

**02. Bridge Watch Keeping**

- .1 Introduction**
- .2 Objectives**
- .3 Responsibilities of the officer of the watch:**
- .4 Handing over / Taking over a navigational watch**
- .5 Composition of the navigational watch:**
- .6 Need to maintain the continuity in watch keeping**
- .7 Fitness for duty and fatigue**
- .8 'Checks' on navigational status**
- .9 Ocean passage**
- .10 Coastal passage and congested waters**
- .11 Vessel arriving port**
- .12 Rounds in accommodation and on deck**
- .13 The bridge team**

**(SAQ – Self Assessment Questions)**

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**.1 Introduction:**

Various aspects of bridge watch keeping were covered in Module 2155. In this module, we shall go through a few more steps to understand the process.

**.2 Objectives**

- **Establish watch keeping arrangements and procedures:**
- **Understand Responsibilities of the officer of the watch in all waters**
- **Composition of the navigational watch:**

**.3 Responsibilities of the officer of the watch:**

**To understand the following:**

- 1: Need to maintain continuity of the watch
- 2: Calling the relief
- 3: Fitness for duty
- 4: Key elements of Handing/Taking over the navigation watch
- 5: Carry out 'Checks' on navigational status,
- 6: Planning ahead for eventualities during the watch

- 7: Be prepared to take appropriate action
- 8: Vessel arriving port
- 9: Need to take rounds in accommodation and on deck

Under the STCW you are primarily responsible at all times for the safe navigation of the ship with particular regards to avoidance of collision and stranding.

As master's representative, you are in charge of the bridge and therefore in charge of the bridge team, until you are properly relieved. You must ensure strict compliance with:

- Company's shipboard operational procedure pertaining to the navigational watchkeeping or bridge procedures.
- Master's Standing Orders.
- Maintaining a Safe Manning Level for bridge watch at all times for the prevailing circumstances and conditions.

*Wrong actions on your part could be detrimental to the safety of life property and protection of environment. It is imperative that you fulfil your duties to best of your ability.*

For maintaining a safe watch, you must keep in mind the three letters **ASK**:

**A** for attitude,

**S** for skill, and

**K** for knowledge.

Accident statistics indicate that the majority collisions and grounding incidents are attributed to **carelessness or a complacent attitude** and **not due to lack of knowledge and skill**.

Upon departure from a port, when the vessel reaches deep and safe waters, a course is set and engines brought to maximum revolutions. The Master writes down his instructions in the bridge order book or advises verbally when he needs to be called. He then hands over the watch to the Officer in-charge of the navigational watch (OOW).

The OOW, having assisted the Master/Pilot to navigate through the narrow channels or confined waters of the port, now has the duty to

- ☆ Inform Port Control VTS pilot disembarked
- ☆ Plot the position at the start of the sea passage,
- ☆ Bring the distance measuring log in operation and confirm its reading and input,
- ☆ Verify the ship's intended track,

- ☆ Verify errors of gyro and magnetic compass and adjust the course being steered. (This is then marked on the course board).
- ☆ Recheck on the readiness of vessel for sea including :
  - a) Securing of cargo gear,
  - b) Battening down of hatches,
  - c) Closing down of water tight doors
  - d) Lowering of flags,
  - e) Securing of pilot ladder, anchors, gangway, any loose ropes hanging overside or any other loose items on deck.

Though these processes should have been completed prior sailing, the same need to be checked again and a positive report about such securing obtained and entered in the log.

When satisfied, the OOW shall inform the Master and take over the watch.

At sea, the vessel is operational throughout the day and night. The vessel is navigated in accordance with the requirements of the planned passage. The OOW maintains the navigational watch during his hours of duty as per watchkeeping arrangement established by the Master. A series of activities are carried out during each watch.

#### **.4 Handing over / Taking over a navigational watch**

At the end of the watch, the OOW hands over the navigation of the vessel to the relieving officer.

Handing/Taking over a navigational watch is of great importance. This is an appropriate time to check:

- ☆ The position,
- ☆ Set due to current and the wind,
- ☆ Weather and visibility,
- ☆ Course and speed,
- ☆ Errors on the compasses,
- ☆ Status of the navigational equipment, and
- ☆ The traffic in the area.

Such checks allow correction to prevent continuation of any error. It also requires that the watch keepers should also check that:

- ☆ The vessel is following the planned passage,
- ☆ All the risks have been recognised and the preventive measures are being taken and

- ☆ The equipment is functioning normally.

### **Key Elements.**

As stated earlier, maintenance of continuity is paramount. The changing over of watch is an opportune time to check all aspects of navigation and to ensure that no errors or omissions are being carried over.

The errors or omissions though not intentional could cause serious consequences and therefore need a closer review. The types of errors or omissions that have been made are:

- Ambiguity in position fixes due to error in the plotting methods;
- Position fixes from various sources not matching
- Position fixes being obtained from only one source and not being verified by other navigational aids,
- Charted depths not matching with the obtained soundings.
- Error on equipment, such as error of compass, being wrongly applied, etc.

The watch-keeping officer may carry on with these errors without realising the same. This is the reason that the relieving officer is required to review the status all over again.

These errors are not figments of imaginations. An officer laid a course on the chart as  $256^{\circ}$  but set the autopilot to  $265^{\circ}$ . The error was observed only at the handing over process.

### **Distractions could be caused due to**

- Workload, stress or fatigue
- Unexpected VHF call which occupies the full attention of the OOW and results in the exclusion of more urgent needs
- Unexpected calls from engine room,
- Inadequacy and confusion due to lack of experience
- These errors, if not rectified in time, could result in formation of an error chain. An effective way to detect an error is by cross checks. Error thus detected can be eliminated. The effective time to correct such errors is at the time of handing over / taking over watch as the crosschecks can now be carried out by a second person.

Check on errors are traditionally explained as ' a stitch in time saves nine' or " but for the horse shoe nail the battle was lost"

This process of error proliferation occurs every day and some times it is fatal.

The key elements to successful handing / taking over and to reduce possibility of errors therefore are:

- Carry out 'Checks' on navigational status,
- "Plan' for eventualities during the watch, and
- 'Be Prepared' for taking appropriate action.

**Process of handing / taking over a watch**

1. Receive true course, gyro course and compass course from the outgoing OOW.
2. Ensure helmsman /lookout is capable of carrying out his duty and has taken over duty properly.
3. Read, understand and sign the Master's standing instructions and daily orders.
4. Check the ship's position, planned course and course being steered by gyro and magnetic compass. Ensure the course board is updated with current courses.
5. Check error on compass and that it is being applied correctly
6. Verify the speed and draught of the ship. Ensure present draft is prominently displayed on the draft board
7. Observe prevailing weather and sea condition, visibility, sea-state, tides and their effect on present course
8. Understand the operational status of all navigation equipment
9. Be aware of the presence and movement of all traffic in vicinity
10. Be aware of conditions and hazards likely to be encountered during the watch
11. Be aware of the effects of heel, trim, water density and squat on under keel clearance
12. Understand the state of internal ship systems, engine and cargo monitoring, communications and crew availability
13. Ensure that the required lookout and helmsman, as appropriate, are on duty, alert and properly instructed.
14. Obtain from outgoing OOW verbal instructions, if any, and occurrences of importance during previous watch.
15. Read log entries made by outgoing OOW
16. Take full charge of the watch on time

17. If at any time the OOW is to be relieved when a manoeuvre or other action to avoid any hazard is taking place, the relief of that officer shall be deferred until such action has been completed.
18. Obtain a positive report about rounds made in accommodation, remote areas and where necessary, on deck.

Read the log entries made at the end of watch by OOW, copy them in your technical journal and explain them.

**.5 Composition of the navigational watch:**

An effective bridge organization should efficiently manage all resources available to the bridge and promote good communications and teamwork. The bridge organization should be properly supported by a clear navigation policy incorporating shipboard operation procedures, in accordance with the company's safety management system onboard ship as required by the ISM code.

In determining that the composition of navigational watch is adequate to ensure maintenance of a proper lookout, you should consider relevant factors including the following:

- ◆ Visibility, state of weather and sea;
- ◆ Traffic density and other activities occurring in the area in which the ship is navigating
- ◆ The additional workload caused by the nature of the ship's functions, immediate operating requirements and anticipated manoeuvres;
- ◆ The fitness for duty of any crewmembers on call that are assigned as members of the watch.
- ◆ Knowledge of and confidence in the professional competence of the ship's officers and crew.
- ◆ The experience of each OOW, and the familiarity of the OOW with the ship's equipment, procedures and manoeuvring capability.
- ◆ Activities taking place on board the ship at any particular time, including radio communication activities, and the availability of assistance to be summoned immediately to the bridge when necessary.
- ◆ The operational status of bridge instrumentation and controls, including alarm systems.

