

Report on the investigation of the grounding
and recovery of the container feeder vessel

Thea II

and the tug

Svitzer Josephine

in the approaches to the Humber Estuary

on 15 December 2018



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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

ABP	-	Associated British Ports
AHM	-	Assistant Harbourmaster
AIS	-	Automatic Identification System
ALB	-	All-weather lifeboat
ASD	-	Azimuth stern drive
BA	-	British Admiralty
BIMCO	-	Baltic and International Maritime Council
BRM	-	Bridge Resource Management
C/E	-	Chief engineer
DCPSO	-	Duty counter-pollution and salvage officer
DPA	-	Designated Person Ashore
ECP	-	Emergency check-off plans
ECS	-	Electronic chart system
GPS	-	Global positioning system
GTGP	-	Guide to Good Practice
HESMEP	-	Humber Estuary Serious Marine Emergency Plan
IACS		International Association of Classification Societies
IALA	-	International Association of Lighthouse Authorities
INS	-	Information Service
IOT	-	Immingham oil terminal
kg	-	kilogram
kt	-	knot
kW	-	kilowatt
LOF	-	Lloyd's Open Form
m	-	metre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
mm	-	millimetre
MRC	-	Marine Response Centre
NAS	-	Navigation Advisory Service
NCP	-	National Contingency Plan

nm	-	nautical mile
OOW	-	Officer of the watch
PMSC	-	Port Marine Safety Code
RNLI		Royal National Lifeboat Institution
SAR	-	Search and rescue
SMCP	-	Standard maritime communications phrases
SMS	-	Safety management system
SOSREP	-	Secretary of State's Representative
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended (STCW Convention)
t	-	tonne
TOS	-	Traffic Organisation Service
VHF	-	Very high frequency radio
VSP	-	Voith Schneider propeller
VTs	-	Vessel Traffic Service
VTsO	-	Vessel Traffic Service operator

TIMES: all times used in this report are UTC unless otherwise stated.

SYNOPSIS

At approximately 1500 on 15 December 2018, the main engine of the Cyprus registered container feeder vessel, *Thea II*, failed while approaching the Humber pilot station. With no propulsion the master anchored the vessel in gale force weather conditions. While awaiting the arrival of tugs, the weather deteriorated further and *Thea II* dragged its anchor towards the Binks shoal.

At 1739, before *Thea II* could be towed clear, the container vessel and one of the tugs attending, *Svitzer Josephine*, ran aground. Search and rescue assets were deployed, but no personnel were evacuated from either vessel.

As the tide rose, both vessels refloated. Just before 2200, *Svitzer Josephine* was able to get underway and return to harbour. However, *Thea II*'s tow was delayed while the vessel's managers attempted to agree contractual terms with another tug operator. At about 0100 the following day, its managers signed Lloyd's Open Form. The vessel was then towed to the deep water anchorage before being taken into harbour on 16 December 2018. There were no injuries and no pollution as a result of this accident.

The investigation found that *Thea II* had lost propulsion due to the failure of its main engine governor, which could not be repaired, and the master had no choice but to anchor the vessel and await the arrival of tugs. However, as the weather deteriorated and the vessel began to drag towards the Binks shoal, the master did not deploy all his remaining chain or his vessel's second anchor. Had he done so, it would have slowed or arrested the vessel's rate of drift and allowed more time for tugs to secure lines and tow the vessel clear.

The investigation also found that the tug *Svitzer Josephine* grounded because the master, focused on passing the towline to the crew of *Thea II*, lost positional awareness and did not appreciate the rate of drift of both vessels towards the Binks shoal.

Thea II refloated on the rising tide. However, despite the best efforts of the harbourmaster, the Maritime and Coastguard Agency and local tugs, in difficult weather conditions, *Thea II*'s managers only agreed salvage terms 2½ hours later, under the threat of formal direction from the Secretary of State's Representative. This delay almost led to *Thea II* re-grounding, risking damage to an environmentally sensitive area.

As a result of this accident, action has been taken by Associated British Ports Humber and Svitzer Marine Ltd, to review their risk assessments and operating procedures. The Secretary of State's Representative has continued an industry wide engagement programme to promote a greater understanding of his role. A recommendation has been made to *Thea II*'s managers, TS-Shipping, to review their emergency response organisation and procedures.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *THEA II* AND *SVITZER JOSEPHINE*

SHIP PARTICULARS		
Vessel's name	<i>Thea II</i>	<i>Svitzer Josephine</i>
Flag	Cyprus	United Kingdom
Classification society	DNV GL	Lloyd's Register
IMO number/fishing numbers	9107394	8919219
Type	Container feeder vessel	Tug
Registered owner	MS Thea II Schiffahrts GmbH & Co. KG	Svitzer Marine Ltd
Manager(s)	TS-Shipping GmbH & Co. KG.	Svitzer Marine Ltd
Construction	Steel	Steel
Year of build	1995	1991
Length overall	94.09m	28.13m
Gross tonnage	2899	364
Minimum safe manning	6	3
Authorised cargo	Containers	None
VOYAGE PARTICULARS		
Port of departure	Amsterdam, Netherlands	Immingham, United Kingdom
Port of arrival	Hull, United Kingdom	Immingham, United Kingdom
Type of voyage	International	Coastal
Cargo information	85 containers	Not applicable
Manning	11	3
MARINE CASUALTY INFORMATION		
Date and time	15 December 2018, at 1739	
Type of marine casualty or incident	Serious Marine Casualty	
Location of incident	Approaches to the Humber Estuary	
Injuries/fatalities	None	None
Damage/environmental impact	Minor damage to ship's bottom, steering gear and deck vents	Water damage to engine room ventilation system and accommodation spaces
Ship operation	At anchor	Underway
Voyage segment	Arrival	Mid-water
External & internal environment	The wind was south-easterly force 9-10, accompanied by a 4-5m sea	
Persons on board	11	3

1.2 NARRATIVE

1.2.1 The grounding

On the evening of 14 December 2018, *Thea II* departed Amsterdam, Netherlands, bound for Hull, United Kingdom. The vessel was loaded with 85 containers, 46 of which were carried on deck (**Figure 1**).



Figure 1: *Thea II*, post-grounding, alongside in Hull

Thea II's passage across the North Sea was uneventful. However, by the following afternoon on 15 December, as *Thea II* approached the Humber, the weather deteriorated and the wind increased to south-easterly force 8, accompanied by a 2-3m sea.

At 1501 an operator at vessel traffic service (VTS) Humber observed that *Thea II*'s speed had reduced to zero and enquired using Very High Frequency (VHF) radio if there was a problem. *Thea II*'s master responded that the main engine had failed, the ship was now 'not under command' and that it required tug assistance. The VTS operator (VTSO) advised the master to anchor in his present position while tugs were sought. Three minutes later, *Thea II*'s master reported that the vessel had anchored using its port anchor with 5 shackles of cable in the water. The VTSO subsequently contacted Humber coastguard and notified them of the incident.

The VTSO then tried to raise the crew of *Svitzer Josephine* (**Figure 2**), Immingham Oil Terminal's (IOT) duty fire tug, on VHF radio, to enquire if they were able to assist *Thea II*. The call went unheard as the tug's bridge was not manned. The VTSO then contacted the IOT duty officer and requested that he activate the duty fire tug alarm. The alarm was heard on board the tug, and *Svitzer Josephine*'s master immediately contacted VTS Humber. The VTSO informed him that the container feeder vessel *Thea II* had broken down, was anchored on the north side of the channel and needed urgent tug assistance. *Svitzer Josephine*'s master agreed to assist. He then asked the VTSO to notify the Svitzer office of their tasking so that they could arrange a replacement fire tug.



Figure 2: Svitzer Josephine

Shortly after *Thea II* had anchored, the port suspended pilotage due to the deteriorating weather conditions. The VTSO observed *Thea II* moving very slowly to the north and, concerned that it might be dragging its anchor, called the vessel on VHF radio:

“At the moment you are moving at about 0.5kts to the north, caution shallow water. You may need to consider dropping more cable. Do not drop another anchor, but you may need to drop more cable.”

Thea II's master confirmed that he understood the instructions and the vessel's drift appeared to stop. At 1507, having briefed his crew, *Svitzer Josephine*'s master got the tug underway and commenced the 14nm passage downriver towards *Thea II*. During the passage the master quickly realised that a second tug would be required to safely tow the container vessel. He contacted the Svitzer office, which tasked *Svitzer Castle* to assist.

At 1546, shortly after sunset¹, *Svitzer Castle*'s master reported to VTS Humber that it was on passage to join *Svitzer Josephine* to tow *Thea II* into port. A harbour pilot was also placed on stand-by to board the disabled vessel if weather conditions improved.

At 1630, *Thea II*'s master first emailed the vessel's managers informing them that *Thea II*'s engine had stopped and the vessel was anchored by the side of the channel.

At 1633, just before low water Spurn Head², the VTSO observed *Thea II* drifting north-west at 1.7kts (knots) (**Figure 3**). He called the vessel and enquired if *Thea II* was dragging its anchor. The master confirmed that this was the case and reported that he was deploying a further shackle of anchor cable. However, this did not stop the vessel's drift.

¹ Sunset was at 1540.

² Low water Spurn Head was at 1637.

Reproduced from Admiralty Chart 0104-0 by permission of HMSO and the UK Hydrographic Office

Time	1500	1600	1700	1800	1900	2000	2100	2200	2300	0001	0100
Wind (dirn/force)	↙ 9	↙ 9	↙ 10	↙ 8-9	↙ 10	↙ 9	↙ 8	↙ 8	↙ 7	↙ 6	↙ 6
Tidal force (dirn/kts)	↙ 2	↙ 1.6	↙ 1.0	↙ 0.2	↙ 0.9	↙ 1.5	↙ 1.6	↙ 1.3	↙ 0.5	↙ 0.4	↙ 0.3

