

(No. 133.)

"SILVERLIP" (S.S.).

The Merchant Shipping Act, 1894.

REPORT to the Board of Trade on the circumstances attending an explosion and fire which caused the death of five persons and injury to several others, together with the loss of the vessel, and which occurred on the tank steamship "SILVERLIP," in the Bay of Biscay, on the 1st day of May, 1907.

In the matter of the inquiry by Captain Jocelyn Home Thomson, C.B., H.M. Chief Inspector of Explosives, and Sir Boverton Redwood, Adviser on Petroleum to the Admiralty and Home Office, being persons duly appointed by the Board of Trade under the seven hundred and twenty-eighth Section of the Merchant Shipping Act, 1894, for the purpose of holding such inquiry into the circumstances and cause of the loss of the British tank steamship "Silverlip," of London, on the 1st day of May, 1907.

*Report.*

London,  
25th July, 1907.

SIR,

In virtue of our appointment by the Board of Trade, dated the 8th June, 1907, we held an inquiry into the above accident, at the Caxton Hall, Westminster, on the 25th and 26th June, 1907, and beg to report as follows:—

*Description of Vessel.*

The "Silverlip" was a steel tank steamship, built at Low Walker, on the Tyne, by Sir William Armstrong, Whitworth & Company, Limited, in the year 1903. Her length was 470 feet, her breadth 55 feet, and her depth 33 feet. She was rigged as a schooner and fitted with triple expansion engines of 586 horsepower, calculated to propel the vessel at a speed of 11 knots per hour. Her tonnage, after deducting 2589 tons for propelling power and crew space, was 4904 tons. She was registered in London, her official number being 118327, and was classed 100 A1.

The "Silverlip" was owned by the Shell Transport and Trading Company, Limited, Mr. Harry F. Swan, Sir Marcus Samuel, Bart., and Mr. Samuel Samuel, of 19 and 21, Billiter Street, E.C., being the registered managers of the vessel.

The construction and arrangement of the vessel are shown in the attached plan, from which it will be seen that the extreme forward part of the ship was appropriated for water-ballast tanks, cargo space and the fore-castle which formed the crew space. Immediately abaft the fore-castle was a cofferdam extending up to the upper deck and separating the fore part from the remainder of the vessel. This cofferdam was usually, but not always, filled with water.

The main portion of the vessel was occupied by holds or tanks, numbered 1 to 7, but as each of these was divided into two by a longitudinal bulkhead, there were in fact 14 separate tanks. The outer walls and bottom of each tank were formed by the skin of the ship. Each tank was provided with an expansion trunk to allow for the expansion and contraction of the petroleum with changes of

temperature. These expansion trunks were of rectangular section and extended from the top of the tank to the deck above. Their position and dimensions are shown in the plans of the upper and main decks. The cover of each expansion trunk was fitted with a screw plug about seven inches in diameter, and there was a gas cock a little below each cover. These cocks were opened twice a day to equalize the pressure in the tank with that of the air, and in doing this there was often a considerable rush of air or vapour. The expansion trunks of tanks 1, 2, 5, 6, and 7 extended from the main deck to a little above the upper deck, while those of tanks 3 and 4 extended from the main deck to the bridge deck. It was usual to fill the tanks up to within about 3 feet of the top of the expansion trunks.

The above represents the usual construction in the most modern tank steamers, but the vessels belonging to this Company being designed not only as tank steamers, but also for carrying general cargo, a complication had to be introduced into the tank construction, which has an important bearing on this accident, as will be seen below. In order to load cargo into the tank holds, it was necessary to provide each with a cargo hatch. It will be seen from the plan that these hatches were placed immediately fore or aft of the expansion trunks. In order to render spirit-tight the covers of the hatches, which were steel plates measuring about 8 feet by 5 feet, they were provided with a large number of holding-down bolts, and the joint was sealed with rubbered canvas and Holzappel's composition.

The sealed cargo hatch was in every case situated on a lower deck than the top of the expansion trunk, and was therefore subjected to a considerable pressure of petroleum when the tanks were full. Above each sealed hatch was an ordinary wooden hatch, which was used both for loading cargo into the tank and into the 'tween decks.

In connection with the tanks 3 and 4 there was a further complication, in that they were fitted with an upper extension occupying the space between the main and upper decks. These extensions are termed on the plan "Indian Summer Tank" and "Summer Tank." On this trip both these extensions were filled, but in some voyages they were left empty and only the main tanks 3 and 4 contained petroleum. This necessitated separate sealed hatches on the main and upper deck for each of these tanks, these hatches being used alternatively.

Between the tanks 3 and 4 was the pump-room, connected with the bottoms of all the tanks by a system of piping shown in the plan of the holds. Between this room and tank 3 was a shallow cofferdam.

It will be seen from the plan that the main deck extended practically the whole length of the vessel immediately above the tops of the tanks. Above this was the upper deck of equal extent. Over the portion of the vessel occupied by the tanks 3 and 4, there was a third or bridge deck on which was the bridge and officers' quarters. The space between this bridge deck and the upper deck was closed at the forward end with a bulkhead having no opening in it. A similar bulkhead closed the after end of this space, but this was provided with two doors or openings. In fine weather the space under the bridge deck could be freely ventilated by opening the hatches above and the side ports, but when there was much sea on all these had to be closed. The evidence shows that they were all closed at the time of the explosion. Cowl ventilators were provided for this space, but it would appear from the evidence that they were not in active operation on the day of the accident, owing probably to their having been turned to leeward to avoid the driving spray.

Immediately abaft tank No. 1, but separated by a cofferdam extending to the upper deck, were the ship's boilers, and abaft of these the engine-room. The space on the main and upper decks above the boilers and engine was largely occupied by coal bunkers, and above these there was a poop deck, on which were the engineers' quarters, the galleys, lifeboats, &c. The

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poop deck, bridge deck, and fore-castle deck were connected with one another by portable gangways.

The vessel was lighted by electricity, and portable accumulator lamps were employed.

#### *Circumstances Preceding the Accident.*

In March last the vessel was at Balek Papan, Borneo, and there she took on board 2576 tons of petroleum spirit shipped by the Asiatic Petroleum Company, Limited. This was stowed in Nos. 2 and 3 tanks. She then proceeded to Singapore, where she loaded a further quantity of 5841 tons, shipped by the same Company, and stowed in the remaining tanks. The total cargo was therefore 8417 tons of petroleum spirit. Details of the specific gravity, boiling point, &c. of the spirit in each tank will be found in Appendix I. The whole of the cargo had a flash-point (Abel) well below 73° Fahr., which, for legal purposes, has been fixed as the dividing line between petroleum spirit and petroleum oil.

The "Silverlip" left Singapore on the 25th of March last with a crew of 53 hands, bound for St. Catherines, Isle of Wight, for orders.

The weather was hot at starting, but on getting into the Mediterranean the temperature moderated considerably. As a consequence of this there was a shrinkage of the petroleum, and on or about the 25th April it was found necessary to "press up" No. 7 tank, the level of the liquid having fallen below the lower end of the expansion trunk, and surging having commenced. The operation of "pressing up" is carried out by pumping water into the tank until the level of the petroleum has reached the required height.

The vessel continued her voyage, encountering stormy weather, and passed Finisterre on the 30th April. The temperature had now fallen to about 45° Fahr., and on the following day, the 1st May, at about 1 p.m., incipient surging was noticed in tanks 3 and 4. This was reported by the chief officer to the master, who, thereupon, ordered him to press up these tanks. This, the chief officer proceeded to do, taking with him Mr. O. Keithing, carpenter, and Mr. A. Grant, boatswain, both of whom seem to have been steady and experienced men. Owing to the fact that the valves of the pumps in the pump room were being repaired at the moment, it was found necessary to utilize the donkey pump in the engine room and the permanent deck washing pipes. The carpenter and boatswain commenced to make connections by means of hose to these pipes at about 1.15 p.m. The plug in the cover of the port side expansion trunk of No. 4 tank was then removed, and the gas cock opened. The hose was inserted through the plug-hole and passed down below the level of the liquid so as to minimize the evolution of vapour.

At this time the hatches and port-holes of the space below the bridge deck were closed. A strong smell of vapour had been noticed in this space during the morning, but as this appears to have been a common occurrence, it did not attract much attention.

At the after end of this space two firemen, D. Munro (a Scotchman) and M. Abbas (a Turk or Arab) were engaged in painting a bulkhead, and were seen shortly before the accident to be scraping the metal previous to applying the paint. Besides these two, the pump man was engaged in repairs in the pump room which was also below the bridge deck.

