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SOME LEGAL ASPECTS OF COLLISIONS BETWEEN RADAR EQUIPPED SHIPS

KENNETH H. VOLK*

The advent of radar was hailed as one of the greatest advances in maritime history. The merchant fleets of the world welcomed this modern scientific development in the hope that safer and even collision-free navigation would now be possible. But after more than a decade since radar became available to merchantmen we find that the anticipated increase in safety has not been altogether realized. In 1956 there were over 1,500 collisions throughout the world involving vessels of more than 500 tons,¹ an increase of about 29% over 1946.² Of the 51 major collisions in 1956 listed by the Liverpool Underwriters Association, included within which number was the much heralded collision between the *Stockholm* and the *Andrea Doria*, 78.4% involved vessels equipped with radar.³

This is indeed a somewhat disillusioning record. An examination of court decisions concerning collisions at sea involving radar-equipped vessels appears to be in order so that we may learn, if we can, the nature of these collisions, the role played by radar in them, and the legal effect that radar has in determining fault.

A general conclusion reached from a study of these cases must be set forth at the outset. Increased safety at sea is not wanting because of any failure on the part of radar. It is rather the failure of those who use it to appreciate its limitations as well as its advantages. Indeed it

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¹ Liverpool Underwriters Association report on casualties to motor and steam vessels of 500 tons gross register and up which have been posted in the Loss Book. Figures for the years 1944 through 1956 are as follows:

Collision			Collision				
Total	Partial	Total	Total	Partial	Total	Partial	Total
Loss	Loss						
1944	23	1377	1400	1951	11	1624	1635
1945	14	1350	1364	1952	11	1624	1634
1946	13	1167	1180				(sic)
1947	11	1455	1466	1953	18	1545	1563
1948	5	1488	1493	1954	6	1368	1374
1949	12	1244	1256	1955	23	1489	1512
1950	6	1271	1277	1956	14	1506	1520

² There has, of course, been a corresponding increase in the size of the world merchant fleet. According to LLOYD'S REGISTER OF SHIPPING (Register Books 1947-56), there were 17,259 vessels of over 500 tons in 1947. In 1956 the figure was 20,289, or an increase of 17.5%.

³ According to LLOYD'S REGISTER OF SHIPPING (Register Book 1956), one or both vessels involved in 40 of these collisions carried radar. In 21 both ships had radar and in 19 radar was installed on only one of the vessels.

appears that in many instances too much reliance has been put on radar without the necessary underlying comprehension of its value. There have been numerous collisions caused by an almost blind dependence on radar to act as a sort of invisible shield to protect the ship from danger.⁴ It is sad to acknowledge that in many instances, if it had not been for radar, there would have been no collision.⁵

One of the causes then for these collisions is a lack of appreciation of radar's capacity. Radar, to be of any assistance at all in navigating a vessel, must be properly used. That is, the information this instrument presents requires interpretation and understanding on the part of the watch officer. It is a common misconception among laymen and perhaps among some deck watch officers as well that radar is a type of television which will give an instantaneous picture of everything, moving or stationary, around the ship. This is not so. First, an echo or pip appears merely as a spot of light on the radarscope and is not immediately identifiable. It may be another ship, or it may be a lighthouse, an iceberg, or some other object. The radarscope won't tell you. Further, even when the object is identified as a ship, a single echo will not show which way she is headed or her speed. Second, because of radar's line of sight characteristics, large intervening objects will conceal objects behind them, and also objects over the horizon will usually not be detected. Third, two objects at the same range and bearing, such as a ship under a bridge, cannot be readily distinguished, but will appear to be only a single echo and therefore the ship may remain hidden on the radarscope. And fourth, low-lying objects, particularly small wooden craft, are sometimes impossible to detect because of sea conditions and the characteristics of the radar wave.

