Drew Shannon, Manager East Coast, London Offshore Consultants, gave a presentation on *Salvage of Containership* Rena *off Tauranga in New Zealand* to a joint meeting with the IMarEST attended by 30 on 5°October in the Harricks Auditorium at Engineers Australia, Chatswood.

Introduction

Drew began his presentation by saying that *Rena* was a 236 m, 3351 TEU Panamax containership, built in 1990 Howaldtswerke-Deutsche Werft AG in Kiel, Germany, and owned by the Greek shipping company Costamare Inc. through one of its subsidiaries, Diana Shipping Co.

Principal particulars of the vessel were

Length OA	236 m
Beam	32.2 m
Depth	18.0 m
Draft	12.0 m
Crew	20
Container capacity	3351 TEU
GRT	38 788
NRT	16 454
Main engine	Sulzer 8RTA76
	21 996 kW @ 98 rpm
Propulsion	Fixed-pitch propeller
Speed	21 kn

On 5 October 2011, while on passage from Napier to Tauranga, *Rena* ran aground on Astrolabe Reef off Tauranga, New Zealand. The ship was carrying 1368 containers, eight of which contained hazardous materials, as well as 1692.8 t of heavy fuel oil and 63 t of marine diesel.

The initial report received from the ship's agent advised as follows:

> 05/10/2011 04:16:35
> Aground — Astrolabe Reef in position 37°32.42'S 176°25.75'E
> 3.75 n miles north of Motiti Island
> 1692.8 tonnes HFO 63 tonnes MDO.

The location was significant, as Tauranga was where the Maori first landed in New Zealand, and Motiti Island and Astrolabe Reef are traditional Maori fishing grounds!

Rena aground on Astrolabe Reef on 5 October 2011 with an 11° list to port
(Photo courtesy Drew Shannon)

Aft container stack on *Rena*
(Photo courtesy Drew Shannon)

Timeline

A timeline of the events following the grounding sets the scene:

Stage 1 *Rena* aground 5 October 2011
Stage 2 Salvors appointed 6 October
Stage 3 Vessel abandoned (due to heavy weather) 11 October
Stage 4 Constructive total loss agreed 17 October
Stage 5 Oil removal 12 October–14 November
Stage 6 Cargo removal November 2011–January 2012
Stage 7 Break Up/Sinking 7–10 January 2012

Here Drew showed a video clip of the NZ News from early October, in which the grounding was declared the most significant marine pollution disaster in decades!

The vessel was working on the reef in way of the forward fuel tanks, and fuel oil was escaping, prompting the use of an aerial dispersant after preliminary tests showed it to be effective. Conditions around the reef were not feasible for booming operations around the ship. Containing the oil that had leaked and pumping oil off the vessel was the priority.

Initial Response

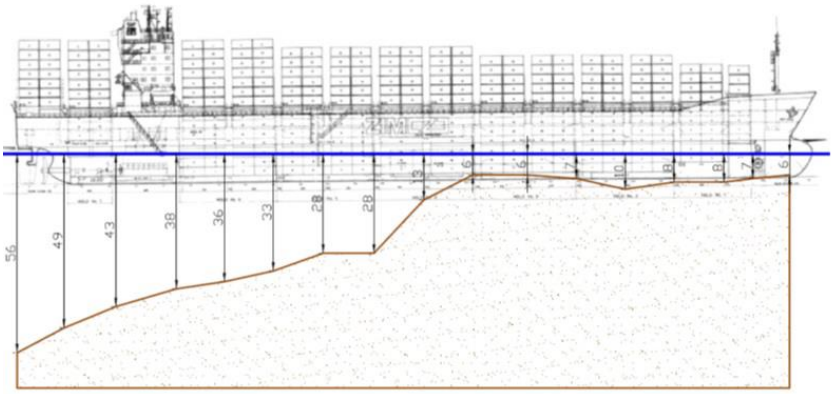
Maritime New Zealand personnel were on board the casualty on the day of the incident, and appointed London Offshore Consultants as technical advisors. A salvage inspection team from Svitzer in Sydney was mobilised and already en route to New Zealand. A Marine Incident Response Team (MIRT) was established in Wellington, a National On Scene Commander (NOSC) appointed, and an Incident Command Centre (ICC) established in Tauranga. An exclusion zone was established around Astrolabe Reef, as this was a local fishing ground.

