

S.S. "ITALIAN PRINCE"

THE MERCHANT SHIPPING ACT, 1894

REPORT OF COURT

In the matter of a Formal Investigation held at Niblett Hall, Temple, and the Institute of Civil Engineers, Westminster, on the 6th, 7th, 8th, 9th, 10th, 13th, 22nd and 23rd days of February, 1939, before Kenneth Carpmael, Esq., K.C. assisted by Eng.-Lieut.-Commander Pearson, M.I.N.A., F.C.M.S., Dr. A. M. Robb, D.Sc., M.I.N.A., Captain W. E. Whittingham, O.B.E., R.D., Commander J. R. Williams, R.D., R.N.R., into the circumstances attending the loss of the steamship "Italian Prince".

The Court, having carefully inquired into the circumstances attending the above-mentioned shipping casualty, finds for the reasons stated in the Annex hereto, that the initial cause of the loss of the "Italian Prince" was an outbreak of fire in the boiler-room, but the ultimate cause was an extension of the fire to the deck and subsequently to the cargo, because of inability to cope with the fire in the boiler room. The Court further finds that the default of the owners, Prince Line, Limited, or their representatives, and of the master, Captain James Halloway and of the chief engineer, Mr. Robert J. J. Smith, all contributed to the loss of the ship; but, as is discussed in the Annex, the default of the chief engineer is partly explained by the initial default of the owners or their representatives.

Dated this twenty-eighth day of March, 1939.

KENNETH CARPMAEL, Judge.

We concur in the above Report.

W. E. WHITTINGHAM,	} Assessors.
J. R. WILLIAMS,	
T. A. PEARSON,	
A. M. ROBB,	

Annex to the Report.

This Inquiry was held in London on the 6th, 7th, 8th, 9th, 10th, 13th, 22nd and 23rd February, 1939. Mr. Owen L. Bateson (instructed by the Solicitor to the Board of Trade) appeared as Counsel for the Board of Trade; Mr. G. St. Clair Pilcher, K.C., and Mr. W. W. Porges (instructed by Messrs. Middleton, Lewis & Clarke) appeared on behalf of the owners—the Prince Line, Limited; Mr. E. E. Addis (instructed by Messrs. Rehder & Higgs) appeared on behalf of the master—Captain James Halloway; Mr. Cecil Havers (instructed by Messrs. Charles G. Bradshaw and Waterson) appeared on behalf of the chief engineer—Mr. Robert J. J. Smith and the second engineer—Mr. Alastair McDonald McNeill; Mr. R. A. Clyde (instructed by Messrs. Clyde & Company) appeared on behalf of the cargo underwriters; and Messrs. Winter & Company watched the proceedings on behalf of Mr. and Mrs. Bovill (passengers). Mr. J. B. Hewson (instructed by Messrs. Piesse & Sons) watched the proceedings on behalf of the British Mexican Petroleum Company, Limited, on the 7th February.

The "Italian Prince" was a single-screw steel cargo steamship built in 1921 by the Furness Shipbuilding Co., Ltd., for and owned by the Prince Line, Ltd. of 56, Leadenhall Street, London. She was of 3477.59 tons gross, 363 feet in length 52 feet in breadth and 22 feet in depth to the upper deck. She had continuous upper and shelter decks and a raised fore-castle. The propelling machinery was amidships.

The ship was built under Lloyd's Register of Shipping Rules and Regulations 1919-1920, and she was classed \star 100 A.1. with Lloyd's Register of Shipping.

Between the fore peak bulkhead and the boiler room bulkhead were Nos. 1, 2 and 3 holds of which Nos. 1 and 2 were separated by a steel watertight

bulkhead and Nos. 2 and 3 by a steel non-watertight bulkhead. Between the engine-room bulkhead and the after peak bulkhead were situated the deep tank fitted for the carriage of water ballast, oil, or cargo and Nos. 4 and 5 holds, all dividing bulkheads being of steel and watertight. Except at the fore peak the above-mentioned bulkheads were not extended above the upper deck. In the boiler room bulkhead were three watertight doors semi-permanently closed when burning oil and used for access to the after end of No. 3 hold when this was used as a cross-bunker for coal.

The shelter deck space was open from the fore peak to the tonnage well aft except for oil settling tank and fresh water tank spaces on the starboard and port sides respectively abreast the engine casing. These tank spaces were formed by steel bulkheads with tonnage openings and steel plate doors. Cargo was also carried in the fore-castle. The five holds each had a main hatch on the shelter deck and on the upper deck fitted with beams, wood hatch covers and tarpaulins. The deep tank had two bolted steel lids on the upper deck and the No. 4 main hatch on the shelter deck extended over these. A cellular double-bottom extended from the fore peak to the shaft tunnel well and from side to side of the ship. The tank top was flat and there were no side bilges. The double-bottom tanks were numbered 1 to 6 and all tanks carried oil fuel except No. 4 which was the boiler feed water tank and was situated under the engine-room. There was a double-bottom tank longitudinally divided known as the boiler room tank in way of the boilers; both sides were available for the carriage of oil fuel but the starboard side was ordinarily used for drainage purposes. There were no oil fuel tanks outside the double-bottom except the settling tanks. The same pipe line served for oil and water ballast to the double-bottom and deep tanks.

The master and officers were accommodated in the bridge house on the shelter deck, and here was also accommodation for twelve passengers. The engineer officers, stewards and petty officers were berthed in houses on the shelter deck abreast the machinery casing and separated therefrom by alleyways. The crew accommodation was in the shelter deck space aft and in the poop house above.