These limitations are inherent in radar and will remain constant regardless of technological advances in the other aspects. Radar manufacturers are continuously improving their equipment with a special emphasis on ease and accuracy of interpreting information received on the PPI scope.⁶ Such improvements, however, will not remove the

⁴ "I think the pilot was at fault, on that fine summer's night, in paying so much attention to radar, and so little to what his eyes could have seen ahead of his vessel." *Gratsos v. The Baranof*, [1953] Can. Exch. 74, 81, 1953 A.M.C. 393, 400. "Although the captain disavowed such reliance [upon radar], the pilot admitted that if the radar had not been in operation speed would have been reduced." *Wood v. United States*, 125 F. Supp. 42, 50 (S. D. N. Y. 1954). "... [T]he master, in the course of his evidence, did say that, but for his possession of radar, he probably would not have been proceeding at the half speed at which he was proceeding." *The Sedgpool*, [1956] 2 Lloyd's List L. R. 668, 679. Cf. *Cities Service Oil Co. v. The S. S. Sea Wind*, 242 F. 2d 368 (2d Cir. 1957). See McGovern, *Head to Head with Radar*, 14 U. S. MERCHANT MARINE COUNCIL PROCEEDINGS 155 (1957).

⁵ In *The Anna Salen*, [1954] 1 Lloyd's List L. R. 475, 488, Mr. Justice Willmer said: "It is a melancholy reflection that the collision probably would not have happened if the ships had not been equipped with radar."

⁶ The cathode-ray tube upon the face of which the pip or echo is projected is

absolute necessity for a clear understanding by those who use it of what radar can and cannot do.

Despite these shortcomings, radar still remains the best anti-collision device yet perfected. It will indicate continuous distances and bearings of objects within range regardless of fog or other weather conditions which might otherwise limit visibility. Yet it is this remarkable ability to "see" in fog which alone accounts for more radar collisions than any other factor.⁷ It is this reliance on radar as a lookout which tempts the ship's master to disregard the International Rules for the Prevention of Collisions at Sea.⁸

The International Rules were, of course, adopted in substantially their present-day form long before such a thing as radar was even thought possible.⁹ But after these many years of use of radar on merchant ships, up to the present time the maritime experts of the world have not deemed it wise to alter or modify the application of the Rules in any way.¹⁰ As for our courts which are given the responsibility of enforcing these Rules, they have not yet shown the slightest inclination to tolerate anything but strict compliance. It may be that were it not for the recurring examples of reckless reliance on radar resulting in collisions, the courts would perhaps allow some relaxation in the

called the plan position indicator or PPI scope. For an elementary description of radar and how it works, see *HORMUNG, RADAR PRIMER* (1948).

⁷ Of 28 collision cases reported in England, Canada, and the United States, 21 occurred in fog, one in smoke, and three at night during wartime conditions when the vessels were "blacked out." Only three occurred under conditions when the two vessels could visually see each other approaching at a distance.

⁸ 65 STAT. 406 (1951), 33 U.S.C. §§ 143-147d (1956).

⁹ The International Rules for the Prevention of Collisions at Sea were agreed to by the International Marine Conference in Washington, D. C., in 1889. They were enacted into law in the United States on August 19, 1890, and became effective on January 1, 1897.

¹⁰ The International Convention for Safety of Life at Sea, 1948, at which all maritime nations of the world were represented, adopted the following recommendation: "The Conference, while recognising that the recent advances in radar and electronic navigational aids are of great service to shipping, is of the opinion that the possession of any such device in no way relieves the master of a ship from his obligation strictly to observe the requirements laid down in the International Regulations for Preventing Collisions at Sea, and in particular, the obligations contained in Articles 15 and 16 of those Regulations."

"The Conference recommends that Governments should call the attention of masters and officers to this opinion." 1953 A. M. C. 1, 83.

H. R. REP. No. 2969, 84th Cong., 2d Sess. 10 (1957) states in part: "After maritime experience in the use of radar is considerably more advanced, consideration may well be given to changes in the International Regulations for Preventing Collisions at Sea, based on the use of radar. However, such action would be premature at this time."

