Cefor

Memo 5
Technical Forum

17 March 2017

Ultra Large Container Vessels

Introduction

During the last couple of years, concerns have been raised about the so-called Ultra Large Container Vessels (ULVCs) now sailing. At present, 69 ULCVs > 14,501 TEU are in service and including all known newbuildings, the sum adds up to 148 vessels.

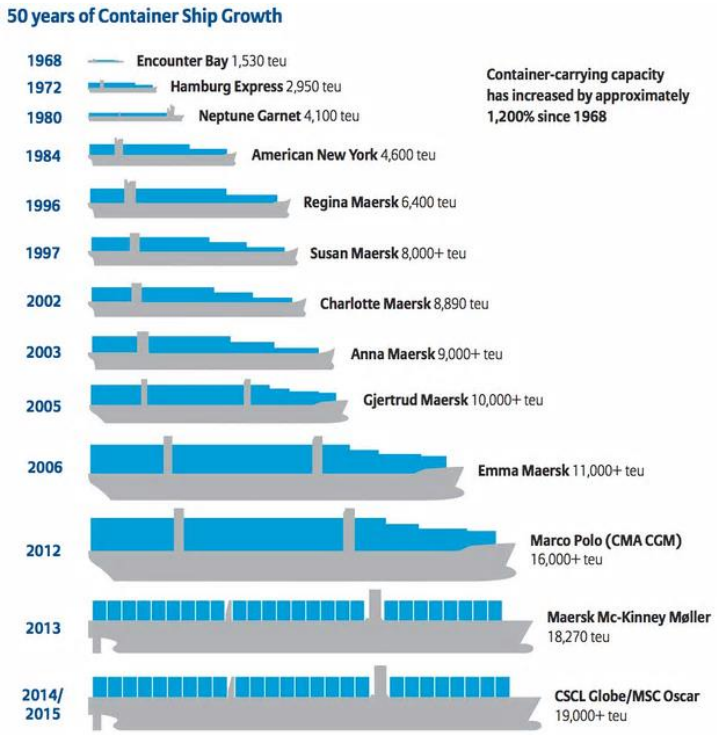
Apart from the commercial challenges in operating these vessels such as upgrading of port facilities and fairway infrastructure, the Cefor Technical Forum has identified a number of technical risk elements that are of particular concern from an insurer's perspective and that should have more focus when ULVCs are being designed and brought into service. Our concern is further accentuated by industrial rumors talking about 24,000 TEU vessels, although such vessels have, as far as we know, not yet been ordered.

We acknowledge that discussions are ongoing on how to deal with the different challenges these huge vessels and their cargoes of thousands of containers present, but are left with an impression that more concentrated efforts to address the identified challenges should be set in motion.

Furthermore, we have an impression that many of the solutions under consideration are rooted in vessels and ship designs of the past. The purpose of this paper is therefore to highlight some of the technical risk elements we have identified, and raise awareness about the challenges.

An ever-increased design to serve economy of scale

The general consensus seems to be that focus has mainly been on building vessels to create economies of scale and that a number of the concerns we are raising in this paper have largely been ignored. We are not in any way luddites, but find that the development of these huge vessels calls for concerted efforts from all stakeholders in the transportation of containers by sea. If not properly addressed, we may be faced with a major incident that could have an unprecedented impact on the environment and infrastructure, not to mention damage to society and economic burden to insurers. The below figure illustrates the development in size of container vessels during the containerization era.



Source: World Shipping Council, 2017

Fire incidents

Fires involving container vessels can be very challenging. Box-cargoes often contain a wide range of hazardous and toxic substances, and it can take time to identify and locate dangerous cargoes that are particularly vulnerable to fire. Because of wrong declaration of dangerous goods, crew may end up applying an incorrect strategy for handling a specific fire scenario on board.

At sea, fires below-deck cannot be fought with water and CO_2 is consequently used to displace the oxygen and extinguish the fire. However, if the fire is burning within a container, the box will protect it from the CO_2 which makes this method of fire-fighting rarely successful. A fire is often allowed to burn out in a controlled manner, leaving more or less all containers in the hold (fire cell/fire compartment) with heat and smoke damage. Currently, there are no other methods of fighting a container ship fire below-deck. As vessels increase in size, cargo holds and the number of containers accommodated in each hold are equally increasing, subsequently endangering more containers to damage in the event of fire.