A wood-sheathed boat deck extended outboard from, and at the level of, the machinery casing top. Three 24-foot lifeboats for 35 persons each and one 23.9 feet for 34 persons were carried in radial davits, the two forward boats Nos. 1 and 2 being abreast the funnel at the forward end of the casing, and Nos. 3 and 4 boats abreast the engine-room skylights, the odd numbers being to starboard as usual. The wireless room was situated on the boat deck at the after end.

An 18-foot working boat for about 12 persons, which was not part of the statutory life-saving appliances, was carried in radial davits abreast the poop house.

The ship was propelled by a triple expansion engine with cylinders 26 inches, 43 inches and 73 inches diameter and 48 inches stroke. Steam was supplied by three single-ended three-furnace boilers 15 feet 9 inches diameter by 12 feet long working at a pressure of 180 lbs. per square inch. The boilers were fitted with Howdens forced draught and the two wing boilers were fitted with smoke tube type superheaters and gave a steam temperature of 530° F. Only the two wing boilers were used at sea and the centre boiler was used to supply steam for auxiliary purposes in port. The boilers were built to burn oil or coal. The vessel burned 20.8 tons of oil per day when developing 1728 I.H.P. The



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boilers were placed in line abreast with their backs against the screen bulkhead which separated the boiler room from the engine-room. Of the 49 feet 6 inches total length of machinery space, the boiler room was 22 feet long to the screen bulkhead. The screen bulkhead extended down to the tank top and had drainage holes in the wings between engine-room and boiler room. A thwartship bilge well of one frame space extended across the ship at the forward end of the boiler room and at the after end of the engine-room. A watertight door in the thrust recess in the engine-room bulkhead gave access to the shaft tunnel from which an escape trunk led to the deck at the after end.

The following engine driven pumps and auxiliary machinery were fitted in the engine-room:—

	Steam Cylinder Dia.	Pump Bore	Stroke
Centrifugal circulating pump	—	12	—
F Ballast pump ...	9	11	10
Main feed pump ...	10½	8	21
Engine-driven feed pump forward ...	—	4½	27
Engine-driven feed pump aft ...	—	4½	27
F Auxiliary feed or general service pump ...	8	5½	8
Engine-driven bilge pump forward ...	—	4½	27
F Engine-driven bilge pump aft ...	—	4½	27
Auxiliary condenser pump ...	7	7	8
F Sanitary pump ...	6	6	6
Engine-driven sanitary pump ...	—	3½	12
Fresh-water pump ...	4½	2½	4
Engine-driven air pump ...	—	22	27
Oil transfer pump ...	8	7	18
Oil unit pumps (two) ...	5½	3½	7
Evaporator pump ...	—	3	8½
Refrigerator circulating pump ...	—	—	—
Fan engines (two) ...	8	—	6
Dynamo engines (two) large	8	—	6
small	7	—	5

Pumps marked "F" were available for fire service.

The oil fuel unit comprising duplicate pumps, heaters and hot and cold filters was made by Smith's Dock and Engineering Co., Ltd., of North Shields, and was fitted on the starboard side at the after end of the engine-room. The two cylindrical return tube heaters, 16½ in. internal diameter by 3 ft. 11½ in. between tube plates, were arranged horizontally over the two fuel pumps with the hot and cold filters at the outboard and inboard ends of the heaters respectively. Adjacent was the oil transfer pump which drew the oil from the double-bottom by way of the oil and ballast line and delivered it to the settling tanks. From the settling tanks the oil ran by gravity to the cold filters and thence to one or other of the unit pressure pumps. These pumps discharged the oil under pressure through the heaters and hot filters to an oil discharge pipe, which ran along the starboard side of the starboard boiler at the ship's side and across the boiler fronts where master-valves and burner valves controlled the supply to the burners. This pipe was of solid drawn steel with the flanges screwed on and expanded. There was no precise evidence as to the actual measurements of the pipe but it was probably 1½ in. bore and 1¾ in. outside diameter. There was a flange in the pipe at about half-way along the boiler. Between the suction valves on the settling tanks and the boiler front valves the following shut-off valves were fitted at the unit. An inlet and an outlet valve on each of the two cold filters

allowed either to be shut off for cleaning. Four similar valves were fitted on the heaters and four on the hot filters. Also each fuel pump was fitted with an inlet switch cock and an outlet valve to allow of overhauling. Each pump was fitted with an air vessel of about one gallon capacity between the pump valves and the discharge shut-off valve. Circulating return valves on the boiler fronts allowed the oil in the discharge line to return to the cold filters through a 1 in. bore pipe and a non-return valve. This return pipe was used to circulate the oil when burners were shut off in order to maintain the oil temperature. A connection on the return pipe allowed the oil to be returned direct to the settling tanks, the valves on the tanks being also non-return.

The original installation had been on the Smith Zulver system with two burners in each furnace. In March, 1938, the furnace fronts were changed to the Todd system with one burner in each furnace. The oil supply and return pipes across the boiler fronts were not altered and the redundant burner control valve on each front was blanked off with a cap nut. The Todd burners were fitted with a safety device to minimise the danger of careless manipulation.

There was a valve on the boiler tops on the starboard side which supplied steam to the transfer pump and the oil fuel unit with an extended spindle to the boat deck.

