information book.

If the vessel is not fitted with a loading computer, the Inspector will need to know and will check how the Chief Officer calculates stress and stability. The Chief Officer should maintain records of stress and stability calculations for all voyages.

Stability conditions will be endorsed by the vessel's class at each Annual and Special Survey.

The loading instrument should be checked for accuracy and the approved loading guidance information (stability information book) confirmed as being available on board. In addition, regular on-board testing (as per the company's SMS) should be carried out and records attesting to this should be maintained. The test should involve physically entering the data for each tank into the computer and verifying the result. It is not acceptable to simply retrieve a stored test condition from the computer and compare this against the official conditions. Calibration by Class is part of normal survey requirements and thus verified by the issue/stamping of the certificate. Individual certificates attesting to this are unnecessary and may sometimes be requested by the Inspector – it is not required.

8.6 Is the vessel free of inherent intact stability problems, are Officers aware of these problems or risks of structural damage from sloshing, and actions required if the vessel takes on an unstable condition and/or angle of loll?

COMPETENCE

The Master and Chief Officer should be familiar with the any damage stability conditions outlined in the Stability Information Book.

If the vessel has any inherent intact stability problems, a procedure must be readily available for the Chief Officer to follow when required. The Chief Officer must be well versed with the procedure and be able to explain its purpose to the Inspector.

The C/O must be able to demonstrate the intact stability in the worst case condition (i.e. all tanks slack and max FSE)

All Officers should be fully aware of any sloshing restrictions for any cargo and or ballast tanks. It is also the Master and Chief Officer's responsibility to ensure that all Deck Watch-keeping Officers are familiar with any such restriction.

Any filling or loading limits, and sloshing restrictions should be posted in the cargo control room (CCR).

Posted instructions must also identify the actions necessary if stability concerns are suspected or experienced.

The Master and Chief Officer should be fully aware of the dangers of these conditions and their effects on the tank structure. It is also the Master and Chief Officer's responsibility to ensure that all Deck Watch-keeping Officers are also familiar with these conditions.

The Master or Chief Officer should be able to demonstrate to the Inspector that the company's SMS includes procedures for these conditions, if not the company should be advised (should be included in the Master's Review of the SMS). It would also be prudent for this procedure to be available in the CCR.

Records must be maintained for at least three years detailing the checks made to verify damage stability requirements for each load/discharging operation

8.7 Is a cargo operations manual available that covers all routine cargo operations and are Officers familiar with the manual's contents?

COMPETENCE

A cargo operations manual should be available onboard and should include procedures for operations such as gas-up, cool-down, cargo loading, loaded passage, cargo discharge, ballasting, ballast passage cargo tank management, cold arrival, gas freeing, purging and hold space management operations. Further details are listed in the relevant VIQ question.

Increasingly, companies are providing ships with electronic versions of their cargo operations manual. However, a hard copy may prove to be more advantageous to assist the Inspector in verifying references. The Officers should be able to demonstrate familiarity with the system, irrespective of whether it is a hard copy or an electronic version of the cargo operations manual.

8.8 Are all Officers and ratings aware of the carriage requirements including emergency procedures for LNG and are Officers familiar with the vessel's cargo system, including emergency discharge arrangements?

COMPETENCE

All Officers and ratings should be able to demonstrate to the Inspector that they are familiar with the carriage requirements of LNG, including the emergency procedures. The following basic knowledge is expected:

- Shipboard operations and cargo handling
- Gas combustion systems
- IGC, GC and EGC coeds where applicable (due to vessels age, generally only IGC code is applicable – it depends when the vessel was built and which Code was in force at the time)
- SIGTTO and ICS guides
- Cargo re-liquefaction procedures if applicable
- Cargo atmosphere control procedures during gas freeing or gassing up
- Hazards when cooling down re: thermal loads
- Min cargo temperature
- Medical treatment requirements for exposure to cargo
- Spill response
- Communications procedures with the shore
- Emergency stop procedures, and knowledge of which systems are affected by the ESD
- Effects of sloshing loads.

The Master and Chief Officer should ensure that all Officers are familiar with the cargo system, including emergency discharge arrangements.

Cargo Operations and Related Safety Management

8.9 Are cargo operations being carried out and logged in accordance with the plan?

The Chief Officer should be able to demonstrate that the transfer operations being carried out are in accordance with the established cargo plan.

Each step of the cargo transfer operation should be recorded as and when they occur. These records should include, but not be limited to, the starting and stopping of cargo and ballast pumps, the tanks being worked, suspension of cargo operations, etc.

Any deviation from the cargo plan should be logged together with the reasons for the deviation. The Master and/or the Chief Officer should ensure that the company's SMS includes procedures and guidance that covers deviations, if not the company should be advised. It would also be prudent for this procedure to be available in the cargo control room.

8.10 Are all Officers aware of the emergency procedures for dealing with leakage, spillage or fire involving the cargo?

COMPETENCE

The Master and Chief Officer should be able to demonstrate to the Inspector, that all Officers are trained and familiar with the company's emergency procedures for dealing with leakage, spillage or fire involving the cargo. Records of exercises for these scenarios will need to be available.

Awareness of the potential cooling effect on hull steel due to escaped cargo must be understood.

8.11 Are the Officers aware of the requirement to isolate the electrical supply of the submerged cargo pump motors, where fitted, during gas-freeing operations and are the pumps fitted with an automatic shut down in the event of low liquid level?

COMPETENCE

If the vessel is fitted with submerged electrical cargo pumps, the Officers should be able to demonstrate their familiarity with any special requirements related to the system. The Master or Chief Officer should check to ensure the company SMS includes procedures for isolating submerged electrical cargo pump during gas freeing operations, if not the company should be advised. If procedures are established within the SMS, the Officers should be able to demonstrate their full understanding and knowledge of the procedures.

The pumps should be fitted with an automatic shut down in the event of low liquid level.

8.12 Are the cargo, ballast and stripping pumps, eductors and their associated instrumentation and controls, where fitted, in good order, free of leaks and is there evidence of regular testing?

The Chief Officer will be asked by the Inspector if all equipment is fully operational. This should be answered honestly and accurately, if the answer is given as yes and the Inspector notes any faulty equipment then the trust built up between the vessel and the Inspector may be lost. The Inspector will then start looking more deeply into the status of the equipment to identify any additional faults and this may result with additional observations.

All cargo pipework, instrumentation and valve systems must be clearly marked to indicate the systems that they service. In addition, all records of instrumentation (pressure gauges, etc.) testing will need to be made available for the Inspector.

8.13 Are cargo pump performance curves available, are Deck Officers aware of the requirements for cargo lines and vapour on the system?

COMPETENCE

It is strongly suggested that all Officers are able to demonstrate full understanding and familiarity with the cargo pump's performance curves and that these are posted in the cargo control room.

Cargo, vapour and inert gas lines must be inspected as per vessel PMS and records kept up to date. Inspections must address any visible damage, corrosion or leakage from glands and flanges. Insulation must be intact.

Routine pressure testing of these lines is NOT required.

8.14 Are the cargo and ballast system valves in good order and is there evidence of regular testing?

The Inspector will inspect all visible elements of cargo and ballast systems and will also wish to sight any associated valve closing times records which will be maintained by the Chief Officer.

8.15 Are Officers aware of the test requirements for cargo system remote and local tank pressure, temperature, and level sensors and gauges and are these in good order with evidence of regular testing?

COMPETENCE

Records of regular testing and calibration of the cargo monitoring equipment should be maintained by the Chief Officer; these should include dates of testing as well as comparisons with secondary tank level gauges.

The Inspector will also look to see if the temperature monitoring equipment is marked with the lowest temperature (approved by the Flag State) that the cargo tank can be subjected to.

Records of dates of testing as well as comparisons with secondary temperature and pressure gauges should be maintained.

8.16 Are the Officers aware of the emergency discharge method in the event of cargo pump failure and are there clear procedures addressing this process?

COMPETENCE

All Officers should be familiar with the means of carrying out an emergency discharge in the event of a cargo pump failure. The procedures for an emergency discharge should be displayed in the cargo control room. In addition, the location of the emergency discharge equipment should be clearly indicated.

Cargo Handling and Monitoring Equipment

8.17 Are tank domes and associated fittings in good order, free from corrosion and leaks?

The Inspector will visually check the tank domes, pipework and fittings during the deck inspection for any signs of corrosion, stains of rust-water rundown, wasted fittings and brackets and leakages. All fittings will need to be kept well painted and clean.

Any cargo leaks will raise an observation that will be deemed as one of high risk. It is also very likely that any cargo leaks will be identified by the terminal's monitoring equipment and will lead to cargo transfer operations being suspended.

8.18 Is the insulation on cargo or vapour lines in good order and inspection routines in place?

The Inspector will visually check all pipework and its associated thermal insulation (lagging) for any breakdown or deterioration. All pipework insulation should be checked regularly and any breakdown must be repaired with the correct insulation materials and repainted.

Evidence of regular sample checks under the insulation should be carried out and documented at convenient repair periods. It is recommended such records are available to be shown to the Inspector if requested.

Corrosion under insulation (CUI) inspections:

Note: It is appreciated that records of such inspections may not be available to satisfy this new item, however, records of a visual inspection can be readily recorded. Revisions to the SMS/PMS indicating these inspections and checks will identify that the company and vessel is aware of these requirements and will be complied with during future repair periods or drydocks.

8.19 Are cargo or vapour lines joints electrically bonded?

If joints are electrically bonded by the use of straps or wires, these should be checked before the inspection to ensure they are all intact. Any broken or missing bonding straps or wires will result in an observation.

8.20 Are cargo and vapour line expansion arrangements in good order and liquid/vapour lines free to move in their clamps?

The Chief Officer should check that all expansion arrangements are free to move and not impeded as the thermal loads vary.

Visually check that all liquid and vapour lines should be able to move within their clamps to allow for movement due to thermal variations or structural movement.

8.21 Are cargo line and system relief valves in good order and officers aware of the requirements?

COMPETENCE

Relief valves must not discharge into the atmosphere but, back into the cargo system. Dates of overhaul and testing of the relief valves should be maintained by the Chief Officer and should be in accordance with the vessel's PMS.

8.22 Are cargo pipelines free of screwed-in connections?

Where applicable, screwed couplings that are acceptable to the Administration may be used on the cargo lines for fitting of accessory and instrumentation lines of no more than 25mm outside diameter.

8.23 Is the cargo tank high-level alarm system independent of both the gauging system and in the case of IGC vessels, also independent of the high level shut-down (overflow control) system and are officers aware of the override procedures where provided?

COMPETENCE

The ship's cargo high-level alarm systems should be independent of other cargo level indicators and should give a visual and audible warning. If the alarm is not independent then the ship will get an observation. Records of regular testing of the high-level alarms should be maintained by the Chief Officer.

If the vessel is fitted with an override key switch for both the high-level cargo tank and/or shut-down systems, the company's SMS must have procedures that specify the circumstances under which these systems can be overridden including the persons that are authorised to override the systems, e.g. the Master or Chief Officer. These written procedures should also be posted next to the key switch.

There must be arrangements in place to prevent inadvertent operation of the overriding system. Overriding should only be done in exceptional circumstances, e.g. tank overloaded and the need to bypass the tank overflow control system.

8.24 Are there records of the calibration of key cargo instrumentation, including temperature and pressure gauges?

Records of regular testing and calibration of the cargo monitoring equipment should be maintained by the Chief Officer and these should include dates of testing carried out in accordance with the vessel's PMS. As a minimum, calibration shall be carried out at intervals not exceeding 36 months.

Where applicable, comparisons between local and remote thermometer readings should be maintained during every cargo watch.

8.25 Is cargo measurement and custody transfer system in good condition?

This is generally achieved by radar ullaging, capacitance systems and by float gauges. Check they are all operational as applicable.

8.26 Are the Officers aware of the test requirements for the cargo tank high level and overflow alarms, and are they in good order with evidence of regular testing in use for both cargo loading and discharging?

COMPETENCE

The high-level alarm system must be switched on during all cargo transfer operations. If the systems are switched off, an observation will be raised.

The ship's cargo high-level alarm systems should be independent of all other tank level gauging systems. Records of regular testing of the high-level alarms should be maintained by the Chief Officer.

The Chief Officer should ensure that all Deck Watch-keeping Officers are aware of the working of the type of high-level alarms fitted.

Officers must be aware of the test requirements and evidence of regular testing available.

LNG Cargo Machinery Rooms

8.27 Are the bulkhead seals, between the compressor room and the motor room, gas tight and operating effectively?

The bulkhead seals should be well secured, intact and cool to the touch. Those bulkhead seals fitted with lubricator reservoirs should be checked to ensure they contain sufficient oil. Checks to ensure the seals are tight is necessary.

8.28 Are the cargo machinery rooms well lit and are electrical fittings suitable for use in gas hazardous areas and in good order?

It is the Chief Engineer's/Electrician's responsibility to ensure the integrity of all cable and light fittings. Regular checks of "Ex" lights must be carried out and recorded – normally by the electrician onboard.

The cables and light fittings must be "Ex" rated, clean, intact, gas tight and all lights should be working.

Any loose or damaged insulation, cracked glass, loose bolts, etc, will result in a high-risk observation.

8.29 Are Officers aware of the requirements for the compressor room ventilation system and is the system maintaining negative pressure?

COMPETENCE

Operating the air lock or opening the doors for entry to these spaces will indicate if the compressor room is being maintained under negative pressure or not. If these spaces are gas-hazardous then the ventilation should be of the negative pressure type.

Warning notices must be in place warning of the need to ensure ventilation is in continuous operation. Officers should be aware of the requirements for the compressor room ventilation system.

8.30 Are Officers aware of the requirements for airlocks, are the alarms in good order and in the event of pressure in the air-lock lost, will the shutdown system operate correctly?

COMPETENCE

If it is possible to do so safely, the Inspector may request to witness the alarm in operation. Permission must be taken from the Chief Officer and/or the Chief Engineer before testing any alarms. If the alarm fails to activate, an observation will be raised. Neither of the doors should be kept forced in the open position; the self-closing devices should always be connected and operational.

The Inspector will note this on entry. Both of these shall be checked and tested prior to the inspection with records of these tests maintained by the Chief Officer.

8.31 Is the compressor room free of gas leaks?

The compressor room should be free of leaks and if there are any leakages, the gas detection system should activate. Leakages will result in a high-risk observation.

8.32 Are the Officers familiar with the operation and requirements of the fixed gas detection equipment and is the equipment in good order?

COMPETENCE

The Chief Officer should maintain records of tests of fixed gas detection systems and equipment. Tests should be carried out in accordance with the maker's instructions or the company's PMS. Records should be maintained and gas detection system must not be isolated.

All Officers should know where the sampling points are located/fitted – see VIQ 8.32 guidance notes on expected fittings.

Officers should be familiar with the operation and requirements of fixed gas detection equipment.

The Inspector will check the records to see if the gas detection system is routinely checked and tested in line with the PMS.

8.33 Are Officers aware of the requirements for setting fixed gas detector sample points and, are they fitted at the upper level of the machinery spaces?

COMPETENCE

The Inspector will ask and/or look for sampling points for fixed gas detection systems. LNG vapours are lighter than air and if sampling points are not fitted at the upper levels then an observation will be raised.

It is considered best practice to have a diagram showing the locations of the sensors in the CCR.

