

The COLREGS and the *Princess Alice*

John Kemp
(Email: prof.kemp@talk21.com)

There is currently considerable interest in the international regulations for preventing collisions at sea (the COLREGS). Suggestions for changes are made, but their validity is difficult to assess because there is little possibility of testing new proposals before they are introduced. There is, however, the possibility of considering the history of the COLREGS, and their effectiveness, as they have evolved over the years. In this paper, the author's aim is to look at the lessons that may be learned from one, particularly tragic, collision between the *Princess Alice* and the *Bywell Castle* in 1878. Opinions differ as to whether a study of history is likely to be a useful exercise.

History is more or less bunk – Henry Ford (American Industrialist)
The only way forwards is backwards – Boris Johnson (British Politician)

KEY WORDS

1. COLREGS. 2. Princess Alice. 3. Bywell Castle. 4. Collisions.

1. **LEARNING FROM HISTORY?** There have been a number of recent articles in publications such as the *Journal of Navigation* and *Seaways*, proposing changes in the international regulations for preventing collisions at sea (the COLREGS), for example, Stitt, 2002, Thomas, 2002 and Syms, 2007. In the past, some of the earlier published proposals informed a debate which led to changes in the 1972 regulations which came into force in 1977. Arguments for and against changes continue to be presented but the validity of these arguments is difficult to assess because, apart from some very limited simulator experiments, there is no possibility of testing new proposals before they are introduced. Given this situation, it may be instructive to look back to past times, when the COLREGS were somewhat different so that, at least, we may avoid some of the mistakes of the past.

There is not space in this paper to make a complete review of the effectiveness, or otherwise, of past forms of the COLREGS, although an outline was contained in a previous paper by the author (Kemp, 1976). The author's present aim is to simply look at the background to one particular, and tragic, collision. This occurred in the River Thames between the *Princess Alice* and the *Bywell Castle* on 3 September 1878.

2. **A NOTABLE COLLISION.** The *Princess Alice* (see Figure 1) was a paddle steamer, returning to London from a "moonlight trip" to Gravesend. She had about 700 passengers on board, most of whom perished as a result of the collision; Captain Grinstead was her master. The *Bywell Castle* (see Figure 2) commanded by

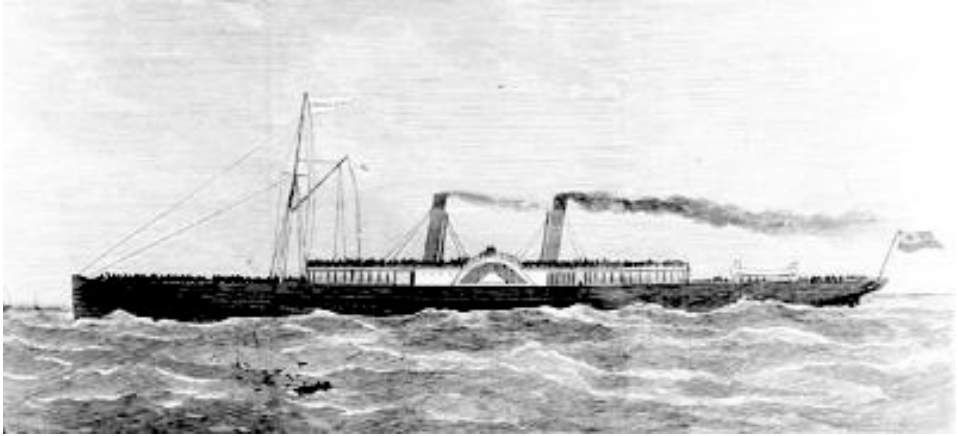


Figure 1. The saloon steam boat *Princess Alice*.