Two rectangular tanks of riveted construction, 12 ft. 9 in. by 9 ft. 9 in. by 5 ft. 9 in. deep and each of about 19½ tons oil capacity at .98 specific gravity, were situated in the shelter deck space on the starboard side. The tanks were raised 1 ft. 6 in. above upper deck level by seatings and there was a clear space of about 1 ft. 6 in. round all sides of both tanks. The forward bulkhead of the tank space was one frame space forward of the screen bulkhead. No tank trays were fitted. A scupper led overboard from the after end of the space and all pipe connections through the upper deck were watertight. Drain valves and pipes led to a funnel connected to the oil sump in the after end of the engine-room tank top. High and low suction sluice valves had extended spindles to the boat deck. A combined air and overflow pipe led to the shelter deck and from this pipe a connection led back to the main oil filling line through a spring loaded valve. Steam heating coils were fitted in the tanks. Manhole doors were fitted on the tank sides and were visible from the doorway in the casing side which gave access to the tank-space from the engine-room. The oil filling line ran athwart the after engine-room bulkhead at shelter deck level. Pneumercator gauges for ascertaining the weight of oil in the tanks were fitted on the after engine-room bulkhead for the settling tanks only. Access to the boiler room from the engine-room was by a door in the screen bulkhead at platform level between the centre and starboard boilers. A door in the screen bulkhead at the level of the cylinder tops led to the boiler tops. The usual ladders and gratings gave access by way of the fidley from doors in the casing side at shelter deck level, and a door in the starboard side of the fidley casing opened on to the empty coal bunker space at upper deck level. The usual storm plates were fitted over the fidley grating on the casing top.

Close fitting stokehold plates extended to the fender or guard plates on the boiler fronts and in the wings these fender plates extended up to about 10 ft. above platform level. Removable plates were fitted for access to the boiler manhole doors. These arrangements were made to exclude dust and ashes from the tank top when burning coal. The tank top therefore could only be seen ordinarily from the passage between the centre and starboard boilers over the top of the tie plate, a gap of about 6 in. The stokehold plates were 2 ft. 6 in. above the tank top.

The Howdens forced draught fan with its twin engines was fitted in the starboard forward corner of the engine-room. The inlet was trunked to an opening about 6 ft. wide by 2 ft. 6 in. deep in the screen bulkhead over the starboard side of the starboard boiler in order to obtain heated air from the

boiler tops. The discharge was trunked through to boiler fronts between the centre and starboard boilers above the passage.

Two 36 in. cowl ventilators immediately forward of the funnel extended down either side of the fidley to within 10 ft. 6 in. of the stokehold plates. Four 18 in. cowl ventilators at the corners of the engine-room skylight on the boat deck extended to within 8 ft. to 12 ft. of the platform. An annular space of 18 in. between the inner funnel and the funnel-casing served as an upcast ventilator from the boiler tops.

Steam steering gear situated in the poop house was controlled by telemotor gear from the bridge.

Fire-fighting Appliances.

On Deck.—A 3 in. to 2½ in. bore steel water service pipe ran fore and aft on the upper deck along the port side of the hatch coamings. There were ten 2½ in. branch couplings and cocks. Of these, three were on the fore end of the bridge house, one was on the fore end of the fidley casing port side, one was on the port boat deck abreast the engine-room skylight and two were at the after corners of the midship accommodation. The remaining three were on the after deck and fore-castle. Three 60 ft. lengths of canvas fire hose with couplings and three nozzles were stowed on the lower bridge and an 80 ft. length of rubber wash deck hose was also carried.

About six two-gallon soda acid extinguishers and about ten Antifyre pistol type extinguishers were distributed throughout the accommodation. Two Siebe Gorman smoke helmets with hose and bellows were stowed on the lower bridge. Six fire buckets were carried on the bridge. Steam smothering connections with permanent pipes and valves were fitted to all cargo compartments.

In Machinery Spaces.—Six two-gallon foam type extinguishers were provided, three being fitted in the engine-room and three in the boiler room. These were new in March, 1938. In addition, two two-gallon soda acid extinguishers and two Antifyre pistols were carried. There was one canvas fire hose long enough to reach the boiler room with a hose connection to the general service pump at bottom platform level. Two steel boxes each containing about 10 cwts. of sand were fitted in the stokehold.

Two auxiliary duplex pumps were ordinarily used for the deck water service and the ballast pump, and the after engine-driven bilge pump were also available. No Downton pump was fitted.

Steam smothering arrangements, which will be described later, were fitted in the engine-room and stokehold.

The "Italian Prince" left Higham Bight, River Thames, on her last voyage at about 3 p.m. on the 3rd September, 1938, bound for Malta. She was loaded with 4,478 tons of general cargo including machinery, oil, cement, food-stuffs and Government explosives and stores. The cargo was distributed throughout the holds between peak and fore-castle. In addition, some cargo was stowed on deck abreast Nos. 1, 4 and 5 hatches. The explosives were carried in the deep tank, in the after 'tween deck in the way of Nos. 4 and 5 hatches, and on the shelter deck in the way of No. 5 hatch. They were stored in magazines to the requirements and satisfaction of the Admiralty.

She also carried about 1,000 tons of oil fuel in all the double-bottom spaces except in the starboard side of the boiler-room tank and in No. 4 tank which was used for feed water.

The voyage proceeded without incident until about 8.30 p.m. ship's time on the 6th September, 1938, when the vessel was 25-30 miles to the south-westward of Cape Finisterre. At this time the fireman trimmer on watch in the stokehold while passing from the engine-room to the stokehold through the passage-way between the starboard and centre boilers observed flames below the starboard boilers. Most unfortunately this man was not available to give evidence at the Inquiry, having left the country for the other side of the world before the Inquiry was ordered. He had, however, made a statutory

declaration in pursuance of Section 465 of the Merchant Shipping Act, 1894, which was placed before the Court. Although efforts were made to extinguish the fire by means of fire extinguishers and hoses, it was found necessary at 9.1 p.m. to send out a distress signal, and shortly before 9.20 p.m. the vessel had been abandoned by everyone except the wireless operator who, however, left the ship shortly afterwards and was saved.