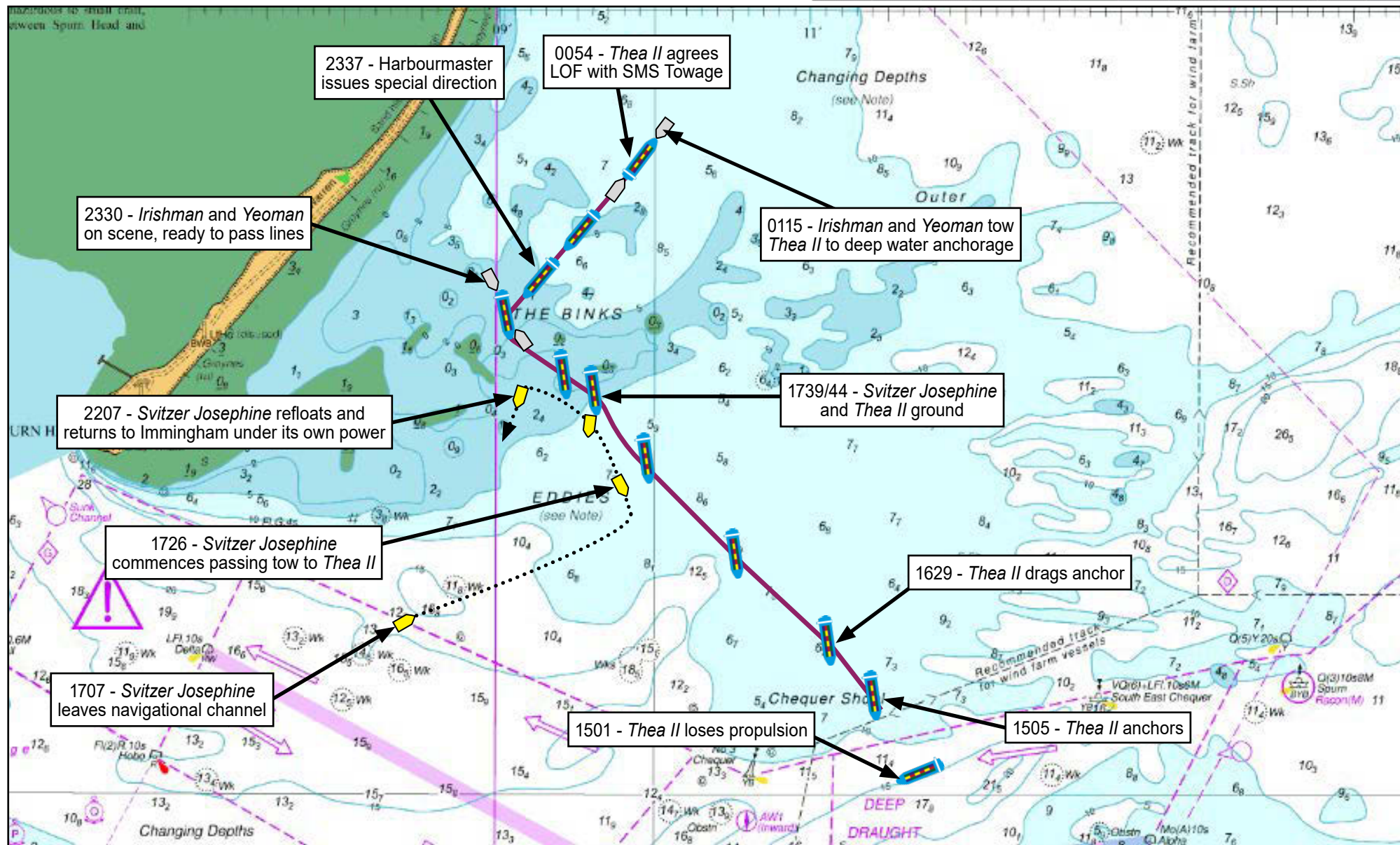


Figure 3: Overview of the accident track from 1501 on 15 December until 0115 on 16 December

Shortly afterwards, *Svitzer Josephine* rounded Spurn Head, followed 20 minutes later by *Svitzer Castle*. *Svitzer Josephine*'s master noted that the weather had deteriorated, and the wind was now south-east force 9-10, accompanied by a 4-5m sea.

At 1707, as the two tugs left the main channel, *Svitzer Josephine*'s master and the VTSO discussed the situation. The tug's master confirmed its draught as 5.4m and expressed his concern that, given the weather conditions, he was unsure if his tug would be able to secure a tow to *Thea II* and move it into deeper water. The VTSO acknowledged the tug master's concern and emphasised that *Thea II* was in need of urgent assistance. He finished the exchange by stating:

"Yeah that's fine and having worked at Spurn for some time I'll keep an eye on you and if I think you're getting too close to the bank I'll let you know. I don't have a chart but from low water experience [Thea II] should be OK at the moment."

At the time, *Thea II*, also with a draught of 5.4m, was 7 cables from grounding on the Binks shoal. *Svitzer Josephine*'s master then contacted *Thea II*'s crew. He established that the container vessel's port anchor was deployed and directed *Svitzer Castle* to stand off while he made his approach to pass the towline. It took 15 minutes for *Thea II*'s crew to make the towline fast.

At 1739, as *Svitzer Josephine*'s master tried to tow *Thea II*, he found his tug was aground. He reported this to VTS Humber, who in turn contacted *Thea II*'s master, who responded that his vessel was also aground.

1.2.2 Actions post-grounding

At 1751, concerned that there might be a need to evacuate personnel from both vessels, Humber coastguard requested the launch of the Spurn Head Royal National Lifeboat Institution (RNLI) all-weather lifeboat (ALB).

Shortly after the lifeboat was underway, *Svitzer Josephine*'s engine room fire alarm sounded, and the master ordered both engines to be stopped. With no propulsion, the tug pounding the seabed and waves breaking over the vessel, the master became concerned for the crew's safety and ordered them to don immersion suits and lifejackets. He then contacted Humber coastguard to request evacuation. The coastguard acknowledged his call for assistance and activated a search and rescue (SAR) helicopter to attend.

At 1758, the Humber harbourmaster activated the Humber Estuary Serious Marine Emergency Plan (HESMEP) and established the Marine Response Centre (MRC) at the port's Grimsby office. At 1824, the Maritime and Coastguard Agency (MCA) and the Secretary of State's Representative (SOSREP) were informed of the incident.

At 1900 the SAR helicopter arrived on scene but, having assessed the situation, the pilot declared the weather conditions out of limits for conducting a winch transfer (**Figure 4**). The ALB offered to evacuate non-essential personnel from *Thea II* and *Svitzer Josephine*, but as the watertight integrity of both vessels was still intact their masters declined.



Figure 4: *Thea II* and *Svitzer Josephine* viewed from the search and rescue helicopter, aground on the Binks Shoal

The harbourmaster arrived at the Grimsby port offices shortly after 1900. Conscious of the opportunity provided by the rising tide and forecast moderation in the weather, he contacted another of the port's tug operators, SMS Towage Ltd, to establish if they had vessels that could assist. As a result of these discussions it was agreed that SMS's shallow draught (3.5m) Hong Kong class tugs, *Yeoman* and *Irishman*, would attend once they had completed their tasking at Hull. At approximately 1920 the two tugs commenced their passage downriver towards *Thea II*.

Thea II's master had been in contact with the vessel's managers by email since 1630, updating them on the tugs' arrival. The chief engineer (C/E) was also in email correspondence regarding the engine defect. However, there was no mention of dragging anchor until 1948, when the master informed the managers that the tugs had been unsuccessful and that *Thea II* had dragged anchor and was now aground. The vessel's Designated Person Ashore (DPA) responded by asking the master to provide the completed emergency check-off plans (ECP) for main engine failure/grounding. In a further email, at 2015, the managers advised the master "*do not ask the captain of the tugs for anything and do not sign anything*". The ECPs were completed by *Thea II*'s officer of the watch (OOW).

Shortly after 2030 *Svitzer Josephine*'s master began to re-evaluate his situation. He sensed the tug's pounding had become less intense and assessed that the tug was beginning to refloat. Aware that the tide was rising, and that the engine room fire alarm had stopped, he decided to send the chief engineer below to restart the tug's main engines.

1.2.3 Recovery of Svitzer Josephine and Thea II

At 2139 *Thea II*'s master received an email from the vessel's managers informing him that insurance brokers were in the process of sourcing appropriate tugs to assist.

At 2145, the tugs *Yeoman* and *Irishman* (**Figure 5**) left the main channel to approach *Thea II*. Shortly afterwards, *Yeoman* reported to VTS that the weather conditions were unsuitable to pass towlines.

Courtesy of [transportsofdelight](https://transportsofdelight.com)



Figure 5: *Yeoman* (Hong Kong class) tug

By about 2200 *Svitzer Josephine* had refloated and was led into deep water by the ALB. As he manoeuvred his tug clear, the master payed out the vessel's 130m towline until its weak link broke and the line detached from the winch. This left the tug's towline attached to *Thea II*. Once clear, *Svitzer Josephine* returned to Immingham under its own power, escorted by *Svitzer Valiant*.

Just before high water at 2235, VTS noted *Thea II* had started to drift towards the Spurn peninsula, so contacted the vessel to enquire if it was going to drop a second anchor. *Thea II*'s master responded, saying that he did not intend to do so as they were drifting into deep water on the other side of the Binks Shoal.

At 2245, after discussion between the harbourmaster, tug skippers and the ALB coxswain, it was decided that the ALB would guide *Yeoman* and *Irishman*'s masters to the bow and stern of *Thea II*. The ALB led *Irishman* to the east of the Binks shoal to *Thea II*'s stern and then led *Yeoman* to the vessel's bow. During *Yeoman*'s approach to *Thea II* the tug was set on to the container vessel's anchor cable, causing some damage to its hull. By 2330, both SMS tugs were close enough to pass lines to the container vessel. Concurrently, the Humber harbourmaster updated the SOSREP on his intentions to secure the tugs to *Thea II* and tow it clear.

At 2300, *Thea II*'s master emailed the vessel's managers, stating his concern over their delay in authorising the tow. Thirty minutes later the vessel's managers responded, informing him that they were '*working on it*'. The master continued to express his concern to them, approximately every 20 minutes, over the delay in granting him permission to take the tugs' lines.

At 2337, concerned that the tide was falling and that *Thea II*'s crew had not taken lines from the tugs, the harbourmaster issued a special direction on VHF radio to *Thea II*'s master, directing him to take tugs' lines. This direction was acknowledged by *Thea II*'s master, but he did not issue instructions to his crew to take lines from the tugs.

Throughout the incident, Humber coastguard had kept the MCA Duty Counter-Pollution and Salvage Officer (DCPSO) updated regarding the situation. The DCPSO, in turn, kept the SOSREP apprised of the situation. The DCPSO also commissioned a model of the environmental risk posed by the grounded vessels and liaised with *Thea II*'s managers and insurers. The vessel's managers and insurers were initially confident that they would be able to contract tugs to tow their vessel clear. However, at 2342, concerned that *Thea II* had yet to take lines from the attending tugs, Humber coastguard contacted the DCPSO, and the Humber harbourmaster was also in contact with the SOSREP.

Several telephone conversations involving the DCPSO and *Thea II*'s managers followed. During these discussions it became clear that negotiations between SMS Towage, the tugs' owners, and *Thea II*'s managers/insurers, had stalled. *Thea II*'s managers/insurers wanted to employ the tugs under a fixed price towage contract, while the tug owners, SMS Towage, given the extreme weather conditions and risk to their vessels, were only willing to salvage the container vessel under Lloyd's Open Form (LOF).

At 0007 on 16 December, VTS informed *Thea II* on VHF:

"[Thea II] your position is not good. You are in a very bad position at this time, if you don't accept the assistance from the tugs."

Thea II responded:

"We have to await instructions from the owners."

