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Rio de Janeiro,

11th January 1934.

H. E. Inman

the Owners attend on board the Steel Sc Tug "MARIA", 2 tons net register, of Rio de Janeiro, on the 15th, 19th, 20th & 27th December 1933, as she lay on the slipway at Ilha dos Ferreiros, at this port, for the purpose of examining and reporting on the condition of the vessel, with special reference to the corrosion which is taking place in the "Dalzo" steel shell plating and rivets.

The undersigned upon examination of the vessel on the 15th December after the hull had been cleaned of marine growth, found the paint with which the outside of the shell plating had been coated, adhering satisfactorily, except in places on the port side amidships and at the stem on the starboard side where there were signs of chafing.

On further examination after the paint had been entirely removed from well above the water line to the bilge keel on the port and starboard sides for the full length of the vessel, this being the part in which corrosion is taking place, found on the port side shell plates Nos. 3, 4 & 5 in "D" strake and Nos. 4, 5 & 6 in "E" strake and on the starboard side Nos. 4 & 5 in "D" strake and No. 3 in "E" strake considerably pitted and corroded in patches and to a lesser extent Nos. 2 & 7 in "C" strake and Nos. 2, 6 & 7 "D" strake



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Tug "MARIA" cont.

on the port side and No.6 in "C" strake, No.3 in "D" strake and Nos.2 and 4 in "E" strake on the starboard side. The corrosion being most accentuated on the port side amidships in "D" strake at the places where the plates are scored and cut through chafing, also the bow plates in "A", "B" & "C" strakes starboard side are chafed and corroded at the forward edge and the plate in "C" strake also deeply scored in way of the two foremost frame spaces. The points of a considerable number of rivets in "D" and "E" strakes of plating on both sides amidships are also corroded. The plating in way of the inlet valve chest for the donkey pump which was reported as being corroded was examined but no sign of corrosion was found at this part.

On the port side in the upper landing edge of plates D 4 and 5, 52 defective rivets were stated to have been removed in January 1933 and as "Dalzo" steel rivets were not at the time available, mild steel ones were fitted in place, these have now been removed and "Dalzo" ones fitted, together with a further six in the butt of E 5 and 6. It is not considered that any special action was set up either in these mild steel rivets or in the plating in the vicinity during the time they were in place.

The conclusion arrived at after careful examination of the corroded plates and rivets and of the position of these in the vessel, is that a pronounced electrolytic action takes place in this special quality steel when owing to the paint having become rubbed off, it is exposed to the action of seawater combined with the action of the air, and that this action is more pronounced than would be the case if Siemens-Martin mild steel had been employed in the construction of the vessel.

After full particulars, photographs and samples of the corroded material had been taken, the corroded parts were treated with four applications of gold size and the plating afterwards painted all over with two coats of red lead, two of anti-corrosive and one of anti-fouling composition.

For further details of the corrosion found to be taking

Tug "MARIA" cont.

place please refer to the shell expansion plan and photographs taken at this time.

Fee: Rs. 800\$ 000

Expenses: 60\$ 000

H. E. Inman,

Surveyor to Lloyd's Register.



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