Stage 2 — Salvors Appointed

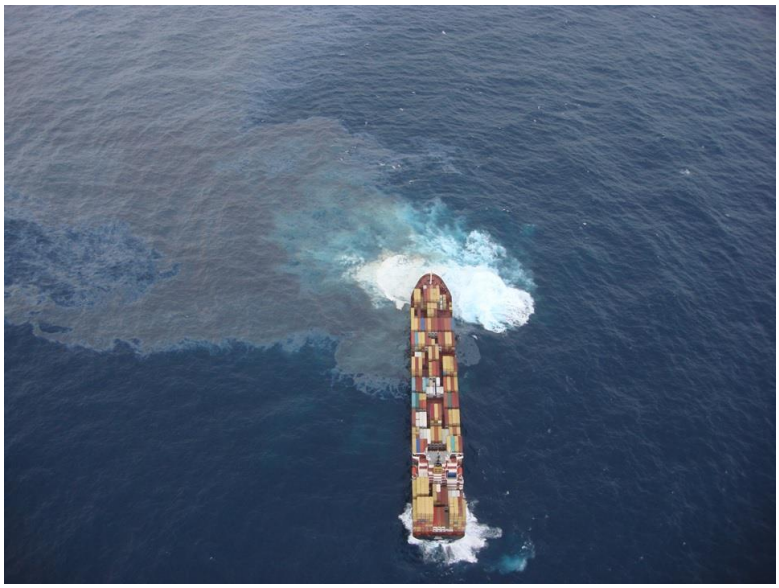
Svitzer were appointed as salvors on 6 October (the day after the grounding) and they commenced mitigation works on board. The Swedish Club, insurers of *Rena*, appointed a Special Casualty representative (SCR) who arrived on site on 6 October. Svitzer's naval architect arrived from The Netherlands to begin essential assessments, and Svitzer chartered the bunker barge *Awanuia* and tug *Waka Kume* from Auckland and they arrived on site on 9 October, with oil removal equipment arriving on the same day. *Awanuia* was connected to the stern of *Rena* and held off by the tug, and the first stage of oil removal was underway, direct hot dipping into tanks.


Awanuia and *Waka Kane* removing oil from *Rena*
(Photo courtesy Drew Shannon)

However, oil continued to escape, and a wildlife facility was set up in Tauranga to clean and rehabilitate up to 500 oiled birds should the need arise. A wildlife base was also established on Motiti Island with the centre being staffed by Massey University wildlife experts. A beach clean-up team was established.
LOC calculated the ground reaction as 9000 t. Here drew showed a profile of *Rena* aground on the reef.



Rena ground reaction on Astrolabe Reef
(Diagram courtesy London Offshore Consultants)



Fuel oil escaping from *Rena* on 10 October
(Photo courtesy Drew Shannon)

Stage 3 — Vessel Abandoned
Deteriorating weather on 11 October caused the decision to be taken to abandon the vessel. NZ naval vessels assisted the crew and salvage team in leaving the vessel. Larger quantities of oil were being released from casualty. The worsening weather caused major changes to *Rena*: she changed from an 11° list to port to a 23° list to starboard, a crease developed in the hull in way of Frames 191P to 181S, there was a large release of bunkers, and the loss of large quantities of containerised cargo. The exclusion zone was therefore extended, and navigation warnings promulgated. The owner's P&I Club appointed Braemar for container and debris recovery. However, some of the containers were never seen again!
The anchor handler *Svitzer Torrens* arrived from New Plymouth, and remained connected to *Rena* throughout the bad weather.