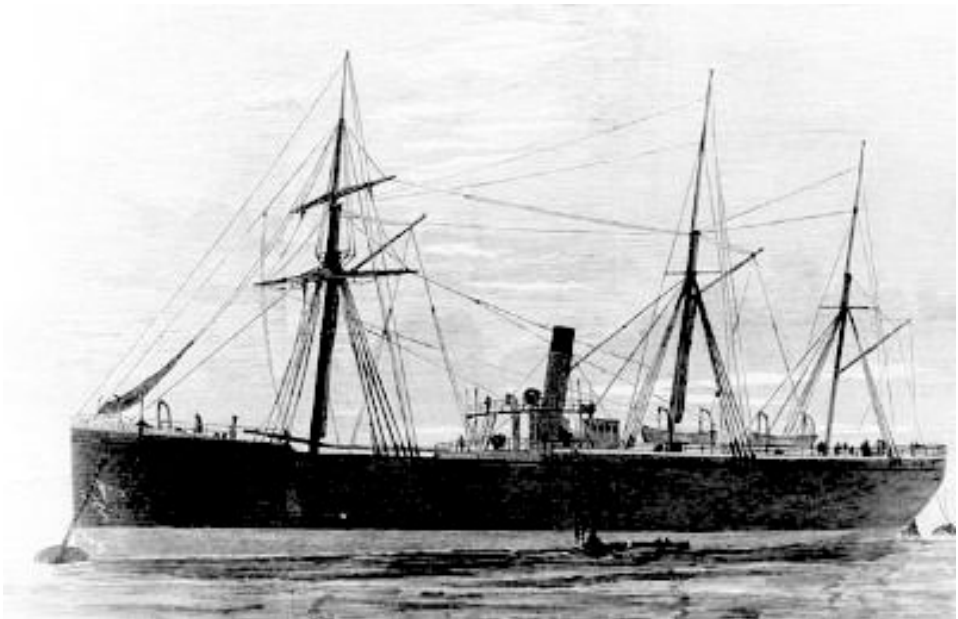


Figure 2. The *Bywell Castle* screw steam collier.

Captain Harrison, was a screw driven collier, proceeding downstream in ballast. She struck the *Princess Alice* just forward of her starboard paddle box and the *Princess Alice* sank in about four minutes. Around 600 people lost their lives. Not many people could swim in Victorian times, and those who could swim were hampered by the heavy clothes they wore – especially the women. Figure 3 shows a somewhat extreme example of a crinolined Victorian, – in actual fact, HRH Princess Alice after whom the steamer was named. Princess Alice, the second daughter of Queen Victoria, was the great grandmother of our Patron, HRH The Prince Philip, Duke of Edinburgh.



Figure 3. Her Royal Highness Princess Alice, Grand Duchess of Hesse. Like most Victorians, she is not dressed with swimming in mind.

3. NINETEENTH CENTURY COLREGS. Before looking at the navigational circumstances leading up to the collision, it is instructive to recall the state of the collision regulations at that time. Following the introduction of steam ships in the early 19th Century, regulations for the prevention of collision (COLREGS)

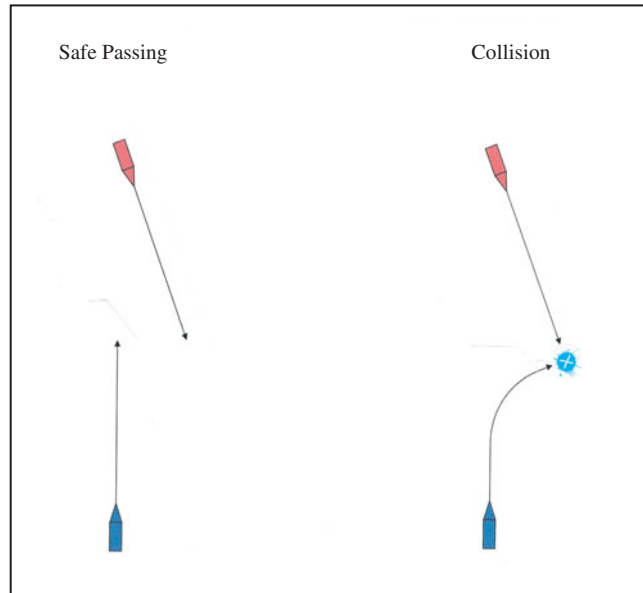


Figure 4. A defect of the “Larboard Helm” Rule.

became necessary. At first, these were local rules applying to particular rivers, like “*keep to the port side*” (in the Mersey) and “*keep to the starboard side*” (in the Thames).