From this short statement of events, which will be expanded later, it is apparent that events moved very rapidly after the discovery of the fire. The Court is of opinion that this is only consistent with the fire having originated in a leakage of oil fuel from the oil supply pipe alongside the starboard boiler. It is therefore necessary to consider the question of the oil fuel installation and the fire-fighting appliances in the machinery space with some particularity.

The "Italian Prince" was constructed from plans which had been approved by Lloyd's Register of Shipping on the 17th September, 1919, under the 1919-1920 Rules, which contained, *inter alia*, the following:—

"Section 49.

(13) Oil fuel pipes should, where practicable, be placed above the stokehold and engine-room plates, and where they are always visible."

The wording of the Rule was changed later and in 1936-7 was as follows:—

"Section 20.

(5) Oil pipes and fittings.—(a) The oil pressure pipes conveying heated oil are to be of solid drawn steel, and placed in sight above the platform in well-lighted parts of the stokehold or engine-room."

It should of course be noted that the later wording was not compulsory with regard to the "Italian Prince" as she had been built under the earlier Rule.

The Court is of opinion that the words "always visible" in the earlier Rule mean that the pipes should be so placed that they can be seen by those on watch in the engine-room or stokehold in the ordinary course of their duties without having to take extraordinary steps in order to sight the pipes.

As stated above, the Court is of opinion that the initial cause of the fire was leakage from the supply pipe which was led along the outboard side of the starboard boiler. It therefore becomes important to consider:—

(a) Whether this pipe was always visible within the meaning of the Rule, and

(b) if not, whether this was due to impracticability.

The Court is clearly of opinion that the pipe was not always visible within the meaning of the Rule, although it would have been perfectly practicable to have rendered it always visible. It was quite invisible from the engine-room and could only have been seen with difficulty from the stokehold even in the absence of the fender plate at the wing. With this fender plate in position, carried to a height of about 10 feet above the stokehold floor, sighting of the pipe, which entered the stokehold immediately above the line of the top of the fender plate, was entirely prevented in ordinary working conditions. There were no gratings over the top of the boiler giving access to the somewhat confined space under the 'tween deck bunker, and even if gratings had been arranged it is doubtful whether the view of the supply pipe would have been adequate, since an oil fuel return pipe was led immediately above it. Nor could the supply pipe readily be seen from the tank top, since it was led at a height of fully 13 feet above the inner bottom and was probably partly concealed by the round of the boiler.

As stated above, it would have been perfectly practicable to have rendered the pipe always visible. For example, an opening could have been provided in the screen bulkhead which would have enabled the engineer on watch to have had the pipe under his constant inspection. Such opening could have readily been closed by means of a plate during periods when the vessel was burning coal. An

alternative method would have been to have placed the pipe below the turn of the boiler instead of above it, and had the fender plate been removed (as could easily and inexpensively have been done while burning oil) this would have rendered the pipe permanently visible from the stokehold platform.

It was only, however, when the vessel was burning oil that the question of the position and sighting of the pipe became of importance. The first occasion on which the oil fuel plant was used was in 1932 for a single short voyage of three weeks to a month. Five years later, in 1937, a decision was taken to bring the oil-burning installation again into service and the necessary alterations were made in May, 1937, while the ship was undergoing her second No. 1 survey for classification. There was no indication in the evidence that the change-over was merely a temporary measure.

In the light of the knowledge which had accumulated in the 16 years which had elapsed since the oil-burning plant on the "Italian Prince" was installed (see for example the revised Lloyd's rule quoted above which had been in force at least since 1925), it would have been reasonable to expect that the owners, or those responsible on their behalf, when taking this decision should have realised the defects referred to above and made some attempt to remedy them. The curtailment or removal of the fender plate or the cutting of a hole in the screen bulkhead would have been a material remedy. In fact the change from coal-burning in 1937 was effected without any consideration of details of the oil fuel installation, although the ship was then undergoing a classification survey which would have provided ample opportunity for consideration of these details. In particular, the Court is satisfied that the pipe in question was never examined. As an indication of the lack of care with which this matter was dealt on behalf of the owners it may be mentioned that Mr. Rhynas, the superintendent engineer who supervised the May 1937 repairs and survey, was at that time entirely ignorant of the existence of the important Board of Trade Notice M.140 to Shipowners, Shipbuilders and Masters with regard to the Prevention and Extinction of Fire on Cargo Ships. There was apparently no provision in the owners' organisation for keeping such an important notice in mind and no provision for ensuring that copies were in the possession of and known to the master and chief engineer of a vessel such as the "Italian Prince" which was being newly converted to burn oil fuel. In fact, the Court is satisfied that neither the master nor the chief engineer knew of the existence of the Notice. Subsequently, in March, 1938, the original burners were replaced by other burners requiring a very considerably increased pressure in the pipe supplying oil to the burners. In this case again, although the installation as a whole was examined and tested under working conditions, there was no examination of the pipe, although it may be that such slight superficial sighting as was possible was made from the top of the boiler.