At the International Conference on the Use of Radar in Maritime Navigation, held at Genoa, Italy, in May 1957, many proposals for changing the Rules or their interpretation were submitted but rejected by the great majority of delegates. In their place, three resolutions were adopted codifying the interpretation of some of the Rules as presently written. *Marine News*, Aug. 1957, p. 25.

interpretation of the rules, particularly Rule 16 concerning speed in fog.¹¹ But so long as excesses are engaged in by ship handlers who point to radar as a justification, the courts have repeatedly indicated that they will strictly enforce the Rules in accordance with traditional interpretations. The most recent admonition came from Mr. Justice Willmer of the British Admiralty Court when he said:¹²

"This Court has said on a number of previous occasions, and I say it again now, and I say it with the full concurrence of the Elder Brethren, that the *possession of radar is not a good excuse for defying the Collision Regulations, or for proceeding at an immoderate speed in fog*. It has been said more than once that radar, like any other of these scientific instruments with which modern ships are supplied, is an aid to navigation, and is to be treated as such. It is not to be taken as a substitute for navigation in accordance with the Regulations." (Emphasis added.)

The Rules have also been narrowly construed in regard to provisions other than that requiring moderate speed in fog. For example, the second part of Rule 16 states that a vessel hearing, apparently forward of her beam, the fog signal of another vessel "the position of which is not ascertained" shall stop her engines.¹³ In the case of *The Prins*

¹¹ Rule 16, 65 STAT. 417 (1951), 33 U. S. C. § 145 n (a) (1956), provides in part: "Every vessel, or seaplane when taxi-ing on the water, shall, in fog, mist, falling snow, heavy rainstorms or any other condition similarly restricting visibility, go at a moderate speed, having careful regard to the existing circumstances and conditions."

"Moderate speed" has been interpreted to be such speed as will enable a vessel to stop in time to avoid a collision after the approaching vessel comes in sight, provided the approaching vessel is herself going at the moderate speed required by law. *The Umbria*, 166 U. S. 404, 417 (1896).

¹² *The Miguel de Larrinaga*, [1956] 2 Lloyd's List L. R. 530, 538. In *The Southport*, 82 Lloyd's List L. R. 862, 872 (1949), the court said: "She is not entitled to invoke the fact that she was fitted with radar to excuse her excessive speed, because she failed to make any proper use of her radar." In *The Prins Alexander*, [1954] 1 Lloyd's List L. R. 281, 290, *aff'd*, [1955] 2 Lloyd's List L. R. 1, the Court of Appeal, speaking through Lord Justice Hodson, said: "... [T]here is nothing in the evidence on the use of radar in this case to justify the view that the stringency of Art. 16 is to be relaxed in the case of vessels employing this aid." In *Gratsos v. The Baranof*, [1953] Can. Exch. 74, 81, 1953 A.M.C. 393, 400, the court said: "... [T]he introduction of radar as an aid to navigation did not warrant the assumption that the international 'Regulations for Preventing Collisions at Sea' are by-passed or in any way changed by reason of the additional and valuable assistance which radar provides." In *The Chusan*, [1955] 2 Lloyd's List L. R. 685, 695, the court said: "It is the fact that this equipment is supplied to be used, and used intelligently; but I am far from saying that the use of this equipment can be prayed in aid so as to justify navigation that would otherwise be reckless." See also *Wood v. United States*, 125 F. Supp. 42 (S. D. N. Y. 1954). Cf. *Pure Oil Co. v. Union Barge Line Co.*, 227 F. 2d 868 (6th Cir. 1955), where the court refused to accept another electronic device, a "Teletalk," as a substitute for compliance with the Rule requiring a proper lookout. But see *The Nora*, [1956] 1 Lloyd's List L. R. 617, 624 (dictum).