Cargo Reliquefaction Systems

8.34 If applicable, are the Officers familiar with the operation of the cargo reliquefaction plant and is the plant and associated machinery and instrumentation in good order?

COMPETENCE

The Inspector will check the visual appearance of the reliquefaction plant for any obvious signs of defects. The Chief Officer should have records available, ideally in the vessel's PMS, that all alarms and trips are calibrated and tested routinely. This machinery space will also be checked for cleanliness and good housekeeping.

8.35 Are Officers aware if the gas supply to the Engine Room is unaffected by ESD Shutdown and are there procedures confirming this?

COMPETENCE

The Inspector will generally ask either the Chief Officer or Chief Engineer this question and both should be aware that the ESD system does not affect the gas supply to the engine room. Other Officers must also be aware of the procedures to confirm this.

8.36 Is the reliquefaction plant fitted with an independent emergency shutdown control to the cargo ESD system?

If the reliquefaction plant is fitted with its own independent ESD, the Chief Officer or Chief Engineer should both be aware of this and should know the location of the shutdown unit.

Gas Combustion Systems

This sub-section is applicable to vessels fitted with a reliquefaction plant or other cargo system that requires a Gas Combustion Unit (GCU) to be fitted.

8.37 Are the Officers aware of the operation of the GCU unit where fitted and is the unit fully operational and ready for immediate use?

COMPETENCE

The Chief Officer and Chief Engineer should be able to advise to the Inspector if the unit is fully operational and have records/logbooks to demonstrate this. All Officers must be aware of the operation. Procedures must be in place and adequate to detail manual operation.

The Inspector will look at the GCU for signs of any obvious visible defects and will ask the Chief Engineer about the operational condition of the unit. The GCU should normally be operated in the automatic mode and if this is not possible then procedures should be posted to demonstrate manual operation.

8.38 Are the alarms associated with the GCU tested in accordance with the Planned Maintenance System?

The Chief Officer and/or Chief Engineer should have records available, ideally in the vessel's PMS, that all alarms and trips are calibrated and tested routinely.

8.39 Are the Officers aware of the gas fuel piping protection and is the system in good order?

COMPETENCE

Visible gas fuel pipelines will be checked by the Inspector for any visible signs of deterioration and to ensure they do not pass through any inhabited spaces. The spaces, between the double walls (concentric) pipelines should be inerted at a pressure higher than the gas fuel and alarms fitted to indicate any pressure drop within this space. Records will need to be made available to indicate to the Inspector they are tested routinely.

8.40 Is the automatic gas shut-off system in good order and regularly tested?

The Inspector will ask either the Chief Officer or Chief Engineer this question and both should be able to demonstrate to the Inspector how the system works and that the system is routinely tested in line with the PMS.

Void and Interbarrier Spaces and Seals

8.41 Is the interbarrier space nitrogen purging system in good order?

The Inspector will check the records of nitrogen consumption and will reference this against the running hours of the nitrogen generator. Both records should be readily available and up to date.

8.42 Is the pressure in the interbarrier spaces being maintained at a sufficient level to prevent ingress from the atmosphere?

The interbarrier spaces should be maintained at a positive pressure and records should be available for the Inspector to sight to prove that monitoring is regularly conducted and that the required pressure as per the Cargo Operations Manual is maintained.

8.43 Are Officers aware of the setting requirements for relief valves for hold spaces and primary and secondary barriers and, where fitted are they in good order?

COMPETENCE

The Inspector will check the arrangements for interbarrier over-pressure relief. These may be relief valves or pressure sensors. Records should be maintained of any calibration and testing of these devices and all personnel involved with cargo transfer and containment should be able to demonstrate their knowledge of the system.

8.44 Are the Officers familiar with the means to sample for ingress of water into the insulation spaces and are checks being recorded?

COMPETENCE

The Inspector will check for the type of water detection system that is installed. Records of the tests carried out on the water detection system should also be available.

8.45 Is the glycol heating system in the void spaces between cargo tanks, where fitted, in good order?

Normally there should be two pumps servicing the system, one in operation the other on standby. The Inspector will verify that the output pressure is within the operating range. In addition, the Inspector may also check that the temperature sensors in the cargo control room indicate that the temperatures are within range. Maintenance records should also be available if required.

Inert Gas Systems

8.46 Is the inert gas system and/or storage and associated pipework, where fitted, in good order?

The Inspector will visually check the vessel's inert gas system where fitted and/or other means used for inerting purposes. Any rust, scaling, corrosion or temporary repairs will result with an observation.

Where a space is continually supplied with an inert gas as part of a leak detection system, a means of monitoring the amount of gas used must be fitted and records maintained.

8.47 Are Officers aware of the arrangements to prevent the backflow of cargo vapour into the inert gas system and is this arrangement in place?

COMPETENCE

Ensure that inspection records for the non-return valves are maintained and available. Also ensure that unless the inert gas system is in use, the spool piece (connecting the inert gas line to the cargo lines) is removed and stowed in a location with its purpose indicated.

The Chief Officer should also positively verify the Deck Watch-keeping Officers are aware of the purpose of the non-return valves and spool piece which are to prevent the back flow of cargo vapours into the inert gas system.

Pressure Relief and Venting Systems

8.48 Are Officers aware of the requirements for setting the relief valves, are certificates of test available and clear procedures for changing MARVS as applicable?

COMPETENCE

Testing is normally carried out during dry dock periods. The Master and/or Chief Officer should have the safety relief valve test certificates.

Any changes of the set pressure must be carried out under the supervision of the Master, recorded in the log book and signs posted in the CCR and at each relief valve stating the set pressure.

The venting system will be visually checked by the Inspector, who will check for any temporary repairs, signs of wastage and its general condition. The system should be well maintained and intact.

8.49 Are Officers familiar with the vent outlet arrangements and, as fitted are protective or flame screens in good order and regularly inspected?

COMPETENCE

The Chief Officer is responsible to ensure that suitable protective screens are fitted on vent outlets (13mm square mesh) to prevent the ingress of foreign objects. The flame screens shall be suitable for the cargo being carried and the Chief Officer should maintain records of routine inspections.

8.50 Where the pressure relief line vents directly through a mast riser, does this system have a liquid sensor?

The Inspector will check if the mast riser has a liquid sensor or arrangements to ensure that liquid does not accumulate in areas of the pipeline where it may accumulate. All personnel involved with cargo operations should be able to demonstrate their understanding of this.

8.51 Are Officers familiar with the operation of any fixed fire extinguishing systems on the vent masts, where fitted, and are the systems in good order and operational?

COMPETENCE

Note that there is no regulatory requirement for this, however, if a system is fitted then the vent masts will be visually checked by the Inspector, who will look for any temporary repairs, signs of wastage and that its general condition should reflect it being well maintained and intact and clearly identified.

8.52 Is the forward mast vent always operated in automatic mode?

The Inspector will raise an observation if NOT operated in the automatic mode.

8.53 Are the Officers familiar with the procedures and authorisation for changing settings and inhibiting alarms?

COMPETENCE

There should be clear instructions within the company SMS outlining the process to be followed should any alarms' settings need to be changed or inhibited. The Master and all Officers must be able to demonstrate their knowledge of these procedures and evidence that procedures have been followed for any changes that have been made will be requested by the Inspector. This may include completed risk assessments.

Emergency Shut Down (ESD) System

8.54 Are Officers familiar with the operation of the Emergency Shut Down (ESD) system, and is the system regularly tested operational?

COMPETENCE

The Chief Officer should ensure that all the Deck Watch-keeping Officers are fully aware of the sequence of operation of the ESD.

The Chief and Deck Watch-keeping Officer should be able to explain to the Inspector the operation and sequence of the fail-closed (closed on loss of power) type ESD system and be capable of local manual closing.

It is good operational practice for the Chief Officer to test the ESD before each cargo operation from all remote locations. It is not acceptable to operate the ESD from the cargo control room only.

Records of testing the ESD must be maintained and should include the location from where each test was made from.

The Chief Officer should be maintaining records of the testing of ESD valves fitted in liquid piping systems – the records must include times of closing and characteristics (closing time no more than 30s).

The emergency closing times of the valves should be posted in the cargo control room along with information concerning the shutdown of the cargo pumps and compressors.

It is extremely important the Chief Officer maintains records of all tests and any maintenance carried out on the ESD.

8.55 Are personnel aware of the locations of ESD points, and auxiliary equipment shut down requirements?

COMPETENCE

The remote locations where the ESD can be manually operated must be clearly identified with their purpose and written instructions posted.

8.56 Are the Officers aware of the requirements for the closing of the manifold valves and tank filling valves, if they form part of the emergency shutdown system, and are they tested and timed to close within 30 seconds?

COMPETENCE

The Chief Officer should maintain records of the testing and the time it takes for the closing of each manifold and tank filling valve (max 30s). All officers must be aware of these requirements.

The emergency closing times of the valves must be posted in the cargo control room along with information concerning the shutdown of the cargo pumps and compressors.

8.57 Are Officers aware of the requirements of fusible plugs, and are they fitted on the liquid domes, in the vicinity of the manifolds and in good order?

COMPETENCE

Where fusible plugs are fitted, they should not be painted over. They are designed to melt at 98 – 104°C.

If fitted, the temperature at which the fusible plugs melt should also be posted and made available in the cargo control room. The Chief Officer should ensure that all Deck Watch-keeping Officers are aware of the purpose of the fusible plugs that are fitted at the tank domes and loading stations.

Fuse elements that cause the emergency shutdown valves to close should not be painted over.

8.58 If the vessel is fitted with a reliquefaction plant, will this be tripped in the event of activation of the ESD?

COMPETENCE

All personnel involved in cargo operations should be able to describe to the Inspector if the reliquefaction plant trips when the ESD is operated. If the reliquefaction plant does trip, then records should be made available to indicate that the trip is routinely tested in line with the PMS.

8.59 Are Officers aware of the secondary tank pressure management system in use at sea and if it is sufficient to handle the gas volume in the event of a shutdown of the reliquefaction system?

COMPETENCE

All Officers should be able to explain and/or demonstrate how boil-off gases (BOG) are managed (used as fuel or reliquified) and how temperatures are controlled. In some cases this may be recorded by the use of an automatic graph recorder in the cargo control room.

8.60 Are Officers fully familiar with the override procedure for the alarms and ESD trips?

COMPETENCE

The authority to override alarms and ESD trips should be clearly posted in cargo control room. This should be in line with the guidance in the company's SMS and be with the Master's approval.

When override is implemented, there must be a continuous visual indication at all control stations and on the bridge.

Manifold Arrangements

8.61 Are the manifolds and associated valves in good order, blank flanges of an equivalent rating to that of the pipelines and pressure gauges securely fitted outboard of the manifold valves on both sides and monitored for leakage?

The ship's manifolds should be kept in a neat and clean condition and should meet the requirements of the "Manifold Recommendations for Liquefied Gas Carriers".

Manifold pressure gauges should be fully operational, readable and properly secured. The pressure gauges fitted to the manifolds not in use, shall have their shut-off valves/ cocks open throughout cargo transfer.

Blanks used on manifolds should be the same thickness as the manifold's presentation flanges. If the blanks are of another material to steel, such as titanium, they may be of a thinner construction. If this is the case, the Inspector will sight documentation to identify that pressure ratings of the manifold flange and the blank are compatible.

All cargo lines and manifold valves must be identified as being either liquid or vapour. In fact, all lines on deck should be indicated with the purpose they each serve.

8.62 Does the manifold arrangement provide for safe access for connection and disconnection of cargo lines and visible restricted access to the manifolds during cargo operations?

The access area around the manifolds must be kept clear of any obstructions or loose items. Manifold gratings, where fitted, should be fully secured and not cause a tripping hazard during the connecting and disconnecting process.

The path for a hard arm must be clear of any item that may obstruct its travel. In the interests of personnel safety, the deck watch must be made aware of the hazards that exist when loading arms have automatic releases and to stand clear of their line of travel when on duty.

There must be clear signs posted to prevent access in and around the manifold areas. The signs shall be placed where they are clearly visible for all. In addition, coloured tape or ropes tied around the manifold area can be used as another means to prevent access.

8.63 Is there clear evidence offshore manifolds are regularly checked during cargo transfer for manifold valve leakage?

Pressure gauges fitted to offshore manifolds should be kept open throughout cargo transfer to identify pressure which is usually caused by the pressure of nitrogen which is normally introduced between the manifold blank and the valve. Leakage is indicated by frosting not pressure.

The Chief Officer's Standing Orders shall include monitoring of offshore pressure gauges including those on any onshore manifolds not in use and any frosting sighted. A written record of these checks shall be maintained to identify if there is any manifold valve leakage.

8.64 Are all flange connections fully bolted?

The Chief Officer shall ensure that checks are carried out before the commencement of cargo transfer to ensure that all flanges including blanks are fully bolted and secure. Any bolts missing from any flanges or blanks will result in an observation.

8.65 Are Officers aware of the procedures for the use of manifold strainers, and where fitted are the strainers not being by-passed?

COMPETENCE

There is no mandatory requirement to fit strainers, however, if the cargo manifolds are constructed or fitted by the terminal with strainers, these should not be by-passed. The by-pass valves must have a sign on them indicating that they are not to be opened.

They are used to protect cargo handling equipment for damage from foreign objects, are often designed for one way flow and must be inspected and kept clean at regular intervals – records should be maintained.

The Inspector will ask what size strainers are fitted so the Chief Officer and all personnel involved in the operation should be aware of this information.

8.66 Are LNG spill arrangements adequate?

A water distribution system must be seen to be in operation during cargo operations, and that the low pressure system provides a water curtain below the manifold and over the ship's hull/ship's side.

8.67 Are Liquid Spill and Manifold Drip tray arrangements adequate?

During operations the drip trays should as far as is practical be dry and be able to be drained via a normally closed drain valve, the line of which should be directed overboard and vertically in a downward direction.

8.68 During the disconnection of the loading arms is the crew aware of the hazards related to the purging of liquid from the arms via the drain cocks?

COMPETENCE

The Chief Officer and crew will need to demonstrate to the Inspector that anyone involved with cargo operations are familiar with this process as well as the safety precautions they are to take. This should be as per the procedure in the company's SMS.

Safety Equipment

8.69 Are crew members aware of the requirements for the use of protective equipment and is there suitable protective equipment available and in use for all crew members engaged in cargo operations?

COMPETENCE

The safety culture on board should be such that all those on deck involved with cargo transfer operations are provided with and wear the correct PPE at all times. The gangway watch should question the Inspector to ensure he/she has the correct PPE to conduct the inspection. If not, then the vessel should provide the appropriate PPE until the Inspector disembarks.

The Master should consult the Safety Equipment Certificate to ensure the vessel is in compliance.

8.70 Are Officers familiar with the requirements for provision of safety equipment onboard, is the safety equipment in good order and are Officers capable of donning the equipment satisfactorily?

COMPETENCE

The Safety Officer should ensure that safety equipment is readily available at ALL times and all officers are familiar with the availability requirement and capable of donning the equipment satisfactorily. All breathing apparatus air bottles must be fully charged, as should ALL spare bottles.

All PPE should be dry, in good condition and ready for immediate use. Not less than three sets should be provided and these are in addition to the normal firefighting outfits required.