#### *Circumstances of the Accident.*

At the time of the accident the vessel was heading north by 40° east, and the wind, which was fresh, was blowing from about two points forward of the port beam. The vessel was travelling at about 8½ knots.

The pumping of water into the tank had commenced at about 1.40 p.m., and a few minutes later, the chief officer, who had been supervising, left and went to his berth which was close by. The carpenter was then standing near the tank with his measuring rod, and the boatswain was attending to the hose.

At 1.48 p.m. the first explosion occurred, followed immediately by a fierce conflagration. The sound of the explosion was rather differently described by the witnesses, being said by some to have been a dull muffled thud, and by others to have been accompanied by a rushing sound like that of the escape of steam from the safety valve of a large steamer, or like a life-saving rocket.

The immediate effect of the explosion was undoubtedly first to blow off the hatches above No. 4 tank, a result which was noted by more than one witness, and secondly to ignite the petroleum in the tank, no doubt through the open plug-hole. The almost simultaneous occurrence of these two events probably accounts for the descriptions of the sound of the explosion.

The accident caused the death of the following persons:—

T. R. Bell	...	...	Chief Engineer.
O. Keithing	...	...	Carpenter.
A. Grant	...	...	Boatswain.
D. Munro	...	...	Fireman.
M. Abbas	...	...	Fireman.

Probably the first explosion was sufficient instantly to kill, or any rate to render insensible, the carpenter, boatswain, and two firemen. The chief engineer, who was aft at the moment of the explosion, was seen to run in the direction of the conflagration, with what object no one seems to know, and was no doubt overcome by the fire or smoke. The pumpman, E. Kamborak, who was working between Nos. 3 and 4 tanks, had great difficulty in escaping, and was beaten back twice by the flames. He opened the sea cock in the pump room and drenched himself with water, when he was able to get through, but he was very badly burnt. Other members of the crew received burns, but not of very serious character.

The captain was in his cabin when the explosion occurred. He instantly ran out and through the saloon into the fore-well. He observed that the two boats on the bridge were burning, and realized that the crew could only be saved by the life-boats on the poop deck. Consequently, he ran through the flames and reached the poop, where he gave the necessary orders for launching and loading the boats. Had it not been for his great foresight and bravery in reaching the after part of the ship, the loss of life would most probably have been very much greater, as there seems to have been some confusion before he arrived on the poop.

The chief officer and second officer ran forward from the bridge to fore-castle, while the third officer was on the poop at the time of the accident. The life-boats were launched under the directions of the captain, and were then rowed to the forward end of the ship, where those of the crew who were on the fore-castle were taken off, some of them swimming to the boats. Shortly afterwards the whole crew were picked up by the s.s. "Westlake," of London, and eventually landed at Plymouth.

As to the end of the "Silverlip" we had no verbal evidence, but from a report by H.M. Vice-Consul at St. Nazaire it appears that the master of the "Kara," of London, saw the vessel burning, and afterwards saw her go down. A trawler, probably French, had taken the vessel in tow, and had to cut the tow-rope as she sank. There were other fishing boats about at the time. A photograph was taken of the burning vessel, probably by one of the officers of the "Kara."

#### *Cause: Accumulation of Vapour.*

In the consideration of the most probable cause, two main questions present themselves. These are—first: How and where did vapour accumulate? and secondly: How was the vapour ignited? In dealing with the first of these two questions, we may say at once that we are convinced from the evidence that the first explosion occurred in the forward end of the space below the bridge deck, and that it was there that the vapour had accumulated. At first sight it would appear that the existence of the vapour must have been intimately connected with the pressing up of No. 4 tank, but a little consideration will show that this cannot have been the case. The water was

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being slowly pumped in, and the rate of displacement of vapour must have been correspondingly slow. Even if vapour had been coming freely from the plug-hole, it would have been carried away harmlessly by the strong breeze which was blowing across the vessel at the time, and in any case there was no ready means of its access to the 'tween decks. The source of vapour must, therefore, have been some leakage below the bridge deck. We have already said that the ventilation of this space was very indifferent at the time, so that any vapour due to leakage had an opportunity to accumulate. Nor was this an unusual occurrence, as several witnesses testified to having frequently noticed a strong smell of spirit, not only in this particular part, but in the confined spaces of the ship generally.

