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SHIP AT ANCHOR

1. ANCHORING PLAN

Prior to anchoring the **Master** shall carefully assess and plan the anchoring while considering the following:

- a. Restrictions to anchoring, undersea pipelines, cables etc.
- b. The proximity of dangers such as shoal waters, rocks, etc.
- c. The degree of shelter provided by the anchorage location.
- d. The depth of water, nature of the bottom and holding ground.
- e. The prevailing weather conditions [and visibility](#)¹.
- f. The prevailing strength and direction of the tidal stream.
- g. The rise and fall of the tide.
- h. The forecasted weather conditions.
- i. The [traffic density and](#)² proximity of adjacent ships at anchor.
- j. Decide on the anchor position and mark on the chart.
- k. Decide on a contingency plan e.g. abort or alternative anchorage.
- l. The scope of anchor cable required and swing room.
- m. Watchkeeping levels.
- n. Main engine readiness.
- o. Security and threat of piracy.
- p. Brief bridge team, anchor party and engine room on duties.
- q. Rocky seabed may compromise the anchor's integrity if anchor is let go from water level, and impacts a rocky seabed.³

A risk assessment for anchoring is to be conducted and discussed with officers. Officer at anchor station to conduct toolbox meeting with the ratings involved prior to anchoring operation. Refer company checklist "Nav B12- Anchoring and Anchor Watch" for Anchoring Appraisal and Planning.⁴

1.1. The Depth of Water

There must be adequate depth of water under the ship at all times. Minimum clearance under the keel, after allowing for all anticipated depth reductions due to swell and rolling/pitching should be at least 2 meters at the lowest stage of the tide. If ship is unable

¹ W 26 / 2024

² W 26 / 2024

³ W 26 / 2020

⁴ W 26 / 2020

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to meet the UKC requirement, Marine Superintendent or DPA shall be informed, and Risk Assessment shall be conducted.⁵

1.2. Swing Room When at Anchor

Anchorage position must be chosen so that the safety swing circle is clear of the limiting danger line. The radius of this circle may be obtained by adding the following:
(Safety swinging circle = Length of anchor cable + Length of vessel + Safety margin)⁶

1.3. The Length of the Ship.

The maximum amount of cable which can be veered on the selected anchor. This allows for the veering of additional cable should the weather deteriorate, while still maintaining an adequate safety margin.

A safety margin. It is impossible to give any definite rule as to how near danger a ship may be anchored in safety. An ample safety margin must be allowed, in addition to above. At single anchor, it is usual to allow at least one cable (1/10 mile), increased as necessary, to allow for:

- The possibility that the ship may not achieve her intended anchoring position.
- The likelihood of bad weather.
- The likelihood of dragging.

1.4. The Scope of the Anchor Cable⁷

The length of cable needed to anchor a vessel varies according to the depth of water, the safe swinging radius needed from other vessels, length of stay, strength of tides and currents, loaded or ballast condition, weather forecast and holding ground suitability, [proximity of shorelines, dangers of dragging anchor and the risk of collision and grounding](#).⁸

In order to achieve the necessary anchor holding power, it is essential that the anchor chain and the forerunner remain horizontal on the seabed and that good holding ground is available. The ratio between water depth and the length of chain – the scope number – is a key factor in ensuring this, and it is recommended that length of the cable should be at least 6 times the depth of water in normal weather condition.

⁵ W 05 / 2018

⁶ W 26 / 2020

⁷ W 26 / 2020

⁸ [W 26 / 2024](#)

1.5. Personnel Matrix for Anchoring⁹

Bridge	As per NAV B2 – Bridge Manning Matrix
Forecastle deck	Minimum 3 personnel • One certified deck officer • Bosun or AB • One rating The certified deck officer shall supervise the anchoring operations. The Master may use additional crew if he believes they are necessary for safety.

2. APPROACHING THE ANCHORAGE

- 2.1. Anchor to be cleared and walked back out of the hawse pipe and made ready for letting go.
- 2.2. Monitor the charted track. Use parallel indexing and transit bearings if practical.
- 2.3. Monitor traffic conditions.
- 2.4. Observe other vessels at anchor to determine wind and current direction and effect.
- 2.5. Manoeuvre the vessel to the desired position, approach head to the wind and/or tide.
- 2.6. The Anchoring Party must meet on the forecastle and the Officer must check the PPE and discuss the anchoring plan with the crew. Once this and the toolbox talk are completed, the Officer will report the fact to the bridge. This is to be recorded in the Bell Book.