Stage 4 — Oil Removal
The salvage team managed to re-board the vessel on 13 October, but the 23° list made movement around the vessel precarious. Serious structural damage was noted — the vessel was effectively broken into two sections in way of Frames 191P–181S; i.e. at No. 3 hatch.
Amazingly, most of the twist locks on the container stacks held, despite the 23° list!

Container stacks on *Rena* on 13 October
(Photo courtesy Drew Shannon)

However, the salvage plan had to change dramatically to remove the bunkers, as the tanks on the starboard side were now 20 m underwater and no longer heated; they had to be reached from the port side! The watertight integrity of the engine room was maintained. *Awanuia* was re-connected for oil removal on 20 October, but the oil was getting colder and harder to pump.

Maritime NZ and the owners agreed on 17 October that the vessel was a constructive total loss, but this did not stop the salvage operation.

Additional personnel and salvage and oil-removal equipment were delivered to the vessel. However, the pumps would not work at 23^{o} inclination. The salvors asked Maunganui Engineering to build platforms which could be rigged over the port side of the vessel for mounting the pumps, and the Manager played the Australia Card: he said that the Australians didn't think that they could build one platform overnight. So the Kiwis built five overnight, and they were installed next day!

The ICC was developed and expanded into a major crisis centre, taking over a complete supermarket in Tauranga for the exercise! There was an extraordinary number of authorities involved: apart from the salvors and the project-management team, they had representatives from Maritime New Zealand, Tauranga port Authority, the Royal New Zeand Navy, Air Force and Army, the Fire Brigade, contractors (such as Maunganui Engineering), and the Maori elders, and they all worked pretty well together.

The beach clean-up continued. The Tauranga coast is the Gold Coast of new Zealand, with beaches and surfing, and this was not popular at the height of their summer season.

At this stage, the salvors believed that the stern section of the vessel could still be salvaged and refloated.

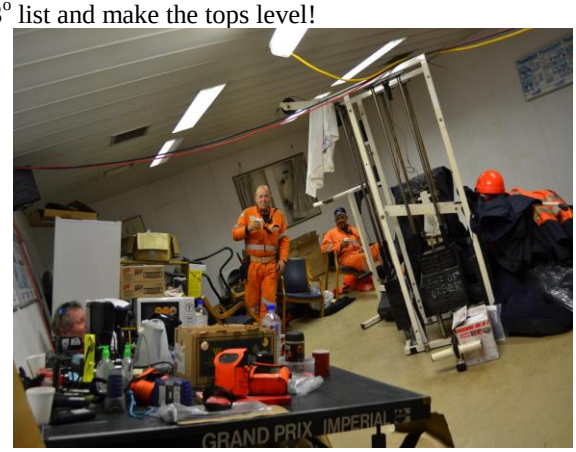
Another anchor handler, *Go Canopus*, arrived carrying sixteen 20 000 L tank-tainers, so she could carry significantly more than the bunker barge, *Awanuia.* Each hose had to be at least 200 m in length to reach from the bunker tanks to *Awanuia*. A water-injection system was used for bunker transfer.

A broken container full of Mrs Mac's pies was going off—and smelling—so these were hosed over the side.

There is not a lot of heavy engineering in New Zealand, and they did not have barges and cranes to offload the containers. They could not blast the twist locks to jettison the cargo, and so had to wait for equipment. After many discussions, they ended up with heavy crane barge *ST60* having a 30-day passage from Singapore to arrive. By this stage, there was a project-management team of ten ashore, making such arrangements.

Dive inspections of the damage were undertaken. There were signs of damage just forward of the accommodation block, but the vessel did not break there.

Most of the salvage team slept on board, as it saved lots of time. In the smoke room, they cut the legs of tables and chairs to allow for the 23^{o} list and make the tops level!