At 0049, after further discussion with the SOSREP, the DCPSO informed *Thea II*'s managers and insurers that unless they agreed terms with SMS Towage by 0100, the SOSREP would formally direct the ship to accept the LOF and take lines from the tugs. Five minutes later, at 0054, the vessel's managers emailed *Thea II*'s master instructing him to accept LOF under protest. This was quickly communicated to VTS and the tugs. By 0110, *Yeoman* was connected to the bow and *Irishman* to the stern of *Thea II* and, led by the ALB, towed the ship clear of the shoal. During this process *Thea II*'s crew discarded the remains of *Svitzer Josephine*'s towline overboard.

The tugs towed *Thea II* to the north following a passage plan agreed with the harbourmaster (**Figure 6**). This took the vessel down sea, between the mainland and the Humber Gateway windfarm. From there, the plan took *Thea II* east of the windfarm, before taking it south to the port's deep water anchorage. Thereafter, the plan was that *Thea II* would remain at anchor until the weather moderated and the vessel could be safely towed into harbour.

Shortly after 0200 the forward tug, *Yeoman*, unexpectedly lost the use of its starboard azimuth unit. This was quickly followed by the failure of its port azimuth unit at 0215. The remaining tug, *Irishman*, was able to control the tow as the three vessels ran down sea at slow speed. VTS Humber was informed and SMS Towage

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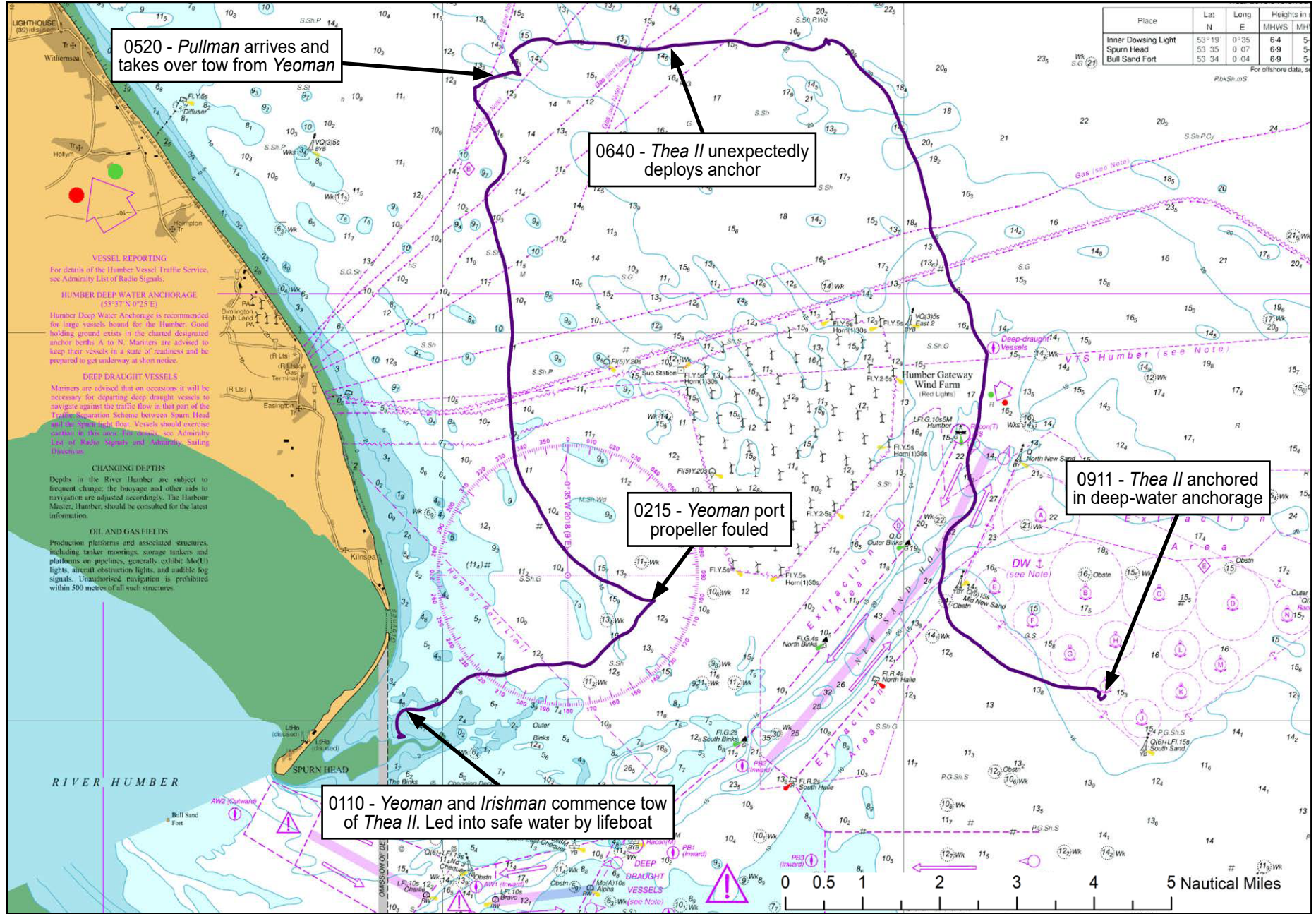


Figure 6: Thea II's passage, under tow, from the Binks shoal to the deep water anchorage

arranged for a replacement tug, *Pullman*, to get underway. The harbourmaster advised the tugs to remain clear of the windfarm exclusion zone and hold their current position until the replacement tug arrived.

At 0520, the replacement tug, *Pullman*, arrived on station and, once *Yeoman* had been released, took over as *Thea II*'s bow tug. The disabled *Yeoman* was left to drift safely to the north.

At 0640, *Thea II*'s master sighted anchored vessels nearby and, thinking that his vessel had arrived at the anchorage, dropped anchor. After discussion with the tugs and VTS, *Thea II* quickly recovered its anchor and the tow to the deep water anchorage continued.

At 0911, *Thea II* anchored in the deep water anchorage. Once released, *Irishman* proceeded north, recovered the disabled tug *Yeoman* and towed it back to port. *Pullman* remained on station until *Thea II* was safely towed into harbour the following day.

1.3 DAMAGE SUSTAINED

1.3.1 *Thea II*

Once *Thea II*'s cargo had been discharged at Hull, the vessel was towed to Germany for repair. After the vessel had been dry docked it was found that:

- The rudder and steering gear were damaged, but operational.
- The vessel's hull was intact, but the hull bottom paintwork was damaged.
- There was minor damage to the propeller blades.
- Two quarter deck ventilation pipes had been broken by the tug's towline.

Thea II was out of service for 6 weeks for repair. The vessel resumed its charter in February 2019.

1.3.2 Tug *Svitzer Josephine*

Post-accident in-water survey of *Svitzer Josephine* revealed that the void space containing the starboard engine room vent fan had flooded. This had shorted the fan motor and probably triggered the fire alarm. The starboard weather deck door had also vibrated open during the grounding, causing water damage to the tug's accommodation and recreational spaces. Initially it was thought that the tug's hull and Voith Schneider propellers (VSP) were undamaged. However, during the dry-docking of the vessel in June 2019, extensive cracking was identified along the skeg and adjoining keel plating, which had not been detected during the in-water survey.

1.3.3 Tug *Yeoman*

Yeoman's hull was damaged when, during its approach to *Thea II*, it was pushed onto the container vessel's anchor cable. Later during the tow, the tug lost the use of both engines. *Yeoman* was towing *Thea II* bow to bow, and its master initially

assumed that its propellers had been fouled by fishing gear. However, when *Yeoman* was in dry dock it was discovered that the port and starboard azimuth units had been fouled by a towline (**Figure 7**). The following damage was also discovered:

- The internal engine room mountings were out of tolerance.
- The starboard bilge keel and starboard side of the hull were damaged.

The vessel was in dry dock for 10 weeks and returned to service in February 2019.

Post-accident inspection of the rope recovered from *Yeoman's* azimuth units suggests that it was an 80mm, 3-strand 'Strongline' polyester, Langhorst towing hawser, attached to a 15m yellow/orange towing pennant. This was similar to *Svitzer Josephine's* towline, which had been discarded by *Thea II's* crew.

Image courtesy of SMS Towing Ltd

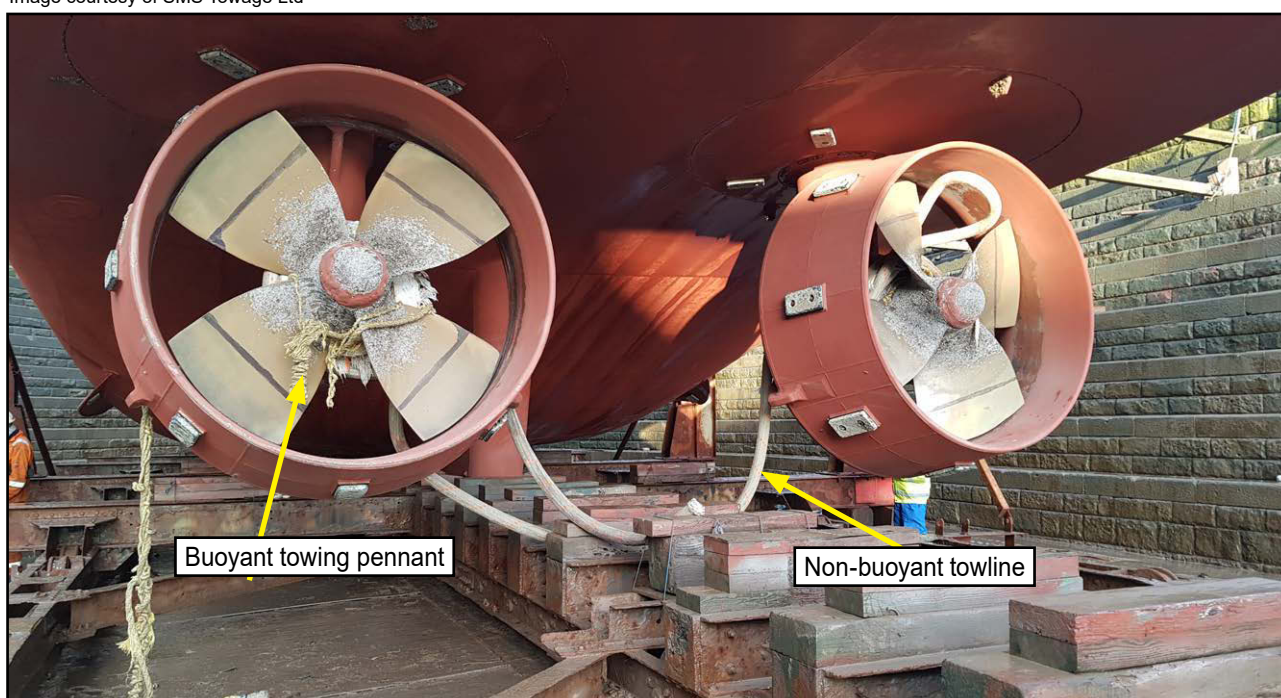


Figure 7: *Yeoman's* propellers fouled by *Svitzer Josephine's* towline

1.4 ENVIRONMENTAL CONDITIONS

During the afternoon of 15 December, weather conditions deteriorated as forecast. At 1500, when *Thea II* first anchored, the wind was south-easterly force 8 accompanied by a 2-3m sea. By 1630, when *Thea II* began to drag its anchor, the wind had increased to storm force 10, with a 4-5m sea. However, by 2300, just after high water, conditions had begun to moderate; the wind had veered to south-south-east gale force 8 and the sea reduced to 2m.

During the following morning, while *Thea II* was under tow, conditions improved further. The wind veered to the south and then south-west and reduced from force 6 at 0100 to force 4 at 0900.

The tidal streams in the approaches to the Humber Estuary near the Binks shoal flowed south-south-west on the flood and north-north-east on the ebb tide, at rates of up to 2kts. Initially the tidal stream set north-north-east until 1800, south-south-west until midnight, before setting north-north-east again (**Figure 3**).

Tides in the Humber were affected by weather conditions and, as a result, their height differed from those predicted. Normally, these variations were between 20 and 30cm. However, on 15 December, with storm force winds from the south-south-east, Spurn Head tide gauge showed the actual height of tide was between 0.9 and 1; 1m less than predicted.

The seabed had a charted depth of between 0 and 10m, and the bottom composition was described as sand and shells; judged to be moderate holding ground.

1.5 THEA II

1.5.1 Crew

Thea II had a crew of 11 made up of five Russian/Ukrainian officers and six Filipino crew.

The 62 year old Russian master had worked at sea for over 40 years and held an STCW II/2 certificate of competency. He had completed four, 4-month contracts as master of *Thea II*. The master did not keep watches in harbour, but at sea kept the 0800-1200 and 2000-0000 watches. On the day of the accident, the master had been on watch as normal in the morning and had returned to the bridge at 1430 to oversee the vessel's entry into the Humber. He then remained on the bridge throughout the incident, only returning to his cabin to rest once the vessel was towed clear of the Binks shoal.

The 62 year old Ukrainian C/E had worked at sea for over 40 years and held an STCW III/2 certificate of competency. He had served as C/E of *Thea II* for over 13 years. The C/E, assisted by a Filipino oiler, worked during the day, adjusting his hours as required so that he could keep watch in the engine room during pilotage.

1.5.2 Vessel background

Thea II had been managed by TS-Shipping GmbH & Co. KG. from build. Since March 2018 the vessel had been on time charter to Samskip, employed on a regular route between the Netherlands and the United Kingdom.

Thea II's primary means of navigation was by paper charts, supported by an electronic chart system (ECS) as a navigational aid. The vessel was also fitted with two navigational radars: Automatic Identification System (AIS) and two global positioning systems (GPS). As *Thea II* was less than 3000gt the vessel was not fitted with a voyage data recorder.

1.5.3 *Thea II*'s managers

Thea II's managers were based in Haren, Germany. At the time of the accident their office was closed for the weekend and the vessel's DPA and safety auditor coordinated the company's response remotely from their homes. During the accident, the DPA and safety auditor made attempts to contact *Thea II*'s master by mobile phone, but with no success. The master, instead, preferred all communications with the managers to be via email. After being initially informed by the master, the managers did not monitor *Thea II*'s position using AIS as they were under the misconception that the ship was safely anchored, awaiting tug assistance.

1.5.4 Anchor arrangement and guidance

Thea II's anchor arrangements comprised a forecastle windlass and two 1998kg, high holding power, D'Hone anchors (**Figure 8**). The port anchor was attached to 12 shackles and the starboard anchor to 9 shackles of 40mm hardened steel cable.

Image courtesy of TS-Shipping GmbH and Co. KG



Figure 8: *Thea II*'s D'Hone, high holding power anchor

Thea II's safety management system (SMS) guidance on anchoring included:

- *That the OOW needs to consider the condition of the holding ground, weather and tidal conditions as well as traffic flow.*
- *To detect dragging, the vessel's position should be checked frequently preferably by different methods (visual bearings, radar bearing and distance).*
- *If the weather deteriorates or there is a risk of dragging, inform the master and make engines ready for immediate manoeuvre. If necessary, consider lowering a second anchor.*

The vessel's SMS did not provide guidance on the scope of anchor cable to be deployed.

Thea II's paper chart showed the vessel's position had been fixed at 1500, 1638 and 1900. It also showed the depth of water on anchoring, including the height of tide (2.3m), was approximately 12m.

1.5.5 Failure of main engine

Thea II's main engine was a MAN B&W, 2950kW, diesel engine connected via a gearbox to a controllable pitch propeller and shaft generator. The shaft generator was used while entering and leaving harbour to operate the 250kW bow thruster. The vessel was also fitted with two generators, both of which were operating at the time of the accident.

Shortly before 1500 on 15 December, the C/E had been working in the engine room with the oiler when he heard the engine speed governor alarm sound. The engine revolutions slowly reduced until the shaft stopped. The C/E immediately went to investigate. He checked the fuel system but could find nothing wrong. He then inspected the governor control unit. There, he found one of the fuses had tripped, which he reset. The C/E then attempted to restart the main engine, without success. He repeated this on three or four occasions. At each attempt, the engine briefly ran before shutting down. He then spoke to the OOW on the bridge, who informed him that the ship was going to anchor.

The C/E continued to investigate the main engine defect, liaising by email with the vessel's managers. By about 1600 he had identified the problem as a defective circuit board within the electronic governor control system. A spare circuit board was not carried on board. The C/E advised the master that specialist technical support from the manufacturer would be required to repair the defect. Until then, the vessel's main engine would be out of action.

1.6 SVITZER JOSEPHINE

1.6.1 Crew

Svitzer Josephine carried a crew of three comprising the master, an OOW (deck) and the C/E, all of whom had joined the vessel at 0830 on 15 December 2018. At sea, the master conned and navigated the tug. The OOW assisted the master when required, and during towing operations worked on deck handling the towline. The C/E oversaw the safe operation of the tug's machinery and, when towing, operated the towing winch from the wheelhouse.

The 54 year old master had worked at sea for over 20 years. He had joined Svitzer tugs as an able seaman before gaining his STCW II/3 tug master's certificate of competency in 2016. He had been working as relief master on various tugs since March 2016.

Svitzer Josephine's minimum safe manning document permitted the tug to reduce from six to three crew when operating within Humber port limits.

1.6.2 Tug background

The UK registered *Svitzer Josephine* was owned by Svitzer Marine Ltd. It was a twin VSP tractor tug and had a bollard pull of 53t. The VSPs were protected from damage by debris or grounding by means of protective steel structures known as 'stools' (**Figure 9**). The tug was designed to tow over its stern and was fitted with a

towing winch that held a 130m long, 80mm diameter towline. The towline was not buoyant, however the 15m rope pennant, secured to the eye of the towline, was. *Svitzer Josephine*, in common with the other Svitzer tugs involved, was based at Immingham and supported shipping movements throughout the Humber Estuary. The tug's normal area of operations confined the vessel to operating within the Humber Estuary's navigation channels. The SMS required the master to maintain a minimum under keel clearance of 1m.

Svitzer Josephine's primary means of navigation was using paper charts. These were kept up to date by the crew and stored on the bridge within a cardboard tube for use as required. The tug was also fitted with a radar, an ECS, an echo sounder, and a GPS. During the emergency response *Svitzer Josephine's* master navigated the tug using its ECS.

Svitzer Josephine's echo sounder transducer was fitted in front of its VSPs. The echo sounder's minimum depth alarm was set at 1m. However, the position of its transducer, like many tugs, meant that it was prone to false alarm due to VSP wash and, on the day of the accident, the echo sounder's audible warning alarm had been silenced.

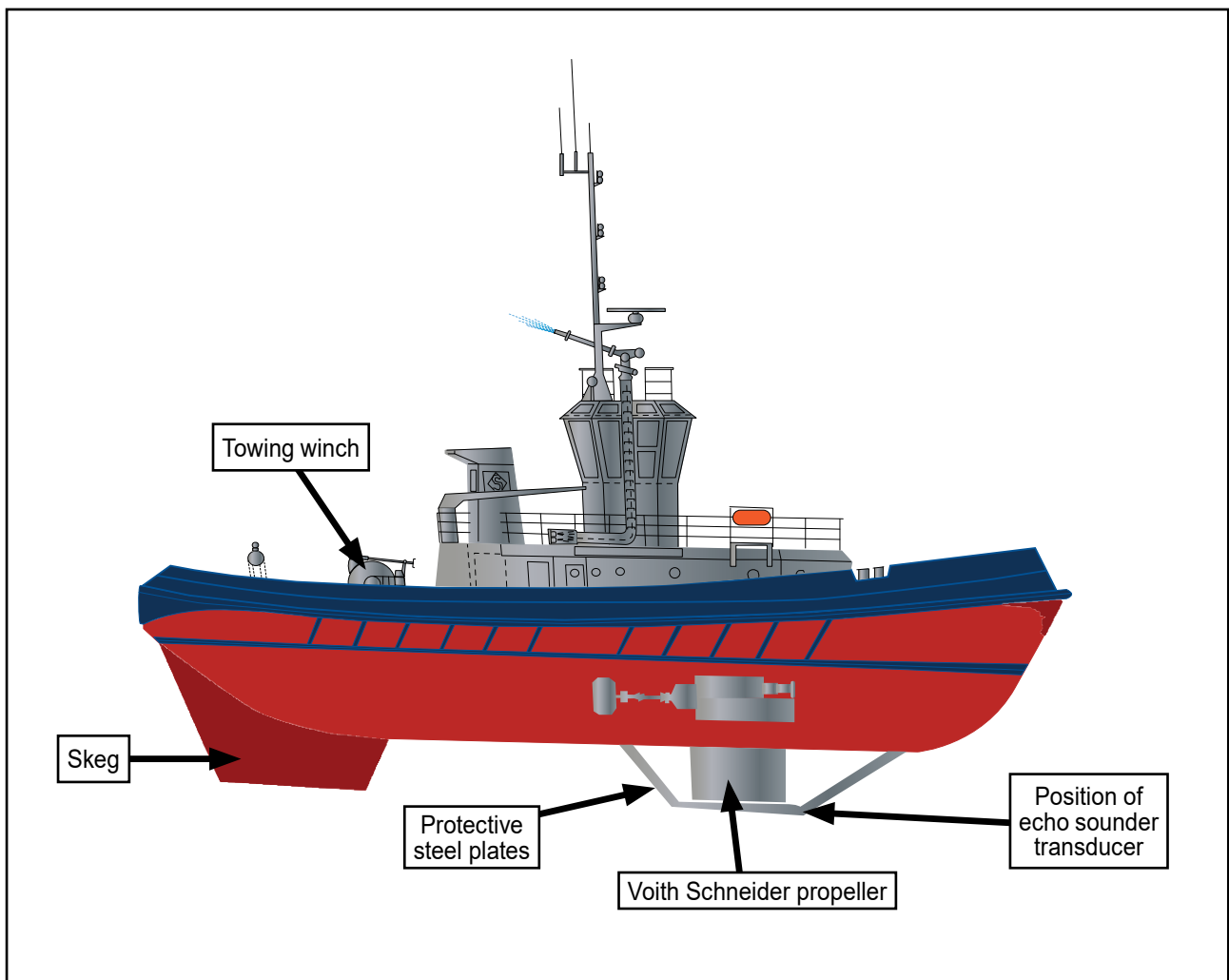


Figure 9: *Svitzer Josephine's* underwater arrangements

The company's SMS guidance for vessels fitted with an ECS stated:

- *Correctly updated paper charts must be carried covering the entire operational area.*
- *Paper charts must be used as primary means of navigation. The charts must be prepared & readily available (not in a drawer).*
- *All electronic charts used by the unofficial electronic chart system, must be kept updated in accordance with the recommended update frequency from the manufacturer/supplier of the charts and publications.*

On the day of the accident, the tug's paper charts did not include BA chart 104, 'Approaches to the Humber Traffic Separation Scheme'. This chart encompassed the area where *Thea II* anchored and both vessels subsequently grounded.

