



香 港 商 船 資 訊

HONG KONG MERCHANT SHIPPING INFORMATION NOTE

Fatal accident resulting from auxiliary boiler explosion during raising steam

To : Shipowners, Ship Managers, Ship Operators, Masters, Officers and Crew of Hong Kong registered ships and Classification Societies

Summary

The auxiliary boiler exploded during raising steam after maintenance and survey, resulted in the loss of four lives and serious injuries to seven crewmembers. This Note draws the attention of the Shipowners, Ship Managers, Ship Operators, Masters, Officers and Crew of Hong Kong registered ships and Classification Societies to the important lessons learnt from this accident.

The Incidents

1. The accident occurred on a Hong Kong registered ship while she was berthing alongside a dockyard in China. The auxiliary boiler on board was overhauled for the classification survey. The duplex-type safety valve of the boiler was found deteriorated and renewed. After a satisfactory hydraulic test of the boiler, all valves were reset to normal condition except the cocks for the Pressure Control Systems which were missed out. Under such circumstance, all over-pressure protection systems and pressure indication gauges were non-functional.
2. In the firing up processes, pressure in the boiler built up to a level exceeding the setting of the safety valves and eventually resulted in steam blowing-off. However, as the pressure gauges indicated low pressure, the crewmembers considered the safety valves were defective and leaky without realizing that the cocks for the Pressure Control Systems were still in shut off position.
3. After repeated unsuccessful trials to rectify the problem, it was determined to gag the leaky safety valve. However, the inlet to the safety valves was blanked-off instead and resulted in the duplex-type safety valve being isolated. When fire was on to raise steam in the boiler, the boiler exploded due to excessively high internal pressure of steam.

4. The investigation into the accident revealed that the main contributing factors to the accident are as follows:

- a) due to communication break-down, the duplex type safety valve was mistakenly blanked-off but the intention was to gag just one of the safety valves of the duplex type safety valve only;
- b) company's procedure for commissioning of boiler after maintenance and survey, including to ensure correct setting of all valves and cocks prior to starting up and raising steam, was not followed;
- c) the company did not ensure personnel assigned to supervise boiler maintenance and survey was competent and experienced; and
- d) the Chief Engineer did not ensure the junior crewmember to carry out the full commissioning of the boiler properly and to supervise his work closely.

5. The report of investigation of the accident can be found in the Marine Department website at http://www.mardep.gov.hk/en/publication/pdf/mai120302_f.pdf

Lessons Learnt

6. It is important that pressure relief valves of pressure vessels, in this case the auxiliary steam boiler should never be isolated under any circumstances. The other lessons to be learnt from this accident are:

- a) Company's procedures for commissioning of auxiliary boiler after maintenance and survey should be strictly followed; and
- b) all personnel and crew responsible for the operation of auxiliary boiler should be competent, experienced and well-trained and junior crewmembers should carry out their duties under close supervision of the senior officers.

7. The attention of Shipowners, Ship Managers, Ship Operators, Masters, Officers and Crew of Hong Kong registered ships and Classification Societies is drawn to the lessons learnt above.

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