

The synchronized light and sound signal has been used by a few vessels navigating the Thames and I think it is most valuable for the smaller craft, tugs and tows, &c., which use a busy river. However, for the larger ships I think an additional signal is desirable.

In the lower Thames, numerous oil wharves extend over a length of 4 miles and at night it is difficult to ascertain when a tanker is about to round for any particular berth as indeed it is difficult in a procession of ships to be sure which ship is blowing to round even if the synchronous light signal is used. I suggest that the larger ships could simply be fitted with a red and green light wired up through the normal Morse flashing key. (Many already have these lights fitted.)

About 2 min. before turning to port the red light (or the green if to starboard) should be switched on and given long flashes. Just before wheel-over the flashes should change to short flashes and extinguished once the ship has started swinging.

This signal may remind some of our older readers of the fixed light manœuvring signals used very successfully by columns of darkened warships and the emergency turn signals used by Commodores of Convoys during the war. Whether this signal should also be used in the open sea is another matter, but I suggest it for use in port approaches with the merit of simplicity and low cost.

---

## The Impact of Radar on the Rule of the Road

Captain F. J. Wylie; R.N.

COMMANDER CLISSOLD's article (*Journal* 19, 109) like others before it seems to base the supposition that a new Rule is required on the idea that the collisions occur today because the present Rules are not good enough. I do not think that this contention is borne out by the evidence in cases of collision that come to Court; those are really the only ones on which conclusions should be based as very few people know what happened in the others. There is also a suggestion in his article that, before the days of radar, the Rules were adequate to prevent collisions happening. This is not so either; there were too many collisions in those days and they were caused by very much the same sort of behaviour as they are today. One should not, perhaps, think about the past success or failure of the Rules without remembering that it is not only the land which has become crowded in this century.

In 1900 there were in the world nearly 16,000 ships of over 100 g.r.t. with a total tonnage of nearly 29 million. In 1930 there were nearly 30,000 ships with a total tonnage of nearly 70 million, while in 1965 there were nearly 42,000 ships with a total tonnage of 160½ million. Compared with the situation at the turn of the century, there are now 2½ times as many ships and the average ship is more than twice as large.

I cannot think of any collision among the many which have been analysed in the

last few years which has not been due to flagrant disregard of one or other of the fog Rules combined with failure to get the necessary information from the radar and use it in an intelligent manner. These things can nearly always be said about both ships. I agree, therefore, wholeheartedly with Commander Clissold that a good Rule alone will not be sufficient to avert collision. However, I can see no reason to expect that a new Rule will be obeyed by those who disregard the old. I do agree that it is desirable to see if the present Rules can be improved upon, for the benefit of those who do follow them.

The principal weakness in the wording of the Rule which is proposed instead of Rules 18, 19, 21, 23 and 24 is the phrase 'as to involve risk of collision'. The beauty of the clear weather situation is that risk of collision can be defined and, better still, it may be assumed to be evident to both vessels. In fog, no simple, absolute or quantitative definition of risk can be envisaged. As far as one can see from collisions in fog, the idea that a collision is imminent or even that there is a risk does not seem to enter the minds of those concerned until a minute or so before the event.

I think that this is more important than it might appear to be. If one takes, by way of example, four almost 'standard' collisions in which alterations of course were made during the approach (in any logical study, I would discount alterations made in the agony of the final moment) it will be seen that one of the ships maintained a steady course throughout. These ships were the *Hudson Firth*, *British Aviator*, *Sitala* and *Jalanta*. The first three also maintained speed up to or almost up to collision. Their partners in catastrophe made more than one alteration of course to starboard during the approach and these ships were, respectively, *Canopic*, *Crystal Jewel*, *Niceto de Larrinaga* and *Constitution*. So, in each of these cases, one ship presumably did not consider there was any risk of collision and the other did. If all had maintained courses and speeds there would have been no collisions; the only risk present would have been that of ill-advised action, which, one must admit, has to be anticipated.

Proceeding from this point, one might ask what circumstances should impel participants to take remedial action and how this is covered by the present Rules?

Rule 16(c) in conjunction with the annex says in effect:

- (a) If circumstances permit disengagement, do it at an early stage but not without adequate (this should certainly include estimated C.P.A. distance and time, and preferably also the other's approximate course and speed) radar information. Do it by means of a starboard turn unless you have strong reasons against it. Make the alteration bold enough to be able to stay on the new course and continue observations.
- (b) If you have to accept a close quarter situation, you may have to take off all your way, so you must adjust your speed depending on the radar range and the closing rate. \* Speed reductions should also be bold.

\* If you collide after a radar detection you may have to explain why your ship was not stopped. An important question is when to begin reducing and an equally important fact to remember is that the distance from the collision point is probably only half the range at any moment. If the closing rate is double your own speed and the range is 4 miles, it is only 2 miles to C.P.A. If the closing rate is three times your own speed, i.e. he is going twice your speed, and the range is four miles, it is only a mile and a bit to C.P.A.! In this case, if it will take a mile to run off your way, you should stop engines at 4 miles!! So you should begin reducing much earlier.

So the urge to take action should come from the realization that, if nothing is done, ships will pass within such a distance that carelessness, stupidity, or loss of nerve on the part of the other man may spell catastrophe for both. This rather loose expression takes the place of the steady compass bearing in defining risk of collision in fog. The critical distance may be as much as 2 miles, or more if speeds are high. It is thought that, the main danger in these cases being the unpredictable behaviour of the man in the other ship, safety will not be increased by making Rules more specific. Most of the collisions which have occurred have been caused by actions contrary to good seamanship.

It seems to be generally agreed that the nearly head-on encounter is by far the most dangerous, i.e. initial bearings within  $10^\circ$  of right ahead and courses intersecting at not more than, say,  $15^\circ$ . If speeds are disparate, wider course intersections will, of course, provide the same effect. In this regard the examples already quoted are interesting:

<i>Ships</i>	<i>Course intersections</i>	<i>Initial bearings</i>	<i>Speeds</i>
Canopic	$12^\circ$	ahead	13
Hudson Firth		$10^\circ$ Std.	10
Crystal Jewel	$11^\circ$	$10^\circ$ Pt.	$7\frac{1}{2}$
British Aviator		$9^\circ$ Std.	$9\frac{1}{2}$
Sitala	$7^\circ$	fine Pt.	$13\frac{1}{2}$
N. de Larrinaga		$7^\circ$ Std.	$13\frac{1}{2}$
Constitution	$36^\circ$	$5^\circ$ Pt.	18
Jalanta		(?) Std.	say 5

These cases are typical of the circumstances involved in many, if not most of the collisions which occur in open waters with room to manoeuvre. It is highly probable that they are also descriptive of the problems which are faced in hundreds of encounters in fog, successfully negotiated every year.

In each case, both ships had radar and made contact with it, both noticed the range decreasing but:

- (i) only one of the 8 ships reduced speed,
- (ii) one in each case altered course to starboard on scanty radar information,
- (iii) the course alterations were either too little, too frequent, too late or entirely misconceived,
- (iv) all ships except one failed on Rule 16(c) and the one which did not was run down.

Rule 16(c) demands the exercise of seamanlike qualities including common sense and familiarity with the taking and meaning of ranges and bearings. It leaves, as I think it should, absolute discretion on the Master to suit his behaviour to the circumstances, within the general framework of the Rule and of the Annex. We have not yet had a case in which both ships obeyed Rules 16(a), (b) and (c) and yet came to grief. Usually, in collisions, at least two of these and the whole of the Annex have been disregarded. The more the Courts emphasize this the safer the high seas will become in fog without, I submit, additional Rules.