



## Bundesstelle für Seeunfalluntersuchung Federal Bureau of Maritime Casualty Investigation

Federal Higher Authority subordinated to the Ministry of  
Transport, Building and Urban Development

Federal Bureau of Maritime Casualty Investigation, P.O. Box 30 12 20 • 20305 Hamburg

**Office building**  
Bernhard-Nocht-Str. 78  
20359 Hamburg  
Tel.: + 49 (0) 40 31 90 – 0  
Fax: + 49 (0) 40 31 90 – 83 40  
[posteingang-bsu@bsh.de](mailto:posteingang-bsu@bsh.de)  
[www.bsu-bund.de](http://www.bsu-bund.de)

**The Federal Bureau of Maritime Casualty Investigation (BSU) publishes the following Safety Alert according to § 29 of the Seesicherheits-Untersuchungsgesetz (SUG) in the version of the 1<sup>st</sup> of December 2011.**

The BSU investigates an accident regarding a container vessel, which led to a collision of the ship with the pier on the 11<sup>th</sup> of April 2012 in the harbour of Freeport / Bahamas due to a technical defect in the avionics of the ship electronic system. Although the investigation is not yet closed, at the present state of knowledge the BSU assumes, that the described technical defect was cocausally for the collision. Because of the possible danger for the safety of the maritime transport, the BSU addresses, after consultation with the involved shipping company, the owners and the operators of all commercial ships as well as the shipyards and recommends the following:

**HANLA LEVEL CO., LTD. HFO-Flow-Sensors: Danger of Earth Fault**

During a damage investigation some sensors from the maker "HANLA LEVEL CO. LTD" were found suspicious. They are designed in a way that a earth fault can occur very easy.

According to our actual knowledge only the sensor type "LIDEC-L91B" is affected. The sensors are installed in the HFO overflow pipe and used as flow-sensor.

The failure occurs when the O-ring for sealing the sensor between the housing and the cover is not installed (picture 1). In this case the cover can touch a jumper on the board of the sensor (picture 2) which leads to an earth fault (-24 V DC).



Picture 1



Picture 2



Picture 3

The thread of the affected sensor covers should be shortened by at least 10 mm. When this counter-measure is done the cover can not touch the jumper even if the O-ring is not installed. Please note that the O-ring should be installed anyway!

If you find a sensor box without O-ring and with slight touching marks on the jumper, please also check if the earth fault detection module of the 24 V system is working correct (picture 3) before fixing the problem at the cover. Therefore connect the earth-port of the module to the ground of the cabinet by using a short line. If then the red LED of the detection module starts to shine, then the original earth line of the detection module is interrupted.

If you find further earth faults in your 24 V system which are not connected to the above mentioned sensor problem, you should check all suspicious cables during your troubleshooting by using the isolation test (also know as "Megaohm-Test"). At this test both ends of the line need to be disconnected. Then a high test-voltage will be applied to the line (at 24 V the test-voltage is 500 V) and the very high resistance to ground is measured. Measuring the "normal" resistance of the cable against ground normally leads to no reliable results.



Cabinet: DC 24 V UPS FOR AMS & BMS

Board for earth fault detection

Ground wire (yellow/green, connected to the board)

Manual bridge between ground connection of board and ground of cabinet

by proxy

*J. Albers*  
Jürgen Albers

Source:

Federal Bureau of Maritime Casualty Investigation, Germany

<http://www.bsu-bund.de>

16 July 2012