

PSS MP107

Manoeuvre vessels in harbours and their approaches



Overview

This standard covers the competence required for manoeuvring vessels in harbours and their approaches.

Whilst a vessel is manoeuvring, external factors may move the vessel in a direction other than that which is intended. The early detection of this movement, and the actions required to compensate for it, are essential and fundamental. The ability to manoeuvre a vessel successfully depends largely on the pilot's spatial awareness. This is improved over time through practical experience and repetition.

There are 4 elements in this standard:

- Handle different types and sizes of vessels
- Manoeuvre in different locations and conditions
- Work with tugs
- Arrive at and depart from berths, buoys, moorings, locks and anchorages

Target Group

This standard applies to authorised marine pilots who have a duty to perform acts of pilotage to facilitate the safe and efficient use of the port and its approaches.

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Performance criteria **Handle different types and sizes of vessel**

- You must be able to:*
- P1 take into account the factors necessary to keep vessel movement under control at all times and within appropriate safety margins
 - P2 ascertain the manoeuvring characteristics of the vessel promptly, including:
 - P2.1 speed at different engine settings and effect on rate of turn
 - P2.2 characteristics of controllable pitch propulsion
 - P2.3 stopping distances
 - P2.4 turning circles, centres of pressure and pivot points
 - P2.5 transverse thrust characteristics of propellers
 - P2.6 effect of heel and list on draught
 - P2.7 trim
 - P2.8 steering qualities, including minimum steerage way
 - P2.9 rudder types and usage
 - P3 take into consideration other external factors, which may affect the manoeuvring characteristics of the vessel, including:
 - P3.1 wind, leeway and drift
 - P3.2 bank effect and shallow water effect
 - P3.3 interaction and squat
 - P3.4 tidal forces and currents
 - P3.5 differing water densities
 - P3.6 under keel clearance
 - P4 take into account different manoeuvring control systems and their effects on vessel handling, including:
 - P4.1 single or multiple propellers
 - P4.2 propeller bias (right- or left-handed)
 - P4.3 fixed and controllable pitch propellers
 - P4.4 type of propulsion fitted
 - P4.5 rudders, including active rudders
 - P4.6 thrusters, including types and effect on efficiency
 - P4.7 engine power and responsiveness
 - P4.8 percentage of full power available with engines operating astern
 - P4.9 number of consecutive air starts available, where applicable
 - P4.10 propeller nozzles, fixed and steering
 - P5 take into account the different handling and manoeuvring characteristics of different classes of vessel, including:
 - P5.1 an awareness of vessel momentum with respect to time allowed for speed reduction in varying environmental conditions

Manoeuvre in different locations and conditions

You must be able to:

- P6 take into account the following when manoeuvring vessels:
 - P6.1 different requirements for manoeuvring vessels in particular tidal, non tidal, canal and river conditions
 - P6.2 effect of currents and tidal streams causing set and drift on vessel manoeuvring, especially in restricted waters
 - P6.3 effects of shallow water on manoeuvring capabilities of vessels, especially when turning
 - P6.4 additional problems associated with vessel size
 - P6.5 effects of squat and interaction
 - P6.6 blockage factors when using locks and dry docks, especially when minimal clearances and tidal constraints apply
 - P6.7 effect of windage, especially at low speeds
 - P6.8 effects of flare, overhangs or obstructions upon clearance through locks and dock passages and when berthing/unberthing
- P7 detect set and drift by all available means, at all stages of the passage
- P8 closely monitor the wash of a vessel, especially in areas with small under keel clearances.
- P9 recognise when tug assistance is required
- P10 make use of anchors, especially for low speed control, swinging and emergency stopping
- P11 employ the use of ropes and moorings to assist in swinging or other manoeuvres
- P12 comply with tidal and weather parameters for arriving and departing at specific berths
- P13 take into account factors affecting safe manoeuvring in narrow channels, including:
 - P13.1 pressure zones
 - P13.2 bank configuration
 - P13.3 bends in rivers
 - P13.4 passing or overtaking in channels
 - P13.5 slow speed control
 - P13.6 turning circles
 - P13.7 thrusters - whether moving the vessel ahead or astern
 - P13.8 manoeuvring close to other vessels or structures
- P14 undertake manoeuvres at a safe speed with due consideration to the effects of the manoeuvre on others

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Work with tugs

You must be able to:

- P15 maintain up to date knowledge of port specific tug(s), their operating potential and limitations
- P16 agree tug disposition and towing procedures with the tug Master
- P17 agree communications with tugs, including emergency and sound signals, before operations commence
- P18 use standard orders when communicating with tugs
- P19 take account of the advantages, disadvantages, capabilities, limitations and manoeuvring characteristics of different types of tugs including:
 - P19.1 interaction
 - P19.2 making fast and letting go procedures
 - P19.3 girting
 - P19.4 bollard pull
 - P19.5 dynamic towing forces
 - P19.6 types of towing gear
 - P19.7 use of tug's weight
 - P19.8 push/pull towage
 - P19.9 use in adverse weather conditions
 - P19.10 speed limitations
 - P19.11 messenger lines of adequate strength and length
 - P19.12 direct and indirect towing methods
 - P19.13 safety of tugs whilst towing
 - P19.14 disengagement (emergency) procedure
 - P19.15 escort towage
- P20 assess the risks and difficulties of using tugs when they cannot be seen from the bridge
- P21 ascertain the suitability of the vessel's fairleads and bits including safe working loads
- P22 take into account the following when making the tow connection:
 - P22.1 vessel course and speed
 - P22.2 capabilities of the tug involved
 - P22.3 sea and wind conditions
 - P22.4 visibility
 - P22.5 intended manoeuvre
- P23 advise tugs promptly when making significant changes in engine movements or heading
- P24 give manoeuvring orders to tugs clearly and unambiguously
- P25 check that manoeuvring orders to tugs have been received and carried out
- P26 ensure that ship's crew handle tug lines correctly and safely
- P27 take into account limitations of towing in restricted and forecast restricted visibility

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P28 take into account tug Master's own responsibilities and knowledge

Arrive at and depart from berths, buoys, moorings, locks and anchorages

You must be able to:

- P29 confirm the presence of persons and equipment necessary for safe operations, including:
 - P29.1 tugs
 - P29.2 Berthing Master
 - P29.3 mooring boat
 - P29.4 boatmen/linehandlers
- P30 establish means of communication between all parties before operations commence
- P31 confirm the intentions of all parties before operations commence
- P32 take into account:
 - P32.1 arrangements and limitations for berths, buoys, moorings and anchorages
 - P32.2 effects of tides, currents and wind on the manoeuvre
- P33 confirm that engines, bow thrusters and steering gear have been fully tested and that safety checks have been completed before commencing a manoeuvre
- P34 agree anchoring procedures in advance
- P35 confirm that anchors are cleared
- P36 confirm that the intended anchorage is suitable
- P37 confirm that tugs or mooring boats are clear before letting go anchors
- P38 check the following before using thrusters and engines:
 - P38.1 all line handling craft, mooring lines and tugs are clear of potential contact points
 - P38.2 there are no obstructions to prevent safe operations
- P39 make allowance for mooring boat safety clearance times, especially if the wind is onto a berth or jetty
- P40 inform the Berthing Master and boatmen/linehandlers in advance of:
 - P40.1 any unusual requirements
 - P40.2 any known facts relating to the vessel's ropes or wires which may affect line handling
- P41 confirm that the crew are on standby in good time
- P42 use springs, lines, fenders and other associated equipment appropriately
- P43 agree the mooring plan with the Master prior to arrival
- P44 communicate the mooring plan to boatmen/linehandlers and crew, including the required order and method of running lines
- P45 ascertain the location of mooring bollards and/or hooks before use
- P46 agree the procedure for singling up with the Master prior to departure
- P47 communicate the procedure for singling up to the boatmen/linehandlers

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Knowledge and understanding

You need to know and understand:

- K1 bridge procedures
- K2 marine resource management for pilots
- K3 theory, operational principles and limitations of:
 - K3.1 anchors, anchoring and use while manoeuvring
 - K3.2 blind pilotage techniques and theory
 - K3.3 chartwork, corrections and Electronic Chart Display and Information Systems (ECDIS)
 - K3.4 effects of weather and tide on vessels
 - K3.5 gyro and magnetic compasses
 - K3.6 hydrodynamics
 - K3.7 hydrography
 - K3.8 magnetic variation
 - K3.9 means of communication
 - K3.10 meteorology
 - K3.11 mooring criteria
 - K3.12 nautical terminology
 - K3.13 propulsion plant, engineering and safety systems
 - K3.14 ship handling and manoeuvring
 - K3.15 ship stability
 - K3.16 ship strength and construction
 - K3.17 standard marine vocabulary
 - K3.18 steering, rudder types and manoeuvring systems
 - K3.19 tides
 - K3.20 tugs and towage
- K4 local, port or area specific
 - K4.1 anchorage names, locations, depths of water and limitations
 - K4.2 bridges and overhead obstructions
 - K4.3 Bye-laws, Directions and local Notices to Mariners
 - K4.4 channels, fairways and bouyage
 - K4.5 characteristics of berths and locks
 - K4.6 coastal topographical features
 - K4.7 conspicuous radar targets
 - K4.8 depths of water, locations of shoals, wrecks, other obstructions and dangers
 - K4.9 dredging and surveying operations including the frequency of operations and craft involved
 - K4.10 dry-docking criteria and procedures
 - K4.11 fog and visibility signals
 - K4.12 lights and navigational marks
 - K4.13 mooring and berthing arrangements

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- K4.14 other hydrographic data
- K4.15 overtaking and passing procedures
- K4.16 sources of meteorological and tidal information
- K4.17 tidal streams and currents
- K4.18 tug names, types, characteristics and operating procedures
- K4.19 vessel traffic services (Vessel Traffic Services and Local Port Services) arrangements and reporting points
- K4.20 weather conditions and forecasting, including wind and its effect in different locations
- K5 the effects of stress and fatigue on capability
- K6 the potential impact of:
 - K6.1 pilotage operations on other port users
 - K6.2 other port users on pilotage operations

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