Recommendation No.114 "Recommendation for the design, construction, operation and survey of emergency shut down valves and safe cargo sampling connections on liquefied gas carriers"

Part A. Revision History

Version no.	Approval date	Implementation date when applicable
New (June 2010)	30 June 2010	-

- **New (June 2010)**

.1 Origin of Change:

☑ Request by non-IACS entity *(UK Marine Accident Investigation Branch (MAIB))*

.2 Main Reason for Change:

Following a major leak of liquid propane which occurred alongside a Marine Terminal in the UK after an accident occurred when sampling the cargo, the MAIB investigated and made some Recommendations (MAIB Report No. 10/2007).

.3 List of non-IACS Member classification societies contributing through the TC Forum and/or participating in IACS Working Group:

None.

.4 History of Decisions Made:

Following the recommendations from MAIB, the IACS GPG tasked the Machinery Panel to review the case and develop requirements if felt necessary. The Machinery Panel developed a new Recommendation which was reviewed by the Survey Panel.

.5 Other Resolutions Changes:

None.

.6 Dates:

Original Proposal: *February 2008, made by Machinery Panel*
Panel submission to GPG: *19 May 2010 (Ref. 7588_PMa)*
GPG Approval: *30 June 2010 (Ref. 7588_IGe)*

Part B. Technical Background

List of Technical Background (TB) documents for Rec.114:

Annex 1. **TB for Original Resolution (June 2010)**

See separate TB document in Annex 1.

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Technical Background for Rec.114, New June 2010

1. Scope and objectives

On 17 October 2006, a major leak of liquid propane occurred alongside at the Fawley Marine Terminal in the UK after an accident occurred when sampling the cargo. The MAIB completed a full investigation and provided some recommendations. The IACS GPG tasked the Machinery Panel to evaluate the recommendations and to take appropriate action.

The MAIB recommendations were:

1) A proposal to IACS on the development of unified requirements (URs) on sampling arrangements for liquefied gas carriers. The standards should, as a minimum, address the relevant shortfalls identified in this investigation, especially with regard to the provision of two valve separation from the cargo system and the avoidance of screw couplings.

2) A proposal to IACS regarding the operation and design of ESD valves which:

   • Stipulates a requirement for ESD valves to be tested and inspected during class surveys to verify effective closure.

   • Ensures that the IGC Code requirement for local manual closure means the ESD valve can be positively closed by hand.

   • Requires arrangements for the indication of the status of ESD valves to accurately mimic whether the valve is open or closed.

2. Engineering background for technical basis and rationale

The accident happened while cargo sampling operations were being carried out by a cargo surveyor using a sampling cylinder connecting to the sampling point. The sampling point was a drain plug fitted on the bottom of a globe valve in series with an Emergency Shut Down (ESD) valve which was located on the cargo pump discharge line of No.2 cargo tank.

When the cargo surveyor turned the sampling connector, the sampling valve assembly fitted on the bottom of the globe valve came off in his hand, and cargo began to leak. He tried to refit the sampling valve assembly, but failed. Although the ESD valve which was in series with the globe valve was activated, it did not completely shut and therefore failed to stop the flow of gas. After several attempts to stop the leak over a 29-hour period, the leak was eventually stopped with the resultant loss of 66 tonnes of gas to the atmosphere. Examination of all ESD valves on board was carried out, the failed ESD valve was found to have internal damage which prevented its operation whilst all the others were found to be in working order.

(Additional details: MAIB Report No. 10/2007, May 2007)

3. Source / derivation of the proposed IACS Resolution(s)

The IGC code Regulation 5.6 specifies the requirements for cargo system valve arrangements and Regulation 9.1 the requirement for gas sampling points. The recommendations provided by the MAIB report are to provide more clarity to the requirements stipulated.

4. Summary of Changes intended for the revised Resolution(s):

N/A

5. Points of discussions or possible discussions

It should be noted that the sampling method used was not an approved one in that the sample point in this case was a globe valve drain connection and that no other vessel had suffered the same fate. However, recognising that the IGC code allows for threaded connections for the sampling connection for pipes with a diameter of 25mm or less, the possibility exists for this connector becoming unintentionally detached with the potential to leak gas and/or injure personnel.

The additional recommendations proposed by the MAIB were intending to further enhance the reliability of the ESD operation due to the lessons learnt. Since there have not been wide spread reports of ESD valve failures, the Panel concluded that a Unified Requirement would be excessive since it would force the changing of all ESD valves currently in use.

The Machinery Panel concluded that an IACS Recommendation would be appropriate and sufficient.

6. Attachments if any

N/A