All safety and fire equipment shall be located in compliance with the Safety and Fire Plan. If the location of any fire or safety equipment is changed on a permanent basis, the Plan should be revised by the Safety Officer to reflect the changes.

Safety equipment required by the IGC Code should be examined by an expert annually and records should be made available.

The Safety Officer shall ensure that the breathing apparatus and emergency escape sets are inspected as a minimum on a monthly basis.

The inspection of this equipment must be recorded in the appropriate logbook. The company should arrange for an annual inspection by a shore technician unless there is a member of the ship staff that has conducted the relevant training and is certified to carry out the annual inspections.

If the vessel is equipped with a dedicated air compressor to charge the breathing air bottles, there must be a certificate available to ensure that the air quality of the compressor delivery has been tested and this should be in the possession of the Master and posted in the vicinity of the compressor. Air quality tests are generally carried out on an annual basis.

The Safety Officer is responsible for checking the compressed air breathing apparatus and emergency escape sets (EEBDs) monthly. These checks and any form of servicing, such as topping up the SCBA bottles, must be recorded in the dedicated logbook. Spare sets and bottles are also included within this monthly schedule.

8.71 If the vessel has a cargo capacity greater than 5,000m³, is the additional fireman's outfit carried?

Every ship carrying flammable products should carry fireman's outfits complying with SOLAS as follows: – 5,000m³ and below: 4 outfits; – Above 5,000m³: 5 outfits. Should this not be the case, the vessel should order additional equipment. The Master should consult the Ship's Safety Equipment Certificate to ensure the vessel is in compliance.

8.72 Are Officers aware of the operation of the chemical dry powder system, and is the system in good order?

COMPETENCE

On vessels fitted with chemical dry powder extinguishing systems, either the Chief or Safety Officer should maintain records to state when the powder has been agitated with nitrogen (moisture free) in accordance with the maker's instructions or company's PMS. The Inspector will wish to check these records. All Officers must be aware of this requirement.

8.73 Are Officers aware of the maintenance requirements for the water spray system and is the system in good order?

COMPETENCE

The system should be tested periodically in line with the company PMS to ensure correct operation and the date and results of the test recorded. If constructed of mild steel, small rust particles can block the system – records must verify system operation.

The Inspector will visually check the pipelines and will look for any temporary repairs, signs of corrosion and wastage. Therefore, the pipeline systems will need to be well painted and the valve for operating the system should be clearly indicated.

8.74 Are Officers familiar with the fixed fire extinguishing systems installed within enclosed spaces containing cargo handling equipment?

COMPETENCE

On vessels with cargo space smothering systems contained within enclosed spaces, the Safety Officer should ensure that these are routinely checked and these checks are recorded. Cargo compressor rooms will be protected by CO₂ systems and hydro-test certificates for the CO₂ bottles will need to be available. It should be noted that not all administrations require hydro-tests to be carried out at five-yearly intervals.

Cargo Hoses

8.75 If the vessel uses its own cargo hoses, are they in good order, pressure tested to their design working pressure and is a record of all hose tests and inspections maintained on board?

Hoses must be protected from sunlight and weather and kept covered when stowed. Flanges must be fitted to each end and the hose filled with nitrogen.

Before being placed into service, vessels provided with their new cargo hoses should hydraulically pressure test them to not less than 1.5 times its specified maximum working pressure, but not less than two fifths of its bursting pressure.

The hose must be stencilled or marked with:

- Date of test
- Max working pressure
- Max/min service temp (if used in service other than ambient).

Any hose not tested must be clearly marked not for use and if possible placed in a quarantine area as best practice.

Original hose certificates must be onboard which shows all test data and compatibility data re: cargoes they can be used with.

These hoses can only safely be tested under controlled conditions ashore as it may include liquid nitrogen as the test medium.

Hoses must be pressure tested prior to each use – each hose marked with test date and numbered for easy identification.

The Chief Officer will be responsible for conducting and maintaining records of these tests which may also be included in the PMS.

Cargo Lifting Equipment

8.76 Are all cranes and other lifting equipment properly marked, regularly inspected, tested and are the vessels crew aware of maintenance requirements?

COMPETENCE

All certification for the deck lifting equipment will be maintained by the Master. All lifting equipment must be clearly indicated with their SWL and test dates.

Certification and evidence of all testing of other of the vessel's lifting equipment shall be maintained by either the Master or Chief Engineer and should be readily available for the Inspector.

Load tests and a thorough examination are to be carried out every five years, and thoroughly examined annually by a competent person.

A chain register is not required but documents/certification must be maintained.

If a single hose crane is installed, a spare set of hydraulic hoses are to be maintained onboard. Where more than one hose is identical, only 50% of these hoses need be maintained.

Wear of the slew bearing must be measured and recorded as per manufacturer's recommendation – normally done by a rocking test where the gap is measured between inner and outer bearing races or by grease sampling and analysis of metallic content. Records are to be onboard to view as required.

Ship-to-Ship Transfer Operations

NOTE: If ships are not involved in regular ship-to-ship cargo transfer operations, questions 8.77 to 8.81 should be marked as N/A by the Inspector.

8.77 Are operator's procedures provided for ship-to-ship operations and equipment approved for LNG transfer?

The Inspector will check the company's procedures to see if procedures for STS operations are provided. The Master and/or Chief Officer should be familiar with and be able to locate the company procedures within the SMS for the Inspector.

Certificates to support that any equipment used for ship-to-ship transfers are of the appropriate type certified for LNG use should be readily available for the Inspector. These certificates should be maintained by the Master.

8.78 Are the Officers and crew familiar with the requirements and risks during ship to ship operations?

COMPETENCE

The Master or Chief Officer should be familiar with and should be able to locate the company procedures within the SMS. There must be an STS plan onboard, approved by the administration.

Risk assessments must be carried out for:

- Suitability of STS location
- STS operation.

Any vessel equipped with STS fenders and hoses – inspection/maintenance must be carried out and recorded as per manufacturer's guidelines.

8.79 Does the POAC have the necessary qualifications and experience and are Officers aware of these requirements?

COMPETENCE

The POAC must have a level of qualification or experience as detailed in the VIQ 8.79 Inspector's guidance notes – Deck Officers please refer to these.

It is clear there will be occasions due to operational areas that the POAC or company providing the POAC is not able to provide evidence of qualifications or experience. However, it is recommended as best practice that best efforts are made by the Master to obtain this e.g. messages to the agents, STS operator etc. which can then be demonstrated to the inspector.

8.80 Are Officers aware of the requirements of the ship-to-ship transfer checklists and are there records of STS operations maintained?

COMPETENCE

The Chief Officer should have all checklists involved with any ongoing STS operations, or past operations, completed and suitably filed.

The checklists should either be provided by the company as part of their SMS and if not, then those provided in the latest edition of the *OCIMF Ship to Ship Transfer Guide* should be copied and used.

They should be available for:

- Pre fixture information
- Prior operations commence
- Before run-in and mooring
- Prior cargo transfer
- Before unmooring.

Each question in the checklist must be answered correctly as errors will result in an observation.

8.81 If a ship-to-ship transfer was in progress during the inspection, was it conducted in accordance with the recommendations of the OCIMF/ICS STS Transfer Guide?

The Chief Officer should ensure that the cargo transfer plan covers all aspects of the operation and is in line with the latest edition of the *OCIMF Ship to Ship Transfer Guide*.

The Chief Officer must then ensure that all personnel involved with STS operations are fully briefed and supervised in accordance with the plan.

It is also strongly suggested the latest edition of the *OCIMF Ship to Ship Transfer Guide* is made available in the cargo control room.



Chapter 9.

Mooring

Mooring

Mooring is both vitally important in ensuring that a ship is safely tied up alongside, but is also a clear indicator of the standard of seamanship of those on board. Good records of all the mooring equipment is also an indicator of how well that equipment is maintained.

A good working knowledge of the publication MEG 4 is required and expected of all Deck Officers.

Mooring Equipment Documentation and Management

9.1 Are certificates available for all mooring lines and wires?

The Master should maintain a file containing certificates covering all mooring equipment including all mooring lines, tails and connecting shackles, including spares. Each mooring line, tail and connecting shackle certificate should also clearly identify the mooring winch that the equipment is fitted on and also the date of fitting. The company may provide their own proforma template to record this information.

9.2 Does the ship have a Mooring System Management Plan?

The company is to provide Mooring System Management Plan (MSMP) to the vessel, to ensure the mooring system is inspected, maintained and operated in accordance with the original design basis. The plan shall be ship- or operator-specific and may form part of the company SMS.

The Mooring System Management Plan Register (MSMPR) is part of the MSMP that stays with the ship throughout its life-cycle. All the relevant information covering the mooring equipment system should be retained, available onboard every ship and maintained as an accurate and up-to-date record, and readily available for inspection.

During the early days after implementation of this VIQ7 Edition, many vessels will not have such a plan but it is important due diligence has been carried out and where necessary mitigating measures have, where possible, been implemented as a result of a risk assessment – this can be achieved by being aware of all the new requirements in MEG4.

9.3 Does the ship have a Line Management Plan?

The Company should develop a programme for line maintenance, inspection, retirement and end-to-end policy (Refer to MEG4 Table 5.2).

This will reduce unnecessary degradation of the lines and ensure lines are operated within safety margins over their service life. Each type of mooring line will need different maintenance and inspection processes but the process for deciding on a safe discard criterion should be similar and based on manufacturer guidance and operational experience.

As a minimum, all vessels should now be recording line condition and maintenance and have procedures already in place to achieve monitoring, inspection criteria and intervals, time in use, allowable degradation and disposal. A spreadsheet is often used to record such information.

Note for 9.2 & 9.3: It is clear that in the initial stages of inspections using this new VIQ, most vessels will not have Mooring System or Line management plans in place. However, it is important that most vessels already have procedures and records in place as per SMS and PMS – thus it is just that these are not contained in the separate plans yet.

Examples include training requirements, risk assessments, hazard warning signs re: snap back zones, records of line inspections and inspection criteria, time in use and maintenance, PMS maintenance requirements/records, criteria for removing from service, line certification etc.

You must ensure Inspectors are made aware of all of this and that if they do record a negative remark it is essential they also note all the above that is positively done.

Information from the office regarding the status of providing such plans is disseminated and onboard. Vessels are not expected to have these onboard with all the required information at such an early stage.

Following is an extract from the MEG4 Introduction:

"If new build ships under construction or existing ships are unable to follow the recommendations of the MEG4, they should, as a minimum, develop a MSMP and LMP that will:

- Remain on the ship throughout its life as part of the management of change records;*
- Identify a timeline and measures needed to follow the recommendations of MEG4;*
- Detail interim measures taken to address the recommendations of MEG4, with reasons given for why the changes have not been implemented yet."*

As best practice, companies should provide vessels with information identifying progress and plans, including timelines where possible, regarding the completion of plans and should be fully available and provided to all vessels.

9.4 Have the operator's policies on line inspections, retirement and wear zone management been implemented as outlined in the Line Management Plan?

Company to develop a programme for line maintenance, inspection and retirement as per the latest MEG guidelines. This will reduce unnecessary degradation of the line and ensure lines are operated within safety margins over their service life.

The frequency of inspections should be clearly defined in the ship's LMP in accordance with the operator's overall planned maintenance policies. The frequency of inspections should be based on several factors such as mooring frequency, severity of loading conditions and consistency of line configuration. The company should work with line manufacturers when creating inspection procedures to make sure appropriate frequencies are chosen to suit their trading patterns.

Each mooring line and tail must be positively and permanently indicated so that it matches with the certificates as describe in 9.1 above. The company PMS or mooring procedures should identify when each component is inspected and the frequency at which this is done. Evidence of these inspections must be made available for the Inspector to sight.

An Inspector will record an observation if the ship's records indicate that the management of mooring lines is not as per the policy and/or schedule outlined in the line management plan.

9.5 Do all mooring lines and where fitted, mooring tails, meet industry guidelines?

The latest OCIMF Mooring Equipment Guideline (MEG) publication shall be used by both the Master and the company for ordering and providing the vessel with the correct sized mooring lines, tails and connecting shackles manufactured in the recommended materials.

Synthetic tails should have a TDBF 25-30% higher than the ship design minimum breaking load (MBL).

Mooring tails are normally 11-22m long and should be inspected before every use – record this inspection.

The inspection and retirement policy will be determined by current procedures and finally as per Line Management Plan.

MEG4 indicates destruction testing to satisfy and be able to determine if a tail has reached 75% of the ship design MBL. Common sense shows that this is impractical and often impossible to achieve.

Owners should endeavour to obtain this information from the manufacturer – e.g. how many hours in use until the rope tail reaches this 75% level.

However, steps can be taken and shown to be addressing this guidance whereby the company can arrange samples of tails of various ages in use and thus identify if 75% MBL has been reached. Such information and historical records can then be provided to vessels showing that 'X No. of hours' indicate a tail may be reaching time for replacement and that this has been reached by actual break tests. This will take time but awareness of the officers explaining this would be a positive best practice.

9.6 If one or more bow stoppers are fitted is a certificate attesting to the safe working load provided?

The Master's mooring certificate file, as referred to in 9.1 above, should also contain the following for the bow chain stopper/s (where fitted):

- (i) The manufacturer's type approval certificate – if available
- (ii) The certificate identifying the SWL
- (iii) Certificate attesting to the strength of the foundations and supporting structure
- (iv) Evidence of five-yearly periodic survey of the foundations and supports having being carried out. (Which might be found in the 5-yearly Class renewal documentation and checklists.)

The bow chain stopper/s shall be permanently marked (i.e. bead welded) with the SWL. For those bow chain stoppers not bead welded, the SWL should be stencilled or dot punched until such time the vessel is in a safe condition to permanently mark this figure. The use of stencils only to mark the SWL may result in a minor observation/comment.

The serial number must also be marked so it can be cross referenced to the certificate easily.

9.7 Is there a policy in place for the testing of winch brakes and are the results recorded?

The latest edition of the OCIMF MEG publication shall be used to identify and understand the methods used to test and set the mooring winches brake holding capacities (BHC). The BHC is the load at when the brake should just start to render and this must be 60% of the mooring line's MBL. The company PMS will identify when the BHC should be tested and the periods between testing should not be in excess of 12 months. The BHC must be stencilled on the mooring winch and the date when the test was carried out.

The Inspector will also wish to verify evidence that annual BHC tests have been conducted.

To ensure each time the brakes are applied to the correct torque equating to 60% of the mooring line's MBL, a permanent method of indication can be fitted such as a pointer to a fixed point. Some companies choose to provide their vessels with a torque wrench for this purpose, if this method is used the torque the brake is set at shall also be stencilled on the winches.

Mooring Procedures

9.8 Are moorings satisfactorily deployed and tended?

Care should be taken to ensure the mooring lines, tails and connecting shackles used in a group (i.e. headlines; spring lines or breast lines) are each of the same materials and MBLs. Mixed moorings will lead to an observation being raised. Mooring techniques as described in the latest OCIMF MEG publication shall be applied.

The mooring layout at some terminals may not be conducive to mooring schematics as outlined in the OCIMF MEG. In these cases the mooring technique used shall be decided and agreed between the vessel and the terminal. Irrespective of this, the mooring must be regularly tended.

Mooring areas are considered “Hazardous” areas and it is recommended such areas are marked to indicate this. Snap back zones should not be marked but all crew members must be aware of the dangers of snap back, and risk assessments and pre-mooring operations discussed and agreed.

Mooring decks can be marked to show these hazardous zones by the use of ropes, warning signs and barricades.

9.9 Are mooring lines secured to bitts and turned up correctly?

Mooring lines must NOT be turned up on a single bitt. Mooring lines must be turned up with one turn on the leading bitt before completing the process using figure of eight patterns.

On no account must mooring lines be left turned up on the warping drum (drum end).

9.10 Are all powered mooring lines correctly reeled on drums, secured on brakes and winches out of gear?

The latest OCIMF MEG publication shall be referred to ensure the mooring line is spooled on in the correct direction. Mooring lines that are spooled on in the wrong direction will severely reduce the brake’s effectiveness and for this reason will create an observation.

On completion of mooring the vessel and again after tending the moorings, the clutches must be disengaged and the securing pins replaced.

9.11 On split drum winches, are all the lines made fast with no more than one layer on each tension side of the drum?

On winches that have split drums, one drum acts as a storage drum while the other is the tension drum and this must have the appropriate number of turns. Details of the number of turns required can be determined from the Winch Operating manual provided by the manufacturer/yard. If this is not available then the company must provide guidance on the number of turns – this can be based on risk assessment or procedures. This information will in the near future be included in the Mooring Equipment and Line Management Plan detailed in MEG4.

If nothing is provided onboard to determine the number of turns on the split drum then the default setting will be no more than eight turns. Also note the installation of oversize ropes will also affect the number of turns possible to place on the split drum. Any additional layers will reduce the effectiveness of the brakes and will result with an observation being raised.

All crew members involved in mooring operations must be familiar with the correct use of the split drum and number of turns required.

9.12 If mooring tails are fitted to wires or HMSF lines, do they have proper connections and are they correctly fitted?

The connections, normally Tonsberg or Mandal, must be connected correctly to the mooring line and tail. The Tonsberg type has a straight pin where the tail shall be connected to, whereas the Mandal has a roller over the pin and the wire must be connected to this. The use of any other method to connect the mooring line to the tail is not recommended and will certainly raise an observation.

The eye of the tail should be protected by a suitable sheath.

9.13 Are all mooring lines stowed neatly to minimise tripping hazards and are mooring areas clear and unobstructed?

Good seamanship and housekeeping must be practised on completion of all mooring activities. Therefore, all loose mooring lines, heaving lines, stoppers, etc. must be neatly coiled, stowed and away from the working areas to minimise any tripping hazards.

Mooring Equipment

9.14 Are mooring winches, including winch foundations, in good order?

The mooring winches should be clean, well painted and free of any leakages. There should be no visible signs of movement of the winches around their foundations, this will be noticeable if any paint is cracked and there are signs of chafing along the flanges, such as metallic dust or rust.

9.15 Do brake linings, drums and pins appear to be in good order?

Even to the most casual observer worn brake linings are very evident. It is very important to renew winch brake linings before they become too worn. The vessel's trading pattern can dictate the wear on brake linings. Vessels on long-haul voyages do not use mooring equipment as frequently as those on coastal trades and therefore, the former vessel's brake linings do not require frequent replacing. Apart from visually observing the thickness of brake linings, another indication of wear of brake bands is the travel of the brake adjusting/tightening screw.

The Chief Officer will need to regularly inspect the mooring winches when the vessel is moored to establish the brake efficiency. Should any member of the mooring teams have any concerns regarding the brake ability they should report this to the Chief Officer.

This is a very frequent observation and it is recommended good procedures for inspection/maintenance are detailed in the PMS. It is recommended adequate spares are retained onboard with a pre-determined minimum stock level for repairs to brake linings are maintained at all times.

9.16 If mooring winches in a gas hazardous area are electrically powered, are motors Ex 'd' rated and have insulation tests been carried out and the results recorded?

Either the Master or Chief Engineer will have the appropriate documentation to demonstrate to the Inspector that, those vessels with electrically powered mooring winch motors are Ex 'd' rated. In addition, records to indicate routine insulation tests are carried out shall also be made available to the Inspector.

Check entry glands at wire entry for tightness and no deterioration. Insulation resistance should be measured and should be above 1 Megohm.

9.17 Are mooring wires, lines, synthetic tails and connecting apparatus in good order?

It is strongly suggested that the use of mooring lines with splices are completely avoided in preparation for an inspection. Any splices noted by the Inspector, and similarly broken wires will result with observations being made.

Any repairs/splices must be carried out by a competent person.

Mooring wires should be routinely lubricated but care should be taken that this is NOT excessive. It is preferable to use an environmentally friendly lubricant.

Regular inspections must be carried out on lines/tails and records kept.

9.18 Are pedestal fairleads, roller fairleads and other rollers well greased and free to turn and are bitts and chocks free of grooving?

The vessel's PMS should include a schedule of the regular lubricating and turning of each roller used for mooring operations and even those that are not routinely used. Hard to turn or seized rollers will result with an observation being raised. On occasion, chocks and fairleads may be cut and grooved by mooring wires. There is little the ship staff can do to rectify this until hot work can be carried out safely. If the vessel does have grooved chocks or fairleads ensure the company is aware and written evidence is available to show the Inspector this has been communicated to the company.

9.19 Is mooring equipment marked with its SWL?

Each fitting connected with mooring shall be permanently marked with the Safe Working Load (SWL). The most common method used is bead welding and this can only be carried out when the vessel is in a safe condition to do so. To avoid any confusion SWL should be indicated in tonnes (t). (kn is an acceptable alternative).

Anchoring Equipment

9.20 Are windlasses, anchors, locking bars and cables in good order and operating effectively?

The windlasses should be clean, well painted and free of any leakages. There should be no visible signs of movement of the winches around their foundations, this will be noticeable if any paint is cracked and signs of chafing along the flanges such as metallic dust or rust.

The Inspector will visually check each anchor for any obvious signs of damage and to see that it is firmly secured in the hawse pipe. He will also check the visible part of the anchor chain. Missing studs will result in an observation.

Brake linings will also be checked and excessive wear will result in an observation.

9.21 Except while alongside, when locking bars should be in place, were the anchors cleared and ready for immediate use during port entry?

The locking bar (guillotine) should be fully seated between two vertical cable chain links and not sitting on top of a vertical link. Unless advised by the terminal, anchors not in use should be ready for immediate use and secured with the brake and locking bar only. On no account should the anchor chains be lashed by wire slings or other methods to prevent its use.

9.22 Are bitter end securing arrangements unobstructed and outside the chain locker?

The bitter ends should be highlighted and a hammer readily available to allow release if need be. The hammer should also be highlighted "For Release of Bitter End". The bitter end may be secured by a locking pin and if such a pin is used, always ensure this is free to move and any split pins used shall also be in a condition that allows its quick removal.

9.23 Are the chain locker doors securely battened down?

As part of the preparations for putting to sea, the chain locker doors must be checked to ensure that they are firmly secured.

9.24 Is the crew aware of the design limitations of their anchor windlass and systems?

COMPETENCE

All staff involved in anchoring operations should be aware of the anchor windlass system limitation, contained in the manufacturer's design information and the classification certificate after the installation and testing on board.

Limiting factors include wind, current, sea state and water depth. The crew should be familiar with the OCIMF publication – *Anchoring systems and Procedures* – especially section 3.8.1.1.

Single Point Moorings

9.25 Is single point mooring (SPM) and associated equipment fitted to OCIMF recommendations?

The installation of the bow chain stopper and SPM mooring equipment is not in control of the ship staff and if this equipment is not as per the OCIMF recommendations in the MEG, the company should be informed. The ship staff should ensure that the locking bar of the bow chain stopper is free to move and the SWL is highlighted by bead welding. If the SWL is not bead welded, then stencilling of the SWL should be applied. Stencilling the SWL may raise an observation but it is better than not having anything and at least the SWL will be marked until the vessel is in a safe state to allow bead welding.

9.26 If the vessel is equipped for mooring at single point moorings, does it meet the recommendations as applicable, contained in Mooring Equipment Guidelines?

See the guidance as per 9.25 above and detailed inspector guidelines in VIQ 9.26.

9.27 If the vessel is fitted with a hydraulically operated bow stopper, are safeguards provided to prevent its accidental release?

Precautionary measures to prevent accidental use of a hydraulically operated bow chain stopper shall be implemented and the appropriate notices highlighting these measures should be posted. The person that accompanies the Inspector should be able to explain the precautions and safeguards if asked by the Inspector.

Emergency Towing Arrangements

9.28 Are emergency towing arrangements readily available for deployment at both ends of the vessel?

The forward emergency towing arrangement should be stowed in a state that allows for it to be deployed within 60 minutes. Therefore, any fittings used to secure the chain should be able to be immediately freed. Instructions (Ship Specific Emergency Towing Procedure Booklet) for deploying the forward emergency arrangement should be made available in the vicinity of where the chain is stowed, e.g. inside the forecastle entrance.

The aft emergency towing equipment shall be able to be deployed in 15 minutes by one person.

To ensure this, all moving parts of the securing system shall be maintained for immediate use. Instructions (Ship Specific Emergency Towing Procedure Booklet) for deploying the aft emergency arrangement should be made available in the vicinity of where the equipment is stowed.

9.29 Does the vessel have on board Emergency Towing Procedures?

The vessel requires a minimum of three (3) Ship Specific Emergency Towing Procedure Booklets. As mentioned in VIQ 9.29 one copy should be available at foc'sle space, CCR and bridge.

A stylized graphic of a globe, composed of several concentric blue circles and horizontal blue lines, creating a grid-like pattern. The graphic is positioned on the left side of the page, with the text overlaid on its lower portion.

Chapter 10.

Engine and Steering Compartments

Engine and Steering Compartments

Ship staff should bear in mind that the majority of Inspectors are not engineers and therefore, will strictly follow the guidance provided in the VIQ as they will not be fully familiar with the workings of the machinery spaces.

Therefore, the Engineers on board have a particular responsibility to ensure that the Inspector is recording his observations in the correct manner and is making the correct interpretations for what he sees.

Policies, Procedures and Documentation

10.1 Are Engineers aware of the procedures for safe operation of the machinery plant including their duties and watch standing instructions as per the Company SMS and are these instructions clearly defined?

COMPETENCE

The Inspector will verify that procedures for the following activities are available in the company SMS:

- Engine room organisation and operation
- Unmanned machinery spaces (UMS) operation, on applicable vessels
- Reporting of equipment deficiencies
- Engine room emergency preparedness and actions in the event of an emergency
- Ensuring all essential engine room equipment is available and fully operational
- Planned maintenance
- The control of spares.

Primarily, the Chief and 2nd Engineers must be able to demonstrate to the Inspector where these procedures are located in the company manuals. Similarly, if asked, the Watch-keeping Engineers should also be able to locate these procedures.

The duties of the Watch-keeping Engineers and ratings should be included in the company procedures and it is suggested to have these posted in a convenient position in the Engine Control Room (ECR). The watch-keeping hours of each Engineer and rating will also need to be posted. On occasion it may be necessary to man the machinery spaces on a six hours on and six hours off rotation. This rotation should be used with caution as this system does not comply with the latest requirements of STCW or MLC 2006.

10.2 If the machinery space is certified for unmanned operation (UMS) is it being safely operated in that mode without regular alarms occurring under normal conditions?

On vessels certified for UMS operation, the Inspector will check whether the vessel is operated in this mode without regular alarms occurring under normal conditions. If the vessel is not being operated in the UMS mode or when there were regular alarms occurring, the Inspector will wish to know the reason. If this is due to malfunctioning equipment or machinery then this may result in an observation.

The Chief Engineer must ensure that the reasons for keeping watches on a UMS vessel is clearly documented.

If watches are kept it is likely the Safe Manning Certificate is not complied with and additional personnel may have to be placed onboard – the office must be advised urgently as it will be necessary to obtain a Flag dispensation until such time as additional staff can be placed onboard.

10.3 Are Engineers demonstrating knowledge and understanding of the Chief Engineer's standing orders and instructions and are the standing orders posted and signed by all engineers?

COMPETENCE

Each Chief Engineer should have his own Standing Orders and instructions. These should include and complement the company's procedures and should be posted in the ECR. The Standing Orders shall be signed by each Watch-keeping Engineer during their familiarisation process upon joining the vessel. Chief Engineer can add as a final sentence to the Standing Orders – "Please sign below your understanding of these Standing Orders".

In addition to the Chief Engineer's Standing Orders, there should be "Night Orders". These can be written and issued on a daily basis and are used to provide additional instruction or advice which is not included within the Standing Orders. The Night Orders shall also be signed by the Watch-keeping Engineers. If the Chief Engineer feels it is necessary to issue Night Orders each evening and has no further advice or instruction to add, the following can be added – "Observe Chief Engineer's Standing Orders".

Night orders are not generally expected for vessels operating UMS.

Each new C/E must update and sign "Standing Orders" on joining the vessel.

The Inspectors like to see the Engineers' knowledge and understanding of the Chief Engineer's standing orders and instructions by asking several selected issues from the standing order. Therefore the Engineers must be very thorough with the content of the standing order. If in doubt, the Engineers must always make reference to the standing order.

10.4 Are the Engineers familiar with safe entry requirements to the machinery space when operating in the UMS mode, especially with regards to use of the dead man alarm where fitted?

COMPETENCE

If the machinery spaces are being operated in the UMS mode the Inspector will want to know the process that is followed when entering the engine room to carry out routine rounds (this question may also be put to a Deck Officer when the Inspector is on the bridge). The company should have procedures guiding the duty engineer to contact the bridge before entering the machinery spaces and then at predetermined intervals during the Engineer's time spent carrying out watch-keeping rounds and finally when returned to the accommodation.

If the machinery spaces are fitted with a dead man's alarm, the Duty Engineer may not be required to stay in regular contact with the bridge during the time spent in the engine room.

When machinery spaces are being operated in the UMS mode, ratings should not be allowed in these spaces and the Inspector should be advised accordingly if the question is asked.

The dead man alarm should be set for intervals not exceeding 30 minutes – the Inspector will check the period that the alarm timer is set for. The alarm will sound on the bridge and one or more of the public spaces in the accommodation. When in the machinery space, the Inspector may request to test the dead man alarm.

Safe entry requirements are to be clearly posted at the normally used entrance – this should also include clear statement to use the dead man alarm (if fitted) during rounds.

10.5 Are Engineers aware of the entries required in the engine room logbook, and are the entries clear, comprehensive and adequately maintained?

COMPETENCE

The working language on board should be specified in the logbook. The logbook should be kept in a clean state and signed daily by the Chief Engineer.

The Inspector will look for entries that must include:

- Bunkering or transfers of lubricating oil
- Times when UMS or manned
- Fuel and LO ROBs
- Change-over fuel / entering ECA
- Machinery operating parameters – rpm, load, temps, pressures
- C/E signatures – daily.

The Inspector will also check on how mistakes are dealt with. Any mistake should be crossed through with a single line, initialled and dated, “blanco, white out or tippex” MUST NOT be used. All logbook entries must be in ink.

Engineers should be aware of the entries required in the engine room log book, and should ensure all entries are clear, comprehensive and adequately maintained.

10.6 Can the engine room staff demonstrate full knowledge of essential emergency equipment and are instructions clearly posted on-site for safe operation?

COMPETENCE

Each engine room staff member shall be aware of the procedure that is in place for starting and safe operation of essential emergency equipment onboard.

