



The freeboard for the Ever Given went up to 45 meters above sea level.

UNCONTAINED FORCES LED TO SUEZ CANAL JAM

Last week I described the saga of the blockage of Suez Canal by the giant container ship, Ever Given. Let me describe how I see the incident unfolded.

Huge ships have a deep draft (depth of vessel beneath the water level), posing a challenge with shallow seabeds, especially those near coasts.

With Ever Given, which can carry 20,000 40-foot containers, they are stacked up to 45 meters above sea level.

The huge area of this 400-meter-long ship with a 45-meter-tall freeboard attracts wind forces much more severe than other large vessels. Oil tankers have a far shallower freeboard height, normally less than 15 meters.

The "sail effect" of this fully loaded container vessel is at least three times higher than equivalent tankers.

In open sea, the captain would be able to steer the ship toward the direction of the wind to cater for sail effect, but obviously this is not possible while traversing through the narrow passage of a canal.

Once the rotation of the ship starts, the momentum is so great that even the side propellers, used to maneuver during berthing, will not be able to correct the rotational movements.

Also, for berthing purposes, these huge machines would be towed by tugboats, and pushed by other tugboats for accurate positioning.

The canal's narrow passageway and the excessive width of the vessel made it impossible to use tugboats for such purposes, so the only way to maintain forward motion is by the ship's own power.

Such a powering method does not allow the finesse of control required for traveling in such close quarters.

It was also reported the ship was travelling at 13 knots, which was far in excess of the eight knots normally allowed in the canal, but we are not sure whether the higher speed was due to the need to main-



Nuts and bolts

Edmund Leung

tain steady forward momentum to counter sudden cross winds, or the captain was in a hurry to pass through that section.

We can rule out lack of knowledge of local conditions as the canal operator confirmed its pilots were on board at the time.

One other factor that may have impacted marine operations is Covid.

First, there is more marine traffic as some railway operations have stopped or became infrequent, and the same goes for road traffic due to a lack of lorry drivers with permission to cross countries amid pandemic restrictions.

To minimize infection risks, most ports do not encourage ship crews to come ashore, disrupting normal shift changes, and many crew members had to stay on board for more than a year, causing operational fatigue, making them more susceptible to making judgmental errors at critical times.

The rescue operation became most difficult, as first there are no room to allow large excavators to clear the silt.

Also, there was no room for large tugboats to pull the grounded vessel free from the canal banks.

Finally, there were no facilities to remove the heavy containers from the vessel to allow it to refloat. Dislodging the stranded vessel depended on a combination of the above and a high tide.

We are all pleased to see that the vessel blockage was finally cleared within a week.

One hates to think what would happen if it remained stuck and required unloading of containers, as that would take weeks, if not months.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure