

- (b) Knowledge of the characteristics of various weather systems, including tropical revolving storms and avoidance of storm centres and the dangerous quadrants.
- (c) Knowledge of ocean current systems.
- (d) Ability to use all appropriate navigational publications on tides and currents, including those in the English language.
- (e) Ability to calculate tidal conditions.

#### 7. *Ship manoeuvring and handling*

Manoeuvring and handling of a ship in all conditions, including the following:

- (a) manoeuvres when approaching pilot vessels or stations with due regard to weather, tide, headreach and stopping distances;
- (b) handling a ship in rivers, estuaries, etc., having regard to the effects of current, wind and restricted water on the response to the helm;
- (c) manoeuvring in shallow water, including the reduction in keel clearance due to the effect of squat<sup>1</sup>, rolling and pitching;
- (d) interaction between passing ships and between own ship and nearby banks (canal effect);
- (e) berthing and unberthing under various conditions of wind and tide with and without tugs;
- (f) choice of anchorage; anchoring with one or two anchors in limited anchorages and factors involved in determining the length of anchor cable to be used;
- (g) dragging; clearing fouled anchors;
- (h) dry-docking, both with and without damage;
- (i) management and handling of ships in heavy weather, including assisting a ship or aircraft in distress, towing operations, means of keeping an unmanageable ship out of a sea trough, lessening drift and use of oil;
- (j) precautions in manoeuvring for launching boats or liferafts in bad weather;
- (k) methods of taking on board survivors from lifeboats or liferafts;
- (l) ability to determine the manoeuvring and engine characteristics of major types of ships with special reference to stopping distances and turning circles at various draughts and speeds;
- (m) the importance of navigating at reduced speed to avoid damage caused by own ship's bow or stern wave;
- (n) practical measures to be taken when navigating in ice or conditions of ice accumulation on board;
- (o) the use of, and manoeuvring in, traffic separation schemes.

<sup>1</sup> Squat: the decrease in clearance beneath a ship which occurs when the ship moves through the water and is caused both by bodily sinkage and by change of trim. The effect is accentuated in shallow water and is reduced with a reduction in ship's speed.