The failure to consider the details of the oil fuel installation was aggravated by lack of proper consideration of the fire-fighting appliances. After her conversion to burn oil fuel, the "Italian Prince" was sailing for six months without any of the foam extinguishers recommended in the Notice M.140 and it was not until January, 1938, when the Board of Trade called attention to the fact that the fire-fighting appliances for the "Italian Prince" were not as recommended, that anything was done to lessen the danger from fire. Upon his attention being called to the matter the owners' chief engineer superintendent, Mr. Kent, at first said that during an overhaul immediately forthcoming the appliances would be brought into accordance with the recommendations. Subsequently, however, this attitude was changed. The number of foam extinguishers was increased but Mr. Kent refused to comply fully with the recommendations on the ground of further expense. On the last voyage the complement of foam extinguishers provided only

two-thirds of the total quantity recommended by the Board of Trade, namely, 12 gallons instead of 18 gallons.

The unsatisfactory attitude in the matter of foam extinguishers was accompanied by a concealment of information regarding the provision of steam-smothering pipes. The Court is of the opinion that this form of protection against the risks of fire was actually installed, in the form of a pierced steam pipe led across the boiler fronts under the stokehold floor and another pierced pipe under the engine-room floor in the region of the oil pumping and heating unit. The Board of Trade were, however, ignorant of the provision of the smothering lines, and in January, 1938, and also subsequently, raised the question of the deficiency of the fire-fighting appliances in this respect. Mr. Kent, on behalf of the owners, did not at any time disclose that provision for the admission of smothering steam had been made when the ship was built; either he had forgotten or was quite indifferent. The Court concludes that in this matter also the owners' representatives gave scant consideration to the question of adequate fire-fighting equipment. The unsatisfactory attitude of the owners' representatives in the matter of the steam-smothering pipes has left on the Court the impression that the surveyors of the Board of Trade were treated as interfering rather than as co-operating in the maintenance of safety of life and property at sea.

With regard to the attempts to deal with the fire, it is noted above that the time between the discovery of the fire and the abandonment of the vessel was a comparatively short one. The Court is of opinion that the failure to overcome the fire was due partly to failure to sight the source of the fire and partly to lack of co-ordinated effort. The Court is, however, of opinion that the failure to sight the source of the fire was largely due to the position of the pipe which is presumed to have failed, and to the presence of the fender plate.

In order to illustrate the failure to sight the source of the fire and the lack of co-ordinated effort, it is necessary to give a resumé of events.

At about 8.30 p.m. the fireman on watch observed fire on the outboard side of the starboard boiler, in the region of the tank top. The alarm bell in the engine-room was rung, thus calling out those members of the engine-room crew who were not on watch. Shortly thereafter the third officer, who was on watch, apparently learned of the outbreak from a message shouted up a stokehold ventilator, and called to the seaman on look-out to ring the bell on the fore-castle. The ringing of the fore-castle bell called out the deck crew and stewards.

When the alarm bells were heard the captain proceeded to the navigating bridge, the chief officer collected a smoke helmet, ordered the boatswain to rig hoses, and went to the boiler tops by way of the engine-room. The second officer assisted to connect hoses and then assisted in bringing a smoke helmet from the bridge to the engine-room door. The chief and second engineers went down to the stokehold, but the chief engineer stopped the refrigerating engine on his way there. The third engineer sent for a smoke helmet; but these had already been taken, and one was then not far from the engine-room door. The fourth engineer, who was then on watch, saw the glow of flames from the outboard side of the starboard boiler, stopped the fuel pump and then attempted to quench the fire with a foam extinguisher which he had obtained from the stokehold.

Two officers took the two smoke helmets, and one engineer tried to obtain one; but the apprentice who, according to the "Instructions for Fire Stations," was responsible for the bringing of smoke helmets to the fire did not do so. In fact, smoke helmets were not necessary, at least in the initial stages of the fire.

Having indicated this initial lack of co-ordinated effort it is proper now to make a comment on the printed "Instructions for Fire Stations" posted at various positions on the ship. These instructions embodied a reference to a Downton pump which

was not installed. It is not suggested that this error should in any way explain any lack of co-ordination, but it does provide emphasis for a charge of laxity on the part of the owners or their representatives.

After coming on to the bridge the captain ordered the third officer to work out the position of the ship and then sent him to obtain information about the outbreak. From the chief engineer the third officer obtained a favourable report which he conveyed to the master. This was the only report received by the master from the chief engineer; but at the climax of the fire the master received a very unfavourable report from the chief officer. Apart from going down to the deck to see hoses rigged, and making an ineffectual effort to enter the stokehold and engine-room, the master remained on the bridge or in its vicinity until about the climax of the fire, ignorant of the extent and development of the outbreak, and not exercising any control over the activities of his subordinates.

The fire had broken out somewhere on the outboard side of the starboard boiler but no one apparently thought of looking over the top of the fender plate, which though not without some difficulty would have been perfectly possible. The first attempt to get at the seat of the fire, made by the fourth engineer across the after end of the boiler from the alleyway between the starboard and centre boilers, was unsuccessful. A further attempt at extinction by playing a hose across the after end of the boiler from the alleyway was also unsuccessful.

Subsequently there was a continued effort to extinguish the fire from the front of the boiler, foam extinguishers and a hose being used through fender plate doors and from the tank top between the boiler stools. The seat of the fire was, however, inaccessible from that position and the efforts were unsuccessful.