¹³ 65 STAT. 417 (1951), 33 U. S. C. § 145 n (1956). The exact language is as follows: "A power-driven vessel hearing, apparently forward of her beam, the fog

Alexander,¹⁴ the House of Lords held that the *N. O. Røgenaes* which was in collision with the *Prins Alexander* was not relieved of her obligation to stop after hearing the fog signals of the latter vessel even though the *Prins Alexander* had been observed on the radarscope for approximately six miles. This, again, was because the *Røgenaes* had not properly used her radar equipment. Lord Somervell of Harrow quoted from a case decided by Lord MacMillan¹⁵ as follows:

In order that the position of a vessel may be ascertained by another vessel within the meaning of the Regulation she must be known by that other vessel to be in such a position that both vessels can safely proceed without risk.

And then he concluded:

It may be that proper observations on a PPI can "ascertain" the position of a vessel in the sense explained by Lord Macmillan. They clearly did not do so in this case so far as the *N. O. Røgenaes* is concerned.

It may be, therefore, that radar, if properly used, will permit a vessel to continue on in fog, at a moderate speed of course, even after fog signals from another vessel have been heard ahead. This on the assumption that the position of the other vessel has been "ascertained" within the meaning of the Rule. If a collision ensues, however, the radar-equipped vessel must bear the heavy burden of establishing that she was making the fullest intelligent use of her equipment.

There is another related problem of "ascertainment" and that is the changing of course by one vessel upon approaching another in fog. A vessel in fog, hearing the signal of another vessel from such a direction as to involve risk of collision should not alter her course blindly.¹⁶ There is no hard and fast rule forbidding an attempt to steer away from the other vessel but there should be a reasonable ascertainment of the other vessel's approximate position and probable course before helm action is taken. The courts so far have been reluctant to permit any such change of course made in reliance upon radar information,¹⁷ but this has been because in each case the radar equipment was used improperly

signal of a vessel the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over."

¹⁴ [1955] 2 Lloyd's List L. R. 1.

¹⁵ *Nippon Yusen Kaisha v. China Navigation Co.*, [1935] A. C. 177, 182 (P. C.).

¹⁶ GRIFFIN, COLLISION, § 129 (1949); MARSDEN, COLLISIONS AT SEA, 395, 489 (10th ed. 1953); see *The Chusan*, [1952] 2 Lloyd's List L. R. 685.

¹⁷ *The Nora*, [1956] Lloyd's List L. R. 617; *The Anna Salen*, [1954] 1 Lloyd's List L. R. 475; *The Dagmar Salen v. Puget Sound Navigation Co.*, [1951] Can. Sup. Ct. 608, 4 D. L. R. 1 (1951), 1951 A. M. C. 1253.

and negligently. There is every reason to believe that if the information supplied by radar is correctly and intelligently interpreted the courts will permit a change of course in fog based upon such information.¹⁸

Although radar does not justify excessive speed in fog, a ship in collision will nevertheless be at fault if she has failed to use her radar.¹⁹ This is no more than is required of every good seaman at sea.²⁰ He must utilize all the means at his disposal to navigate safely and carefully and if he does not, and such failure results in collision, his vessel will be held to blame. However, if visibility is good and there is no reason to suspect fog²¹ or if the radar is not delivering accurate information²² the courts have held that there is no duty to use the radar.²³

On the other hand, if radar is used, it must be used properly and intelligently. The courts are unanimous in this requirement.²⁴ This

¹⁸ See Miguel de Larrinaga, [1956] 2 Lloyd's List L. R. 530.

¹⁹ *The Medford*, 65 F. Supp. 622 (E. D. N. Y. 1946), 21 TUL. L. REV. 106, 32 CORNELL L. Q. 570 (1947), 33 VA. L. REV. 71 (1947); *The Esso Plymouth*, [1955] 1 Lloyd's List L. R. 429. In *The Indus*, [1957] 1 Lloyd's List L. R. 335, the court held a vessel to blame for not using radar facilities maintained on the *River Mersey*, radar information being radioed to ships requesting it. See also *The Tynwald*, [1953] 1 Lloyd's List L. R. 271.