Ship-specific procedures must be available to address:

- Regain power from the emergency to the main switchboard
- Charge the air receivers for the main diesel generators in order to provide electrical power to all auxiliaries (fuel and lube oil pumps and boiler supply)
- Restart of auxiliaries
- Restart main engine and boiler.

The posted procedure must be a precise step-by-step instruction to include each stage of the process to restore the vessel's power.

The use of photographs to supplement instructions is very beneficial and as a result, is considered best practice.

The Inspector will look for the instruction which should be clearly posted.

10.7 Does the operator subscribe to a fuel, lubricating and hydraulic oil testing programme on a frequency in accordance with the manufacturer's recommendations and are there procedures to act on these results?

The Inspector will check the results taken from in service lubricating and hydraulic oil systems, in addition to the analysis of fuel oils. The Inspector will also enquire as to which service provider conducts these tests and at what intervals these are done in accordance with the manufacturer's recommendations.

Any analysis which makes recommendations to address any results of such analysis must be sent to the vessel and implemented. The Inspector will expect to sight communications between the office/vessel.

The last set of results of sampling must be available onboard – very often observations are identified because of a lack of paperwork or late results. Very often samples cannot be sent due to the vessel port of call, thus planning when and where to send samples from is considered critical.

There should be procedures for dealing with the oil, based on the test result.

10.8 Are the vessel's staff engaged in bunkering operations well aware of safe transfer requirements and are detailed bunker transfer instructions available?

COMPETENCE

All staff involved in bunkering operations should be well aware of the safe transfer procedures.

The Inspector will wish to observe the company's bunkering procedures to ensure that all steps in the process are followed.

The company procedures should address those items listed in VIQ 10.8 and are expected to be implemented by the use of a checklist – check and use the one provided in the SMS.

If bunkering is taking place during the inspection, those persons taking part shall be concentrating on this transfer operation only and must not be distracted in their duties. They should have no other task to do.

Preparation for loading bunkers should include the following:

- A risk assessment
- Completion of the checklist as described above
- A loading plan that includes the duties of those taking part in the operation
- A check of the Work and Rest hours using a plan of hours expected for the operation
- A bunker pipeline diagram
- Material safety data sheets (MSDS) for the fuels being loaded.

It is recommended that the items mentioned above should be kept together in a single file and on completion of the operation the documents should be archived as records.

Those taking part in the bunkering process must be aware of the dangers of H₂S and benzene and the loading plan should state whether the bunkers being supplied need to be checked for H₂S and/or benzene. If found to be present, regular tests should be carried out.

Personnel should wear personal gas detection equipment.

During bunkering, tank lids and/or manhole covers must not be opened.

10.9 Are Engineers aware of the requirements for vessels operating within a ECA and are there clear procedures available regarding use of low-sulphur fuels in boilers, main plant and auxiliary engines?

COMPETENCE

All Engineers should be aware of the ECA requirement and the fuel changeover process detailed in the procedures. Changeover requirements must be included in the voyage plan.

Vessels operating in ECA areas must have documented evidence that boilers, main plant and auxiliary engines are capable to safely operate with low-sulphur fuels. The Master or the Chief Engineer should have a copy of this document in their possession, preferably both.

10.10 Are Engineers aware of the requirements and precautions necessary to control the change from residual to low-sulphur fuels and are these requirements posted?

COMPETENCE

Vessels operating in ECA areas will need to show to the Inspector the procedures for fuel changeover from residual fuels to low-sulphur fuels and back again, and these procedures are to be posted.

These procedures should also be complemented with a full risk assessment as this will show the Inspector the proactive approach being taken by the Engineers.

This would generally be covered by a HAZID provided by the company and it should include as part of the assessment for changeover:

- Fuel storage and handling
- Boilers including combustion control
- Main and aux. engines.

The procedures should include:

- When to initiate changeover taking safe navigation into account (passage plan note)
- Sequence of valve operations and cautionary notes
- Advice and guidance on associated issues as a result of changeover.

10.11 If the vessel is fitted with a Class-approved Exhaust Gas Cleaning System are the Officers well familiar with the system and safety requirements and are these documented?

COMPETENCE

All Engineers involved with exhaust gas cleaning systems should be able to describe to the Inspector the safe operation and safety requirements of the system. The Inspector will look at the records and see if the system is routinely tested in line with the safety requirements.

Safety guidance should be provided for the use of chemicals and any chemicals/compounds that may be produced as a result of the cleaning process.

Crew training should cover:

- Normal operation
- Use of chemicals
- Calibration of sensors
- Routine maintenance
- Procedures to reactivate a failed system
- PPE and MSDS
- Hazard identification (see VIQ 10.11 for notes).

Ideally this can benefit from a risk assessment.

Planned Maintenance

10.12 Are the Officers familiar with the PMS and is the system being followed and maintained up to date?

COMPETENCE

The Inspector will want to check if the Officers are familiar with the PMS system and whether the maintenance of vessel's machinery follows a planned schedule as in the PMS.

The upkeep of the PMS is the responsibility of the Chief Engineer. At some point during the inspection, generally after the Inspector has visited the machinery spaces, the Inspector will want to check what kind of system is being used – i.e. is it a paper- or a computer-based system?

The Chief Engineer will be required to demonstrate how the vessel's PMS operates and if all maintenance is up to date. If maintenance is not up to date and in line with the PMS, the Inspector will raise an observation or at least a comment.

Very often drydock/repair lists are asked to be seen to be provided by the PMS, inventory and minimum stock levels maintained. Comments in the PMS jobs such as "tested", "OK", "completed" etc. are considered inadequate and will result in an observation. More details of the work carried out must always be recorded.

It must also be noted that any "unplanned" maintenance should also be recorded in the PMS.

10.13 Is a ship-specific list of Critical equipment defined and available on board and highlighted in the PMS? Are there measures in place to ensure that defined critical spare parts are available on board?

The company should conduct a risk assessment to identify critical equipment and thus decide on a minimum level of critical spare parts.

This assessment should include consideration of manufacturers' recommendations, class requirements and redundancy factors of machinery. The list of ship-specific critical equipment is updated in the PMS.

When the Inspector is going through the PMS with the Chief Engineer he will ask questions about the vessel's critical spare parts inventory. The Inspector will expect to see the inventory up to date and determine how it is maintained at an expected level. It is expected that critical spare parts are always available on board.

On vessels where the pump room is fitted with a single extraction fan, it should be expected that the Inspector will check if there is a spare motor for the fan and it should be labelled as such.

Safety Management

10.14 Is an Engineer's call alarm fitted and is it in good order and tested regularly and the results recorded?

There are generally two Engineer's call alarms: one is manually operated and the second is operated when the vessel is operating in the UMS mode.

The Engineer's call alarm may be requested to be tested by the Inspector. However, if this test is requested, consideration should be given to any off-duty Engineers who may be resting and this should be brought to the Inspector's attention citing hours of work and rest as the reason to decline the request. There should be an entry in the logbook for each time the alarm is tested. This can then be shown to the Inspector as evidence of the tests being carried out.

The alarm may be tested if there are no watch keepers that are resting, however, before carrying out a test, a PA announcement should be made to inform all on board of the test.

10.15 Are all areas of the machinery space well illuminated, emergency escape routes clearly marked and unobstructed, and are ship's crew familiar with the escape routes?

COMPETENCE

Prior to any inspection, the Electrical Officer should check that all light fittings are working properly, including all emergency lighting. In addition, the glass covers or diffusers for all light fittings will need to be clean so no light is obscured. Poor lighting will raise an observation.

The direction to the emergency escape routes must be indicated by reflective signs. As good practice, the signs for emergency exits should be placed at eye level/or just above deck level. The emergency exit itself should be well lit and if it is an escape trunk, the lights must be switched on at all times and the doors positively closed by the door closures. The escape trunk should have a safety line and harness readily available for use, or fitted at the top of the trunk.

10.16 Are Engineers aware of the testing requirements and able to demonstrate familiarity with the procedure for testing of emergency equipment?

COMPETENCE

The Inspector will ask Engineers to explain the testing requirement and request to see records to verify that the following equipment, where fitted, have been routinely tested:

- Emergency fire pump
- Main fire and foam pumps – always ensure the foam pump can be turned by hand before the inspection
- Emergency air compressor (ensure the emergency air reservoir is at the required pressure)
- Emergency generator
- Emergency generator switchboard – the Inspector will wish to see there is no earth leakage
- Emergency steering system, emergency stops, Engineer's alarm and bilge ejectors.

The Inspector may request to see the emergency fire pump, emergency air compressor, emergency generator (NOT on load) and emergency steering being tested, in checking the familiarity of the engineers. Should any of the tests interfere with normal operations, the Inspector's request should be declined and the reasons explained.

10.17 Are Engineers aware of the operation of the machinery space liquid fuel system remote closing valves, and are the closing devices regularly tested and in good order?

COMPETENCE

Records to indicate that quick closing fuel valves are routinely tested will need to be provided to the Inspector. Under NO circumstances must quick closing valves be modified to prevent remote closing. If the quick closing system is operated by air, the air reservoir must be fully charged and similarly if hydraulically operated, the oil levels must be full. If remote closing is operated using wires, these must be without damaged strands and be well lubricated. The mechanism used for remote operation of quick closing valves must be identified at the release location.

The Inspector will check Engineers' awareness of the operation of the machinery space fuel system remote closing device.

The Inspector may request testing of the emergency generator quick closing valve where permitted.

Fire Fighting Equipment

10.18 Are Officers aware of the location of the accommodation and engine room ventilation fans emergency stops, are they clearly marked to indicate the spaces they serve and is there evidence of regular testing and maintenance?

COMPETENCE

The accommodation and engine room ventilation fan emergency stops will need to be clearly and prominently identified and marked to indicate the spaces they serve. The Inspector may ask Engineers to identify the locations of these stops so all Engineers should be aware of these locations. The Inspector will also wish to sight records that prove that the stops are tested on a regular basis. The frequency of testing should be stated in the vessel's PMS.

10.19 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?

High-pressure fuel lines such as those fitted between the main engine or diesel generator fuel pumps and injectors and boiler fuel oil pressure lines must have sheathed protection. The sheathed protection must be fitted the full length of the line and must be fully connected at the flanges. Flanges on fuel lines can be protected by a specially manufactured self-adhesive tape. In the event of any leakage, the leaking fuel may pass to a fuel pipe leakage tank or similar containment which has provision of a high-level alarm. The Inspector may request to test this alarm and also check records verifying that the alarm is routinely tested.

It is extremely important that main engine and diesel generator exhausts are shielded from any potential oil spray which could result in a fire. If the exhausts are not suitably shielded an observation will be raised.

Any oil leaks from fuel or lubricating oil systems will definitely be registered as an observation. In fact, any form of leak from any oil, steam or water system will usually result in an observation. Ensure that all leaks are rectified and evidence of any leak, no matter how small, is cleaned up. Oil-stained lagging will result in an observation and must be replaced prior to any inspection.

10.20 Are purifier rooms and fuel and lubricating oil handling areas ventilated and clean?

The fuel handling and transfer areas must be free of any leaks and oil staining. The areas that must be clean of any leakages or staining are the purifier rooms, oil spill containment areas around the service and settling tank drains, the transfer and sludge pumps.

10.21 If the vessel class notation allows UMS operation, are main engine bearing temperature monitors, or the crankcase oil mist detector, in good order?

If the main engine or main engines are fitted with an oil mist detector, the Inspector will ask for the unit to be tested and records should be available to indicate that these tests are routinely carried out. All bearing monitoring equipment for the main engine must be working and the engine room logbook will be reviewed by the Inspector and to check if there is any fault with the monitoring systems.

10.22 Where hydraulic aggregate pumps are located within the main engine compartment, is an oil mist detector fitted?

This question refers to hydraulic power packs that are situated in the machinery space and NOT those that are in their own dedicated compartments or rooms. Hydraulic power pack rooms are normally fitted with an oil mist detector or leak detector system.

For hydraulic power packs that share machinery space with the main engine and other forms of machinery, it is recommended that an oil mist detector is fitted particularly when operated in the UMS mode.

There is often incorrect interpretation of what constitutes a fully segregated compartment – it is one that prevents vapour/mist from easy reach of a hazardous space and ignition source.

- Any wire runs, kick pipes or other passes through a bulkhead, the space should be insulated by retardant putty or similar material
- Doors/hatches/wire runs need not be watertight.

10.23 Are the main switchboard, alternators and other electrical equipment satisfactorily protected from water spray?

For those machinery spaces that do not have an engine control room and in which the main switchboard is located in the open machinery space, there should be adequate protection for the switchboard to

ensure that any failure of water or oil pipeline systems does not result in spray on to the switchboard. Should a fire hydrant be located adjacent to the switchboard a deflector arrangement is suggested to be fitted that does not impede the fire hose or hydrant.

Best practice allows for mitigating measures be in place to prevent water splashing/spray on electrical switchboards.

10.24 Is deck insulation provided to the front and rear of medium power (i.e. 220V and above) electrical switchboards and is it in good order?

The front and rear of medium power switchboards that provide electrical power of 220 volts and upwards shall have insulation mats/gratings.

Note: starter boxes for individual machinery are not considered to require non conducting mats on the deck, etc.

Insulating matting used must confirm to EU standards IEC 61111:2009 or equivalent.

10.25 Are gauge glass closing devices on oil tanks of a self-closing, fail-safe type and not inhibited?

Fuel and all types of oil storage and service tanks that are fitted with gauge glasses must have self-closing devices fitted that should be in the closed position unless the level is being monitored with a member of the crew standing by. On no account must the self-closing device be left or modified to stay in the open position.

10.26 Are self-closing sounding devices to double-bottom tanks in good order and closed?

Sounding cocks for double bottoms are often found in the open position. They must be closed.

In general, there are two types of double-bottom sounding cocks. One is the type fitted with a spring to return the sounding cock to the closed position. Always ensure the spring is fitted and the operating handle is not latched open but closed under spring pressure. The other type of sounding cock is that which is fitted with a deadweight to ensure that it stays in the closed position. On occasion, these have been found with their deadweights removed or turned 90 degrees that allows the weight to drop leaving the cock in the open position.

Adapting machinery to work in a manner that it is NOT intended to simply to facilitate shortcuts reflects negatively on the working culture onboard, therefore, before any inspection all sounding cocks should be checked to ensure that the closing mechanism is functioning correctly and that all are in the closed position.

10.27 Is all moving machinery provided with effective guards and adequate eye protection available?

Where practical, all machinery drive shafts and couplings or other moving parts which present a hazard should have guards to prevent hands, fingers or rags being caught in the rotating elements and adequately fitted with eye protection cover.

Drilling machines, lathes, milling and grinding machines must have guards fitted in place and/or safety goggles readily available for use. The work rests for grinding machines shall be adjusted so that they are as close as possible to the grinding wheel without them touching each other. The same should be in place for those grinding machines fitted with wire brushes.

If a guard is missing, the piece of machinery must be isolated and not used until replacement is carried out.

10.28 Are records maintained for the regular inspection and testing of lifting devices and loose gear?

Records for regular inspection and testing of all lifting equipment – cranes, portable and beam chain blocks, pad eyes, lifting beams, etc.