- ◆ Rudder and propeller control and ship manoeuvring characteristics.
- ◆ The size of the ship and the field of vision available from the conning position;
- ◆ The configuration of the bridge, to the extent such configuration might inhibit a member of the watch from detecting by sight or hearing any external development.
- ◆ Any other relevant standard, procedure or guidance relating to watch-keeping arrangements and fitness for duty.

#### **.6 Need to maintain the continuity in watch keeping**

In the performance of his duties, the OOW carries out a number of functions almost simultaneously. This naturally keeps him quite busy. Let us list out the number of tasks / functions that demand his attention. The Master being the overall in charge needs to be kept informed of progress of the voyage. The information that is required by the Master is normally recorded as standing orders or the specific orders in Bridge Order book or on some ships called Bridge Night order book.

#### **Navigational safety of the vessel requires that**

- ☆ The position is monitored at all times,
- ☆ The navigation instruments are working satisfactorily,
- ☆ Appropriate lookout is maintained,
- ☆ The pre-planned course is actually made good.

#### **Maintenance of internal security requires that**

- ☆ The safety of the crew is ensured,
- ☆ General fire watch is maintained,
- ☆ Engine room is kept informed of any changes

#### **Safety of the cargo requires that**

- ☆ The hatches, tanks and openings are secured weather tight,
- ☆ Ventilation is provided where required,
- ☆ The deck cargo, where carried, is secured properly.

#### **General safety of the vessel requires that**

- ☆ Weather watch is maintained,
- ☆ Where necessary, precautions against wet weather, rolling or pitching, are taken in sufficient time so as not to cause damage to persons, the ship or the cargo

### **Attend to information external to the ship including**

- ☆ Navigational warnings,
- ☆ Latest weather reports,
- ☆ Communications with charterers, owners, other vessels in vicinity, VTS, port control, pilots etc.

### **Records to be maintained**

Some of the orders may be of lasting importance and need to be noted in the bridge order book. For example, maintaining a minimum specified safe distance from all traffic during a passage across ocean.

Orders / Information of current importance may only be marked as annotations on the chart or may be passed on verbally. These may include the times of calling the master at course alteration points The OOW needs to be aware of such orders / information.

### **Changes of status**

Monitoring the changes in situation as the status of the situation may be different towards the end of a watch from what it was at the start of the watch. The changes in such situation may include

- ☆ Change in draft due to ballast / deballast operation,
- ☆ Changes in course, deviation to another port,
- ☆ Change in the errors on navigational equipment,
- ☆ Change in weather,
- ☆ Change in movement of vessels in vicinity, etc.

The relieving OOW should be familiar with these changes. All the aspects need to be watched and cared for by every watchkeeping officer, irrespective of his rank or experience. There is therefore a need to maintain continuity in the watch. This can be achieved only by ensuring that a proper handing/ taking over process is followed.

### **Calling the relief**

The standby man on the bridge calls the relief. On most of the ships it is done on the internal telephone. Where it is necessary to send the standby man, the OOW should ensure that it is safe to do so.

In order to provide the relieving officer sufficient time to freshen up and be ready, the time of calling is normally decided among the watchkeepers. Where there is any doubt, it should be clarified before the relief goes to sleep.

Where necessary, follow up calls should be made for heavy sleepers and the relief should be informed of a change in weather conditions so

that he arrives prepared with raincoat or dons warm clothing accordingly.

**Remember :**

Weather changes in some areas of the world can be quite dramatic and the person sleeping in his cabin would be unaware of the same. The relieving OOW should arrive early on the bridge in order to:

- a). Read, understand and sign the Master's night orders,
- b). Sight the chart for any annotations,
- c). Inquire about any verbal orders, and
- d). In general, get used to the bridge situation.

**At night, the watch shall not be taken over till the relieving OOW gets used to night vision.**

**STCW<sup>95</sup> requires that the relieving officer shall personally satisfy himself regarding:**

- Standing orders and other special instructions of the Master relating to navigation of the ship;
- Position, course, speed and draught of the ship;
- Prevailing and predicted tides, currents, weather, visibility and the effect of these factors upon course and speed;
- Procedures for the use of main engines to manoeuvre when the main engines are on bridge control; and
- Ensure his watchkeeping team is fit and capable of performing the watch.

**.7 Fitness for duty and fatigue**

It is a well-known fact that prolonged mental and physical activity or inadequate rest can induce fatigue. Fatigue causes an individual to become so tired that he is unable to carry out his duties efficiently. The danger of mental fatigue is that it can creep up on individuals without them being aware of it. Consequently, an individual may focus attention only on what he considers important whereas other peripheral warnings may go unnoticed. This is a dangerous situation particularly where the task on hand demands added vigilance.

