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GENERAL CIRCULAR *1st Feb 2019*

To: The Fleet

Subject: Cargo Oil Hoses – Handling Procedures

The purpose of this SOPP is to provide general guidelines for the safe handling of the Cargo Oil Hoses.

It is essential we understand that the consequence of a hose failure not only from an operational and environmental standpoint but above all from the personal safety stand point.

Undoubtedly hoses will get damaged over time due to 'wear and tear' but in many instances the manner in which the hose is rigged up is contributing to its failure / deterioration.

To try and minimize failure of Cargo Hoses particularly when in use, it is important to be aware of the construction details of the Hose and as well as their CORRECT & INCORRECT handling.

Construction Details (Please refer to the attachment 'Hose Construction Details').
The reference attachment will give you a general idea as to the manner in which the Cargo Hose is constructed.

- Item (1) is the internal spiral metal hose.
- Item (3) is the metallic braiding that is placed over the spiral metal hose.
- The spiral metal hose and the metallic braiding is then covered at both ends by the braiding ring (Item 7).
- The spiral metal hose + the metal braiding + braiding ring are then welded onto flanged pipes(Item 4)

This welding is of the extreme importance and should be checked frequently for any 'cracks/pitting' or other mechanical damage.
Should either this welding or the metallic braiding (Item 3) get damaged then there is every likelihood that the hose will burst. Reason being that it is the metallic braiding (Item 3) and the welded seam that is keeping the core of the hose (Item 1) in its effective designed condition.

Frequently the cargo hoses are delivered with a 'rubber sleeve and on this rubber sleeve is printed that the hose is for water and the working pressure is 4 bar (or something like that!). This is often misleading, but please note that this Rubber Sleeve is there only to try and 'protect' the 'metallic braiding' from any handling damage and above all to protect the crew when handling the 'hot' hose for rigging / unrigging. **The data markings on this rubber sleeve DO NOT apply to the Cargo Hose.**

Correct Rigging and Handling Procedure for the Cargo Hoses
Please find attached illustrations for the correct rigging and handling of cargo hoses.
It is very important that these procedures are strictly followed.

Hose assemblies should be visually inspected on a regular basis. When hose assemblies are in constant or frequent use, the assembly should be inspected before each loading/unloading operation. Hose assemblies subject to infrequent use should be inspected each time they are brought into use.
Hoses should always be handled with care and should not be dragged over a surface or rolled in a manner that twists the body of the hose. Protection should be provided at any point where chafing or rubbing can occur.
Lifting bridles and saddles should be used.
The use of steel wires in direct contact with the hose cover should not be permitted. Hoses should not be lifted at a single point with ends hanging down, but should be supported at a number of places so that they are not bent to a radius less than that recommended by the manufacturer.

Testing and Maintenance Requirements for Cargo Hoses
General
Cargo hoses in service should have a documented inspection at least annually to confirm their suitability for continued use. This should include:

- A visual check for deterioration/damage.
- A pressure test to 1.5 times the Rated Working Pressure (RWP) to check for leakage or movement of end fittings. (Temporary elongation at RWP should be measured as an interim step.)
- Electrical continuity test.

Electrically discontinuous hose should have a resistance of not less than 25,000 ohms measured between end flange to end flange. The testing of electrically discontinuous hoses should be carried out using a 500 V tester.
Electrically continuous hoses should not have a resistance higher than 0.75 ohms/metre measured between end flange to end flange.

Visual Examination
A visual examination should consist of:
• Examining the hose assembly for irregularities in the outside diameter, e.g. kinking.
• Examining the hose cover for damaged or exposed reinforcement or permanent deformation.
• Examining the end fittings for signs of damage, slippage or misalignment.
A hose assembly exhibiting any of the above defects should be immediately removed from service and from the vessel at the first available opportunity.

Pressure Test (Integrity Check)
Hose assemblies should be hydrostatically tested to check their integrity. The intervals between tests should be determined in accordance with service experience, but in any case should not be more than twelve months. Testing intervals should be shortened for hoses handling particularly aggressive products or products at elevated temperatures. Hoses for which the rated pressure has been exceeded must be removed and re-tested before further use.
A record should be kept of the service history of each hose assembly.

The recommended method of testing is as follows:
(i) Lay out the hose assembly straight on level supports which allow free movement of the hose when the test pressure is applied. Conduct an electrical continuity test.
(ii) Seal the hose by bolting blanking-off plates to both ends, one plate to be fitted with a connection to the water pump and the other to be fitted with a hand operated valve to release air through a vent. Fill the hose assembly with water until a constant stream of

water is delivered through the vent.
(iii) Connect the test pump at one end.
(iv) Measure and record the overall length of the hose assembly. Slowly increase the pressure up to the Rated Working Pressure.
(v) Hold the test pressure for a period of 5 minutes whilst examining the hose assembly for leaks at the flanges or for any signs of distortion or twisting.
(vi) At the end of the 5 minute period and while the hose is still under full pressure, re-measure
the length of the hose assembly. Ascertain the temporary elongation and
record the increase as a percentage of the original length. (Refer to the Manufacturers limit values)
(vii) Slowly raise the pressure to 1.5 times the Rated Working Pressure and hold this pressure for 5 minutes.
(viii) Conduct an electrical continuity test with the hose at test pressure.
(ix) Reduce the pressure to zero and drain the hose assembly. Re-test for electrical continuity.
If there are no signs of leakage or movement of the fitting while the used hose assembly is under test pressure, but the hose exhibits significant distortion or excessive elongation, the hose assembly should be scrapped and not returned to service.

Explanation of Pressure Ratings for Hoses
The attachment 'Terminology used for Defining Hose Pressures' - provides an illustration of the relationship between several definitions of pressure that are in common usage.
The individual terms are briefly described below:

a) Operating Pressure
This is a common expression to define the normal pressure that would be experienced by the hose during cargo transfer. This would generally reflect the cargo pump operating pressures or hydrostatic pressure from a static system.

b) Working Pressure
This is generally considered to mean the same as 'Operating Pressure'.

c) Rated Working Pressure (RWP)
This is the common oil industry reference that defines the maximum cargo system pressure capabilities. This pressure rating is not expected to account for dynamic surge pressures but does include nominal pressure variations as expected during cargo transfer operations.

d) Maximum Working Pressure (MWP)
This is the same as Rated Working Pressure and is used by BS and EN Standards for designing hoses to these standards.