3. LETTING GO THE ANCHOR

- 3.1. Reduce speed and take way off the vessel. Make use of the bow thruster to maintain the vessels head in the desired direction. Be aware of any current or tidal movement at the anchoring position.
- 3.2. At the 'let go' position put the engine astern to give some stern way to the vessel. When the propeller wash of the vessel going astern is level with the bridge wing inform the foc'sle to 'let go' the anchor. Put the engine to stop.

⁹ W 11 / 2024

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- 3.3. When the anchor touches the seabed the vessels position must be taken and plotted. Set anchor watch feature in the ECDIS¹⁰. The Officer forward must update the bridge on the lead of the cable and the direction of the lead.
- 3.4. The vessel will move astern. The Officer in charge of the anchor party should order the brake to be taken off and allow the cable to run out with the weight of the anchor. The idea is to lay the cable out in length along the sea bottom, and not cause it to pile up on itself.
- 3.5. The Officer in charge should apply the brake once enough cable has run out to prevent it piling on top of the anchor. While slacking out the cable the procedure is to check the cable periodically, by applying the brake, while the vessel drops astern, to prevent the cable from piling up and to stretch it out in a straight line. Should the chain appear to be coming taught to quickly, the Officer must inform the bridge. The Master may then kick the vessel ahead to avoid over stressing the windlass and cable.
- 3.6. In heavy weather and strong winds care must be taken to keep the vessels head to wind. The vessel can easily turn beam to wind and gather side speed over the ground, resulting in excessive forces being put on the cable, critical when the anchor holds, and the cable is brought up with a violent snap.
- 3.7. Once the required amount of shackles is paid out the brake is applied and the vessel is brought up.
- 3.8. Good communication between the Officer in charge on the foc'sle and the Master is essential. The Master must be kept advised of the direction that the cable is leaded and the amount of tension on it e.g. leading straight ahead (under tension) with two cables clear of the water or cable up and down (no tension).

4. ANCHORING IN DEEP WATER

- 4.1. Anchoring in deep water should be avoided, if possible, unless an emergency has occurred or depth at designated anchorage is deep e.g. Fujairah¹¹. The anchor must not be let go in the normal manner but walked back all the way to the seabed. Deep anchoring is any depth over 25¹² meters.
- 4.2. Most windlasses are designed to lift 82.5 metres of chain (3 length of chain) plus weight of the anchor¹³. Before anchoring in deep water consideration must be given to the capabilities of the windlass and its ability to lift the considerable weight of the cable and anchor in the vertical up and down position. Anchoring must never be attempted in water

¹⁰ W 26 / 2020

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over 80 metres without consulting with the Marine Superintendent or DPA. A risk assessment is to be conducted prior anchoring in deep water¹⁴.

- 4.3. The depth of water and the total length of cable required to place the anchor on the sea bottom must be determined. The anchor and cable are then walked out to the required depth.
- 4.4. Once the anchor is on the seabed the vessel should be allowed to slowly drop astern while the cable is paid out in a controlled manner with the windlass engaged. Ensure vessel's astern speed over the ground is less than the walking-out speed, which is typically 9 metres/min, equivalent to less than 0.3 knots. Higher speed over the ground may cause the motor to render, and cause damage.¹⁵
- 4.5. Exercise caution when paying out maximum amount of chain as the distance from bitter end to water line is to be taken into account e.g. if 11 shackles on board, chances are that you cannot put 10 shackles in water if in ballast.¹⁶
- 4.6. Due to the weight of the cable and depth of water there will be little indication of it leading forward and it will be difficult to see the cable snatching or growing to indicate that the vessel is brought up. Initially check the vessels position frequently to ensure that the anchor is holding.

5. WATCHKEEPING

- 5.1. A continuous watch must be maintained for the purpose of safety at all times, while the ship is at anchor or moored. [The OOW shall ensure proper use of radar / GPS including guard rings/alarms for position monitoring.](#)¹⁷ Comply with company checklist Nav B12- Anchoring and Anchor Watch.¹⁸
- 5.2. The safety of the vessel is paramount and if there is any doubt as to the risks involved the Master should rather double up watches i.e. continuous bridge watch plus a separate cargo watch keeper.
- 5.3. The Master shall determine the level of readiness required for use of the main engine e.g. immediate; 10 minutes' notice; 30 minutes' notice, etc.
- 5.4. In all circumstances, while at anchor, the OOW should:
 - a. determine and plot the ship's position on the appropriate scale chart as soon as practicable.