On specialised cargo carriers, prolonged hours of work is a common phenomenon. Masters many times alter the conventional watch keeping hours in order to provide sufficient rest to the watchkeepers and provide a change in routine.

**In order to maintain fitness for duty the administration and the management company should:**

1. Establish and enforce rest periods for watchkeeping personnel;
2. Require that watch systems be so arranged that the efficiency of all watchkeeping personnel be not impaired by fatigue and that duties are so organised that the first watch at the commencement of a voyage and subsequent relieving watches are sufficiently rested and otherwise fit for duty.

Note the words "**at the commencement of the voyage.**" Very often the entire ship's complement, including officers and other watch keepers, are busy in completing cargo operations and other essential tasks before sailing. The Master may therefore specifically rest some of the officers and watch keepers so that they can keep watch immediately on sailing.

**Fitness of relief watch**

When handing over the watch, it is imperative that the OOW ensures that the relieving officer and members of his team are in complete fitness and are capable of performing the navigational watch at sea.

In this regard, the officer in charge of the navigational watch shall not hand over the watch to the relieving officer if there are reasons to believe that the latter is not capable of carrying out the watchkeeping duties effectively. In such case the Master shall be notified.

*This is not as easy as it sounds. If the relieving officer is your senior, you may have to use some tact to ensure that he goes back to sleep and the Master makes some other arrangements.*

The relieving officer shall ensure that the members of the relieving watch are fully capable of performing their duties. Whenever there is any doubt the Master shall be notified. Particular attention shall be given to the **adjustment of night vision** of the relieving team. Relieving officers shall not take over the watch until their vision is fully adjusted to the light conditions.

**.8 'Checks' on navigational status**

In order to perform efficient checks on the navigational status of the vessel the OOW should report to bridge about 15 minutes before commencement of watch and check the navigational situation including, but not limited to the following:

1. **Inspect the chart to ensure:**
  - a) Appropriate scale in use
  - b) Charts in use are corrected up to date,

- c) Inspect and actually verify the course/s laid;
  - d) Verify the previous positions marked on the chart and ascertain the course and speed being made good;
  - e) Inspect the set/drift experienced,
  - f) Check the charts to see which lights will be seen during the watch and which navigational hazards to expect during the watch.
2. **Compare the above observation to ensure that it is according to the passage plan.**
3. Read, understand and sign Master's night orders,
4. **Plot present position and ensure that it conforms to earlier charted positions, in so doing verify:**
- a). The depth obtained from echo sounder matches with charted position (adjusted for vessel's draft and location of transducer)
  - b). Position obtained from other sources conforms to charted position
  - c). Check azimuth book for error obtained and that it is being correctly applied
5. Check the steering including
- a) Course being steered correctly
  - b) Auto-pilot settings are appropriate as per weather conditions
  - c) Auto-pilot is steering well as per present settings
  - d) Course board is updated for current courses
  - e) Check on operational status of navigational equipment including:
  - f) Time and course being displayed on the course recorder is set correctly
  - g) Check that VHF watch is being maintained on channel 16
  - h) Check latitude/speed input to gyro is correctly fed
  - i) Check navigation lights sentinel for bulbs glowing and test failure buzzer.
6. Check that the inputs to radar, GPS, course recorder are appropriate

Normally most integrated navigational equipment relies on data that is supplied automatically. However, this needs to be checked. One way to ensure is to ascertain that the logs and gyros are working in

efficient condition. Remember we are moving to an automated world to ease our labour but this brings along more monitoring in any case.

Note in your journal the data that each of the instruments receives from external source.

**7. Use and check of main engines**

The main engines are under the control of the OOW. This brings some responsibilities as each ship's engines have peculiar requirements and it is necessary to familiarise with them. However, all said and done the engines are at your disposal. Be familiar with the procedures for the use of main engines to manoeuvre when the main engines are on bridge control. Check the tachometer for the rpm and the status of engine to ensure that they are in accordance with planned passage. Check that the UMS control settings are appropriate.

8. Check on the operational condition of any safety equipment being used including: -

- Smoke detector
- Inert Gas System
- Engine room fire alarm on UMS vessels and the emergency STOP device
- Frequently step outside the wheelhouse and make yourself familiar with the situation. Simultaneously ensure that:
- Navigation lights are burning brightly,
- Shore lights and navigational marks in the vicinity are identified,
- The presence of other vessels in vicinity is detected by sight or by hearing,
- The movement of traffic in vicinity is identified and verified with the radar picture.
- Ensure that the lookout is alert and aware of his functions.

**Planning for eventualities during the watch**

Having looked at the routine checks, we should now see the situations, which arise unplanned or for which we should be prepared.

A vessel on a coastal passage is likely to pickup shore lights, navigational marks etc. As a part of the passage plan, it is necessary to know its characteristics and calculate the raising / dipping distances and the likely bearing at which it will be raised. At the same time, the

lookout should be informed of approximate direction in which this light will be picked up.

Navigational watch can be efficiently executed if it is properly planned. Upon confirming the present position on the chart, the OOW should work out estimated positions at certain time intervals, say every half an hour, and at the end of the watch. He should inspect the chart to identify:

- ☆ The depths to be encountered during the watch,
- ☆ Any significant depth changes and times of its occurrence,
- ☆ The conditions and hazards likely to be encountered during the watch,
- ☆ Any lights, conspicuous buoys, landmarks that may be picked up during the watch, the characteristics and time of its occurrence and estimated time of arrival at such positions
- ☆ Check on the operational condition of all navigational equipment likely to be used during the watch,
- ☆ Familiarisation with the weather forecast and tidal streams to be encountered.
- ☆ Inspect and confirm safe passing distance off dangers
- ☆ Plan of action to enter or leave a traffic separation scheme
- ☆ Reporting of positions to vessel traffic services, if any

### **Be prepared for taking appropriate action**

Being prepared means to keep the situation under control. Situations do vary from time to time. OOW should be aware of the changes. Some of these are discussed below:

#### **Deviation of the vessel from the track.**

The vessel is likely to deviate from the track due to forces of current and wind. The OOW should plot the vessel's position frequently to detect the deviation and apply corrections to bring the vessel back on the track.

#### **Increase of traffic density**

Where the traffic density is increasing, call the helmsman to the bridge, switch on the Radar and if warranted alert the engine room.

#### **Reduction of visibility**

Call the lookout man or post additional lookouts, alert the Master and the engine room, if the traffic density is also heavy, alert other OOWs to assist you. When necessary make appropriate sound signals,

switch on the navigation lights even in daytime as when close quarter situation develops, the navigation lights indicate the aspect better. Reduce speed to safe speed.

### **Onset of heavy weather**

Call out the crew to tighten the deck cargo lashings, trim ventilators, ensure that all weather tight doors and hatch coamings and tank openings are closed properly, secure sounding pipes and air pipes, ensure that the anchors are properly secured and the spurling pipes are closed. Inform Master of the action taken and if the ship is labouring heavily, CALL THE MASTER. Under such circumstances the course and or speed needs to be adjusted to make the vessel ride comfortably.

## **.9 Ocean passage**

*Watchkeeping during ocean passages will require all the activities related to performing a navigational watch as discussed previously. In addition, priority is given to the following*

### **Lookout**

During ocean passages, the principle threat to a vessel is the risk of collision. It is of utmost importance that an approaching vessel is detected early and avoiding action is taken in sufficient time. The emphasis therefore must be given to keeping an efficient lookout.

### **COLREGs Rule 5 states:**

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

Priorities between visual lookout and radar lookout vary under different conditions of visibility.

### **Electronic Navigation Aids**

When out of the sight of land, the navigational accuracy depends greatly on instruments. It is therefore necessary that the officer of the watch monitors the equipment and ensures its accuracy. During each watch, the principal instruments directing the navigation of the ship should be checked with other sources of position fixing as well as with estimated position. Any deviation detected should be investigated and corrected.

Gyro compass is more commonly used to steer the vessel during ocean passages. It is therefore important to check the compass error, compare the compasses and monitor the courses steered.

### Celestial Navigation

In case of failure of electronic navigational aids, the only recourse a navigator has, to fix his vessel's position, is with the help of celestial bodies. There is therefore a need to practice this art. Learn to calculate position based on this observation as accurately as possible and cross check positions obtained from electronic navigational aids.

#### .10 Coastal passage and congested waters

During coastal passage, the OOW is generally busy plotting the vessel's position, manoeuvring the vessel when required, to avoid collision and to alter the course as per passage plan. He therefore has little time to do other duties not related to navigation. Time management becomes very essential to ensure that all the navigational tasks are carried out at the appropriate time and in accordance with the required accuracy and efficiency.