Some time after the initial outbreak there was a minor outbreak on the outboard side of the port boiler. There were no oil pipes in this region and it is presumed that the fire developed either in an accumulation of oil vapour or in some oil, or oily residue, on the tank top. This fire was extinguished by a foam extinguisher and by a hose which had been led down from the deck. In order to reach the fire it was, however, found necessary to burst in the upper portion of the fender plate on the outboard side of the port boiler; on the port side the upper portion of the fender plate was merely sheet iron, whereas on the starboard side the heavy steel plating was continued to the top.

At an early stage of the fire the chief engineer, chief officer and third engineer had all made separate visits to the boiler tops, each acting on his own initiative and not in accordance with any ordered plan. During these early visits there were no serious signs of fire in this region; but it was actually in this region on the starboard side that the culmination occurred.

After the fire on the port side had been extinguished there was something in the nature of a muffled explosion over the boiler tops, in the region of the fan intake, and from the stokehold floor the second engineer observed flames over the boilers; the explosion was probably the ignition of oil vapour which had been driven from oil leakage, had been drawn towards the fan intake, and had there been ignited by the flames below. It is possible that the ultimately large conflagration over the boiler tops could have been prevented had further fire-fighting appliances been available. Both the second and third engineers were on the boiler tops at some time when there was serious fire in that region. The third engineer used a foam extinguisher with some effect, and the second engineer a soda-acid extinguisher without much effect. The foam extinguishers had nowall been discharged and no attempt had been made to use the four refills that were available. In these circumstances the second engineer and third engineer went for a hose, but before that had been brought the water supply was failing because of shortage of steam for driving the pumps, and the order had been given to abandon the ship.

A distress signal had been transmitted at about nine o'clock and a few minutes thereafter the wireless operator had gone to the bridge to report to the master that the signal had been acknowledged. On his return to the wireless-room the operator observed the forward lifeboat on the port side being lowered, and at about 9.12 transmitted a message calling for urgent assistance. The forward port boat was, however, the second boat to be lowered. The aft port boat had already been sent away with the passengers and ten of the crew. The forward boat was being used for the abandonment of the ship; but the wireless operator was not advised and transmitted a signal that the boats were being lowered after the ship had, in fact, been abandoned. The chief officer had gone to the wireless-room to tell the operator of the abandonment, but the operator was outside the room attending to the emergency batteries since the dynamo supply had become inadequate, this being a concomitant of the inadequacy of the pumps. The absence of the wireless operator was ultimately noted in the forward port lifeboat and it approached the ship and picked up the operator, who had left the ship and swum towards the boat on receiving a signal made to him.

The order for abandonment was given by the master without his having received any information from the chief engineer as to the progress of the fight with the fire, but on the other hand he had received a very unfavourable report from the chief officer. Moreover, the climax of the fire had been accompanied by a great burst of flame out of the funnel, from the space between inner and outer casings; and this fact would give emphasis to the unfavourable report. A further consideration was that fire had spread to the starboard side of the boat-deck; it is probable that before the climax the fire on deck was not serious, but the cover on the forward boat on that side had been set alight and an attempt to swing out the after boat had been abandoned. The fire on the boat deck was caused by burning paint from the funnel, but no attempt was made to prevent the fire spreading. No reasonable explanation was put forward by the master to explain why no such attempt was made. The passengers had been sent away immediately before the abandonment of the ship.

It is not proper to censure the master for premature abandonment, in view of the facts that all the extinguishers had been discharged and the water supply had practically failed. In fact, however, the abandonment was premature. Between nine and ten hours after the abandonment the ship was still afloat. The fire in the boiler room seemed to have died out and the starboard after lifeboat was swung outboard at the davits, but the accommodation amidships was completely ablaze and the fire had spread to No. 4 hatch; this last development provides an explanation of the complete and, in the end, probable sudden disappearance, since some explosives were stowed in this region.

There is no direct evidence on the origin and seat of the fire, but the Court is of the opinion that the initial cause was either leakage from a joint in the supply pipe led along the outboard side of the starboard boiler or from the pipe being "necked" at the flange. It is possible that the jointing material was of a kind which is not now considered suitable for use in pipes carrying heated oil under pressure. There was evidence before the Court that jointing material of the kind suggested was found in a sister ship of the "Italian Prince," although in another sister ship the correct packing was found. It is probable also that the leakage had dripped down the boiler cleaving and saturated a portion of an asbestos mattress on the lower portion of the boiler. A likely theory put forward on behalf of the Board of Trade was that owing to the heat of the boiler shell the saturated mattress ultimately became glowing red and so ignited the oil vapour. It is possible that the leakage had been in existence for a considerable time, and that before combustion occurred a considerable quantity of vapour had been given off. These considerations are consistent with

the fact that the fire in the boiler room seems ultimately to have died out; it would die out because of lack of fuel since the supply valve from the settling tank in use had been shut by the chief engineer at a late stage in the proceedings.

The probable explanation of the origin of the fire is here interposed because it provides the background against which the general conduct of the fire-fighting operations can be viewed. Reference has already been made to the lack of co-ordinated effort in the initial stages. The lack of co-ordination persisted throughout. There was no concerted attempt to determine the seat of the fire although the presence of flames on the outboard side of the starboard boiler, towards the after end, should have suggested that there had been leakage above the flames from the oil fuel piping. This should, in turn, have suggested the desirability of attacking the fire from the top of the boiler. But although sporadic visits were paid to that region there was no real attempt at fighting the fire from there until the culmination, and it was then too late; the bulk of the foam had been squandered in ineffectual attempts to extinguish the flames on the tank top.