In 1840, Trinity House set out standard rules for the whole of the UK, and adopted the “*keep to the starboard side*” rule for all rivers and narrow channels. Trinity House also introduced the so-called “*larboard helm rule*” whereby, in an encounter in open waters, each ship should avoid collision by turning to starboard. These rules were given the force of law in the UK by an Act of Parliament in 1846. At the same time, ships’ navigation lights, green to starboard, red to port and white at the masthead were also specified.

Subject to minor changes in wording, these rules were consolidated by Shipping Acts in 1851 and 1854. However, the larboard helm rule was seriously flawed, so radically new rules were introduced in 1863. The larboard helm rule worked well in precise collision situations but, as illustrated in Figure 4, it could, and did, cause problems in close passing situations. One ship might apply larboard helm (i.e. alter course to starboard) thus transforming a close passing situation into a collision. Subsequently, the other ship would be held to blame because its defence that it stood on because there was initially no risk of collision was clearly at variance with the fact that a collision occurred. Such findings caused shipmasters to alter course to starboard for larger and larger initial miss distances and many collisions were created from situations in which, if neither ship had manoeuvred the two ships would have passed clear. Sadly, it is still the case, today, that most collisions result from situations such that, if neither ship had altered course, there would have been a close, but safe passing.

The main purpose of the 1863 COLREGS was to get rid of the unsatisfactory larboard helm rule, and this was done for all cases except for ships meeting end-on.

Unfortunately the legislators were so anxious to make a new start that they also omitted the existing, perfectly satisfactory, rule requiring steamships to keep to the starboard side of narrow channels. This was a clear case of throwing the baby out with the bath-water.

In 1867, Thomas Gray (an under-secretary at the UK Board of Trade) produced a pamphlet explaining how the new COLREGS should be applied. This included some verses which are by no means forgotten today. For example:

When both sidelights you see ahead,
 Port your helm and show your red. (i.e. turn to starboard – the old larboard-helm rule)
 Green to green or red to red,
 Perfect safety, go ahead.
 If to starboard, red appear
 It is your duty to keep clear.

In 1876, a Joint Committee of the Admiralty, the Board of Trade and Trinity House recommended, *inter alia*, that the rule to keep to the starboard side of narrow channels should be reinstated. Unfortunately, this recommendation was not implemented until 1880. Tragically, this was too late for those passengers and crew of the *Princess Alice*, who had lost their lives two years earlier. From 1880 until the present day, the “*keep to starboard*” rule has worked well in rivers and narrow channels. Meanwhile, the old larboard helm rule, requiring that each vessel in an encounter should alter course to starboard, continued to create mischief, although it only applied to ships meeting end-on. It contributed to many collisions during the next one hundred years. Unfortunately, no-one could devise a better rule for meeting ships, and the practical solution has been to introduce marine traffic separation schemes which provide one-way lanes and thus reduce the number of end-on meeting encounters, – e.g. in the Dover Strait.

4. GUIDANCE IN 1878. In the absence of the “*keep to starboard side of narrow channels*” rule in 1878, the only real guidance for the masters of the *Princess Alice* and the *Bywell Castle* was that they should follow “*the ordinary practice of seamen*” (See Appendix 1 for a comparison of the 1867 and the 1972 versions of the applicable rule). However, this was not a simple matter in a tidal river such as the Thames. From 1840 to 1863, ships had been required to keep to the starboard side in rivers and narrow channels. On the other hand, it was quite normal for ships proceeding upstream to give way to ships proceeding downstream. Also, ships proceeding against the tide (like the *Princess Alice*) would try to keep out of the main tidal stream, while ships proceeding with the tide (like the *Bywell Castle*) would prefer to keep within the main stream. Furthermore, ships requiring deep water would tend to keep in the centre of the channel and to the outside of bends. So vague advice to follow the ordinary practice of seamen was not helpful in deciding which side of a channel a ship should keep to. The two shipmasters would also, of course, have had in mind the rules for steamships meeting in open waters. Prior to 1863 the rule for two ships approaching so as to involve risk of collision was that they should each alter course to starboard. This was the old larboard helm rule, previously mentioned.