Where the OOW has to plot the ship's position, he shall ensure that the lookout is alert. He shall also assess the situation around him and avoid being absent when ships are approaching and a risk of collision is present. This again calls for planning so that collision avoidance and position fixing get equal priority. In cases when the OOW finds it difficult to manage both, he should not hesitate to call the Master. OOW must understand that calling for assistance is not a sign of inefficiency.

Continuous monitoring of vessel's position for safe navigation and collision avoidance is of equal importance. The officer of the watch will therefore have to understand how to set the priorities and how to manage time.

In coastal waters, the navigator has to allow for:

- ☆ Navigation in close proximity to navigational hazards viz. shallow waters, oil fields, etc. This is best done when these are marked out conspicuously when passage planning.
- ☆ Strong tidal currents;
- ☆ Compliance with traffic separation schemes or prohibited zones;
- ☆ Changes in the way the position is ascertained
- ☆ Identification of land marks and the navigational aids;
- ☆ Plotting of position frequently and comparing the same with various methods available
- ☆ Adjustment of courses to allow for deviations;

- ☆ Increase in traffic density including the presence of fishing vessels and or sailing vessels as on the Indian coast
- ☆ Necessity of hand steering and therefore the additional requirement of a stand-by seafarer on or off the bridge.
- ☆ Reports to be made to VTS, where required;
- ☆ Take avoiding action such that sufficient depth is maintained under keel. Plan in advance to ensure vessel does not come in close proximity to other navigational hazards.

**Note: -Under keel clearance is not totally covered in your course but it is sufficient to mention here that the vessel's draft increases in direct proportion to the cube of the speed and the depth of the water.**

- ☆ Be prepared to use the engines if necessary, to ensure adequate sea room.
- ☆ Use the largest scale chart suitable for that area and corrected up-to-date
- ☆ Plot vessel's position at regular intervals and more frequently when in confined waters. The position shall be compared with the estimated position.
- ☆ Adjust course if vessel is found to have deviated from the planned track due to any cross track error
- ☆ Take a fix at every alteration of course and at regular intervals thereafter,
- ☆ Check soundings and log at regular intervals, record them.
- ☆ Where nav aids are available, vessel's position to be fixed by using more than one method.
- ☆ Where necessary allow for set and drift to keep vessel on the planned track.
- ☆ Identify positively all relevant navigational marks.
- ☆ Call the Master before a potentially dangerous situation becomes critical
- ☆ Study the chart and expect to pick up landmarks before they are actually seen.

#### **.11 Vessel arriving port**

The following is a checklist prepared on one of the ships for arrival port. Do check the list. Note in your technical journal the process of checking every item on the checklist

**Preparation for arrival in port**

1. Port information available
2. Instructions for pilot/tugs/berthing received and acknowledged
3. Latest weather reports obtained,
4. Tides and currents for port / adjacent areas calculated
5. Calculated / known minimum and maximum depths of water in port approaches channels and at berth.
6. Large scale charts for port's pilotage water available.
7. Master / Pilot information exchange forms prepared.
8. Any restrictions on draught, air draught within limits for bridges and berth, trim, speed, entry times, etc.
9. Relevant approach charts and nautical publications are corrected up to date and course laid off.
10. The latest navigational messages received for the area,
11. ETA sent to pilot station at appropriate time with all relevant information required e.g. details of dangerous / hazardous goods carried.
12. Pilot ladder ready.
13. All navigational equipment has been tested
14. Course recorder has been checked.
15. Clocks have been synchronised
16. Internal communication equipment has been tested.
17. Signalling equipment, including flags / lights have been checked.
18. Deck lighting has been tested.
19. Mooring machinery tested, lines prepared.
20. Manual Steering has been tested and engaged in sufficient time for the helmsman to become accustomed before manoeuvring commences
21. The crew has been advised of the time of "stand by" for entering the port.
22. The VHF channels for the various services (e.g. VTS, pilot, tugs, berthing instructions) have been noted and a radio check carried out.
23. Cargo handling gear in state of readiness.

24. Engine room has been notified at least one hour prior arrival.
25. Engine tested for satisfactory operation ahead and astern.
26. Steering gear system has been tested (both motors be running when manoeuvring).
27. Anchoring/berthing, establish of proper anchorage.
28. Which side to jetty?
29. Ship or shore gangway.
30. Mooring lines.
31. Accommodation ladder.
32. Cargo Documents ready.

**.12 Rounds in accommodation and on deck**

There are many parts of the ship, which are not visited regularly. Small deviations if any, not detected and corrected in time, may lead to a disaster. There is therefore, a need to ensure that everything is under control in remote parts of the vessel. Rounds should therefore be made in the accommodation, decks, galley, stores etc.