The SMS guidance on fixing the tug's position stated that it:

- *Must be done at regular intervals.*
- *Must be done utilizing either the radar, visual landmarks, navigational marks or a combination.*
- *Must be recorded in the logbook or the chart utilized.*
- *If applicable the echo sounder read out must be compared with the charted depths in the electronic chart system when position fixing.*
- *Svitzer do not accept position fixing solely by GPS.*
- *Svitzer do not accept past track as a means of position fixing.*

1.7 YEOMAN

1.7.1 Crew

Yeoman was operated by a crew of three: a master, deckhand and an engineer. While towing, the master conned the tug, the deckhand remained on the bridge and operated the winch, while the engineer worked on deck passing and returning the towline. *Yeoman* was certified under *The Small Commercial Vessel and Pilot Boat Code of Practice* (MGN 280). The 66 year old master held a commercially endorsed Royal Yachting Association, Yachtmaster Offshore (Power Driven Craft) certificate of competency and had completed a voluntary towing endorsement.

1.7.2 Vessel background

The UK registered *Yeoman* was operated by SMS Towage. It was 24m in length, had a 40t bollard pull and was propelled by a twin azimuth stern drive (ASD). Known locally as a 'Hong Kong' class tug because of its country of build, *Yeoman's* towing winch was fitted to its forecandle and it was designed to primarily tow over the bow. *Irishman*, which was also involved in the salvage operation, was a sister vessel to *Yeoman*.

1.8 HUMBER PORT AND VESSEL TRAFFIC SERVICE

1.8.1 Overview

Associated British Ports (ABP) was the Statutory and Competent Harbour Authority for the Humber Estuary, responsible for ensuring the safety of marine operations within its area. The accident took place within the port's limits. ABP's authority for the Humber Estuary was underpinned by legislation, which permitted the Humber harbourmaster to issue general and special directions.

1.8.2 Risk assessment

ABP Humber conformed to the UK Port Marine Safety Code (PMSC) and the associated Guide to Good Practice (GTGP). As part of the code the port was required to ensure that:

All marine risks are assessed and are eliminated or reduced as low as reasonably practicable.

Of the port's 43 generic risk assessments, two were relevant to this accident: 'Equipment failure (vessel)'; and 'Grounding: Sea to Cleanness'.

- Equipment failure (vessel).

The worst credible scenario was based on equipment failure leading to loss of control of a vessel resulting in serious injuries; moderate damage to the vessel/infrastructure, with no measurable environmental impact; and, minor local media attention.

Overall, vessel equipment failure was assessed as a 'low' risk. The most significant control measures included: the requirement for ships to declare defects prior to arrival/departure, the use of bridge resource management (BRM), harbour directions, port state inspection and pilotage.

- Grounding: Cleanness to Sea.

The worst credible scenario was based on a vessel aground that could not be refloated on the same tide, which resulted in serious damage to the vessel and environment and the potential for serious injuries and serious impact on port business.

Overall, grounding was assessed as a 'medium' risk. The most significant control measures included: aids to navigation; AIS coverage; BRM; stakeholder communication; accurate hydrographic data; passage planning; pilotage; tug availability; and VTS.

1.8.3 Accident statistics

In 2018 the port recorded 28 minor incidents during 33,000 vessel moves, where vessels had suffered main engine failure while operating within the Humber port area. This equated to approximately one incident every other week.

In the last 20 years the port recorded four groundings in the approaches to the Humber Estuary ('Cleanness to sea'). In each case, the vessel had been aground for only a short period, before getting underway without tug assistance.

1.8.4 Environmentally sensitive sites

The Humber port area contained several environmentally sensitive sites. *Thea II* and *Svitzer Josephine* grounded in a Marine Conservation Zone³ and Special Protection Area⁴, which were adjacent to a Special Area of Conservation and Ramsar site⁵ (**Figure 10**).

The environmental modelling, initiated by the DCPSO, showed that marine diesel or lube oil released from *Thea II* or *Svitzer Josephine* could have been deposited on to the Spurn peninsula before being swept into the North Sea.

1.8.5 Humber Estuary Serious Marine Emergency Plan

The purpose of HESMEP was to provide a framework for the management of serious marine emergencies within, and close to, the Humber port area. The plan gave the harbourmaster the lead for coordinating the emergency response to incidents located within the port boundary, while the coastguard led the emergency response for those outside it.

The HESMEP was exercised annually. The last exercise involving the port, the coastguard and other emergency services had been conducted a few weeks before the accident.

1.8.6 Vessel traffic services

VTS Humber was located at Grimsby. It was operated as a 24-hour service and was manned at all times by three personnel: a VTS supervisor (known as the assistant harbourmaster (AHM)), supported by two VTSOs. VTS's role was to monitor and regulate shipping within the Humber port area. The AHM and operators used a bespoke computer system, which combined data from several radar sites, vessel AIS and environmental information to produce a comprehensive picture of maritime activity within the Humber and its approaches.

Charts for the VTS area were available in both electronic and paper form. The electronic chart data could be displayed on the VTSO's computer system in simple, intermediate and detailed views (**Figure 11**). In most cases operators configured their display to use the uncluttered, simple view, so that they could monitor vessel traffic without distraction.

³ A Marine Conservation Zone is a type of marine nature reserve in UK waters. They are established under the Marine and Coastal Access Act (2009) and are areas designated with the aim to protect nationally important, rare or threatened habitats and species.

⁴ A Special Protection Area is a designation under the European Union Directive on the Conservation of Wild Birds. Under the Directive, Member States of the European Union have a duty to safeguard the habitats of migratory birds and certain particularly threatened birds.

⁵ A Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention. The Convention on Wetlands, known as the Ramsar Convention, is an intergovernmental environmental treaty established in 1971 by UNESCO, which came into force in 1975.

Image courtesy of [Natural England](https://www.naturalengland.org.uk/)