²⁰ Rule 29, 65 STAT. 419 (1951), 33 U. S. C. § 147a (1956), provides in part: "Nothing in . . . [these rules] shall exonerate any vessel or the owner or master or crew thereof, from the consequences . . . of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case."

²¹ *British Transport Comm'n v. United States*, 230 F. 2d 139 (4th Cir. 1956), *aff'd*, 354 U. S. 129 (1957). But see *Oliver J. Olson & Co. v. The Marine Leopard*, 152 F. Supp. 197 (N. D. Cal. 1957).

²² *Pocahontas Steamship Co. v. The Esso Aruba*, 94 F. Supp. 486, 490 (D. C. Mass. 1950), where the court said: "There might well be times when the continued use of radar by a navigator who was uncertain of the results he was observing and unwilling to place reliance thereon might well be foolhardy and hazardous. There should be a certain discretion allowed competent and experienced ship-handlers to use or not use radar as the circumstances of the moment require."

²³ The question of whether a vessel will be held at fault for negligent failure to keep her radar equipment in good repair has never been decided. Only one case has been found which touches on the subject and there the court said: "At this point it is well to refer to the *Duke's* radar. Its use would have avoided the collision and its unavailability was due to neglect of repair. There was ample warning—a day or two—of its disrepair. Had it been in operation, the situation so urgently demanding its services, omission to use it would clearly have been negligence. However, as the *Duke of York's* excessive speed was the pre-dominant fault leading to collision, it is not necessary in this case to pass upon the question of whether or not, in the absence of statute requiring radar, a lack of diligence in maintaining existing radar facilities is negligence." *Petition of United States*, 131 F. Supp. 712, 717 (E. D. Va. 1955), *aff'd sub nom.*, *British Transport Comm'n v. United States*, 230 F. 2d 139 (4th Cir. 1956), *aff'd*, 354 U. S. 129 (1957).

²⁴ *United States v. S. S. Washington*, 241 F. 2d 819 (4th Cir. 1957); *United States v. The Australia Star*, 172 F. 2d 472 (2d Cir. 1949), *cert. denied*, 338 U. S. 823 (1949); *The Robert L. Holt*, [1956] 2 Lloyd's List L. R. 337; *The Chusan*, [1955] 2 Lloyd's List L. R. 685; *The Southport*, 82 Lloyd's List L. R. 862 (1949). In *The Dagmar Salen v. Puget Sound Navigation Co.*, [1951] Can. Sup. Ct. 608, 612, 4 D. L. R. 1, 4 (1951), 1951 A.M.C. 1253, 1257, the court said: "If radar is to furnish a new sight through fog, then the report which it brings must be interpreted by active and constant intelligence on the part of the operator." And in *The Anna*

means a careful analysis of the movements of other vessels observed on the radarscope. In certain cases a physical plot may be required.²⁵ As was recently said by the United States Court of Appeals for the Second Circuit in the case of *Polarus Steamship Co. v. The T/S Sandefjord*:²⁶

There were a number of other factors, such as . . . the failure of those in command of the Sandefjord to make proper use of her radar. Indeed, what happened here demonstrates how radar may, when not properly used, increase the chances of collision. Had successive observations been plotted to determine the course and speed of the Polarusoil, which was plainly visible on the radar screen when about seven miles away, the ships would probably have passed one another in safety. But the master of the Sandefjord made no such calculations; he merely guessed that the Polarusoil was steering a course parallel to the coastline and moving to the left of the Sandefjord. While a matter of conjecture, it seems not unlikely that the Sandefjord would have proceeded more cautiously had she not been equipped with radar, which, under the circumstances, gave a false sense of security.