Loose gear includes items such as chain blocks, hoists, strops, slings and shackles, chains, hooks, connecting links, turnbuckles, binders, sheave blocks and swivels.

Records shall be maintained by the Chief Engineer either in paper copy or within the vessel's electronic PMS system.

10.29 Are machinery spaces and steering compartments clean and free from obvious leaks and is the overall standard of housekeeping and fabric maintenance satisfactory?

The machinery spaces, including all areas contained within the machinery space such as steering gear compartments, store rooms, workshops, purifier and hydraulic rooms, etc. should be clean, well painted and free of leaks and spills.

Poor housekeeping will be seen as a reflection of a poor working culture and management on board. Safety notices/signs appropriate to the space must be seen to be in place. This applies to the entire vessel and not just the machinery spaces.

10.30 Is the bilge high-level alarm system regularly tested and are records maintained?

In preparation for the inspection all bilge alarms should be tested. The Inspector may randomly select one or more bilge well alarms to be tested. Ensure that all bilge high-level alarm tests are recorded in the logbook or other form of record book, or alternatively in the vessel's PMS records.

10.31 Are seawater pumps, sea chests and associated pipework in good order and free of hard rust and temporary repairs, particularly outboard of the ship-side valves?

The Inspector will look for temporary repairs on all parts of the seawater systems. Temporary repairs may, for example, take the form of rubber patches or bandages with hose clips, cement boxes or doubler plates. Attempts at disguising temporary repairs will rouse an Inspector's suspicions and any trust built up during the inspection will be lost.

Hard rust on the sea water chests, strainers boxes, flanges and pipework will indicate advanced corrosion and will certainly result in an observation.

Every effort must be made to repair any leaking pipes prior to an inspection. This observation generally results in a ship not being acceptable until the repair is carried out.

Machinery Status

10.32 Are the following, where applicable, all in good order and do they appear to be well maintained?

Main Engine

The Chief Engineer is responsible for ensuring that the main engine is not disabled for maintenance while alongside, unless there is written agreement from the terminal. Verbal agreement is NOT acceptable.

The main engine shall be free of oil leaks and run-down stains; similarly there should be no water leaks or evidence of any arrangement of hoses and buckets to collect any leakages.

Main engine exhaust leaks are clearly evident and little can be done to correct these due to the nature of the work involved.

Machinery spaces should be clear of any leakages and when this is not possible it is perhaps best brought to the Inspector's attention by the Engineers themselves.

Generators

Load sharing of generators should generally be set to automatic and not manual; it is also prudent to have instructions posted on how to manually put the generators on load, to run them in parallel to each other and to take them off load in preparation for shutting down the unit.

Any request from the Inspector to trip a generator should be politely declined as this will affect the operation of the vessel. The logbook or PMS records should have evidence proving that the generator trips including reverse power trips are routinely tested.

Boilers

Boilers that have the option to be run on automatic should always be on the automatic mode. Where boilers have the option to operate in the automatic mode but are unable to do so there should always be a member of the engine room staff present to operate the controls and constantly monitor all boiler operations.

The boilers should be free of steam, water and exhaust leaks.

The boiler water levels should be clearly observed through the gauge glasses, if these are illuminated, the light fittings should be in place and the bulbs working. The remote operating levers or wires for the gauge glasses must be connected. It is good operational practice NOT to rely on remote boiler water level gauge glasses.

The boilers must not be emitting any excessive smoke.

Air Compressors

These should be clean dry and free of any air, water or oil leaks. If any drains are venting then the ship's staff should be prepared to explain to the Inspector why. The emergency air compressor, either hand-operated or power driven, will require to be tested to satisfy the Inspector of its operational status.

Purifiers and Fuel Oil-handling Systems

The purifier room or space is a location where any oil leaks noted by the Inspector will result in an observation. Ensure that all fuel- and oil-handling areas are clean and leak free. This includes all piping systems, bulkheads and the areas under the gratings. Open containers of cleaning liquids and oily rags should not be present as these will also result in an observation.

Inert gas plant, including fans, scrubber, O₂ analyser and valves

The IGS will be visually inspected by the Inspector.

Records will be required to be made available so the Inspector can verify that all trips are routinely tested. It is advised that calibration records of the Oxygen analyser are posted and also available at the analyser's location.

There should be no gas leaks. If the inert gas is located in its own compartment, the Inspector may look for an O₂ analyser for that space.

Sewage Plant

The sewage plant should be operational and in the auto mode where applicable. The raw sewage overboard must be closed and directed to a sewage holding tank. In keeping with all systems, it should be leak-free.

Bilge pumping arrangements and the oily water separator

Strictly follow the guidance provided in Chapter 6 and specifically in 6.14 to 6.19.

Pipework, including steam, fuel, lubricating oil, seawater, sewage, drain and air pipes, etc

Ideally all pipework should be well painted and colour coded for the systems they each serve. Any noticeable leaks or temporary repairs will result in observations. Any effort made to disguise leaks or temporary repairs will result in losing the trust of the Inspector.

Pipework that is lagged (thermally insulated) particularly for any exhaust systems shall be in very good condition, as missing lagging is considered a source of ignition.

Any lagging on pipework for fuel oil systems should not be soaked with oil and should be clean and free of any staining. If the lagging is simply stained with oil from leakage that has been repaired then painting the lagging should be considered.

Refrigeration and air conditioning machinery

In warm climates any lack of air conditioning, whether by choice or mechanical breakdown, will be seen as a safety concern. Lack of adequate air conditioning will be considered unsafe, as this encourages portholes and doors to be left open.

Insulated pipeline systems should have their lagging intact.

Care must be taken to maintain the vessel's cold rooms and freezers at the correct temperatures and it is recommended that each temperature read-out is indicated with the desired temperature range.

Hydraulic Aggregate Pumps (Power Packs)

Areas around the hydraulic aggregate pumps, including their prime movers, must be clean, leak-free and dry. Pay particular attention that hearing protection is worn in this area.

Ventilation Fans and Trunkings

Ensure all ventilation fans are running unless climatic conditions (extreme cold) dictate otherwise. Should there be any dampers fitted, ensure that these are free to move and the open/close directions are indicated.

Engine rooms are designed to operate with their hatch cover (skylight) closed and with all ventilation fans (supply and extraction) operating fully. The opening of the hatch in hot climates may aid the cooling of the machinery space but this will result in an observation.

Stern Tube Sealing Arrangements

The Inspector will look at the stern tube area to identify if there is any leakage. If there is any leakage there is little, if anything, that the ship staff can do to remedy this apart from informing the company and demonstrate to the Inspector that the office has been advised. Verbal evidence will not be sufficient so proof of email correspondence will need to be available. The Inspector may look at the high and low stern tube oil tanks for signs of discolouration that may indicate sea water contamination and/or a stern tube leak.

All machinery including stand-by machinery

It goes without saying but all machinery and systems must be kept leak-free, clean, well painted and fully operational.

Burners, tubes, uptakes, exhaust manifolds and spark arrestors (if fitted)

There must not be any form of spark emissions from the funnel while the vessel is alongside and no soot blowing should be conducted while in port. Ensure logbook entries of soot blowing are entered prior to port entry and after departure. In addition, the Inspector will wish to see procedures within the company SMS that state this.

10.33 Are Engineers familiar with the procedure for taking over the controls for manoeuvring the vessel from the bridge in an emergency?**COMPETENCE**

At the main engine emergency control location there should be clear and precise instructions posted on how to change over the manoeuvring to the emergency mode. The periodical testing of the main engine emergency manoeuvring shall be in line with the PMS and records of tests should be maintained in the logbook (or other).

This includes testing the communications systems between locations.

10.34 Are Officers fully familiar with all starting procedures for the emergency generator and are these procedures clearly and displayed?**COMPETENCE**

Procedures to start the emergency generator shall be written in a simple step-by-step process and posted. The procedures must include each method of starting the emergency generator and written in languages understood by all on board.

If the emergency diesel generator has just one method of starting, e.g. batteries, then a spare starter motor must be available.

The emergency diesel generator will be required to be started in the presence of the Inspector using all methods that can be used to start the generator. Any failure to start the emergency generator will result in a high-risk observation. The Inspector may request the most junior member of the ship staff present to start the generator.

Any request from the Inspector to put the emergency diesel generator on load must be politely refused.

10.35 Is the emergency generator reserve fuel tank provided with sufficient fuel?

The emergency diesel generator shall be capable of operating on full load for 18 hours, the fuel content required to operate for this length of time should be indicated on the fuel tank gauge. This does not necessarily mean a full tank but it is strongly suggested to ensure that the tank is full to avoid any misunderstandings by the Inspector.

If the fuel gauge is of the variety that has self-closing shut-off cocks these will be tested for positive closure. In addition, the fuel tank quick closing valve will also be tested by the Inspector. The release mechanism for this shall be in a separate location and its purpose indicated – once tested the quick closing valve should be reset.

10.36 Where an emergency generator is not fitted, are engine room emergency batteries in good order and fully charged?

Emergency batteries installed instead of an emergency generator shall be fully charged and a record maintained of the charge. It should be noted that, particularly if questioned by the Inspector, the duration of the batteries on load is a minimum of 18 hours.

If batteries are of the non-sealed type which requires topping up with distilled water and their specific gravity checked with a hydrometer, then the appropriate PPE, including eye washes, should be readily available for use.

10.37 Is all electrical equipment including junction boxes and cable runs in good order?

Ensure all cables are properly secured and none are hanging loose. All connections entering or leaving junction boxes are intact, tight, properly sealed and not loosely fitted. All junction, fuse and switch boxes should be closed and should not have any means of temporary cooling arrangements rigged, such as temporary air trunking, as this will indicate overheating and a safety hazard.

10.38 Are switchboards free of significant earth faults?

The Inspector will look for any earth faults and will ask for the earth leakage meters (or in some cases lights) to be tested to identify if there is a low resistance. The most desirable reading is infinity on both the high- and low-voltage circuits. Not less than five megohms should be aimed for. A low resistance on the high-voltage system can be serious and the Inspector may record this as an observation and would be considered to be high risk.

As most of the accommodation and domestic power is served from the low-voltage system, this can be the cause of earth faults and a low megohm reading – two megohm – is considered acceptable. One megohm is the lowest reading acceptable to Class.

The Electrician should ensure that no earth leakage exists before the inspection as this is an easy observation for an Inspector to make.

Steering Compartment

10.39 Are the Officers aware of the test requirements for the steering gear both pre-departure and for emergency steering drills and have these tests been conducted satisfactorily with operating instructions clearly posted?

COMPETENCE

It is expected that all Officers are aware of the test requirements for the steering gear both pre-departure and for emergency steering drills.

These tests must be done within 12 hours of departure. For testing requirements – please refer to the list in VIQ7 10.39 (These are as per SOLAS requirements which should be clearly known.)

As a minimum, emergency steering drills shall be carried out at intervals NOT exceeding three months. Records of these drills shall be available in either one or both, the logbook and PMS, and should be available for the Inspector to sight.

The operating and changeover instructions must be posted both on the bridge and locally at the steering gear. The instructions shall be user friendly and easily understood. Regular training must be carried out to ensure that all personnel and not just the Engineers, are fully familiar with change over and the operation of the steering gear in all modes. This training must also be recorded.

The Inspector will request any one of the Engineers present to change over and operate the steering gear in the emergency mode. Therefore, it is recommended that only Engineers are present at this stage of the inspection. Any demonstration of change-over should come across as being a well-practised activity conducted by a well-trained crew.

10.40 Is the steering gear emergency reserve tank fully charged?

The content of the emergency oil tank required to fully charge one system should be indicated on the reserve oil tank gauge. This does not necessarily mean a full tank but it is strongly suggested to ensure that the tank is full to avoid any misunderstandings by the Inspector.

10.41 Are the arrangements for the provision of communications with the wheelhouse and heading and rudder indication in good order?

Vessels fitted with a compass repeater in the steering gear compartment, should ensure that the compass repeater is aligned with that on the bridge. This should be checked at the end of each watch and UMS period as best practice.

During the Inspector's time spent on the bridge, a note will be made of the compass reading and this will be used to check the repeater in the steering gear compartment. This alignment check should be

carried out on a routine basis and particularly before an inspection of any kind. Communications tests must also be verified.

The steering compartment shall also have a means of communication with the bridge. It is recommended that the method of communication, e.g. telephone, can reach the emergency steering position.

During the testing of the emergency steering gear, which the Inspector will witness, a check will also be made to verify that the communications between the steering compartment and bridge are functioning correctly. This check should also be made when preparing for an inspection and during all emergency steering drills.

The rudder angle indicator will need to be checked for alignment with the indicator on the bridge. This check should also be made when preparing for an inspection and during all emergency steering drills.

10.42 Is access to steering gear unobstructed?

The walkway leading to the steering gear must be clear of any obstructions and be clearly marked. There shall be no loose gear on the route or around the steering gear.

10.43 Is the steering compartment fitted with suitable handrails, gratings or other non-slip surfaces?

The steering gear machinery and controls shall be clearly marked and allow for working access. These arrangements should include non-slip surfaces and handrails. The non-slip surface can be gratings (not wooden slat type) or paint that has grit or similar substance added to it to prevent slipping if coated with hydraulic oil. If non-slip paint is used, all new coats of paint will need to be of the non-slip type otherwise the walk way will lose its non-slip properties.

The entire steering gear should be surrounded with handrails. In addition it is suggested to have a set of handrails provided alongside the walkway to the steering gear and control location.

Note: 10.43 does not apply to vessels of less than 10,000gt built before 1 July 1986.

10.44 Are Officers and crew aware of the safe operating requirements of any watertight doors fitted?

COMPETENCE

Doors referred to here include:

- watertight doors
- side scuttles
- valves and closing mechanisms scuppers
- ash chutes
- rubbish chutes.

Officers and crew shall be familiar with the safe operating requirement of watertight doors. The Inspector will visually check the watertight doors and seals in good condition and capable of being securely closed and easily opened, any significant deterioration or defect may result with an observation.

Drills are to be carried out and recorded weekly. In ships where a voyage exceeds one week, a complete drill must be held prior to departure and then at weekly intervals.

LNG Bunkering Operations

10.45 Are detailed LNG bunkering and fuel-handling instructions/manual available?

The ship's SMS should include detailed guidelines and instructions as well as checklists covering the planning, pre-bunkering, bunkering and post-bunkering stages of the operation including a suitably detailed fuel handling manual. (IGF 18.2.3)

Note: Guidelines/instructions should include gas-up, cool-down, loading, vapour management, tank management, gas freeing and purging operations. The guidelines/instructions should also include gas hazard zones and an appropriate risk assessment.

The following issues should be addressed:

- Bunkering equipment – emergency release and risks posed connecting/disconnecting
- Communications methods
- Mooring assessment, emergency departure
- Agreement of line cool down
- Line draining and N₂ purging procedures
- Agreed tank pressure control
- Ships side protection against leaks
- STS and pre bunkering checklists
- Agreed transfer and topping off rates
- Manning arrangement, deck and CCR
- Adequate lighting.

10.46 Are risk assessments for LNG bunkering completed and available?

A risk assessment shall be conducted to ensure that risks arising from the use of low-flashpoint fuels affecting persons on board, the environment, the structural strength or the integrity of the ship are addressed.

Consideration shall be given to the hazards associated with physical layout, operation and maintenance, following any reasonably foreseeable failure.