¹⁴ W 26 / 2020

¹⁵ W 26 / 2020

¹⁶ W 26 / 2020

¹⁷ [W 26 / 2024](#)

¹⁸ W 26 / 2020

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- b. determine the anchor drop position and the ship's swinging circle. This is essential for recovery of possible lost anchor and provides closest approach to other shipping or objects.
- c. when circumstances permit, check at sufficiently frequent intervals by taking bearings of fixed navigation marks or readily identifiable shore objects whether the ship is remaining securely at anchor.
- d. record in the Deck¹⁹ Logbook each time the anchor bearings are checked. This should be at least every 30 minutes or more frequently if instructed by the Master.
- e. ensure that an efficient look-out is maintained.
- f. ensure that inspection rounds of the ship are made periodically; and be aware of possible piracy.
- g. observe meteorological/ tidal conditions and the state of the sea/swell/wind. Call the Master if the wind increases above force 5 or the swell increases to 2m. Serious consideration must then be given by the Master to heave up and proceed to sea;
- h. notify the Master and Engine Room and undertake all necessary measures if the ship drags anchor.
- i. ensure that the state of readiness of the main engines and other machinery is in accordance with the Master's instructions.
- j. if visibility deteriorates, notify the Master and comply with the applicable regulations for preventing collisions at sea.
- k. ensure that the ship exhibits the appropriate lights and shapes and that appropriate sound signals are made at all times, as required.
- l. take measures to protect the environment from pollution by the ship and comply with applicable pollution regulations.
- m. ensure exclusion zones are set on Radars/ECDIS equipment to warn of possible dragging.
- n. a flag is posted on the anchor windlass to indicate to the bridge watchkeeper if the cable is paying out and the brake is holding.

5.5. In ships with the bridge aft, especially large ships, it should be borne in mind that the position of the anchor can be an appreciable distance from the indicated plot at the bridge. The maximum distance between the anchor and the stern must be calculated and used as a radius to encircle the anchor position on the chart to establish that the vessel has clear swinging room.

5.6. When anchored with a single anchor, the other anchor is to be kept ready for use in an emergency.

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- 5.7. Hawse pipes to be closed against pirates/robbers, and if necessary, anchor chain-washers to be turned on.
- 5.8. Letting go and weighing of anchors are always to be supervised by a certificated Navigating Officer.

NOTE: This 'anchor'-Officer must be in constant radio contact/communication with the Bridge reporting the length of chain paid out, the direction and the tension.

6. WEIGHING ANCHOR

The Master shall take early and effective action to avoid any dangerous situation when vessel is at anchor.²⁰

- 6.1. This is a basic procedure that requires good communication between the Officer in charge on the foc'sle and the Master. The Anchoring Party must meet on the forecastle and the Officer must check the PPE and discuss the anchoring plan with the crew. Once this and the toolbox talk are completed, the Officer will report the fact to the bridge. This is to be recorded in the Bell Book.
- 6.2. Should the weight on the cable become excessive due to strong wind or current it is necessary to use the engine ahead in order to relieve tension in the anchor chain before 'heaving in'. It is essential that the anchor chain is closely monitored when weighing, and that 'heaving in' is stopped as soon as any significant tensioning is observed, or any difficulty is experienced. Whenever heaving is stopped due to excessive strain, the brakes must be immediately applied so as to not overload the motor..²¹
- 6.3. Care must be taken to prevent the bow from paying off in strong wind or heavy weather to prevent the vessel from turning beam to wind and dragging anchor. Use should be made of the bow thrusters and/or engine.
- 6.4. Keep anchor wash open when heaving in the anchor to keep chain and anchor clean. "Rinse anchors and anchor chains when the anchor is retrieved to remove organisms and sediments at their places of origin" (33CFR 151-2050 section-e). In areas of known clay and heavy mud, fire hoses may be rigged to wash off excess mud..²²
- 6.5. When anchors are being weighed, the chains, shackles and 'markings' are to be closely inspected by the aforementioned 'anchor'-Officer. Check the chain links for wastage due to wear and tear and for loose or missing studs. Check the pin of the kenter shackle for the lead pellet. ²³

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NOTE: Chains to be thoroughly washed. If time allows it, 'markings' to be attended to if so required.

Once the anchor clears the waterline the Officer is to report the fact, along with any noted fouling or damage, to the bridge.

- 6.6. Anchors shall be kept ready for immediate use at all times while the vessel is underway in restricted waters, but the riding pawls are to be left down until just before letting go.
- 6.7. When securing and lashing the anchor for sea, ensure shank is fully in the hawse pipe as loose fluke may damage the hull plating by hitting the plate during rough sea condition.²⁴

6.8. Anchoring and remaining at anchor during worsening weather conditions

- 6.8.1. If Wind force is exceeding **Beaufort scale 5** or there is a forecast for deteriorating weather within the next 12 hours, Master to inform port authority and pick up anchor and drift at safe location..²⁵
- 6.8.2. If the vessel is at anchor and the onset of worsening weather conditions is expected, the following should be done:
 - a. The interval of position fixing to be increased.
 - b. The strain on the anchor is to be checked and logged.
 - c. Engine room to be placed on short notice/stand-by.
 - d. Extra watchmen placed on stand-by
- 6.8.3. If the vessel starts to drag anchor during bad weather, the Master is to weigh anchor and re-anchor the vessel or ride out the weather offshore.