The rivetting of the tanks gets slightly started by the working of the vessel in a sea-way, and this will always account for a little leakage; but, in our opinion, this was probably not the main source of leakage below decks in this vessel. It will be remembered that the sealed hatches, which were subjected to a pressure of petroleum spirit, were all 'tween decks. It is true that two or three witnesses stated that these hatches were frequently examined, and found quite free from leakage. They admitted that they meant free from visible leakage, and could not say whether a slow leakage may not have been going on which evaporated as fast as it escaped, and was, therefore, invisible to the eye. Looking to the fact that the total length of the sealed joint was 26 feet for each tank, we think it highly probable that such slow leakage was continually going on. Petroleum spirit is very difficult to keep in by any mechanical sealing, especially when under pressure; and this can only be done effectually by the use of a sealing surface several inches broad and a special sealing material. The use of rubber is not desirable as the spirit can pass through this material and eventually deteriorates it considerably.

We are inclined to think, therefore, that the principal source of vapour between decks was a slow but continuous leakage round the sealed joints of the cargo hatches.

#### *Ignition.*

It remains to consider the most probable manner in which the vapour became ignited. It was suggested that the ignition may have been caused by a spark formed by the firemen in scraping the steel bulkhead. We consider this highly improbable because, in the first place, the operation of scraping a painted surface will not, unless very undue violence is used, give rise to sparks, and secondly because, though perhaps not impossible, it is extremely difficult to ignite petroleum vapour by a spark from iron or steel.

We regret that we are forced to look for the cause of the ignition in some reckless and prohibited act committed by one or other of the firemen. This theory is very much strengthened by the evidence of R. G. Mackey, the ship's cook. This man states that two days before the accident he saw the fireman, Abbas, under the bridge deck smoking a cigarette, and that he reported this to the boatswain, who thereupon knocked the cigarette out of the man's mouth. The other fireman, Munro, appears to have been angry at this, and to have told Mackey to mind his own business. Mackey also states that Munro carried a short pipe in his pocket, and that Abbas always smoked cigarettes.

In view of this evidence we cannot but consider that the most probable cause of the ignition was the lighting of a match by one or other of these firemen. It seems likely that they left their work and retired into the carpenter's shop to escape observation. By doing so they would have selected a place where there would have been more accumulation of vapour than at the spot where they were working, which was near an open door.

#### *Question of Blame.*

If the theory which we have put forward as to the origin of the ignition is correct, the primary blame for the disaster rests with the fireman who, in gross disobedience of orders, lighted a match. The rules

on the subject were perfectly clear and properly posted. In the Articles of Agreement signed by each member of the crew, appear the following clauses:—

"No smoking or naked lights shall be allowed on board except in places appointed by the master. Anyone breaking these rules will be fined for the first offence, 5s., and for the second and each subsequent offence, 10s. or they shall be discharged on the case being enquired into by the proper authorities.

That during the vessel's progress through the Suez Canal, no member of the crew shall have in his possession any matches or anything of an inflammable nature, or about his person any means whatever of obtaining a light, under penalty of 10s. in each case."

In addition to the above, certain codes of rules were issued by the company to be posted in their vessels. One of these codes contains the following rule, which was posted in several parts of the ship:—

"Any person found smoking, except in the place and time set apart by the captain, will be logged and discharged. The 'tween decks and below decks are on no account to be lighted otherwise than by the portable electric lamps, and under no circumstances whatever is anyone to be allowed to enter the tanks with any light other than the portable electric lamps provided for the purpose."

These rules are good as far as they go, and it is fairly certain that they were known and understood by every member of the crew. As will be seen below, however, we consider that some amplification of the regulations, and some more efficient method of enforcing their observance are desirable.

We shall also have suggestions to make in regard to improvement of ventilation, and on other matters.

#### *Prevention of similar Accidents in Future.*

It forms part of our duty in reporting on a disaster of this kind, to deal with any additional precautions which may occur to us as likely to diminish the risk of a repetition of similar accidents in the future.

#### *Rules.*

Our first remarks will be directed to the question whether the present rules and agreement might not be amplified, and whether some better means might not be found for absolutely enforcing these most vital regulations.

We consider in the first place that the penalties for smoking and other serious offences, as set out in the articles, should be increased and brought into more accordance with those in the posted rules.