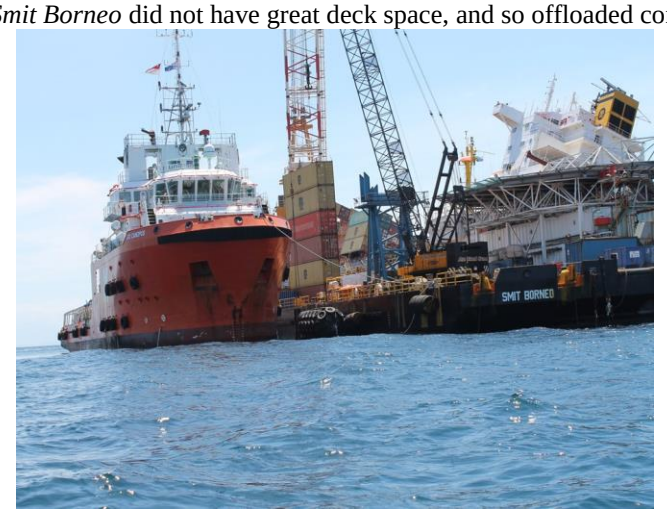
Smoke room on *Rena*
(Photo courtesy Drew Shannon)

The tide range was of the order of 1.0–1.5 m and, in the event, the salvors were a victim of their own success—the more mass they took off the vessel, the more the two halves moved relative to one another. The bow was wedged high and dry, but it destroyed the bulbous bow.
Bulk oil removal was completed on 14 November. Of 1700 m^3 of HFO, the salvors recovered 1200 m^3 and 300°m^3 escaped, so they removed most of it — and the authorities understood the impossibility of extracting absolutely everything.

Stage 5 — Cargo Removal
Heavy crane barge *ST60* had arrived from Singapore and, on 15 November, was positioned at the stern of *Rena* for cargo-discharge operations. Containers were recovered to *ST60* and then transhipped to *Go Canopus* for discharge ashore in Tauranga. The lifeboats had to come off too, and there were questions about import tax! Eventually the lifeboats were sold to a local polytechnic for $1.

Rena with crane barge *ST60* ready for cargo discharge
(Photo courtesy Drew Shannon)

A wildlife preservation unit was set up in Tauranga, and they had to treat some penguins, but no dopey dotterels (a local bird) were affected. When the penguins were judged safe to go back into the water, they had a special releasing day, with a crowd of several hundred on the beach to watch.
A container bund was established within Tauranga port for initial cleaning and handling of containers. Braemar establish a container cleansing and cargo-disposal facility outside of the port area. Some of the containers contained timber, cars, etc, but a container load of powdered milk was condemned.
There was much media attention—they came in dozens, and even the Prime Minister of New Zealand turned up.
A level platform was built on top of the forward container stacks (the last to be offloaded) from which personnel could be winched up to or down from the Bell 214B helicopter. the helo had a 2 t payload, and could carry 4 personnel in addition to the pilot.
Smit and Svitzer agreed terms on a joint venture, and *Smit Borneo,* having a larger crane and larger container capacity, arrived on 11 December and replaced ST 60. The speed of discharge improved significantly, as *Smit Borneo*'s crane could reach either side from port or starboard, and was not held up by weather as was *ST60* whose crane could not reach both sides. Containers could also be lifted off in stacks of six at a time with the bigger crane. However, *Smit Borneo* did not have great deck space, and so offloaded containers to *ST60.*