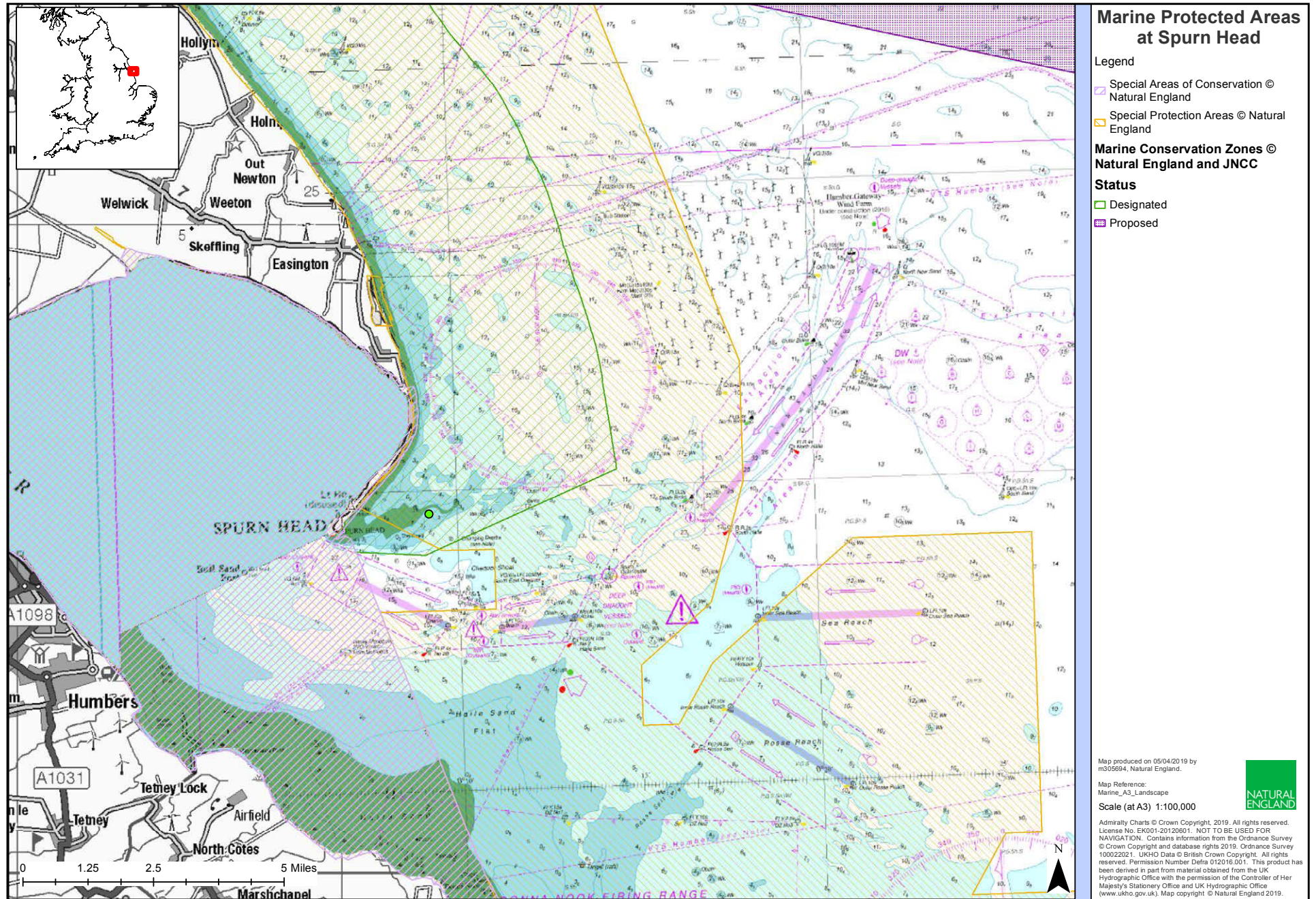


Figure 10: Marine protected areas at Spurn Head

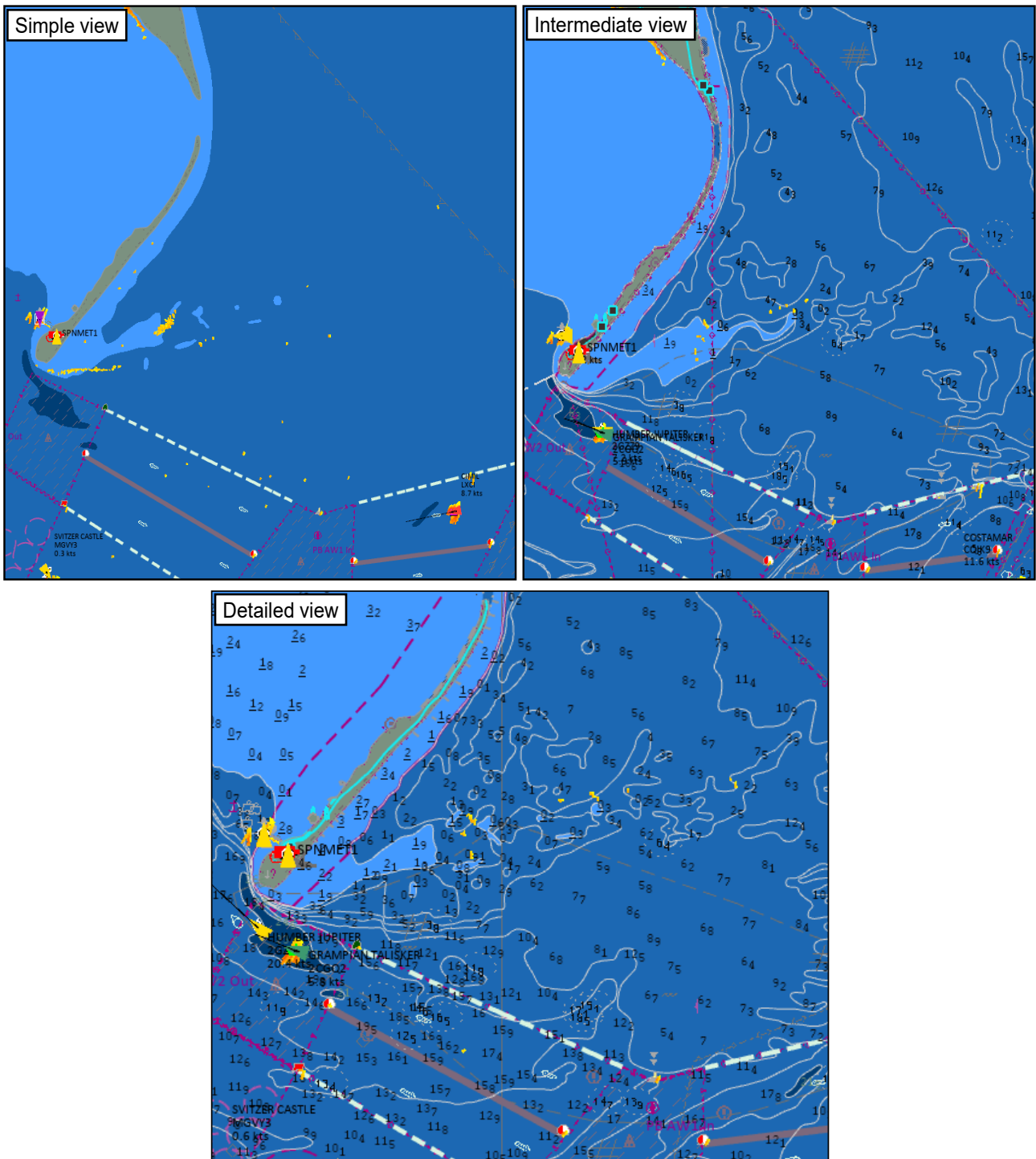


Figure 11: VTS display showing up to date S57 chart data

Governed by the International Association of Lighthouse Authority (IALA) regulations, VTS Humber provided vessels with the following services:

- Information Service (INS). A service that provided relevant information to vessels within the VTS area. This included vessel movements/ intentions, weather or hydrographic information, and information concerning manoeuvring limitations of vessels.
- Traffic Organisation Service (TOS). A service that coordinated vessel traffic within the VTS area to prevent dangerous situations developing.

VTS Humber did not provide:

- Navigation Advisory Service (NAS). This service would have provided essential and timely navigation information. It would have included the provision of navigational advice or instruction. However, the IALA is clear that VTS provision of NAS did not relieve masters of their responsibility for the safety of their vessels.

To ensure VTS information and direction were understood by foreign crew, for whom English might not have been their first language, the operators were taught to use IMO Standard Maritime Communication Phrases (SMCP). A key element of SMCP was the use of specific message markers, such as the following: 'instruction', 'advice', 'warning', 'information', 'question', 'answer,' 'request' and 'intention' to ensure the significance of the message that followed was understood.

All VTS Humber operators on watch at the time of the accident had completed approved IALA VTS courses appropriate for their roles.

1.8.7 Immingham Oil Terminal duty fire tug

ABP Humber had contracted Svitzer Marine Ltd to provide a duty fire tug ready and equipped to respond to emergencies at either Immingham or South Killingholme Oil Jetties. The duty tug was at 10 minutes' notice to get underway and could be contacted by VHF or emergency alarm. This contract did not commit Svitzer Marine to provide emergency towage to incidents elsewhere within the port.

1.9 GUIDANCE ON ANCHORING

1.9.1 Length of anchor cable deployed

In order for the maximum holding power of an anchor to be achieved, the anchor flukes must be buried in the seabed and the shank must be pulled horizontally. If the anchor's shank is lifted by only 5° from the seabed, then the anchor's holding power would be reduced by 25% (**Figure 12**). To ensure that this does not happen the crew must deploy sufficient cable. Industry guidelines on the length of anchor cable to be deployed state that:

- the length of cable in metres must be between 6 and 10 times the depth of water; or,
- the length of cable in shackles must be greater than:

$$1.5\sqrt{\text{depth of water}}. \text{ (in metres)}$$

Using a charted depth of 12m these guidelines indicate that *Thea II*'s master should have deployed between 2.6 and 5.2 shackles of cable. When *Thea II* initially anchored, 5 shackles of cable were deployed, which was increased to 6 shackles once the vessel started to drag its anchor.

These guidelines recommend that in bad weather additional anchor cable be deployed. Furthermore, in strong winds, high-sided vessels like *Thea II*, with containers stowed on deck, can be prone to yaw either side of their anchor cable. At the extremity of each yaw, the vessel would snatch at the cable, placing it under

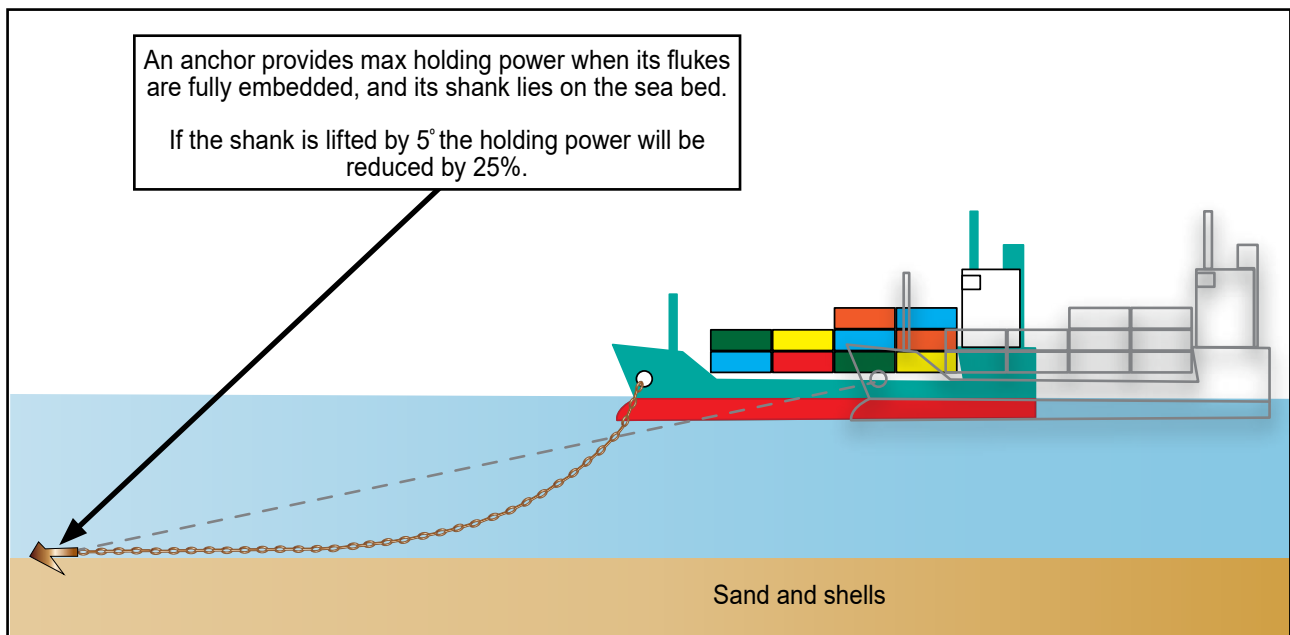


Figure 12: Scope of deployed anchor

considerable load and increasing the risk of the anchor breaking free and dragging. *Thea II* was yawing approximately 35° either side of its cable immediately prior to dragging its anchor.

1.9.2 Use of a second anchor

A method to reduce the likelihood of dragging anchor in bad weather is to deploy a second anchor (**Figure 13**)⁶, by either:

- Dropping a second anchor 'underfoot'. Employing this method, the second anchor is deployed with sufficient cable to just touch the seabed. The drag provided by the second anchor 'underfoot' slows the vessel's rate of yaw, reducing the likelihood of the other anchor breaking free and dragging. Or
- Deploy a second anchor with a similar length of cable to the first. However, this method is suitable only when the vessel is expected to be at anchor for a short period of time. If the vessel swings, due to wind or tide, its cables will become fouled and can be difficult to untangle when the anchors need to be recovered. For this reason, many mariners are reluctant to deploy a second anchor in this manner.

1.10 THE ROLE OF THE SECRETARY OF STATE'S REPRESENTATIVE

The SOSREP's role, as described in the UK National Contingency Plan (NCP), is to represent the Secretary of State for Transport by removing/reducing the risk to safety, the environment and property, arising from a maritime accident. In support of the NCP, the SOSREP regularly engages directly with UK port authorities, as well as harbour and towage industry associations. When possible, SOSREP is also involved in exercises undertaken by ports and the UK coastguard where pollution and salvage responses are tested.

⁶ Admiralty Manual of Navigation volume 1.