Some vessels carry deck cargo. The lashing on these becomes loose due to vessel's movement in the seaway. These need to be checked and tightened from time to time. The OOW upon being relieved should therefore take a round on deck and in accommodation. When taking rounds, the OOW should ensure that:

- a. No fire hazard exists
- b. No apparent sign of flooding of vessel
- c. Nothing unusual is detected including unsecured door, leaking hydraulic line, loose electric connection
- d. No loose or unsecured articles are detected in common rooms
- e. Deck cargo lashings are tight and are in order. If necessary, the crew should be called out and lashings tightened in presence and to the satisfaction of relieved OOW. A positive report of this should be made to the bridge.

**.13 The bridge team**

All ship's personnel who have bridge navigational watch duties will be part of the bridge team. The master and pilot (s), as necessary, will support the team, which will comprise the OOW, a helmsman and lookout (s) as required. The OOW is in charge of the bridge and the bridge team for that watch, until relieved.

It is important that the bridge team works together closely, both within a particular watch and across watches, since decisions made on one watch may have an impact on another watch.

The bridge team also has an important role in maintaining communication with the engine room and other operating areas on the ship.

**Duties and fitness of watch keeping officers:**

In order to maintain a safe watch, the following are among your primary duties:

- Your watch keeping duties are to include the following
- Maintaining a proper lookout,
- General surveillance of the ship,
- Collision avoidance in compliance with COLREGs,
- Recording bridge activities,
- Making frequent periodic checks on the navigational aids and bridge equipments

**Remember:**

1. You responsible for safety of lives of your crew, property & the environment. An error on your part may cause a disaster including deaths.
2. You should be well versed with the handling characteristics of your ship including procedures for use of engine in an emergency. You will have no time to learn the ship's manoeuvring characteristics in an emergency.
3. A great number of accidents have occurred because of over reliance on the automatic navigational aids & other automation. Automation is excellent and today it is not viable to run a ship without automation, but it is extremely dangerous to over rely on automation. You must be a good monitor and supervisor to ensure that any malfunctioning is promptly detected and rectified.
4. As navigational watch keeping officer, you continue to be responsible for the safe navigation of the ship, despite the presence of the master on the bridge. The master will specifically inform if he wants to take over this responsibility.

**Navigation:**

1. **General:** It is important that you execute the passage plan as prepared and monitor the progress of the ship relative to that plan.

2. **Deviation from the plan:** If you have to deviate from the passage plan for any reason, you should return to the original plan as soon as practicably possible. If you need to deviate from the original plan for a longer time, due consideration must be given to all the dangers, restrictions etc. The deviated plan should be made in the same manner as a new plan. A briefing to this effect should be given to the other concerned team members.

**Do you know the grounding accident of Torrey Canyon?**

**The Tanker Torrey Canyon ran aground on the 18<sup>th</sup> March 1966 off Scilly Isles. On making the landfall, the vessel was found to be about 17 miles off the course. The watch officer altered the course to port in order to come back to the original track. However, he decided to take the different route in order to save some time. The deviated route was decided without considering the proper passage planning procedures. The result was a disaster both for the ship and for the environment.**

**Monitoring the Progress of the ship:**

**Good navigational practices demand that:**

1. You are well versed with and fully aware of the capabilities of your engines, steering systems, turning circle, stopping distances, navigational aids and any other navigational systems being used. Monitor their performance continuously.
2. You should cross check the position fixes using independent source of information. This is particularly important when electronic position fixing systems such as GPS, LORAN-C are used. Visual position fixing must be used for cross checking the electronic aid fixes.
3. You should keep in mind that automation and automated navigational equipment is very good but over reliance on it can be very dangerous. In most of the cases, these work well however any malfunctions should be promptly noticed and appropriate actions taken.
4. **Navigation in coastal or restricted waters:** Navigating in coastal/restricted waters you should:
  - a. Follow advice / recommendation as given in sailing direction.
  - b. Calculate the tides and currents in advance.
  - c. Obtain weather information including visibility,
  - d. Identify primary & secondary position fixing methods and their accuracy.