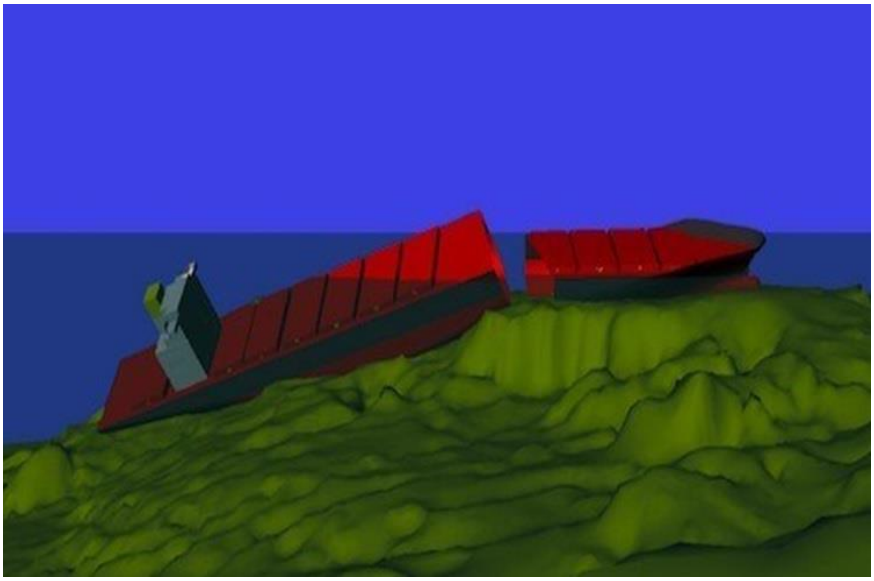
Smit Borneo unloading a stack of six containers
(Photo courtesy Drew Shannon)

Stage 6 — Wreck Break-up

The new year (20120) brought a protracted period of unsettled weather, and each weather event had a detrimental effect on the wreck. On 7 January they had 11 m seas (recorded on the ocean data buoy) due to a cyclone which had passed by to the north and, by that time, no-one was living on board *Rena* any more; they had moved onto *Smit Borneo.* On 8 January there was total separation of the aft section from the forward section.

Rena on 10 January 2011
(Photo courtesy Drew Shannon)

On 10 January the double bottom ripped out of the aft section on the reef and, later that day, the bridge went under water. There were 18 containers left on the aft section (all scrap) and 100 on the forward section, and there was still $350 000 of salvage equipment left on board. The Lloyd's Open Form contract was terminated and the salvors signed a Wreck Removal contract.



Rena resting
(Image courtesy London Offshore Consultants)

Then they had to determine what to do. They removed the accommodation block from the aft section, and the forward section was cropped to the waterline, so there was not much except left, but a fair amount of scrap steel. The vessel has subsequently moved twice, slipping further down the reef. In the event, the court has said that this can remain.

Conclusion

The circumstances changed significantly over the course of the event, from a salvage to a constructive total loss, and then to a wreck removal. There were many regulatory authorities involved, as well as the Maori, and eventually all worked well together. The wreck was finally reduced so that it is no longer a danger to navigation, and the harm to the environment and to wildlife was minimised.

Questions

Question time was lengthy, and elicited some further interesting points.

The vessel was proceeding at about 17 kn when she struck the reef.

There was sufficient buoyancy in the side ballast tanks and the engine room to float the vessel if they could have removed all the fuel and all of the containers.

They asked the Maori elders where they could dump pieces of the wreck. The Maori gave them six sites; five where they absolutely could not dump, and one where it was preferred not. When asked the difference, they replied that Maori were buried in the five sites, but pakeha (white men) were buried in the other site!

There was no question of the accuracy of the charts on board *Rena*; the vessel was taking a short-cut.

The vessel was declared a constructive total loss, and the P&I Club paid all the bills. The total cost of salvage and wreck removal amounted to something like $0.5 billion, behind *Costa Concordia* at about $2.5 billion and *Exxon Valdez*.

All of the lube oil was removed from the engine room.

A highlight of the presentation was the huge number of photographs which Drew showed, illustrating every aspect of the operation.

The vote of thanks was proposed, and the certificate and "thank you" bottle of wine presented, by Graham Taylor. The vote was carried with acclamation.