This failure carefully to analyze radar information can have two harmful effects. First, it may result in the deck watch officer's acting on incomplete and, perhaps, even erroneous information. Second, it deprives the radar operator of the opportunity to appreciate and understand the principles of relative motion. Without this understanding there is great

Salen, [1954] 1 Lloyd's List L. R. 475, 488, Mr. Justice Willmer said: "These scientific installations and particularly radar, are potentially most valuable instruments for increasing safety at sea; but they only remain valuable if they are intelligently used, and if the officers responsible for working them work them and interpret them with intelligence. That is only another way, I think, of saying that a good look-out must be maintained. A good look-out involves not only the use of ears, but it also involves the intelligent interpretation of the data received by way of these various scientific instruments. This collision ought never to have happened, and certainly would not have happened if both vessels had made intelligent use of the scientific instruments with which they were equipped."

²⁵ Plotting has been encouraged for all ships' deck officers for many years by leading writers on the subject. For a recent example, see Thayer, *Plot—For Safety*, 14 U. S. MERCHANT MARINE COUNCIL PROCEEDINGS 52 (1957).

²⁶ 236 F. 2d 270, 271 (2d Cir. 1956), *cert. denied*, 352 U. S. 982 (1957); *accord*, *Oliver J. Olson & Co. v. The Marine Leopard*, 152 F. Supp. 197 (N. D. Cal. 1957); *The Guildford*, [1956] P. 364, [1956] 2 Lloyd's List L. R. 74; *The Prins Alexander*, [1955] 2 Lloyd's List L. R. 1. In *The Guildford*, *supra* at 80, Lord Merriman said: "If the second officer had done what he admitted that he knew to be his duty, and had taken continuous observations and plotted them, he would have known, not merely that a vessel was coming nearer to him, as indicated by successive distances on the radar, but that she was a vessel which was closing him on a bearing which was substantially unchanged." In *Oliver J. Olson & Co. v. The Marine Leopard*, *supra* at 205, the court said: ". . . [I]f either had taken the trouble to plot the course of the other by radar, the fact that there was a risk of collision would have been all the more apparent to both and corresponding adjustments in course could have been made." See also *The Nora*, [1956] 1 Lloyd's List L. R. 617.

danger of confusing relative motion with true motion,²⁷ and such confusion can be fatal when two ships are approaching each other at sea. Furthermore, through a close study of these concepts of motion, the watch officer can develop a fine analytical sense or "seaman's eye" which will enable him to quickly evaluate a risk of collision and to make the appropriate manoeuvre.

From what has already been said it would appear that radar imposes additional responsibilities and duties on a ship. This is true.²⁸ Since radar warns of another ship's presence before she would ordinarily be detected and, further, will enable an accurate determination of her course and speed, it seems obvious that good seamanship will require that the radar-equipped vessel navigate with regard to this information so as to avoid any risk of collision.²⁹ Indeed, such extra responsibility would

²⁷ On the PPI scope commonly found on merchantmen today, the position of one's own ship, that is, the ship upon which the radar is installed, always appears in the center and is stationary. All objects detected by the radar will, therefore, move relatively to the center of the scope. But such are not the *true* movements of the objects because they embody components consisting of the movements of one's own ship. Thus, the navigator must compensate for his own ship's course and speed before any meaningful information is derived.

Some radar manufacturers have recently introduced models for use on merchantmen which will automatically make these computations, projecting own ship onto the screen as a spot of light moving on its true course at its true speed. All detected objects will appear to move or remain stationary according to their actual movements. Advertisement in *Fairplay*, March 28, 1957, p. 813; *Marine News*, Aug. 1957, p. 24; *The New York Times*, Sept. 24, 1957, p. 69, col. 4. Such advancements, while of great assistance in certain circumstances, *do not* relieve the watch officer of the necessity for understanding the capabilities of radar as previously mentioned. Nor do they dispense with the necessity for acquiring a knowledge of the concepts of relative and true motion. This knowledge is essential regardless of radar since, to the watch officer at sea, looking from the bridge at an approaching vessel, his own ship appears to be stationary. He must always either mentally, if he has developed that "seaman's eye" or, if circumstances permit, physically by making an actual plot, determine, at least roughly, the other ship's true course and speed.

