Container vessels and Salvage
Is the salvage industry prepared for the ever growing vessels?
A picture paints a thousand words
Containers

- Container; steel box designed for carrying of goods around the world
- Malcom Purcell McLean is considered "the father of containerization". In 1956, he developed the metal shipping container, which replaced the traditional break bulk method of handling dry goods and revolutionized the transport of goods and cargo worldwide. McLean was named "Man of the Century" by the International Maritime Hall of Fame.
- SS Ideal X, the first container ship
Containers

- International standardisation of containers as from the 1970’s
  8 feet wide, 8 feet high (original), length in 10 feet equivalent
  4 strong corner posts for lifting and stowage.
Containerships
Containerships

Source: Alphaliner
Containerships
Containerships

- Ships are just a link in the global transportation of goods
- Strong growth of carrying capacity of container vessels
- Decreasing independence of containerships (they are depending on shore facilities for cargo handling operations)
Risks

Effect of the growing container vessels to the main risks

- Structural failures
- Fire
- Collision
- Grounding
Risks – structural failure
New generation of container vessels are all purposely built, new vessels with a specific design for carrying containers.

Limited number of ship conversations in order to increase carrying capacity.

Effect of ageing ships to be seen in future. Simulations can provide good estimates.

In case of structural failure it is unlikely that the complete cargo will be lost.
Risks - fire
Risks - fire

- Increasing difficulties in combatting fire from the vessel itself
- The increasing number of containers in a bay can increase the heat generating capacity of the fire and reduce the possibilities of boundary cooling
- Consequences of fire will depend on the location of the fire and the response time of assisting units to the vessel in distress
- In order to decrease risks the ability of the vessel to contain and/or fight the fire will need to increase
Risks - fire
Risks - fire

- When the vessel remains afloat it will be possible to tow her to a port of refuge where container handling can take place
- Little operational time constraints
- Cargo losses are likely to be severe
Risks - collision
Risks - collision

- All ships at sea run the risk of a collision; The longer the ship, the bigger the area that can be hit
- The bigger the ship the “more” difficult to manoeuvre in case of emergencies
- The bigger the vessel, the bigger the number of watertight compartments
- A collision may lead to local flooding (1 or 2 holds), but unlikely the vessel will sink
- As the vessel remains afloat it will be possible to tow her to a port of refuge where container handling can take place
- Little operational time constraints
- Cargo losses are likely to be “limited”
Risks - collision
Risks - grounding
Risks - grounding
Risks - grounding

- A vessel is aground when her draft exceeds the waterdepth. There is not enough water to “carry” the vessel, thus a part of the weight of the vessel is carried by the seabed → ground reaction.
- If the vessel is aground partly the ground reaction might be reduced by changing the trim of the vessel.
- If the trim cannot be changed sufficiently, or the vessel is aground over a bigger area than weight needs to be discharged in order to reduce the ground reaction.
- In many cases a weight can only be reduced by discharging part of the cargo.
- Time available for refloating will depend on the circumstances of the grounding, risk of structural damage.
Handling casualty containers

Standard container handling is designed for a vessel without trim or list.

On deck (outside cellguides) there is some flexibility, but within the cell guides the margins are limited.
Handling casualty containers

Container terminals have some tools to handle non-standard situations.

For more complex situations additional equipment is required.
Handling casualty containers

- A container terminal is the most suitable facility to handle container vessels, but they have severe restrictions if a vessel is not in her normal condition.
- Depending on the capability of the stevedores and the flexibility of the terminal services can be provided.
- The increasing growth of container vessels is reducing the capabilities of other port equipment to assist in the discharge.
Handling casualty containers

Challenges for container terminals, but possible when a vessel is in port
Handling casualty containers

Pressure and requirements from authorities to deal with IMO cargo as a matter of urgency after the grounding. Discharging will need to be done by available equipment. Bigger vessels will carry more IMO cargo, subject to special requirements.
Handling casualty containers

Size of the casualty manageable
5000 - 8000 TEU
Bays of 14 – 16 Containers wide

At the grounding location
Large cranes available,
with sufficient reach to deal
with the casualty of this size.
Cranes can either be placed on barges or on the coast.
In the last 5 years more than 100 new built container vessels of 11,000 TEU and above have been delivered. Now a generation of 18,000 TEU vessels have been ordered.
Handling casualty containers
“Standard” cranes are not sufficient anymore to discharge the containers, high capacity / large reach cranes will be required.
Handling casualty containers

Heavy onshore cranes semi permanent installed on a barge for offshore work.
Handling casualty containers
Possibilities for discharging of containers by means of external cranes is restricted by two main factors;

- Accessibility; is there a possibility to come alongside with any lightering barge?
- Weather
Handling casualty containers

• Discharging “speed” is the challenge in an effective operation
• By providing on-board discharge system weather restrictions are reduced
Handling casualty containers

Modular gantry systems can be used to create a custom designed discharge system for large containervessels.
Handling casualty containers
Handling casualty containers

Apart from your crane system a versatile spreader will be required. Intellectual spreader

Winched spreader
Handling casualty containers

Larger vessel may require extreme measures to deal effectively with a casualty.
Containers from a casualty often require handling on a special area and are not allowed on a normal container terminal.
All containers will need to be surveyed by multiple parties in order to determine any damage.
Handling of damaged containers from a cargo hold cannot be done by means of a gantry crane, but will require heavy cranes or alternative means.

Cargo may need to be discharged in bulk if the container fails.
Contractual aspects

- LOF salvage contracts; operational challenges commercial safe contract due to very high funds challenging process obtaining securities
- Wreck removal contracts; operational high performance required limited number of salvors capable of offering services expensive!
Conclusion

- A new generation container vessels will require a different approach from salvors, a marine approach will not be sufficient.
- Incidents with large container vessels will lead to high claims for salvage and/or wreck removal.
- In the design of bigger vessels emergency preparedness is to be taken into account.
- The container sector will need to be prepared to deal with large scale incidents.