The 1863 regulations did away with the larboard helm rule except for the case of steam ships meeting end-on or nearly end-on. However, for that situation it

was felt necessary to emphasise the principle that ships should not alter course unnecessarily away from a safe passing situation. This was the purpose of Thomas Gray's verse:

Green to green or red to red,
Perfect safety, go ahead.

It was also the purpose of a set of Explanatory Clauses which were promulgated with the force of law in 1868. They were incorporated into the COLREGS from 1880 to 1977 (see Appendix 2) and are permanently burnt into the memories of those of us who were at sea prior to 1977. Two thirds of the wording of the Explanatory Clauses was used to explain when an alteration of course to starboard was *not* required.

It is fair to say that hard-won experience of the pre-1863 rules had made people highly conscious of the danger that an unnecessary alteration of course to starboard by one of the two ships involved might convert a safe, green-to-green, passing situation into a collision. In 1878, the shipmasters of the *Princess Alice* and the *Bywell Castle* would have been well aware of this danger, and would have had Thomas Gray's exhortations and the wording of the Explanatory Clauses fresh in their minds. The international regulations of the day were included in Conservancy Bye-laws for the River Thames but, reportedly (Joslin, 2007) these were not, separately, enforced.

Taking all the circumstances together, even without a specific rule for narrow channels in force at the time, one might have expected the *Princess Alice* and the *Bywell Castle* to have each moved to their own starboard side of the river and so to have passed clear of each other. Captain Harrison of the *Bywell Castle* attempted to do this, but Captain Grinsted of the *Princess Alice* turned to port instead, and collision ensued (see Figure 5). Probably the *Princess Alice* was already on the south side of the River and Captain Grinsted was intending to avoid the strongest part of the ebb tide by keeping to the inside of the bend around Tripcock Point (Margaret Ness). In doing so, he would have expected to pass the *Bywell Castle* green to green which, according to Thomas Gray's rhyme, was perfectly safe.

We will never know what was in Captain Grinsted's mind, but it is a poignant thought that he might have made a different decision if the Joint Committee's recommendation to reinstate the "*keep to the starboard side of a narrow channel*" rule had been implemented earlier.

5. WHISTLE SIGNALS. In 1878, there were no whistle signals prescribed for steam ships in sight of one another. Such signals were introduced on a voluntary basis in 1880, and became compulsory in 1897. The convention was (and still is) to sound one short blast to indicate an alteration of course to starboard, two short blasts to indicate an alteration of course to port, and three short blasts to indicate a movement of the engines astern. Since 1960, it has been permissible to supplement these whistle signals with a flashing light. It is a sad thought that, if whistle signals had been available to the masters of the *Princess Alice* and the *Bywell Castle*, they might have coordinated their actions and avoided collision.

It is of interest that, at the 1948 International Conference on Safety at Sea, a US delegate, (Captain Farwell, USCG) proposed that whistle signals should be used to

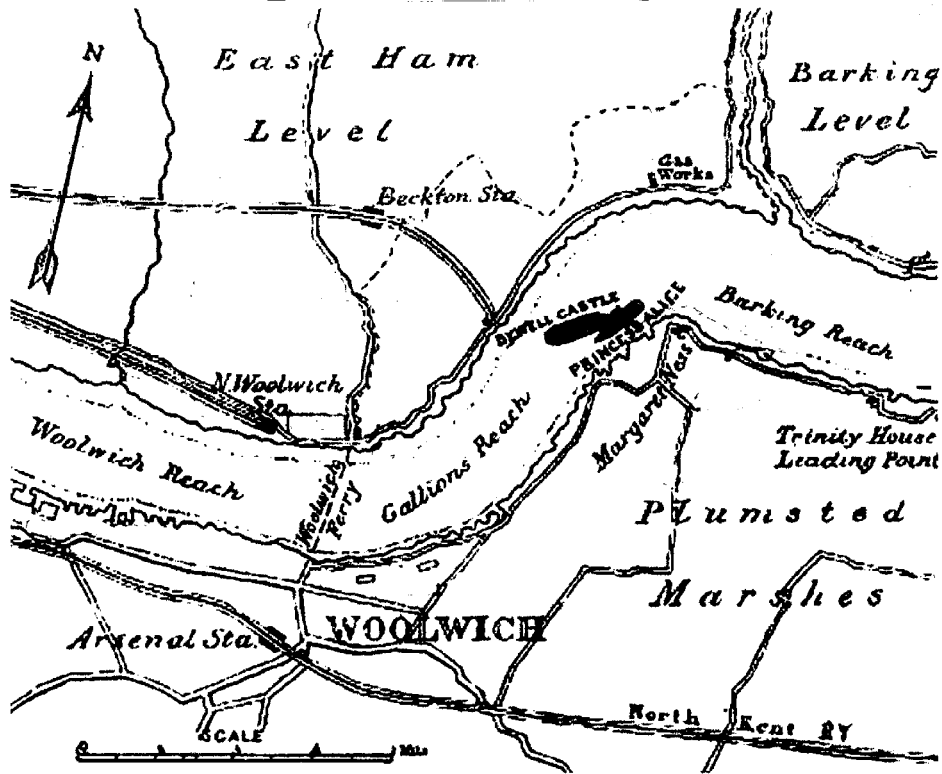


Figure 5. The position of the Princess Alice – Bywell Castle collision, from a contemporary chart.

indicate on which side a vessel intended to pass another. Specifically, one short blast would propose a red-to-red passing, to be confirmed by one short blast by the other ship, if accepting. And two short blasts would propose a green-to-green passing, to be confirmed by two short blasts by the other ship if accepting. This convention had long been used with great success in US inland waterways. It is difficult to understand why such “*intent and consent*” signals have never been accepted internationally. If the convention had been in force in the Thames in 1878, it could well have saved 600 souls.

Some thought has also been given to the improvement of light signals for indicating alterations of course, for example, Iijima and Satoh, 1996, but little has been done in practice, which might be thought strange in view of the great utility of direction indicator lights on motor vehicles.

After an incisive analysis of the human factor aspects of collision avoidance during the 1960s, E S Calvert concluded that “*negative (i.e. green to green meeting) encounters are dangerous, whatever the rules and the attempt to deal with them without an exchange of signals probably accounts for a high proportion of collisions*”. (Calvert, 1973).

6. CAPTAIN HARRISON. Captain Harrison and his crew on the *Bywell Castle* all survived the collision. His ship was a collier, 250 feet (76 metres) long and

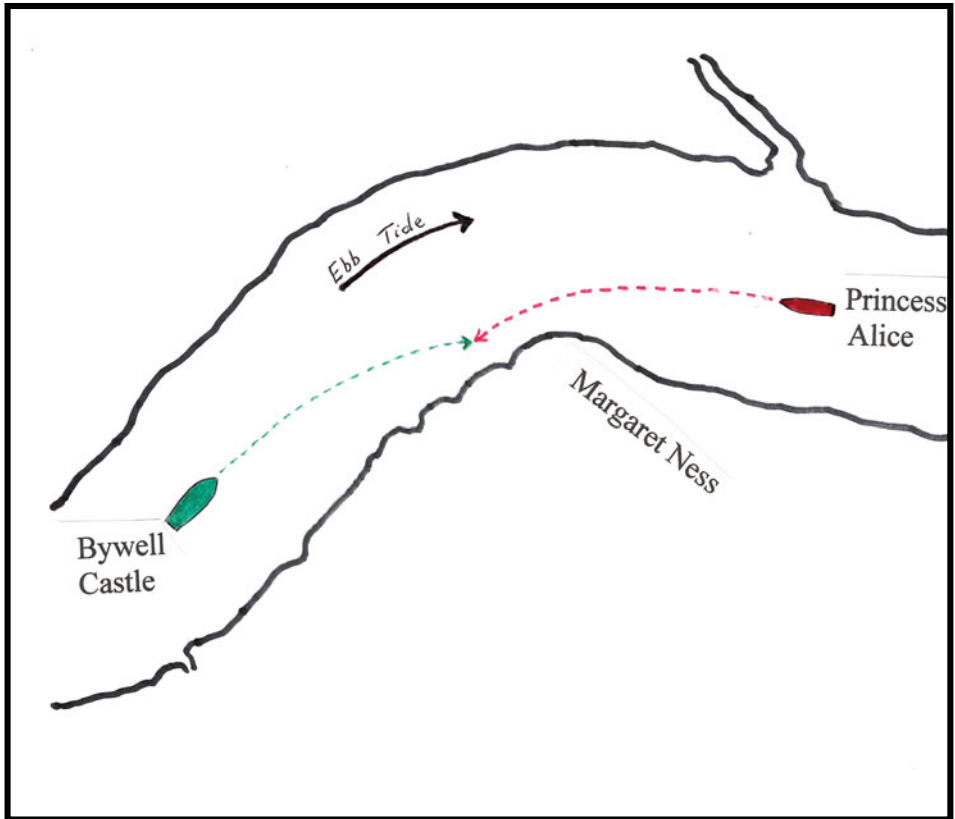


Figure 6. A simplified view of the approach four minutes before the collision.

displacing 890 tons. She was proceeding down-river, in ballast, after a refit. The *Bywell Castle* was riding high in the water, so that her bow was 20 feet (6 metres) above the waterline. At about 1945 hours, Captain Harrison and his pilot, Captain Dix, were on the upper bridge. Their ship was proceeding at half speed down the centre of Gallions Reach. An ebb tide was running, which would have increased the *Bywell Castle's* speed from 5 knots through the water to about 6 knots over the ground. (See Figure 6).

In the absence of the *Princess Alice*, Captain Harrison would probably have kept the *Bywell Castle* in mid-stream as his ship turned to starboard around the near ninety-degree bend leading into Barking Reach. This would have made good use of the favourable tide. In the event, Captain Harrison saw the red sidelight and white masthead light of the *Princess Alice* when the ships were about a mile apart. This would have been about four minutes before the collision. Captain Harrison did not have a difficult decision. On seeing the lights of the *Princess Alice*, he altered course to starboard, which took him nearer to the south shore. This measure was in accordance with the suspended rule that ships should keep to the starboard side of narrow channels. It also avoided crossing the bows of the *Princess Alice*. The *Bywell Castle* would, in any case, have soon needed to turn to starboard to negotiate the bend in the river. Finally, since his ship was in ballast, Captain Harrison would not have been

unduly worried by the relatively shallow water that tends to accrue on the inside of bends.

At the last minute, when the ships were about 100 metres apart, Captain Harrison saw that collision was imminent, and he gave orders to stop engines and go astern. The order to stop engines was carried out, but collision occurred before the engines were put astern.

7. **CAPTAIN GRINSTED.** Captain Grinsted, and most of his crew, did not survive the collision, and any assessment of the circumstances on board the *Princess Alice* is therefore speculative. The ship was considerably smaller than the *Bywell Castle*, with a length of 209 feet (67 metres) and of 251 tons gross. Amazingly, for such a small ship, she was licensed to carry 936 passengers.

At 1945 hours, the *Princess Alice* was in Barking Reach, approaching Tripcock Point (Margaret Ness). She was making 11 knots through the water, which the ebb-tide would have reduced to about 10 knots over the ground. (See Figure 6).

It is likely that Captain Grinsted saw the green sidelight and the white masthead light of the *Bywell Castle* at the same time as Captain Harrison saw the lights of the *Princess Alice* – when the ships were about a mile apart. However, Captain Grinsted had a more difficult decision. He knew that he would soon have to turn to port to negotiate a near ninety-degree bend into Gallions Reach. He was probably already on the south side of the river, and would thus have been in a position to save time by keeping to the south side as he rounded the bend. By doing so, the distance would be shorter and the adverse tide would be weaker. Perhaps reciting Thomas Gray's verse to himself he might have had in mind that a green-to-green passing was as safe as a red-to-red passing.

A turn to starboard, on the other hand, would have taken the *Princess Alice* across the bows of the approaching ship, which is something no shipmaster likes to do. Captain Grinsted would have known that the *Bywell Castle* was a large ship because of the height of her green sidelight above the water. He might have expected her to keep to the deep water in the centre of the stream or towards the outside of the bend. In the darkness, he would not have been able to see that, as a ship in ballast, the *Bywell Castle* did not need the deepest water. Finally, he might have worried that, if he altered course to starboard, there might have been insufficient room for the *Princess Alice* to pass between the approaching large ship and the north shore.

