

*The Address—Mr. Pearkes*

Transport the advisability of applying inclining tests to foreign-built vessels hereafter coming under Canadian registry and steamship inspection for the first time, failing satisfactory proof as to the vessel's stability having been established while under foreign registry.

That seems a reasonable recommendation, and I hope it will be possible to include it, or some modification of it, in the amendments introduced this session to the Canada Ship-ping Act. Subsequently the steamship inspection board in Vancouver called a meeting of the owners of fish boats and tugs to discuss this question of having stability tests. I believe the board of steamship inspectors there stated that stability tests would be carried out by steamship inspectors in future.

I think that that was a slightly different practice, or was notification that a slightly different practice would be followed from that which had been carried out on the Pacific coast in the past when, if a stability test was required, naval architects were invited to come in and to carry out those tests in the presence and to the satisfaction of the steamship inspectors.

There is a difference between the steamship inspector carrying out the inspection himself, and calling upon an expert naval architect to carry out the test in his presence. It is questionable whether the examination for entry into the steamship inspection service calls for high enough standards in mathematics to enable a steamship inspector, once he is admitted to the service, to carry out the rather complicated tests demanded, if the stability of a vessel is to be thoroughly tested.

It is questionable whether steamship inspectors without the adequate knowledge might not constitute a very serious danger to shipping and seafaring men in the future as, if the tests were not carried out efficiently, it might result in a considerable loss of life.

Without going into all the technical details required to carry out these inclining tests, I might say that they consist of shifting known weights through measured distances across the surface of a vessel, and at the same time measuring the angle of heel of that vessel as the weights are shifted across its surface. The weight of a vessel is then obtained by the volume of the displacement of water. Hence what is known as the GM or meta-centric height in the condition in which the vessel is then inclined is obtained. Then follows an analysis of the stability of the vessel under various conditions—that is, the amount of cargo she may be carrying, whether it is a full or a half cargo, whether her tanks are full or only partly filled, the number of passengers and so on.

As a result of that analysis it then becomes possible to plot the hydrostatic curves—that

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is, the height of the metacentric above the baseline at the various drafts. Then, through the means of a rather expensive instrument known as an integrator, the curves of the righting lever are plotted. Those in the trade are known as the GZ curves. These show the maximum righting lever tending to return the vessel into an upright condition. They will also show the range at which the righting lever may disappear when, of course, the ship would capsize.

I understand there are no precise or fixed mathematical standards which can determine these actual ranges or distances at which the vessel may right herself, or at which it is inevitable that she will collapse. That is where the personal and professional experience of the naval architect can be brought into play. From the data that he has acquired from his calculations, and from his experience, he is able to advise as to the stability of the particular vessel under examination.

The point that I should like to have considered is whether it is now advisable to have these stability tests carried out entirely by the steamship inspectors and whether it might not be desirable to require a higher standard of education in order to enter that service than has been considered necessary in the past. It might still be advisable to call in qualified professional naval architects to carry out these inspections, as has been done in the past in the presence and to the satisfaction of the steamship inspector who was present. In view of the unfortunate experience that occurred with this particular vessel I believe it is most desirable that ships being brought under Canadian registry from a foreign flag should be required to take the stability and inclining tests that are now considered essential.

I come now to another occurrence in Pacific waters during the last few months and I refer to the experiences of the S.S. *Lake Canim*. Last summer the Chinese national government informed various governments of the world that they were going to close to foreign vessels certain ports then held by the communist forces of China and the territorial waters adjacent to certain parts of China, that they would in effect establish a blockade of certain ports and the entrance to certain navigable rivers of China. Great Britain, the United States, and I believe Canada, refused to accept that announced blockade as being valid because according to international law a blockade must be real and effective. The Chinese national government were not able to produce evidence that would lead the other great powers to believe that they were able to establish a real and effective blockade of the waters which they