Operational Aspects on Decision-making in STS Lightering.

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ABSTRACT
A lightering operation typically involves two crude oil tankers which are manoeuvring in close proximity and operating alongside for transfer of cargo. This is a challenging task for the officer in charge of the decision-making process during the operation, which is based on visual observations and radar measurements. Well trained and experienced officers are necessary to minimize the risk of miscommunication between the ships. Mooring Masters were given a questionnaire focusing on the decision-making process and aspects of the ongoing development of an additional navigation support and guidance system for ship-to-ship operations. The paper discusses the potential for improving the process of decision-making and the operational safety.

KEY WORDS: STS lightering; Decision-making; Mooring Masters.

INTRODUCTION
A ship-to-ship (STS) lightering operation can either be carried out while two ships are under power making way through water or when one ship is already positioned at anchor. In the case of two ships under power the ship-to-be-lightered (STBL) is supposed to maintain speed and course and is also referred to as the Constant Heading Ship. The Manoeuvring Ship, also called the service ship (SS), will approach until it is parallel with the Constant Heading Ship before commencing the final approach phase that is to manoeuvre until both ships are side by side and mooring can take place, Figs. 1 and 2. These types of marine operations are expected to be increasing significantly in frequency and new geographical areas in the coming years. An example is the rapid development of Northwest Russian onshore and offshore oil and gas fields that will increase the need for ship-to-ship transfer from a fleet of smaller ice-strengthened vessels to standard vessels for transport of oil and gas products to customers in Europe and the USA. This will require lightering operations to be carried out in proximity to coastlines that are sensitive to any emission to the environment.

In an STS lightering operation the Captains on the two ships are, as always, in charge and responsible for their respective ship. However, it is often normal to have a Mooring Master (or STS Superintendent) onboard in the Manoeuvring Ship and an Assistant Mooring Master onboard the Constant Heading Ship. These officers have long experience in STS lightering and have additional training giving them an advanced competence in STS operations. The Mooring Master will act as a Pilot and advise the Captain and his crew on how to navigate and manoeuvre, but is normally also authorized to terminate the operation if the safety is at risk. In operations where no Mooring Master is present, one of the Captains will be the person with advisory control.

Fig. 1: The approach phase of a lightering operation; the Constant Heading Ship is underway at minimum controllable speed (about 5 kts), [Courtesy of Skaugen PetroTrans Ltd].

Fig. 2: The principle of approach manoeuvre, [OCIMF & ICS, 2005]