In the event, Captain Grinsted chose to alter course to port. A bad move as it turned out, but he had probably made many similar decisions in the past, with perfectly satisfactory results. Whatever the case, the author would not have liked to have been in Captain Grinsted's shoes, and to have faced the dilemma he had to resolve only four minutes before the collision.

8. **CONCLUSIONS.** The author believes that a number of conclusions can be drawn from consideration of the *Princess Alice* – *Bywell Castle* collision that still have relevance today.

- (i) Rules (such as the current rule 14) which require action by both vessels in an encounter are dangerous. They can result in conflicting manoeuvres. In the past, they have converted many safe passing situations into collisions.

- (ii) It follows from (i) that rules which are designed to reduce the probability of vessels meeting end-on are of great importance. Examples are rules 9 and 10 of the current COLREGS. (See also Belcher, 2002, who concluded that “*collision avoidance should be through the physical separation of vessels such that risk of collision no longer exists.*”)
- (iii) There is great value in two ships reaching an agreement to accept a red-to-red or a green-to-green passing situation when it is safe to do so. It is important that means and procedures (whistle signals, flashing lights or otherwise, including radio or electronic communication) should be available, *and that they should be used*, to allow such agreements to be reached. (It is accepted that VHF communication for agreeing passing conventions should be used responsibly (Cockcroft, 2003, and Stitt, 2003)).

ACKNOWLEDGEMENT

This paper is based on a presentation made by the author at the TransNav 2007 Symposium, Gdynia, 20–22 June, 2007, and published in the Symposium Proceedings.

REFERENCES

- Belcher, P. (2002) A sociological interpretation of the COLREGS, *The Journal of Navigation*, **55**, 213–224.
- Calvert, E. S. (1973) Collision avoidance in a traffic system. *The Journal of Navigation*, **26**, 137–144.
- Cockcroft, A. N. (2003) The use of vhf in collision avoidance at sea. *The Journal of Navigation*, **56**, 338–340.
- Iijima, Y. and Satoh, S. (1996) Light signals for indicating course alterations. *The Journal of Navigation*, **49**, 350–361.
- Joslin, J (2007) The Princess Alice disaster. *Thames Police Museum Website*: http://www.thamespolitemuseum.org.uk/h_alice_1.html
- Kemp, J. F. (1976) Two hundred years of the collision regulations. *The Journal of Navigation*, **29**, 341–349.
- Stitt, I. P. A. (2002) The COLREGS – Time for a rewrite. *The Journal of Navigation* **55**, 419–430.
- Stitt I. P. A. (2003) The use of vhf in collision avoidance at sea. *The Journal of Navigation*, **56**, 67–78.
- Syms, R. (2006/7). The Colregs. *Seaways. 3 parts*, December 06, January 07 & February 07. London. Nautical Institute.
- Thomas, D. 2002. *The Fatal Flaw: Collision at sea and the failure of the rules*. Phaiacia, Carmarthenshire.

APPENDIX 1.

RULES WHICH INVOKE THE ORDINARY PRACTICE OF SEAMEN

1863 – Article 20: “Nothing in these rules shall exonerate any ship, or the owner, or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of the neglect to keep a proper look-out, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.”

1972 – Rule 2(a): “Nothing in these rules shall exonerate any vessel or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.”

APPENDIX 2.
EXPLANATORY CLAUSES

Explanatory Clauses were promulgated in 1868 and added to the rule for steam ships meeting end-on from 1880 until 1977:

“This Article only applies to cases where ships are meeting end-on or nearly end-on, in such manner as to involve risk of collision, and does not apply to two ships which must, if both keep their respective courses, pass clear of each other.

The only cases to which it does apply are, when each of the two ships is end-on or nearly end-on to the other; in other words, to cases in which, by day each ship sees the masts of the other in a line, or nearly in a line with her own: or by night, to cases in which each ship is in such a position as to see both the side lights of the other.

It does not apply by day to cases in which a ship sees another ahead crossing her own course; or by night where the red light of one ship is opposed to the red light of the other, or where the green light of one ship is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.”