We recommend that the clause in the articles dealing with smoking should be amplified so as to extend to the non-carrying of matches in any part of the ship, and to the crew agreeing to allow themselves to be searched for matches at any time by any officer of the ship. We have the authority of the marine superintendent for supposing that the latter requirement would meet with little opposition. To the above might also be added a requirement that matches must not be brought on to the vessel by any ordinary member of the crew, or if brought on inadvertently, they must be handed over to the master for custody. Systematic searching at known times would be, we understand, practically impossible to carry out on board ship, and we think that on the whole the power of carrying out unexpected searching, as we have suggested, would be more effectual as a deterrent.

It would, we understand, be quite impossible to prohibit smoking altogether, but we consider it sufficient if the places where the men are allowed to smoke are strictly defined as at present. The above arrangement could best be enforced if safety matches were provided by the company, and were kept in

suitable receptacles at the places where smoking is allowed, and elsewhere where they are required; but we consider it desirable that each of these receptacles should be in charge of a person who should be made responsible for the number of boxes, and should report any deficiency.

If any or all of the above suggestions are adopted, they should be embodied in the rules which are posted in the vessel.

We cannot leave this question of rules without referring to the existence at the end of one of the present codes of an admirable appeal to every person on the ship to assist the officers in preventing breaches of regulations of such vital importance. This appeal would probably have even more weight if it were also made verbally to the ship's company by the master, before starting on a voyage with petroleum.

#### *Ventilation.*

It is evident from the circumstances of this accident that the ventilation of the space under the bridge deck was insufficient. Owing to bad weather the hatches had not been removed and the ports had not been opened since the previous day. There is also reason to believe that such cowl ventilators as were provided were turned away from the weather, and were therefore not acting in their most efficient manner. Probably the same conditions obtained in all the 'tween deck spaces of the vessel. We think that this defect could be remedied to a great extent by providing "weather-proof" ventilators in ample number for all such spaces. These ventilators are so designed that, while freely admitting air, they do not admit flying spray. This removes the temptation to turn them away from the weather, and there is no longer any reason why they should not always be set to act at their maximum efficiency.

The ventilation of the interior of the tanks should also be considered. At present reliance is placed on the regular and periodical opening of the gas cocks for preventing rise of pressure in the tanks. We consider that it would be better to provide a continuous means of equalizing the pressure by fitting vapour pipes where the gas cocks now are. These pipes may be of small diameter, and should all be led independently up the foremast, the ends being turned over and fitted with fine gauze caps. We consider it better to lead these pipes up the mast, than that they should be led overboard, as in the latter case it would be impossible to ensure that naked lights are not brought near their ends when boats are alongside in a harbour.

#### *Cargo Hatches.*

The probability of there being a continuous slow leakage from all the sealed cargo hatches has already been pointed out; and it will be remembered that these hatches are under a pressure of petroleum spirit and are all between decks. We consider that it would be very desirable that by a structural alteration the sealed hatches should be brought up on to an open deck, or failing this, that some method should be adopted by which they can be absolutely hermetically sealed.

As to the structural alteration which we would propose, it must be remembered that there is no special virtue in a particular size of expansion trunk, and on this vessel, the fact that pressing up was rather frequently necessary, seems to indicate that these trunks were somewhat too small. We would propose, therefore, that the present trunks should be abolished, and that the cargo hatches should be carried up to the open deck and should be made to serve as expansion trunks. The advantage of this alteration appears to us to be that the sealed hatch would be no longer under pressure, and would not, therefore, be so liable to leakage, while any leakage which would then occur would be of little importance as the vapour would be quickly carried away in the open air. Incidentally, there would also be the advantage that a more ample latitude of expansion and contraction would be provided. It is true that the hatches would no longer be

available for loading 'tween deck cargo as at present, but it would appear that the removal of the present expansion trunks will afford sufficient space for the placing of the necessary ordinary hatches for this purpose.

It is possible that the alteration proposed above cannot be made on existing vessels, in which case it is necessary to consider whether some better method of sealing could not be devised.

#### *Summary of Recommendations.*

The above recommendations may be summarized as follows:—

- (1) The Articles and posted Rules to be extended so as to prohibit the carrying and possession of matches, and to admit of any member of the crew being searched at any time by an officer.
- (2) Provision to be made for safe custody of matches required for the use of the ship.
- (3) Weather-proof ventilators to be provided for all 'tween decks.
- (4) Pipes leading up the mast to be provided as outlets for vapour from each tank.
- (5) If possible the cargo hatches to serve also as expansion trunks and to be carried up to the open decks.
- (6) Failing the possibility of carrying out No. 5, improvement to be made in the method of sealing these hatches.