²⁸ *The Medford*, 65 F. Supp. 622 (E. D. N. Y. 1946); *The Sedgpool*, [1956] 2 Lloyd's List L. R. 668. In *The Sedgpool*, *supra* at 679, Mr. Justice Willmer said: "An instrument such as radar is supplied to be used, and I think its very possession does impose some additional duty on the vessel fortunate enough to be equipped with it." And again, in *The Nora*, [1956] 1 Lloyd's List L. R. 617, 626, Mr. Justice Willmer said: ". . . [T]he possession of this radar equipment gives the *Westerdam* a great advantage over other vessels which are not similarly equipped; but it brings with it, in my judgment, a concurrent duty to see that intelligent and reasonable use is made of the equipment provided. If she makes a mistake, being so much better equipped than the *Nora*, so much the less does she have an excuse for doing so."

²⁹ There are also three cases, the first two involving wartime convoy conditions, which impose upon the radar-equipped ship a duty to try to warn another vessel if she observes her standing into danger. *United States v. The Australia Star*, 172 F. 2d 472 (2d Cir. 1949), *cert. denied*, 338 U. S. 823 (1949); *Chesapeake & O. Ry. v. Cleveland Tankers, Inc.*, 121 F. Supp. 830 (E. D. Mich. 1954); *The Sobieski*, [1949] P. 313, 82 Lloyd's List L. R. 370 (1948). In a more recent case, *United States v. S. S. Washington*, 241 F. 2d 819 (4th Cir. 1957), the court explained that such a duty arises only if the vessel in collision is under the control of the other radar-equipped vessel or its commanding officer as distinguished from the control of a group commander who happens to be using that other vessel as his

follow the installation of any other electronic device designed to assist navigation. But, the shipowner might well ask, then, if radar is such an extra burden, why install it in the first place? The answer is that radar-equipped vessels, although charged with additional duties, enjoy the use of a navigational aid which, if used properly, can greatly increase their safety. This safety factor far more than offsets any extra responsibilities which may be imposed. There can be no question that this instrument which enables seamen to see in fog and in the dark is essentially the means by which collisions at sea can and should be reduced, if not eliminated. To blame radar for the shortcomings of those who use it would indeed be a backward step.⁸⁰

No country in the world presently requires sea-going vessels to be equipped with radar. Nor has any court decision been found which holds a vessel at fault for failure to carry radar. To the contrary, in the case of *Anglo-Saxon Petroleum Co. v. United States*³¹ the court said that "The failure of the Wilkes to carry navigational radar did not make it unseaworthy." It is, however, true that that case involved a collision which occurred in 1942 when radar was still in its infancy. Eventually, when radar has proven itself the great navigational aid we know it to be, and when it is readily available to all merchantmen at a relatively low cost, the courts might very well change their position and require its installation.

Such was the history of radio. In the case of *The T. J. Hooper*,³² Judge Learned Hand held a vessel unseaworthy because she was not equipped with a radio receiver even though there was no law requiring it at the time and even though there was no custom among that type of vessel to use such equipment.³³ Of course, since 1928, when that

flag ship. And in *United States v. Adrastus*, 190 F. 2d 883 (2d Cir. 1951), it was held that the escort vessel's negligence in failing to relay radar information to the convoy vessel could not be attributed to that convoy vessel. See for a brief discussion of this subject 55 MICH. L. REV. 582 (1957).

³⁰ In *The Hindoo*, 74 F. Supp. 145, 149 (S. D. N. Y. 1947), modified on other grounds *sub nom.* *United States v. Australia Star*, 172 F. 2d 472, cert. denied, 338 U. S. 823 (1949), the court said: "It has been suggested that to hold the *Australia Star* at fault is to penalize her because of her equipment with radar. That is a misconception. The conduct which is regarded as negligent on the part of a person of sound vision is not the same as that which is condemned when practiced by the blind. The fault of the *Australia Star* is that she chose to remain blind when she had the means to see."

³¹ 88 F. Supp. 158, 160 (D. C. Mass. 1950).

