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**TECHNICAL INFORMATION ON A VAPOUR PRESSURE CONTROL SYSTEM  
IN ORDER TO FACILITATE THE DEVELOPMENT AND THE UPDATE  
OF VOC MANAGEMENT PLANS**

- 1 The Marine Environment Protection Committee, at its fifty-ninth session (July 2009), approved Guidelines for the Development of a Volatile Organic Compound (VOC) Management Plan for tankers carrying crude oil (resolution MEPC.185(59)).
- 2 MEPC 59, recognizing that additional information on vapour pressure control systems and their operation would assist the industry in the development of VOC management plans, agreed to the technical information on systems and operation to assist development of VOC management plans for tankers carrying crude oil, as set out in the annex to MEPC.1/Circ.680.
- 3 MEPC 60 (22 to 26 March 2010) noted an additional technology to reduce the formation and emissions of VOC from crude oil tankers, which was not described in the annex to MEPC.1/Circ.680, and agreed to issue a separate circular on that technology, as set out in the annex to this circular.
- 4 Member Governments are invited to bring this circular to the attention of their Administrations, relevant shipping organizations, recognized organizations, shipping companies and other stakeholders concerned.

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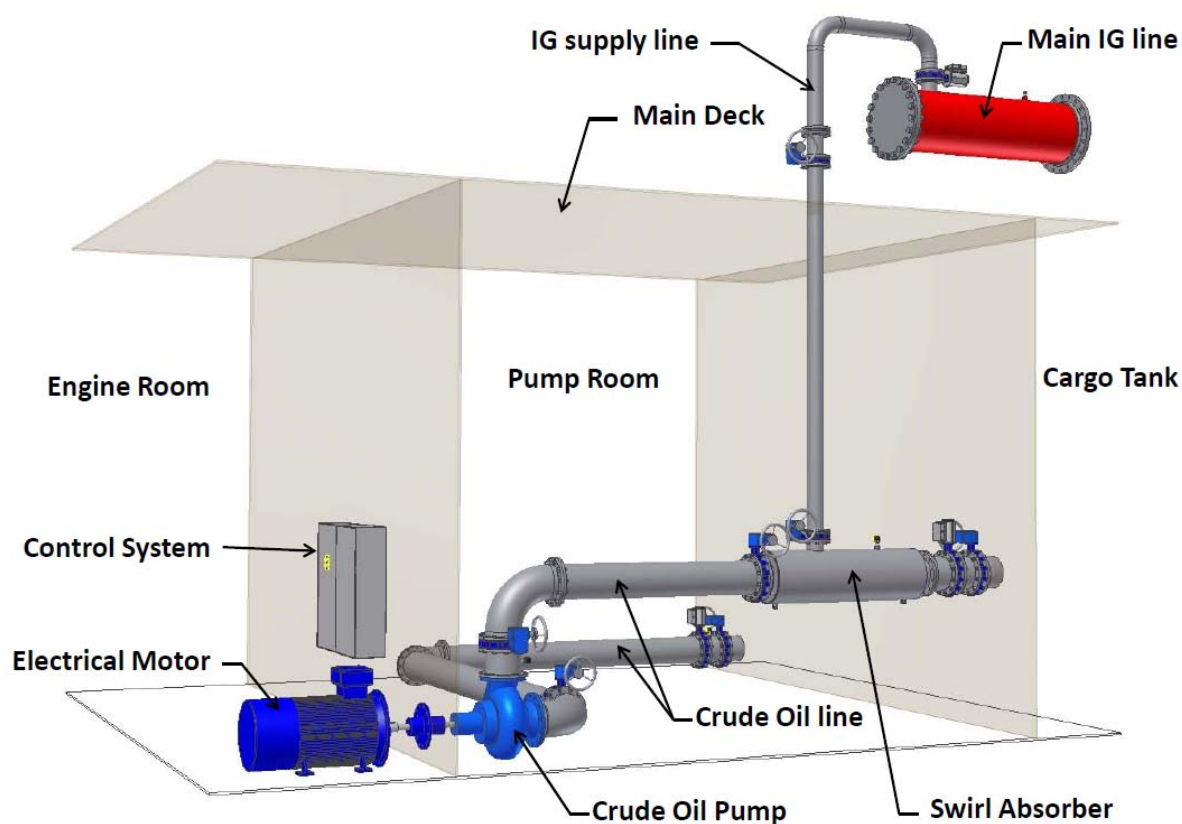
## ANNEX

### DIRECT ABSORPTION OF VOC IN THE CRUDE OIL (CVOC SYSTEM)

The CVOC System has been designed to utilize hydrostatic pressure in the cargo tanks to re-absorb emitted VOC back into the Crude Oil. This process allows tank pressure to be reduced without venting to the atmosphere, and thus eliminates all emissions from the cargo during transit – including H<sub>2</sub>S. The CVOC system will also reduce VOC emissions from the cargo during loading and cargo transfer operations.

The CVOC system is based on direct absorption of VOC in the crude oil. The Swirl Absorber, a combined ejector and mixing unit, are using crude oil from one of the cargo tanks to create a low-pressure area where vapour from the main inert gas line can be mixed with crude oil. The mix of VOC, inert gas and crude oil is then led back into the same cargo tank the crude oil was originally taken from. VOC is absorbed in the crude oil due to increased pressure in the bottom of the cargo tank, while inert gas rises to the surface without being absorbed.

Oil circulation is obtained by using a standard centrifugal pump driven by an electrical motor, and system operation is controlled by a simple PLC located in the engine-room and a number of pressure and temperature sensors. Operation and monitoring is done on two 10" LCD touch screen panels located in the Cargo Control Room and on the Bridge.



Automatic system operation is controlled by a dedicated pressure sensor installed in the main inert gas line, and is based on pre-set pressure levels determined by the crew. The CVOC system can also be operated manually as long as the cargo tank pressure is sufficient.

The CVOC System is a stand-alone installation, and has no interference with existing safety features or operational procedures.

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