It must, however, be emphasized that there was an initial handicap on any efforts made at extinction; the handicap resulted from the inaccessibility of the pipe and the presence of the high fender plate. If there had been no high fender plate the seat of the fire might have been seen; it is even possible that glowing lagging could have been seen before there was any actual fire. And if there had been convenient access towards the oil fuel pipes, efforts from above would have been facilitated. Moreover, if there had been available the additional six gallons of foam required to bring the quantity up to compliance with the recommendations of the Board of Trade, it is possible that the fire could have been extinguished; and the chances of success would have been further increased if any attempt had been made to use the four refills carried on board. It is, however, proper to mention that, however undirected their efforts, the chief officer, second engineer and fourth engineer did work continuously and energetically.

The next point to be considered is that of the steam smothering apparatus which was never in fact brought into use. The question whether this should have been done and, if so, when, is a difficult one.

The Court is of opinion that it was proper to attempt to extinguish the fire in the first place by means of the foam extinguishers, but it would have been wise to have closed all the ventilation possible at the beginning so as to have prepared the way for turning on the steam in the event of the foam extinguishers being unsuccessful. It would have been perfectly practicable as an alternative method of fighting the fire to have turned on the steam smothering at an early stage. In fact, however, the Court is of opinion that the question of using the steam smothering was never considered and the ventilation was never closed—further indications of the lack of co-ordinated effort. Although, owing to the drop in steam pressure to about 70 lb. at the time the engine-room and stokehold were abandoned, the efficacy of the steam would have been very much reduced, nevertheless it would have been wise, had the ventilation previously been closed, to have turned on the steam even at a late stage. It was suggested that the control valve on the boat-deck was rendered inaccessible because of the heat from the funnel, near to which the valve was located. But there was great heat from the funnel only after the climax, and the Court is of the opinion that even then the valve could have been reached if a determined effort had been made.

Having concluded the history of the case, it is now necessary to consider the question whether the vessel was in a good and seaworthy condition at the time she sailed on her last voyage (see Question 10).

Having arrived at the conclusion indicated above that the source of the fire was due to the failure of a pipe for conveying heated oil under pressure, which pipe was in fact masked from view and largely

inaccessible, it is in the opinion of the Court impossible to come to any conclusion other than that the "Italian Prince" was not in a good and seaworthy condition on sailing. The Court in coming to this conclusion has also in mind that the "Italian Prince" was very considerably lacking in the foam extinguishers as recommended by the Board of Trade.

The question thereupon arises as to who was responsible for this state of affairs. It was urged on behalf of the owners that the vessel had been built according to plans approved by Lloyd's Register which showed the actual position of the pipe in question; that the vessel was regularly surveyed thereafter by Lloyd's Surveyors; and that at the time the change to oil-burning was made in May, 1937, the vessel was in fact undergoing her second No. 1 survey. These are powerful considerations in favour of the owners but, for the reasons indicated above, the Court is of opinion that there was failure on the part of the owners' representatives to which the condition of the vessel on sailing must be attributed.

As regards the future, the Court considers that the record of this disaster provides emphasis for the requirement that all pipes containing heated oil under pressure must be completely visible and easily accessible. It considers also that attention should be drawn to the need for fire drill in machinery spaces as well as on deck; and organization of fire services should include provision for the re-filling of used extinguishers.

The Court also desires to draw attention to the fact that where a fire occurs in the machinery space of an oil-burning vessel this must in many cases necessitate the closing of the oil fuel supply to the boilers. As a necessary consequence the steam supply must gradually and progressively fail, with the result that the water pumps are put out of action. There may or may not be a remedy for this state of affairs and whether there is one is not a matter for this Court. The fact remains that in this case the failure of the water supply must have been one of the most important factors in the decision of the captain to abandon his vessel. Had pumping power been available the Court is of opinion that the upper deck fire could readily have been extinguished.

There was no actual evidence as to when or how the "Italian Prince" sank, but it appeared that on the 8th September the Dutch tug "Thames" searched the vicinity where the "Italian Prince" had been on fire but only found large patches of oil and some drifting cargo. It is therefore presumed that the fire eventually reached the explosives and that the vessel blew up and sank.

Questions and Answers.

The Court's Answers to the Questions submitted by the Board of Trade are as follows:—

Q. 1. When and by whom was the steamship "Italian Prince" built? By whom was her propelling machinery built? With how many boilers was she fitted? In what manner could they be fired?

A. The steamship "Italian Prince" was built by the Furness Shipbuilding Co., Ltd., Haverton Hill-on-Tees, in 1921. The propelling machinery was built by Messrs. Richardsons, Westgarth & Co., Ltd. Three boilers were installed, arrangements being made for the burning of either coal or oil.

Q. 2. Who were the owners of the steamship "Italian Prince"?

A. The steamship "Italian Prince" was owned by the Prince Line, Limited, London.

Q. 3. What surveys had been carried out by Lloyd's Register of Shipping from and including May, 1937, to the time of her loss?

A. The steamship "Italian Prince" was surveyed for classification second No. 1 Special Survey, for renewal of Load Line Certificate, and on account of minor damages, in May, 1937. The machinery was surveyed on account of damage in August, 1937.

The engine and the starboard boiler were surveyed on account of minor damages in October, 1937.

A survey was held on the rudder, because of the locking pintle, in October, 1937.

A survey of minor hull damage was made in November, 1937.

A survey of the repair of the above minor damage was made in December, 1937.

A survey of the engines on account of damage was made in December, 1937.

The Annual Boiler Survey, survey of the alterations consequent upon the installation of superheaters, and survey of minor engine damage repairs, were carried out in March, 1938.