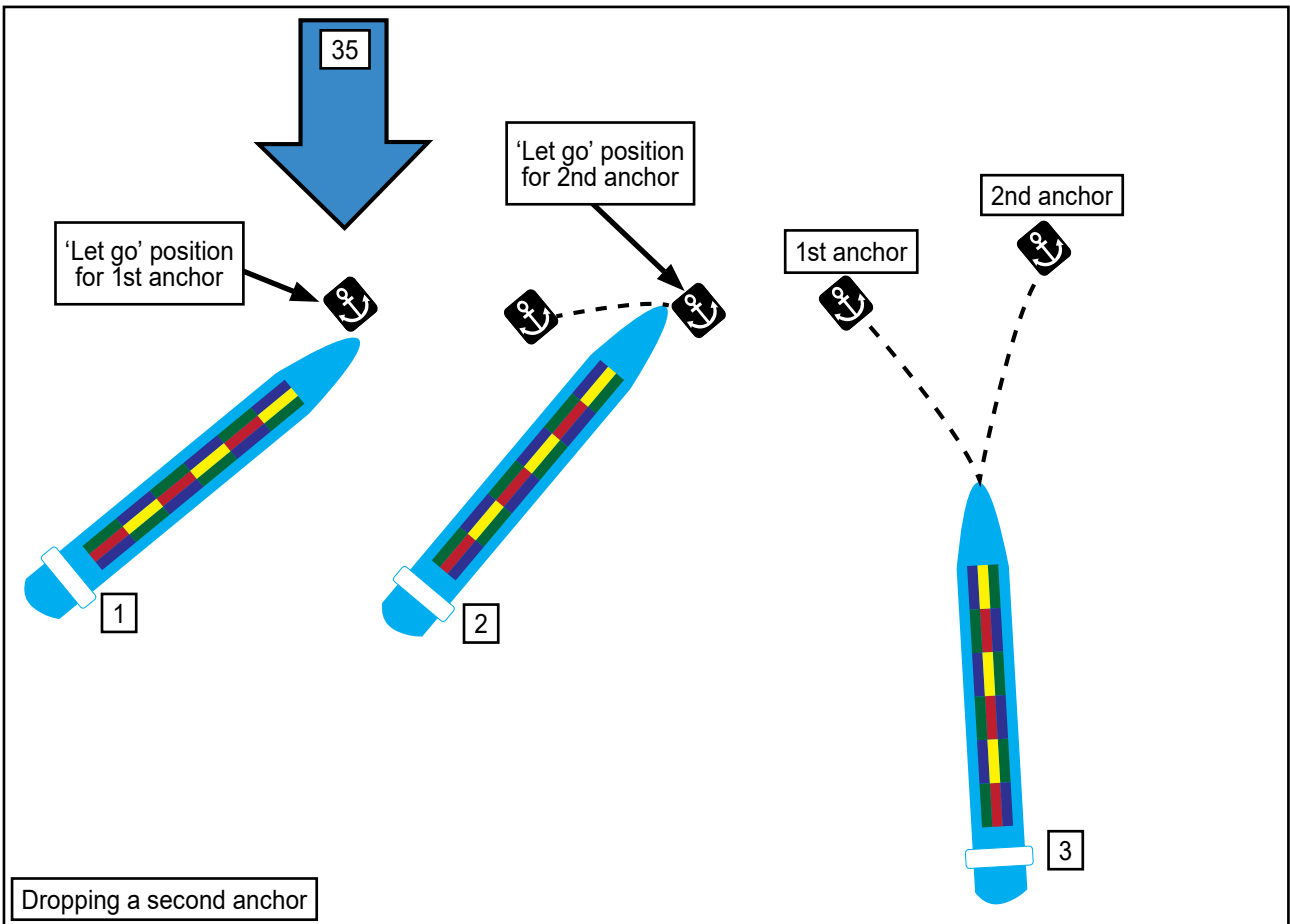
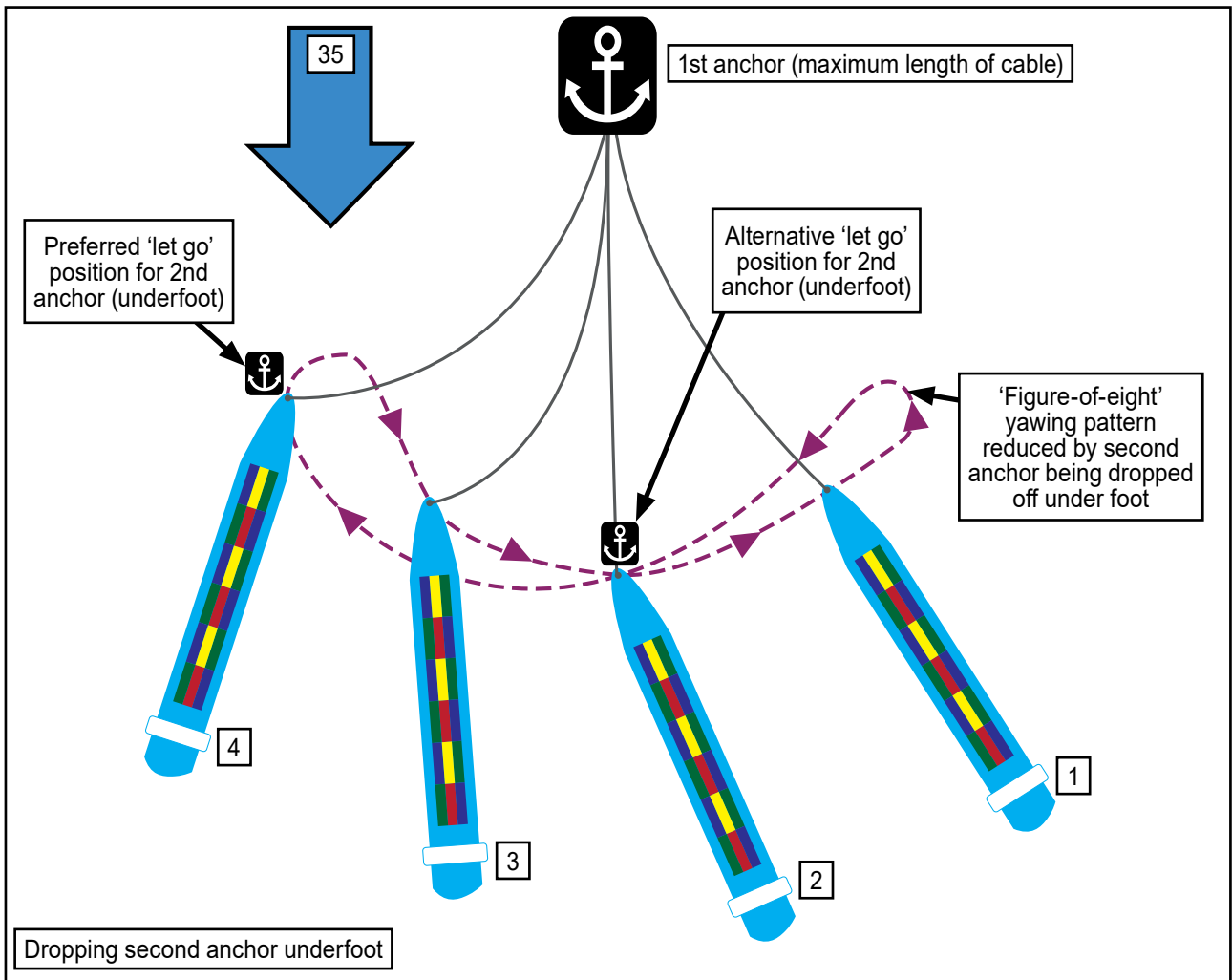


Figure 13: Use of the second anchor

The UK NCP states that, when an accident takes place within a harbour area, the SOSREP will monitor the situation and tacitly approve the harbour authority's response to actions. However, the SOSREP can intervene and use his powers in support of the harbourmaster if required.

The SOSREP's powers, defined in the Merchant Shipping Act 1995, include being able to issue the following:

- An initial caution. This is normally issued by the coastguard or the DCPSO where the actions of the master/owners have been unsuccessful, advising them that, under UK law, the SOSREP has the power to order the vessel to take a tug or accept tug assistance. The caution warns the master/owner that if they fail to make adequate arrangements for assistance, the SOSREP will formally direct action and recover the costs from them.
- Formal direction. The SOSREP can issue a formal direction ordering the vessel to accept tug assistance. If the vessel fails to do so, then not only will action be taken to recover costs from the owners, but also the owners/master will have committed a criminal offence under UK law and be subject to prosecution.

The SOSREP's initial caution and formal direction would be issued by VHF radio, followed up with an email. There is no requirement to issue an initial caution prior to issuing a formal direction; similarly, an initial caution can be issued without the need to escalate it to a formal direction.

In this case, while no initial caution had been issued, the DCPSO had informed the vessel's managers and insurers that if *Thea II* did not take lines from the tugs by 0100 on 16 December, the SOSREP would issue a formal direction for the vessel to do so.

1.11 THE ROLE OF THE DUTY COUNTER-POLLUTION AND SALVAGE OFFICER

The MCA's counter-pollution and salvage branch has specific responsibility for counter-pollution preparedness and response at sea, as well as management of the UK's stockpile of equipment and dispersant. Members of the team keep week-long duties as the DCPSO, coordinating the national response to marine incidents in UK waters that have the potential to result in pollution or salvage. As part of their role they have the authority to liaise with the SOSREP and other stakeholders as required.

1.12 TOWAGE AND SALVAGE CONTRACTS

Thea II's managers/insurers had two contractual options for negotiating the towage of their vessel to a place of safety: a contract tow or LOF.

Negotiation of a contract tow is often based on Baltic and International Maritime Council (BIMCO) standard towage contracts. These allow the towage contract to be drawn up, using a proforma. The payment is based on a daily charter fee, paid for by the vessel's managers/insurers on completion of the tow.

In contrast, LOF, the standard contract for marine salvage, does not specify the sum paid to salvors. Instead, based on the principle of 'no cure no pay', it requires salvors to use their 'best endeavours' to recover the ship to a place of safety in order to receive payment. LOF can be agreed over VHF and allows the salvage to start quickly without the salvors, insurers and owners having to negotiate contractual terms. Where salvage is successful, the remuneration awarded under LOF is intended to incentivise salvors to respond to stricken vessels. However, while the scale of the reward is likely to be considerably larger than that received for a contract tow, it is often paid many months after the event following arbitration.

1.13 SIMILAR ACCIDENT

On 18 December 2018, the Russia registered bulk carrier *Kuzma Minin* grounded after dragging its anchor in Falmouth Bay, England. The vessel was in ballast and was successfully refloated on the next high water. There was minor damage to the vessel and there were no injuries or pollution. The MAIB investigation ([Report 11/2019](#)) identified that the vessel dragged anchor in wind speeds of over 50kts. The vessel's movement was quickly detected by the crew and the master attempted to get the vessel underway. However, the anchor was fouled by a chain and, while the crew attempted to clear this, the vessel was blown ashore. Following the accident, the port strengthened existing measures to check visiting vessels have protection and indemnity insurance, and to improve the safety of vessels at anchor in Falmouth Bay. A recommendation was made to the vessel's owner aimed at ensuring its vessels are appropriately resourced and meet the requirements of international conventions.

SECTION 2 - ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 OVERVIEW

While approaching the Humber pilot station, the container feeder vessel *Thea II* suffered an engine failure that could not be immediately repaired and which meant that the vessel had to anchor in gale force conditions. The master had no choice but to ask for tug assistance to enter port. While at anchor the winds increased to storm force, leading to *Thea II* dragging its anchor as insufficient chain and no second anchor were deployed.