We consider that the circumstances elicited in this inquiry indicate the need for certain structural alterations and for additional precautions, but we do not desire that our remarks should be held to convey any reflection on the owners in respect either of construction or management, or any blame on the master for the neglect of precautions.

#### *Previous cargoes of petroleum spirit carried by Company.*

It is only fair to the Shell Transport and Trading Company, Limited, to say that their record in conveying petroleum spirit is very satisfactory. Their books show that they have conveyed 258 cargoes, or 778,403 tons, of this spirit without any accident to their ocean-going steamers. The only mishap which they have to record has been the burning out of a small vessel, termed a hopper, containing 90 tons of petroleum spirit, which occurred off Sousa in 1902.

#### *Captain Hocken.*

We take this opportunity of expressing the greatest admiration of the bravery and presence of mind of Captain Hocken, the master of the "Silverlip," on the occurrence of the accident. As we have already said, it is probable that if he had not ventured to run through the flames to the poop, the loss of life might have been much greater.

We have the honour to be,

Sir,

Your obedient servants,

J. H. THOMSON,

Captain,

H.M. Chief Inspector of Explosives.

BOVERTON REDWOOD.

The Assistant Secretary,  
Marine Department,  
Board of Trade.

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Sir,

Your obedient servants,

J. H. THOMSON,

Captain,

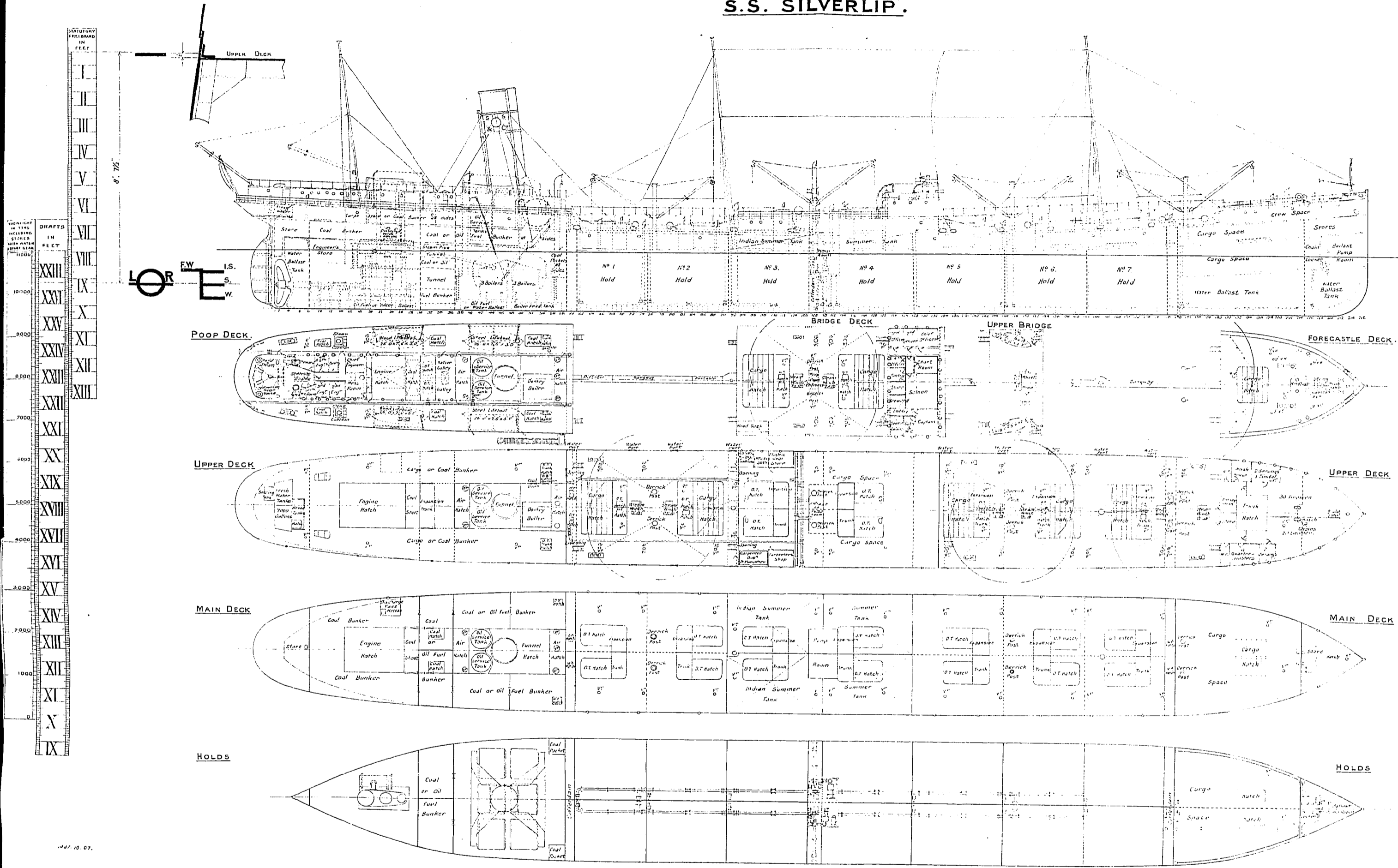
H.M. Chief Inspector of Explosives.