7. EMERGENCY ANCHORING

It may be necessary all of a sudden to drop the anchor in case of an emergency i.e. steering/engine failure, to avoid imminent collision/entering shallow water/grounding in order to reduce the ship's speed or stop the vessel.

In most circumstances it is unlikely that the ship's anchors would be capable of stopping a laden vessel if vessel is proceeding with good speed. As anchor holding power is not proportional to vessel size, the larger the vessel, the less effective emergency anchoring is likely to be in arresting the vessel's motion. Despite this, in an emergency every available means, including use of the anchors, should be considered for use. The factors likely to impact on the success of emergency anchoring include:

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²⁵ W 26 / 2020

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- size of the vessel
- speed over the ground.
- steepness of the seabed and proximity of shoals
- nature of the seabed and anticipated holding power of the anchors
- environmental conditions
- condition of the ship's propulsion and steering systems
- status of the anchoring equipment
- availability and capability of tug support.

During channel/river/port transits it is recommended that anchors are made ready for use before transit. Otherwise, vessel will have to let go the anchor directly from the hawse pipe for avoiding imminent danger.

If the water depth is deeper than the length of the available cable, the anchors may be walked-out to about 3 shackles in the water and then the brake and chain stopper applied. The anchors and cable may have the effect of a drogue and may also help to keep the ship's head to the weather.

If the water depth is suitable, it may be possible to slow or stop the vessel's drift by lowering the anchors on the brake until such time as they start to drag along the seabed. The actual length of cable deployed will vary with the depth of water and the vessel's size. For larger vessels, the amount of cable on the bottom should initially be short but can be gradually increased as the ship's speed decreases. This action should bring the ship's head into the weather and slow her speed over the ground. This is unlikely to be successful on a rocky seabed but should still be attempted.

Any attempt to use the anchors to slow or stop a vessel's drift may result in the loss of the anchors and cables and/or significant damage to the vessel's anchor system, including the risk of catastrophic failure of windlass drive motors. While this may be acceptable when considering the wider aim of preventing the vessel from grounding, the potential for injury to the anchor party in such cases should be recognized.

In the event that an anchor has to be let go in an emergency to stop a vessel, the minimum number of personnel should be used in the operation and once the anchor has been dropped and brake applied the forecable should be cleared of personnel.

8. BITTER END QUICK RELEASE MECHANISM

In exceptional cases where a vessel is unable to heave her anchor and this prevents her from getting underway to escape from imminent danger or where she can become a threat to safety of the environment, master should consider slipping the cable to facilitate speedy departure. In such event vessels exact position must be noted for retrieval of anchor at a later date / time.

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It is important that the quick release mechanism at the bitter end outside chain locker is maintained adequately and is operable so that it can be readily deployed in an emergency.

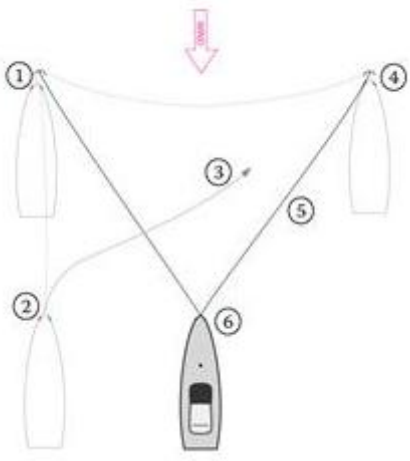
Designated and appropriate hammers should be provided to release the anchor bitter ends, these hammers shall be conspicuously marked and placed on site for easy availability.

9. USE OF TWO ANCHORS²⁶

One anchor is designed to provide adequate holding in most cases. Two anchors may be used at congested anchorages, poor holding ground, strong and shifting currents, prevailing swell, dragging anchor, the narrow edge of a channel/river where sufficient sea room is not available for swinging.

The common method to set two anchors is in a 'V' configuration. There is risk of riding on two anchors of chain tangling with each other in strong wind. Keep a good spread between port and starboard anchor to avoid it.

9.1. Anchoring using two anchors



1. Head to wind/current and let go or walk back first anchor.
2. Drop back and apply brake on first anchor.
3. Run ahead upwind and to one side
4. When bow in position upwind in line with first anchor, let go or walk back 2nd anchor.
5. Drop back paying out the second anchor
6. Adjust both anchors chains to equal shackles for equal distribution of weight