³² 60 F. 2d 737 (2d Cir. 1932).

³³ Judge Hand said: "There are, no doubt, cases where courts seem to make the general practice of the calling the standard of proper diligence. . . . Indeed in most cases reasonable prudence is in fact common prudence; but strictly it is never its measure; a whole calling may have unduly lagged in the adoption of new and available devices. It never may set its own tests, however persuasive be its usages. Courts must in the end say what is required; there are precautions so imperative that even their universal disregard will not excuse their omission." *Id.* at 740.

marine casualty occurred, the maritime countries of the world have entered into treaties³⁴ requiring vessels to carry not only radio but radio direction finders. Furthermore, the United States as well as other countries have statutes making it unlawful for certain vessels to put to sea without such equipment.³⁵

Radar probably has a long way to go before it reaches the level of importance now attached to radio. It may be that by compact, conference or other international agreement, all seagoing vessels will be obligated to carry radar. Such a step would undoubtedly be followed by statutory requirements. Until that day, however, or until radar is so well established that it will be recognized in court as an essential aid to navigation, a vessel will not be at fault for failing to carry such equipment.

CONCLUSION

An examination of the cases involving radar collisions leads to but one conclusion. Too many of those who are charged with the responsibility of navigating vessels at sea not only fail to understand and properly interpret the information which radar gives them but they compound that failure by regarding radar as a sort of navigational wizard worthy of their greatest trust, something even its manufacturers would not advocate. It is not difficult to see how radar, if put into the hands of those who do not know how to properly use it, can be a trap, an invitation to destruction. Indeed, this is the principal cause of the collisions in fog which in recent years have grown increasingly in number.

There appears to be only one solution to this problem. The deck officer of a seagoing ship must be fully qualified before he can be permitted to use radar at sea. The maritime nations of the world, recognizing their duty to protect lives and property, can and should refuse to grant a license to any merchant marine deck officer unless he has demonstrated that he understands and knows how to use this equipment.³⁶ When this has been done we can expect with some assurance

³⁴ International Convention for the Safety of Life at Sea, May 31, 1929, arts. 27, 47, 50 STAT. 1121, T. S. No. 910; International Convention for the Safety of Life at Sea, June 10, 1948, [1952] 3 U. S. TREATIES & OTHER INT'L AGREEMENTS 3450, T. I. A. S. No. 2495.

³⁵ 68 STAT. 704 (1954), 47 U. S. C. § 351 (1956), originally enacted June 19, 1934. Former 46 U. S. C. § 484, now incorporated in 47 U. S. C. § 351, was enacted in 1910 and also required certain vessels to carry radio. But the vessel (a tugboat) in *The T. J. Hooper*, 60 F. 2d 737 (2d Cir. 1932), was not covered by that statute. Therefore, when the *Hooper* case was decided there was already a federal statute requiring at least some vessels to carry radio, unlike the situation today in regard to radar.

³⁶ In 1956 the United Kingdom took such action and there are probably other nations which have enacted such requirements. Ministry of Transport and Civil Aviation Notice No. M.404, Nov. 1956. To date, no similar action has been taken in the United States, although the Secretary of the Treasury and the Commandant

that the number of collisions will decrease and that at last radar will prove itself and be accepted as an invaluable aid to navigation.

of the Coast Guard have ample statutory power to issue a regulation embodying such a requirement. 60 STAT. 1097, 46 U. S. C. § 224 (1946); 63 STAT. 544, 14 U. S. C. § 631 (1949); 63 STAT. 545, 14 U. S. C. § 633 (1949).

The courts have looked favorably on programs for training in the use of radar. See *Stranding & Loss of S. S. Princess Kathleen*, 1953 A. M. C. 392 (Can. Ex. Ct.), where the court said: "Although the question of radar was not in issue here, we note with satisfaction the action of the Department of Transport in providing schools for instructions of ships' officers in its use, as recommended by this Court at its last sitting."