On existing container vessels, the crew is likely to have access only to hoses and nozzles on deck. It is therefore a positive development that new regulations in force require container vessels constructed on or after 1 January 2016 to install at least one water mist lance and a number of water monitors, the latter depending on the vessel's size and number of tiers (SOLAS Reg.II-2/10.7.3).

We are also aware that other measures to prevent and fight fires onboard container vessels are under discussion in various industry fora. This discussion is appreciated by and will be closely followed by the Cefor Members.

Groundings

In the event of a grounding involving a larger container vessel, equipment for lightering such a vessel can hardly be found. The size of the container vessels overtook the salvage capacity years ago.

An illustration is the 3,351 TEU Rena grounding near Tauranga, New Zealand on 5 October 2011 carrying 1,368 containers. After heavy weather in January 2012, the stern section sank completely on 10 January 2012. By June 2014, 77% of the initial carried containers had been salvaged.

It was not that efforts were not made to save at least the containers, but the coast was simply too exposed and the equipment available for the salvage operations far from sufficient. Imagine if a similar accident had happened to a vessel carrying 10 to 15 times the number of containers that were loaded on board Rena.

The vessels are challenging in respect of height and width in order for the lightering crane to reach the containers.

The discharge rate in comparison with the number of containers carried also represents a challenge. A discharge rate of 4 containers per hour is quite optimistic. Assuming a vessel of 19,000 TEU carrying 10,000 containers of which the salvage operation needs to discharge at least 4,000, it will take 42 days working around the clock to complete the operation. It can easily be assumed that this salvage operation can last much longer.

Locations for repair and availability of dry docks.

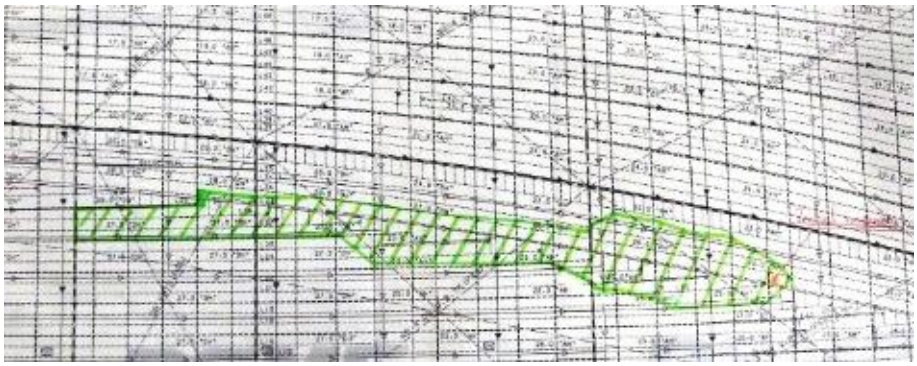
The number of repair yards worldwide that are able to accommodate the ultra large container vessels in dry dock facilities are very limited. This is not a concern in the event of scheduled dry-docking, but could pose a problem if one of these vessels experiences a damage or general average situation far away from repair facilities.

Material availability of steel plates > 80 mm

The sheer strake consists of very thick plates. Such plates are normally only produced on demand and this should be a concern to both owners and insurers in the event plating is needed. One thing is the logistics, another if shipyards in many parts of the world have the necessary equipment and welders to repair a hull plate of this size.

Damage due to bank effects in Canals

In recent years we have seen a number of ultra large container vessels involved in collisions and ground touching while transiting the Suez Canal. When investigating these incidents, it is obvious that they fall within the definition of “Bank Effect”. Often the touching of ground passes unnoticed by pilots and crew, but with massive damages as a result. Below is a typical example estimated to cost > USD 2 million to repair.



There seems to be a need for better training of not only navigating officers but also Suez Canal Authority pilots.

Closing comment

As stated above, the purpose of this paper is to raise awareness and discussion on some of the possible problems associated with increasingly larger container vessels – seen from an insurer's perspective. There are most probably many answers to the challenges, and we encourage that these discussions get more focus as development continues.