A survey of sundry damages to hull was also carried out in March, 1938.

A survey of minor hull repairs and a survey for the renewal of the Load Line Certificate were carried out in June, 1938.

Q. 4. With what lifesaving appliances was the vessel fitted? Were they in good condition when the vessel left on her last voyage?

A. The ship was provided with four lifeboats, capable of carrying 139 persons in all, with 71 life-jackets, with line-throwing apparatus and four rockets, and with 24 rockets. These were all in good condition when the ship left on her last voyage.

Q. 5. Was the vessel supplied with all proper and adequate fire-fighting appliances (a) for machinery spaces; (b) for other parts of the vessel?

A. (a) The fire-fighting appliances for the machinery spaces were not in accordance with the recommendations of the Board of Trade, and were inadequate as appears in the Annex. (b) The fire-fighting appliances for the other parts of the ship were in accordance with the recommendations of the Board of Trade.

Q. 6. With what cargo was the vessel loaded for her last voyage? How was it distributed, and what was its total weight?

A. The ship was loaded with 4,478 tons of general cargo, including machinery, oil, cement, foodstuffs, and Government explosives and stores. The cargo was distributed throughout the holds, 'tween deck and fore-castle; in addition, some cargo was stowed on deck abreast Nos. 1, 4 and 5 hatches. Detonators were carried in the deep tank, and other explosives in the after 'tween deck in the way of Nos. 4 and 5 hatches, and on the shelter deck in way of No. 5 hatch; they were stowed in magazines to the requirements and satisfaction of the Admiralty and the War Department.

Q. 7. On what day, at what time and from what place did the vessel leave on her last voyage?

A. The ship left Higham Bight, River Thames, at 3 p.m. on the 3rd September, 1938.

Q. 8. Were there any, and if so how many, passengers on board her?

A. There were 12 passengers on the ship—six women, four men and two children.

Q. 9. What was the total number of crew on board her?

A. The total number of crew was 34.

Q. 10. Was the vessel in good and seaworthy condition when she left on her last voyage?

A. The ship was not in good and seaworthy condition when she left on her last voyage; the considerations underlying this Answer are developed in the Annex.

Q. 11. How many boilers were in use during the vessel's last voyage? With what fuel were they fired? For how long had this method of firing been used?

A. Two boilers were in use during the last voyage. These were fired with oil, and had so been fired since May, 1937.

Q. 12. Was the fuel system in use during the vessel's last voyage satisfactory? If not, in what respects was it unsatisfactory?

A. The fuel system in use was satisfactory, but in details the installation was not satisfactory;

these details form the subject of consideration in the Annex.

Q. 13. Did fire break out during the last voyage? If so, at what time and where did it start? What efforts were made to extinguish it? Were such efforts successful? If not, why not?

A. Fire broke out in the boiler room at about 8.30 p.m. ship's time, on 6th September. Attempts at extinction were made with foam extinguishers and water hoses. These efforts were unsuccessful. Reasons for lack of success are developed in the Annex.

Q. 14. If fire did occur, what caused it? A. It is probable that the fire originated in oil which had leaked from the pipe conveying fuel to the burners, this oil having run down the cleading of the starboard boiler and impregnated the asbestos mattress on the lower region of the boiler.

Q. 15. Was an S.O.S. message sent out? If so, when?

A. An S.O.S. message was sent out shortly after 9 p.m. ship's time.

Q. 15. Was the vessel abandoned? If so, when and for what reason?

A. The ship was abandoned between 9.15 and 9.20 p.m. ship's time. She was abandoned because the means of fighting the fire had been exhausted; the extinguishers had been used and there was not adequate steam for the operation of the water pumps. This Answer is qualified by considerations developed in the Annex.

Q. 17. What were the conditions on board at the time of abandonment?

A. At the time of abandonment there was a fierce fire in the upper region of the boiler room on the starboard side and there was an outbreak on the starboard side of the boat deck, abreast the funnel.

Q. 18. Were any, and if so which, of the vessel's lifeboats safely launched?

A. The two lifeboats on the port side were safely launched.

Q. 19. Were all those on board the vessel saved? A. All on board were saved.

Q. 20. Was the vessel sighted by any vessels after abandonment? If so, what was the latest time at which she was seen and in what condition was she at that time?

A. The ship was sighted on several occasions after abandonment. On the last known occasion, between 6 a.m. and 7 a.m. on 7th September, the fire in the boiler room seemed to have died out, but the accommodation abreast the machinery casings was ablaze and there was fire on, or in, No. 4 hatch.

Q. 21. What was the cause of the loss of the steamship "Italian Prince"?

A. The initial cause of the loss was an outbreak of fire in the boiler room, but the ultimate cause was an extension of the fire to the deck and subsequently to the cargo, because of inability to cope with the fire in the boiler room.

Q. 22. Was the loss of the steamship "Italian Prince" caused or contributed to by the wrongful act or default of her owners, Prince Line, Limited; her master, Captain James Halloway; and the chief engineer, Mr. Robert J. J. Smith; or any, and, if so, which of them?

A. The default of the owners, Prince Line, Limited, or their representatives, and of the master, Captain James Halloway, and of the chief engineer, Mr. Robert J. J. Smith, all contributed to the loss of the ship; but, as is discussed in the Annex, the default of the chief engineer is partly explained by the initial default of the owners or their representatives.

KENNETH CARPMAEL, Judge.

We concur in the above.

W. E. WHITTINGHAM,
J. R. WILLIAMS,
T. A. PEARSON,
A. M. ROBB,

Assessors.

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