The risks shall be analysed using acceptable and recognised risk-analysis techniques, and loss of function, component damage, fire, explosion and electric shock shall as a minimum be considered. The analysis shall ensure that risks are eliminated wherever possible. Risks which cannot be eliminated shall be mitigated as necessary.

Details of risks, and the means by which they are mitigated, shall be documented to the satisfaction of the Administration.

10.47 Are pre-bunkering checklists and verifications appropriately completed and carried out?

Records and documentation for LNG bunkering in either electronic or hard copy form should be available for review.

Prior to conducting bunkering operations, pre-bunkering verification including, but not limited to the following:

- Communications methods, ship/shore link if fitted
- Operation of fixed gas and fire detection equipment

- Operations of remote controlled valves and:
 - inspection of hoses and couplings
 - Calculation of temp, volume, vapour pressure, tanks transfer details

... shall be carried out and documented in the bunker safety checklist.

Verification shall be indicated by the mutually agreed and executed bunkering safety checklist signed by both Persons in Charge (PICs).

10.48 Does the vessel have appropriate emergency response plan and PPE relevant to LNG bunker operations?

The ship shall be provided with suitable emergency procedures. (IGF 18.2.4)

All staff engaged in duties or working in the vicinity of the operations shall wear appropriate personal protective equipment.

10.49 Does the vessel have an established emergency bunkering shut-down procedure which is agreed upon with the personnel from the supply facility and is tested prior commencement of operations?

The fuel handling manual should be familiar to all involved in the bunkering operation.

The shut-down procedure must be tested prior to operations starting. This must be logged.

Audible and visual alarms used for gas detection must be tested and records maintained.

10.50 Is information on loading limitations for the LNG fuel tanks available?

COMPETENCE

A loading limit curve must be readily available and understood by Officers involved in the operation.

10.51 Are the appropriate ships personnel trained and certified in bunkering operations involving LNG as a marine fuel?

COMPETENCE

Seafarers on board ships using gases or other low-flashpoint fuels shall have completed training to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up.

Records of training and certification must be available and maintained by the Master taking into account the provisions given in the STCW Convention and Code, as amended. (IGF 19.2)

The ship's guidelines should specify a dedicated PIC.

10.52 Are visible means provided to restrict access to the bunker manifold area during operations?

Warning signs shall be posted at the access points to the bunkering area listing fire safety precautions during fuel transfer (IGF 18.4.6.1)

During the transfer operation, personnel in the bunkering manifold area shall be limited to essential staff only.

10.53 Are permanent fixed gas detection and alarms fitted at appropriate LNG bunkering manifold and vent areas and other required locations?

Bunkering stations that are not located on open deck shall be suitably ventilated to ensure that any vapour being released during bunkering operations will be removed outside.

Audible and visible alarms from the gas detection equipment shall be located on the navigation bridge or in the continuously manned central control station.

10.54 Are appropriate cryogenic spill protection measures tested and deployed?


Protection should be provided wherever any spillage of cryogenic material or contact between cold bunker hoses/pipes and carbon steel structures could occur. These systems may be either active or passive, and include for example, water curtains (active), drip trays (passive) and insulating blankets (passive).

Cryogenic protection systems, such as water curtains and insulating blankets, should be maintained and tested as part of the planned maintenance system (*SGMF Safety Guidelines*).

Vessel's LNG bunkering stations/manifolds shall be adequately protected against spills.

Drip trays:

- Should be fitted in areas where spills can cause damage to the structure
- Made of suitable material and thermally insulated
- Fitted with a drain valve
- Have a capacity to address the max spill identified in the risk assessment.

A stylized graphic of a globe, composed of several overlapping circles and horizontal lines, creating a grid-like pattern. The lines are a light blue color, and the overall shape is a large circle that is partially cut off by the right edge of the frame.

Chapter 11.

General Appearance and Condition

General Appearance and Condition

A clean and well-painted vessel will provide the Inspector with a good first impression of the vessel and will show that those on board and in the company take pride in the vessel's appearance. This will also include verifying the health and hygiene including sanitation onboard is to the required and expected standards. The Master and Senior Officers must be familiarised with the requirements for winterisation of their ship.

Hull, Superstructure and External Weather Decks

11.1 Is the general condition, visual appearance and cleanliness of the hull satisfactory?

When approaching the vessel, the Inspector will be checking to see the hull coating does not suffer from excessive breakdown, the amount of marine growth and for any oil staining. Any oil staining observed along the ship's side or from any over-boards will raise concerns and suspicions.

The assessment of coatings will be based on guidance given in Resolution MSC.261 (84) – the vessel should request a copy if there is not one onboard.

The Inspector will scrutinise the ORB (Part II) to ascertain if any record has been made of the loss of containment of cargo. If there has been a loss of containment then this will raise an observation and if a loss of containment is not entered in the ORB Part II this will result in a high-risk observation.

If the vessel has passed through water in daylight that may have been contaminated by oil, an entry must be made in the deck logbook and also any messages to and from the company concerning this should be made available for the Inspector.

11.2 Are hull markings clearly indicated and correctly placed?

The vessel's marking must be both permanently indicated and be in a location that is clearly visible. Efforts should be made to ensure these markings are clearly painted and clean.

It is known today that it is nearly impossible to get permission to paint over the side, and efforts made re: requests to the Harbour authorities – it is recommended these are recorded onboard as evidence of the efforts made to do this maintenance work.

11.3 Is the general condition, visual appearance and cleanliness of the weather decks satisfactory and are deck working areas clearly identified and provided with non-slip surfaces?

There are, of course, times due to the seasons or the waters and weather the vessel trades in when external maintenance cannot be carried out and this should be explained to the Inspector.

The Inspector will, however, commence the inspection as soon as the vessel is seen. It cannot be emphasised enough that every opportunity should be taken to present the vessel in a clean and well-painted state. In addition to this, no loose, unused items, tripping hazards or oily decks should be present.

Again, a clean and well-painted vessel provides a good first impression and you DO NOT get a second chance to create that.

Deck areas around mooring equipment, and where operations will require the mooring teams to work, shall be coated with a non-slip material. In addition, consideration should be given to coating external steps on ladders with a non-slip material.

11.4 Is the general condition of service pipework satisfactory and is it free from significant corrosion and pitting and soft patches or other temporary repairs?

The Inspector will look closely at all external pipeline arrangements and systems. The Inspector will be looking at the condition that will include signs of excessive rusting and corrosion wastage, temporary soft patch repairs and any other form of repair. If there are any temporary repairs it would be advisable to be truthful to the Inspector if asked. If the Inspector is advised that there are no temporary repairs and they are found to exist, then any trust built up between the Inspector and ship's staff will be lost.

Special attention will be paid to the undersides of pipework – an area often neglected during onboard inspections. Sliding feet on pipelines will also be another point to view and confirm that they are working as they should.

11.5 Are pipe stands, clamps, supports and expansion arrangements satisfactory?

The Inspector will also look closely at pipeline supports, brackets, mounting pads and expansion pieces for corrosion wastage etc. as described in 11.4. The Inspector will also look to ensure, that bonding straps or wires, if fitted, are properly connected and intact.

Ensure there is a maintenance plan in place to ascertain the condition of piping in these areas.

11.6 Are all deck openings, including watertight doors, bridge windows and portholes, in good order and capable of being properly secured?

Ensure all deck openings such as manholes, inspection covers, watertight doors, bridge windows and ports are each in good condition and/or capable of being securely closed and easily opened.

11.7 Are fuel, ballast and other space vents and air pipes in good order and does visual evidence indicate regular maintenance?

All air pipes and vent heads should be checked under the supervision of the Chief Officer. All closing devices should be operating correctly and flame screens must be intact and should not be painted over.

Vent heads should be regularly dismantled to check the condition and records available to verify this. Vents and airpipes must be marked to indicate the space they serve.

Note: Ballast tanks vents are not required to have flame screens fitted.

11.8 Is the general condition, visual appearance and cleanliness of the superstructure satisfactory?

The vessel's external condition should be clean and well painted. There are occasions when weather and sea conditions will not allow external painting and cleaning and if the external areas require attention and maintenance this should be explained to the Inspector. Soot staining and rust run down do not provide a good appearance. Clean and well-painted surface areas will give the Inspector a good impression of the vessel.

Vessels appear to be reluctant to wash down and clean the accommodation and decks today – doing this prior to entry is a recommended best practice. The use of environmentally friendly detergents are also seen as a bonus.

The monkey island may get special attention so ensure the following are checked and maintained properly:

- Mast stays and securing
- Magnetic compass binnacle – clean, light operational
- Aerials and supporting brackets and connections.

Electrical Equipment

11.9 Are the deck lights all operational and sufficient in number and range to illuminate the deck to facilitate safe working during darkness?

The Electrician must check all deck lights are operational and sufficient in number and range to illuminate the deck. To maintain the condition, carry out good housekeeping through the keeping of all light covers and diffusers clean inside and out, and free of paint.

The Inspector is likely to check them to ensure they all work and there are no significant earths on the switchboard.

11.10 Is the general condition of electrical equipment, including conduits and wiring, satisfactory?

The Electrician must routinely check all lighting and ensure that connections are water-tight without any deterioration of insulation or sealing arrangements. It is also advisable to clearly identify the emergency lighting by either clearly stencilling their purpose or painting the fitting red – not the diffuser.

11.11 Are light fittings in gas-hazardous areas Ex 'd' rated and in good order?

Certificates or letters of approval, confirming that the various light fittings and appliances are intrinsically safe and Ex 'd' rated should be kept in a suitable location and presented to the Inspector if there is any doubt about the equipment's integrity in gas hazardous areas.

All Ex 'd' rated lighting and fittings must be kept free of damage such as cracks in metals or glass, broken seals and incomplete securing arrangements – i.e. all bolts fitted. The cable connections must be kept well sealed and without any damaged insulation.

For vessels fitted with cargo pump rooms, routines must be regularly carried out to ensure that securing arrangements for all light fittings are intact. A common observation is for loose or missing securing screws. The Electrician should be proactive to ensure all Ex 'd' rated lights and equipment are well maintained and their integrity is kept intact.

Records of lighting checks (checklists) should be made available if asked.

Internal Spaces

11.12 Are forecastle stores free of water, internal spaces and storerooms clean, free from debris and tidy?

All passages and alleyways must be kept clean, should not be obstructed and should be well lit. Ensure all accessible stores and rooms are clean and well lit. Garbage bins should be kept empty and any content secure and stowed in a tidy manner.

Do not allow the Inspector to enter the forecastle stores without first ensuring the ventilation is running. The forecastle stores must be clean, dry and well lit. Always check that any hatches leading to the space are securely closed and no light is passing through.

Any equipment stowed in the forecastle space will need to be firmly secured.

Accommodation Areas

11.13 Are accommodation, public spaces, sanitary areas, food store handling spaces, refrigerated spaces, galleys and pantries well illuminated, clean, tidy, in a hygienic condition and obstruction free?

All alleyways should be clean, unobstructed, dry and hazard-free.

The spaces should be seen as clean without overflowing ashtrays and garbage bins (made from non-inflammable material).

Ship staff should avoid sitting in the common spaces in working clothes as it leads to an unfavourable impression of not taking any pride in the vessel.

The public toilets should all be clean and fully operational with clean towels.

The pantries, galley and food store handling areas MUST be well illuminated, clean, tidy, hygienic and obstruction-free. The galley staff will need to be familiar with the locations of the first aid kit, fire blanket and extinguishers, supply and exhaust fan stops and the fire alarm activation points. If provided, deep-fat fryers should have an operational thermostat with high temperature cut-out; galley staff must be knowledgeable of the extinguishing system fitted.

Fridges and freezers must be kept at the correct temperatures, food management uses the first in first out procedure. No out-of-date food should be kept.

Food is not to be stored on the decks in freezers but on gratings, the required height above decks. The decks must be clean and the drain free of material.

The galley staff must be in the appropriate safety footwear and clothes. In addition, the Inspector will wish to ensure that the "trapped-in alarms" in the refrigeration rooms are working fully – records of testing the alarms must be kept and available.

The Inspector will check the area of the extractor fans for oily and greasy deposits so ensure that these are clean and dry. All light fittings shall be clean and the lighting bright so all routes and areas are visible.

If the Inspector accepts a meal onboard during the inspection, ensure that the mess-man/steward is dressed in clean uniform.

11.14 Are laundries free of accumulations of clothing that could constitute a fire hazard?

Ensure that the laundries are clean and that the garbage bins are not overflowing. Clothing should not be lying around such that it is seen as a fire hazard. Those vessels that are provided with tumble driers should check the filters and dispose any lint that may have accumulated.

It is recommended such spaces are covered by fixed fire detection systems.

11.15 If fitted, is the ship's hospital clean and tidy and ready for use?

If the vessel is provided with a hospital it must be ready for immediate use. In many cases the hospital is kept locked in port, if this is the case then the location of the key should be clearly posted on the hospital door.

It must not be used as a spare cabin or as a store room.

The Inspector will also need to look in the hospital, which must be clean and tidy with clean bed linen and towels available.

If oxygen or resuscitation equipment is provided it must be well secured and available for immediate use.


The medical locker must have a record of all medical supplies available and all medicines and bandages must be in-date. A record should also exist of when any medicine or medical treatment has been administered.

11.16 Is the condition of electrical equipment in the accommodation satisfactory?

All light fittings should be intact with covers and/or diffusers securely in place without any hanging cables or exposed wiring.

11.17 Are personnel alarms in refrigerated spaces in good order and operational?

As mentioned in 11.13, the Inspector will require the alarms in all refrigerated spaces to be tested. The galley staff must test this in preparation for the inspection.

A stylized graphic of a globe, composed of blue lines forming a grid of latitude and longitude. The globe is partially visible, with the right side cut off by the edge of the frame. It is positioned in the upper right quadrant of the page.

Chapter 12.

Ice Operations

Ice Operations

This chapter is only applicable to those vessels issued with an Ice Class Notation, a valid Winterisation Certificate or Polar Ship Certificate.

Note: Severe sub-zero temperatures are defined as forecast daily mean ambient temperatures below -15°C.

It is recommended that Officers are aware of the POLAR Code and the OCIMF publication "The Use of Large Tankers in Seasonal First Year Ice and Severe Sub -Zero conditions"

12.1 Are procedures available for operations in ice or Polar Waters?

For vessels with an Ice Class Notation or a Winterisation Certificate, the company shall have issued and provided the vessel with operational procedures. If operating in Polar Waters – a Polar Water Operational Manual (PWOM) approved by Class must be provided. The Master and other Officers on board should be familiar with all procedures.