- e. Note time of passing of danger points and arrange for any extra precautions to be taken.
- f. Obtain Information, if available, on likely traffic.
- g. Arrange for monitoring local/coastal broadcasts.
- h. Participate in area reporting system including vessel traffic management system (VTMS).
- i. Give required notice for use of the engines.
- j. Post extra lookouts, if necessary.
- k. **Remember** a helmsman engaged in steering is not a look out and STCW does not permit one-man bridge during the darkness period.
- l. Use the most suitable largest scale chart available for the area.
- m. Plot position at frequent interval so that at no stage there is chance of grounding or coming dangerously close to any danger.
- n. Positively identify all navigational marks.
- o. Comply with the Coastal water routing scheme, ship reporting systems and vessel traffic systems.
- p. Give due consideration to squat and calculate it well in advance. Remember that squat is proportional to the square of the ship's speed and that the speed is the only function that determines squat that can be varied as the other two functions viz. block coefficient and draft can not be varied. Take into account and allow for shallow water effects such as bank effect, smothering the ground etc.

**Take into account:**

- Time and efforts needed to keep radio watch keeping & Radio Communications
- Pollution Prevention and emergency situation
- Cargo monitoring if applicable viz. securing of cargoes, refrigerated cargo temperatures etc.
- Monitor and control safety systems e.g. fire extinguishing system, fire petrol etc.
- Bridge should never be left unattended. However, in a ship with separate chartroom, a visit to that chartroom may be

made for a short period to carry out necessary navigational duties after strictly ensuring that it is safe to do so.

**Have you heard of the following accident, which occurred off the coast of Australia?**

*A second officer, soon after taking over the midnight watch, left the bridge and descended two decks down to his cabin to get a jacket and some cigarettes. There was no lookout. While in cabin, he decided to smoke a cigarette and thereafter fell off to sleep. Next, every one woke up at 0515 hrs when the ship had run hard aground. The second officer slept through the watch, no quarter call was given to the chief officer, he slept through an intended 30 degrees alteration and he also slept through the grounding.*

**Your duty and the master:**

It should be clearly established in the company's safety management system that the master has the overriding authority and responsibility to make decisions with respect to safety and pollution prevention. The master should not be constrained by a ship owner or charterer from taking any decision, which in his professional judgement is necessary for safe navigation, in particular in severe weather and in heavy seas.

The bridge team should have a clear understanding of the information that should be routinely reported to the master, of the requirements to keep the master fully informed, and of the circumstances under which the master should be called.

When the master has arrived on the bridge, his decision to take over control of the bridge from the OOW must be clear and unambiguous.

**Your duty and the Pilot:**

Once the pilot has embarked and has arrived on the bridge the pilot joins the bridge team temporarily and should be supported accordingly. Study the pilot card and keep it ready for handing over. The pilot has a specialized knowledge of navigation in local waters. Depending on local pilotage laws, the master may delegate the conduct of the ship to the pilot who directs the navigation of the ship in close co-operation with the master and or the OOW. It is important that the responsibilities of the pilot and the master are agreed and clearly understood.

The presence of a pilot does not relieve the master or the OOW of their duties and obligations for the safety of the ship. Both should be prepared to exercise their right not to proceed to a point where the ship would not be able to manoeuvre, or would be in any danger.

**(SAQ – Self Assessment Questions)**

Emergencies do occur and it is necessary for a watchkeeping officer to be ready for them. Describe the actions that you would take in the following:

- a. Vessels starts to swing rapidly and the off course alarm is ringing.
  - b. After sunset, the navigation light sentinel gives an alarm and visually it appears that the forward masthead light is not functioning.
  - c. On plotting the positions by visual bearings and GPS, it is observed that a difference of three miles is observed.
  - d. Your charts are corrected up to date. In the approaches to a port, it is observed that a buoy in the channel is displaying lights of a wreck-marking buoy but it is not marked on the chart.
  - e. In the middle of your watch, you are feeling very sick
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**Answers to (SAQ – Self Assessment Questions)**

- a. Switch over to hand steering, call the master, check if the steering is working, if in traffic bring engines on stand by and inform the engine room of the malfunction of the steering so that they can depute someone to check.
- b. Switch to the second light provided, if the same is also not functioning, then send out a message to all ships indicating that your ship is plying only with one masthead light, call the master and the engineers to make effective repair to electrical circuit.
- c. Recheck the visual position by an alternate method such as two ranges from Radar or by LORAN. It is possible that the GPS has developed a fault without giving an alarm. In coastal waters call the master if close to danger.
- d. Accept that light as a warning, proceed with caution, engines on stand by, recheck with port authorities and if there is not sufficient sea room stop engines call the master.
- e. Call the Master and tell him your problem. Do not feel embarrassed as you may not be functioning correctly and it is unsafe to continue watchkeeping and the Master shall understand the same.