BOVERTON REDWOOD.

The Assistant Secretary,  
Marine Department,  
Board of Trade.

# S.S. "SILVERLIP".

HALF MIDSHIP SECTION.



## CAPACITIES.

Converts for all in 94 Cubic Feet Per Ton				Converts for all in 100 Cubic Feet Per Ton			
Compartments	Holds	Decks	Total	Compartments	Holds	Decks	Total
No. 1	42601	10000	52601	No. 1	1309	59	1368
No. 2	5170	10000	15170	No. 2	1460	59	1519
No. 3	5473	10000	15473	No. 3	1564	52	1616
No. 4	5650	10000	15650	No. 4	1611	52	1663
No. 5	5874	10000	15874	No. 5	1679	59	1738
No. 6	5429	10000	15429	No. 6	1649	59	1708
No. 7	5232	10000	15232	No. 7	1606	59	1665
Total	32221	70000	102221	Total	13768	479	14247

Converts for all in 94 Cubic Feet Per Ton				Converts for all in 100 Cubic Feet Per Ton			
Compartments	Holds	Decks	Total	Compartments	Holds	Decks	Total
No. 1	1309	59	1368	No. 1	1309	59	1368
No. 2	1460	59	1519	No. 2	1460	59	1519
No. 3	1564	52	1616	No. 3	1564	52	1616
No. 4	1611	52	1663	No. 4	1611	52	1663
No. 5	1679	59	1738	No. 5	1679	59	1738
No. 6	1649	59	1708	No. 6	1649	59	1708
No. 7	1606	59	1665	No. 7	1606	59	1665
Total	13768	479	14247	Total	13768	479	14247

## PRINCIPAL DIMENSIONS

Length Over all	486
Length between Perps.	473
Length Extreme	55
Depth Moulded	35
Depth of Hold	38
Depth of Bottom	20

No 723

## APPENDIX I.

*Particulars of Cargo shipped per S.S. "SILVERLIP."*

Tank No. 1	...	...	940	tons	...	Specific Gravity	·750	...	Shipped at Singapore.
Tanks Nos. 2 & 3	...	...	2576	"	...	"	"	...	" B. Papan.
Tank No. 4	...	...	1458·23	"	...	"	"	...	" Singapore.
" No. 5	...	...	1194	"	...	"	"	...	" "
" No. 6	...	...	1105	"	...	"	"	...	" "
" No. 7	...	...	1144·18	"	...	"	"	...	" "
Total	...	...	8417·41	tons.					

When leaving SAMBOE. the particulars of cargo were as follows:—

Tank No.	Quantity B/L.	Specific Gravity at 15° C.			Distillation at		Final Boiling Point.
		Starboard.	Port.	Average.	100° C.	125° C.	
1 ...	940—	0·7498	0·7494	0·7496	Per cent. 26	Per cent. 89	149
2 ...	2576—	0·7595	0·7596	0·7596	71½	94½	150
3 ...							
4 ...	1458·23	0·7489	0·7495	0·7492	25½	89	149
5 ...	1194—	0·7190	0·7190	0·7190	70½	95	143
6 ..	1105—	0·7180	0·7180	0·7180	70½	95	146
7 ...	1144·18	0·7179	0·7180	0·7180	70	94	146

(Issued in London by the Board of Trade on the 15th day of October, 1907.)