- It is recommended that the procedures should state that a Risk Assessment will be required to be carried out prior entry and operation in ice. Vessels that have already operated in these conditions should retain evidence of the Risk Assessments that have been done to demonstrate to the Inspector that procedures have been followed.
- The vessel's particulars for operating in ice should include equipment such as heated P/V valves, heated ballast tank vents, etc.
- The vessel's Classification Society certificates on board will identify the limitations to its ice class notation such as for example Class 1A, Class 1B, etc. These limitations will vary between Classification Societies so the Master ought to be familiar with the vessel's own.
- The procedures shall also provide guidance on loading methods and the limitations involved when operating in severe cold weather.
- Limitations concerning stress and stability should be available in the Class-approved manual.
- Vessels operating in severe sub-zero conditions will require contingency plans that may vary from those when a vessel is operating in warmer climates.
- If there is a spill while operating in severe sub-zero conditions the oil spilled will behave in a different manner than when in warmer climates. The company's oil spill response plans should provide appropriate guidance on managing spills in sub-zero conditions.
- Procedures should be provided by the company for maintaining regular checks on the integrity of the hull. This may include, amongst others, regular checks to be carried out on the ballast tank levels.
- The Master should be aware of the company's procedures when being assisted by ice breakers.
- The company's procedures should provide guidance for situations when the vessel may be towed or if the vessel is to perform a tow.
- Escorted and convoy operations with ice breakers.
- Passage planning when operating in ice will vary from normal. The intended operations and conditions must be taken into consideration when planning the voyage.
- The ship staff must be aware of the precautions to be taken in severe sub-zero temperatures which may include, as an example, operating deck machinery to prevent it becoming frozen and other external systems, use of correct PPE, work and rest hours limitations due to the low temperatures and the effects of hypothermia.
- The bridge manning levels may also need to be increased.
- Communications and navigation capabilities in high latitudes.
- Arrangements for receiving forecasts / ice information.

12.2 Are means in place to detect ice?

Methods to detect ice vary and these will need to be provided by the company and may include ice-free searchlights on each bridge wing using either a 2kW halogen or 1kW xenon lamps.

If a visual forward lookout is utilised, the appropriate cold weather gear must be provided and worn. Another method of detection is a 12-bit processor ice radar, the function of which should be known and demonstrated to the Inspector.

12.3 Are systems in place for the routine receipt of navigational, meteorological and environmental data including ice data, ice charts and satellite images?

The company should provide guidance and/or systems to receive the latest meteorological and navigational information. The receipt of this information along with ice charts or whatever data is arranged for and received will need to be provided to the Inspector by the Master or Bridge Watch-keeping Officers.

12.4 Has training specifically addressing navigation in ice or polar waters been provided to members of the vessel's complement in accordance with STCW Section A-V/4?

COMPETENCE

The Inspector will ask to see evidence that the appropriate navigation-in-ice training or polar waters has been received by the Master and Bridge Watch-keeping Officers. This training can be a formal course, in house or onboard training and the regulated use of CBT. Therefore, certificates for this training will need to be available. If the training is conducted either by video or computer-based training (CBT), it is advisable for the Inspector to be shown the particular training type if asked.

12.5 Are means in place on at least one main engine sea water chest to prevent its freezing or clogging?

The vessel should have a means of preventing at least one of the sea chests from choking/clogging up with ice. The method the vessel has been designed with will be one or more of the following:

- Recirculation of sea water
- Steam injection
- Compressed air injection
- Hot water injection.

12.6 Are procedures available for operations in sub-zero temperatures?

Procedures and equipment shall be provided by the company to ensure ship-staff are protected against severe weather while carrying out their duties and during their off-duty time. These should include the following and be known to the Master:

- Cold weather clothing and alteration of routine watch keeping duties
- A suitable means of ensuring that the accommodation is heated
- External access around the vessel can include grit or sand on the decks
- Severe weather protection against freezing of navigational equipment and maintaining a good look-out. To combat the latter some vessels may have enclosed bridge wings to protect the look out and navigational equipment
- The Master should know what procedures are in place to ensure critical firefighting and life-saving equipment remains readily available for use

- The Master and Chief Officer will need to be able to explain to the Inspector the procedures that are in place for cargo and ballast handling in severe weather conditions
- Means to remove or prevent ice and snow accretion around hatches and doors.

12.7 Are means and/or procedures in place to protect personnel from exposure to sub-zero temperatures?

The Master and Senior Officers should be aware of, and be able to demonstrate, knowledge of the procedures and cold weather clothing that is available to keep the gangway and bridge wing watch-keepers suitably protected from severe weather.

Work routines must be carefully managed.

12.8 Are means provided to maintain accommodation spaces at a temperature suitable for habitation?

The Master will need to provide the Inspector with the details of how the vessel's accommodation is heated e.g. warm air, hot water, electric, etc.

Guidance can also be found in MLC guideline B3.1.3 – Heating.

12.9 Are means and procedures in place to ensure safe access and movement about the vessel in sub-zero conditions?

The vessel will require a means to allow freedom of movement around the external areas. Methods that will have to be explained to the Inspector will include the provision of wooden mallets, grit, sand and, if provided, heated handrails and stairs.

12.10 Are means in place to prevent the icing of wheelhouse windows?

The means of maintaining the wheelhouse windows ice free will need to be explained to the Inspector by the Master or Bridge Watch-keeping Officers. These may be heated windows or heated blowers.

12.11 Are radars fitted that are of a type classed as being suitable for operation in sub-zero temperatures?

The Master will need to have to hand the radars antennae manuals and be able to quote from the specification section. If the specification section states the antennae operates to IEC 60945 then this will identify they are able to operate within the -25°C to +55°C range.

Best practice would allow for the operation temperature ranges to be clearly stated and displayed.

12.12 Are means and/or procedures in place to ensure that air driven whistles and fog horns are operable at sub-zero temperatures?

The Inspector will ask for information on the means and/or procedures that are used to ensure that the air-whistle and fog horns remain operational in severe weather.

12.13 Are means and/or procedures in place to ensure the operability of critical equipment and systems in sub-zero air temperatures?

Procedures should be in place in preparation for entering severe weather areas. These will include the fuels and lube oils used for the emergency generator (these normally have a heater in the sump) and lifeboat engines. Consideration should be given to referring to these procedures in the Risk Assessment.

12.14 Are means and/or procedures in place aimed at ensuring the ready availability of life-saving appliances?

Procedures will need to be in place to ensure life-saving appliances are readily available. Those on board shall need to be aware of the following:

- The thermal protective aids and immersions suits should be stored to allow ease of access in case they are needed
- Escape routes are accessible and safe
- The Engineers must ensure suitable fuel and lube oils are used in the lifeboat engines, and if provided engine heating systems are fully operative
- Lifeboat water containers must be removed to a location where the contents will not freeze. All on board must be aware of the location of these containers and should know their duties to collect the water in the event of need.

Included within the Risk Assessment, as mentioned in 12.1, should be a reference to ensuring the lifeboats and launching equipment are maintained in a manner to allow release. To assist, a wooden mallet should be available to hand. Door seals are of high importance, too.

12.15 Are means and/or procedures in place aimed at ensuring the operability of firefighting systems?

It is of extreme importance that all external fire mains are drained well before entering into severe weather conditions. The company procedures should clearly identify this in an effort to prevent freezing and pipeline damage.

Similarly, fire extinguishers normally positioned where their contents may freeze shall be relocated to an area that is unlikely to be exposed to freezing temperatures.

Fire mains should be drained from the lowest point and drain valve closed. The location of the drain valve must be recorded and all staff aware of its location.

Regularly check and operate valves to verify operational.

The Master or Chief Officer should be able to explain these procedures and precautions that are taken to prevent the freezing of critical firefighting equipment.

12.16 Are means and/or procedures in place to ensure the proper functioning of air intakes and fire flaps?

Severe cold weather procedures will also contain guidance to ensure that fire flaps and air intakes remain operational and the Master or other Senior Officers should be aware of what these are.

12.17 Are means and/or procedures in place to protect piping systems on deck from the risk of freezing?

A Risk Assessment will identify what activities are taken to ensure procedures are carried out to prevent freezing of deck pipe line systems and the Master and other Officers will need to be aware of any precautions to take and be able to explain these to the Inspector.

12.18 Are means and/or procedures in place to ensure the operability of ballast systems and any drenching systems at sea temperatures of -2°C and sub-zero air temperatures?

The Master and Chief Officer, as a minimum, shall need to be aware of the company procedures and the means to prevent ballast water from freezing, particularly when loading cargoes that are at sub-zero temperatures.

Methods may include heating, bubbling or ballast water exchange.

12.19 Are means or procedures in place to prevent the icing up of cargo tank primary and secondary venting arrangements?

It is extremely important for the Master and Deck Officers to be aware of the procedures and methods used to ensure that the cargo tank protection systems are kept functional.

The cargo tank protection systems will include P/V valves, IGS deck water seals (normally heated) and liquid P/V breaker that will have an anti-freeze agent added.

If no heating is provided, frequent operational checks must be carried out and flow rates confirmed in deck water seals.

12.20 Are means and/or procedures in place to prevent the icing up of air pipes to settling and service tanks required for the operation of the main propulsion plant and essential auxiliaries?

There should either be a method of ensuring air pipes for the fuel oil service and the fuel oil settling tanks are prevented from icing up, or a procedure to follow. The Chief Engineer should know the methods that are used as the Inspector will want to know.

12.21 Has training specifically addressing operations in sub-zero temperatures and/or Polar water area and PWOM been provided to the vessel's complement?

The Inspector will verify that the Officers and crew have received appropriate training for operations in ice and therefore, certificates for such training will need to be made available to the Inspector. If the training is conducted by video or computer-based training (CBT) then it is advisable that the Inspector is shown the particular training type. Refer to comments made in 12.4.

A stylized graphic of a globe, composed of several overlapping circles and horizontal lines, creating a grid-like pattern. The lines are a light blue color, and the overall shape is a large circle that is partially cut off by the right edge of the frame.

Inspection Close-out Meeting

Inspection Close-out Meeting

Note: The management team must be aware of the Conduct of Inspections advised in Section 4 of the VIQ.

It is also recommended that the vessel takes photographs to identify any observation where it is practical to do so. These can be provided to the company and thus assist in their response to the final SIRE report.

The close-out meeting is an extremely important and perhaps the most critical part of the SIRE inspection and should be attended by both the Master and Chief Engineer as a minimum and preferable by all four Senior Officers.

A polite and professional attitude is expected at all times (this includes the inspector) and during all discussions on the observations ensure the VIQ and the guidance is referred to at all times.

Language and culture differences can lead to mis-interpretations – it is important these are clarified at the time.

Should the closing meeting or any part of the inspection not comply with the guidance given here on in the VIQ it is important to call and discuss with the company.

The close-out meeting is the time when any observations made by the Inspector can be described, discussed and accurately explained, which in some cases may result in observations being amended or deleted. It is not unusual that the Inspector's interpretation of an answer provided by the accompanying Officer, to either not be fully understood or be misunderstood by the Inspector and discussions during the close-out meeting can remove any doubt or misunderstandings.

In general, the Inspectors should be following the guidance notes in the VIQ and not offering their own personal opinion of subjective comment.

Not all oil majors allow their Inspectors to provide a list of observations. Therefore, notes should be carefully written as a reminder of the full list of observations and of any observations that may have been discussed. This will help the Master and Chief Engineer to accurately report back to the company.

It is common for some observations reported by the Inspector to be corrected at the time of the inspection. This does not mean the observation will be deleted from the eventual SIRE report. The observation should state what was observed and corrected at the time of the inspection. The company will still be required to provide a full response to the initial observation.

Inspectors are not always correct and the observations they make should have a reference point, i.e. based on the SIRE-VIQ, ISGOTT, MARPOL, SOLAS, CDI-SIR etc. The Inspector can be challenged without being argumentative particularly if an observation is identified as being the Inspector's opinion or supposition and not taken from one or more of the aforementioned reference points. The Inspector must provide objective evidence for any noted observation.

The Inspector must also record when actions have been taken by the vessel during the inspection.

If the Inspector has not included evidence which supports the VIQ question fully you must ensure he does this – for example the Line Management Plan might not be completed yet but there are already many other procedures and records in place and that the officer are familiar with the requirement – these must be recorded. If the Inspector does not want to record anything – then you must.

The vessel's Master must not be afraid to write comments on the list discussed by the inspector – if you do not agree with the observation you must clearly state this and why.

Once you have signed the document you are accepting the contents as being correct.

The close-out meeting should be carried out in an amicable manner. If the close-out meeting is not considered to have been carried out correctly and the Inspector has been considered to be unreasonable, not followed the VIQ guidance and issued observations you can clearly identify, with evidence, as being incorrect – it is critical you advise the office immediately so they can contact the inspecting member and if required delay the issue of the report and investigate any concerns.

On completion of the inspection and close-out meeting the Inspector should be safely escorted to the vessel's access point (gangway).

The communication between the inspector and vessel ends here. Any further communication for clarification will be managed by the commissioning member.

The Master should then complete and submit the INTERTANKO Inspector Feedback Form. If this is not available on board, the company should be requested to forward the form to the vessel.

INTERTANKO Vetting Inspection Feedback Form

As mentioned in the introduction to this publication, INTERTANKO has provided a means of reporting Inspector behaviour in a confidential manner, this to ensure continuous improvement of ship inspections and inspection procedures.

The reporting system has been developed in an electronic format, see opposite, which allows the reports to be submitted directly into a database. In view of the confidential nature of this system, a username and password, which can be obtained from INTERTANKO, is required to upload reports – email **marine@INTERTANKO.com** to obtain said username and password.

Part 1 - Commercial Vetting Inspection

Scope & Purpose:

The scope of this feedback form is to supply confidential information to INTERTANKO for statistical purposes which will allow the vetting committee to continue to produce graphical data for improving Commercial Ship Vetting Inspections. This information will be shared with the OCIMF compliance manager on a confidential basis as necessary.

Date of Inspection	<input type="text"/>	Oil or Chemical Company	<input type="text"/>
Name of Inspector	<input type="text"/>	Inspector Accreditation Number	<input type="text"/>
Total Time of Inspection	Hours <input type="text"/> Mins <input type="text"/>	Time Spent Discussing Observations	Hours <input type="text"/> Mins <input type="text"/>
Name of Vessel	<input type="text"/>	Vessel IMO Number	<input type="text"/>
Owner / Technical Manager	<input type="text"/>	Name of Port	<input type="text"/>

Master Comments

Did the inspector introduce himself to the Master or the Master's authorized daputy, explain and agree the order in which the inspection was to be carried out, prior to commencement of the inspection?	<input type="radio"/> Yes <input type="radio"/> No
Did the inspector conduct himself in a professional manner?	<input type="radio"/> Yes <input type="radio"/> No
Did the inspector wear appropriate Personal Protective Equipment?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Was the inspector polite to all staff and show due respect for the Master's position?	<input type="radio"/> Yes <input type="radio"/> No
Did the inspector use or attempt to use any electrical or electronic equipment of non-approved type in the gas-hazardous area?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Did the inspector carefully consider and provide a proper response to every question?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Did the inspector identify objective evidence when answering each question?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Was a close out meeting held and did the inspector discuss each observation raised and provide necessary references to support the observations prior to leaving the vessel?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Did the inspector explain in factual terms the basis for any observation without use of opinions or subjective comments during inspection?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Was an indication of the vessels acceptability or non-acceptability provided by the inspector at any time during his attendance onboard?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Did the inspector leave a written list of his observations onboard, prior to leaving the vessel?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Did the inspector any time during his attendance, act unethically or indicate that an observation could be overlooked in return for financial or other reward?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A

Owner Concluding Comments

Did the inspector raise any observations at the debriefing meeting that were not discussed on-site during the course of the inspection?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
In the event that the inspecting Company's policy is NOT to leave a written list of observations, did the inspector fully discuss his inspection findings with the Master prior to departure and did the inspection report submitted to SIRE broadly agree with the verbal de-briefing?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A

Other Notes



ISO 9001:2008
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