Subsequently, while trying to establish a tow, both *Svitzer Josephine* and *Thea II* grounded on the Binks shoal. The tug grounded because its master, focused on securing a towline, lost positional awareness and did not fully appreciate the drift rate of the two vessels.

The delays in *Thea II* securing a tow after refloating were due to the managers' lack of awareness of the vessel's situation. Despite numerous emailed requests by *Thea II*'s master, and a special direction issued by the Humber harbourmaster instructing him to secure tug towlines, it was only the threat of intervention by SOSREP that persuaded the managers to take action to prevent their vessel re-grounding in an environmentally sensitive area.

2.3 THEA II – GROUNDING

2.3.1 Main engine failure

Thea II, which was 23 years old, was a well-maintained vessel with a reputation for being mechanically reliable. Its C/E, with over 13 years' experience on board, was able to quickly identify the engine defect. This revealed that *Thea II* had lost propulsion due to the failure of its main engine governor circuit board. Without a replacement component, the engine could not be repaired.

Thea II did not carry a spare circuit board, as such a repair would normally be carried out by service engineers. Consequently the master had no option but to anchor his vessel and summon assistance.

2.3.2 *Thea II* dragging anchor

Thea II maintained its position for almost 90 minutes, lying to its port anchor with 5 shackles of cable in the water. The master believed that his vessel would be at anchor for only a short period awaiting the arrival of tugs; the amount of cable he had deployed reflected this. However, as the wind increased to storm force 10, the vessel started to yaw, and shortly afterwards began to drag its anchor. The master's response was to deploy a further shackle of cable.

This was unsuccessful in stopping the anchor dragging, and *Thea II* continued to drift towards the Binks shoal at 1.7kts. The weather conditions were now extreme and, while they exceeded the International Association of Classification Societies' (IACS) design threshold for the vessel's anchor,⁷ the master still had several options to arrest or slow *Thea II*'s drift towards the shore.

The first option was to deploy all remaining cable on the port anchor. Thereafter the master could also, as the vessel's SMS advised, have deployed the starboard anchor, either 'underfoot', or as a second anchor. Had the master taken any of these actions they might have stopped, or at least reduced *Thea II*'s rate of drift towards the Binks shoal. Had the vessel's rate of drift been reduced by 0.5kt, it would have allowed the tugs a further 25 minutes to secure lines and tow *Thea II* to safety.

The master was reluctant to drop a second anchor because, like many mariners, he was concerned that the two anchor cables would become entangled. In addition, at 1505 the VTSO had advised *Thea II* not to drop a second anchor because it might have hampered or prevented the vessel from securing tugs.

Therefore, while it is unsurprising that *Thea II* dragged its anchor in such severe weather conditions, the master could have taken further action to slow or arrest the vessel's drift. Moreover, the additional time gained might have been sufficient for the tugs to attach their lines and prevent the vessel from grounding.

2.4 SVITZER JOSEPHINE – GROUNDING

2.4.1 Master's appreciation of risk

Svitzer Josephine's master left Immingham expecting to tow a disabled ship, anchored by the side of the main channel, into harbour. Yet, while on passage downriver the task changed to intercepting and towing to safety a disabled vessel that was dragging its anchor towards shallow water. As the tug rounded Spurn Head, the master began to appreciate the severity of the weather and the challenge associated with passing a towline to the disabled vessel. His VHF conversations with VTS indicate that he was unsure as to whether to proceed. However, with the AHM's assurance, he decided to attempt to secure a towline, as his vessel and *Svitzer Castle* were the only assets available to prevent *Thea II* from grounding.

The task faced by *Svitzer Josephine*'s master was unusual. Routinely employed in harbour towage, the master was more accustomed to operating in the familiar waters of the Humber Estuary, under the direction of a ship's master or harbour pilot. However, on this occasion *Svitzer Josephine* had left its normal area of operation and was proceeding independently, making a challenging night time approach, in storm force conditions, to assist a disabled vessel.

As the master turned the tug to make the approach to *Thea II*'s starboard shoulder, his crew of three were fully occupied. The OOW was on deck passing the towline to the container vessel and the engineer was operating the towing winch. The master was manoeuvring the tug, monitoring the activity on the upper deck of both vessels, while occasionally glancing at the tug's navigational equipment (radar, ECS and echo sounder). It was therefore unsurprising that he lost positional awareness and had not seen that both vessels would shortly ground on the Binks shoal.

⁷ IACS required anchor equipment to moor the vessel up to 135m in length in winds up to 25m/s (49.6kts) and currents up to 2.5m/s (4.9kts).

The guidance on the conduct of a tug's navigation in Svitzer's SMS was detailed but did not match day to day practice. *Svitzer Josephine* was fitted with an ECS, and the crew were therefore obliged to use paper charts as the primary means of navigation. However, chart work was not a routine activity on board the tug, and the paper charts therefore remained in the storage tube. Instead, *Svitzer Josephine's* master relied on his knowledge and experience to keep the vessel navigationally safe. Ordinarily, a further safeguard was that, when tugs were towing larger, deeper vessels, the pilot or master of those vessels would help keep the tugs navigationally safe by ensuring that the vessel they were piloting did not ground.

Even if BA chart 104 had been on board, given that all three of the crew were fully occupied the use of paper charts to plot and monitor the tug's position was impracticable. The echo sounder alarm, prone to false alarm, had been silenced and, while it would have indicated the approaching shoal, neither the master nor the OOW were visually monitoring it.

Svitzer Josephine's master did not fully appreciate the level of risk he was exposing his vessel to when he took the tug out of the main channel to attend *Thea II*. He did not have a passage plan to keep his vessel safe from grounding or an effective method of monitoring his position. The tug grounded because the master became task focused on passing the towline to *Thea II*, lost positional awareness and did not appreciate the rate of drift of either the casualty vessel or his own tug towards the Binks shoal.

2.4.2 Vessel Traffic Services Humber's advice

Until the harbourmaster took over at 1900, VTS Humber led the port's response to this accident. The VTSOs were quick to spot that *Thea II* had lost propulsion, and identified when the vessel started to drag its anchor. However, as the disabled container vessel began to drag its anchor at 1.7kts towards the Binks shoal, their advice became less helpful.

In particular, when *Svitzer Josephine's* master weighed up the risk of leaving the fairway to provide assistance to *Thea II*, the VTSO was keen that he should assist the casualty. He even offered to "keep an eye" on the tug, letting it know if it "got too close to the bank". In effect, VTS staff went beyond their remit of providing an information and traffic service, tacitly offering the tug navigation advice, albeit caveated by the statement that they did not have a chart. In the event, VTS staff provided no warning to *Svitzer Josephine* before the tug grounded.

ABP Humber's new VTS facility at Grimsby was state of the art, and combined meteorological, tide, radar and AIS information, all of which could be displayed alongside the latest chart data. The AHM and his VTS team had the tools necessary to estimate the time of *Thea II's* grounding. Had they done so, and had they shared this information with *Svitzer Josephine*, it might have prompted the tug master to move his vessel to deeper water and prevent his vessel grounding.

While it might not have been appropriate for the VTSOs to provide the tug with direct navigational advice, they could have used the SMCP message markers 'caution' or 'warning' to alert both vessels to the approaching shoal. While responsibility for the safety of the tug rested with its master, timely advice from VTS Humber might have prompted him to take action to prevent his vessel grounding.

2.5 SALVAGE OF *THEA II*

2.5.1 Emergency response by ABP Humber

Once *Thea II* and *Svitzer Josephine* were aground, ABP initiated HESMEP. The harbourmaster, who had been briefed on the accident by phone, arrived at the MRC at about 1900 and took over control of the port's emergency response. His initial concern was for the safety of those on board the two grounded vessels. The RNLI ALB and SAR helicopter were deployed. However, by 1930, having established that neither master wished to evacuate his crew, the harbourmaster's priority had shifted to minimising risk to the environment. To do this he needed to expedite the salvage of both vessels before they grounded again as the tide fell. As the tide rose *Svitzer Josephine* refloated and returned to harbour under its own power. However, *Thea II* remained aground.

The harbourmaster's challenge was that, while he held the legal responsibility for managing emergencies within the port, he had no direct control of any salvage assets, such as tugs, to recover *Thea II*. Strictly speaking ABP's IOT fire tug agreement only contracted Svitzer tugs to support emergencies at Immingham and South Killingholme terminals. While the statistics of machinery breakdowns in ABP Humber's area would suggest this lack of salvage assets would be a concern, in practice these breakdowns had always been resolved, without external assistance to the vessel's crew.

With a Svitzer tug aground, the harbourmaster commenced discussions with one of the other tug operators, SMS Towage Ltd, to establish whether they had any assets that could assist. This led to their shallow draught Hong Kong class tugs being deployed to assist the casualty. He also requested that the coxswain of the RNLI ALB use his vessel's echo sounder to survey the water around *Thea II* so that the tugs could be safely guided into position when they arrived at the scene. Concurrently, he kept the SOSREP and other stakeholders apprised of developments, as best practice would dictate.

The harbourmaster's plan was put into place. By 2330 *Thea II* was afloat, with two tugs close enough to pass lines and tow the vessel clear. However, with the tide falling there was now an urgent need to tow the casualty vessel into safe water. The only option available to the harbourmaster was to use his statutory powers to issue a special direction ordering *Thea II*'s master to take the tugs' lines. Even then, *Thea II*'s master refused to do so until he had received his manager's approval. By transmitting the special direction to the master solely by VHF radio, its legal significance might not have been fully appreciated. Had it been backed up by email to *Thea II*, its agent, managers and insurers might all have better understood the status and importance of the harbourmaster's special direction. Furthermore, the master, whose first language was not English, and German managers who, by this stage, were controlling the decision whether to take tug's lines, would have both received the same message.

Given the assets available, ABP Humber's emergency response to the grounding of both vessels was well managed. The harbourmaster correctly assessed that if *Thea II* was not towed clear during this tidal cycle, there would have been a significant risk of the vessel grounding on the Spurn peninsula, with the increased likelihood of environmental damage to several environmentally sensitive sites. The harbourmaster used his power of special direction appropriately and, when

unsuccessful, engaged with the SOSREP to ensure the timely removal of the casualty. In future, to guarantee that harbourmasters' special directions are fully understood by all parties, the port should consider reiterating significant VHF communications by email. This would help ensure that key decision makers, who might not be on board the vessel, understand the significance of the direction given and the gravity of the situation.

2.5.2 Emergency response by *Thea II*'s managers

The initial emails from *Thea II*'s master to the vessel's managers, insurers and agent advised them that the crew were unable to repair the engine defect and that the vessel was at anchor awaiting tugs to tow it into harbour. In these initial emails, the master did not inform the company of the severe weather conditions, or that the vessel was dragging its anchor. In return, the company advised the master that:

"Towage is the worst option always! ...all officers have to know. If towage is requested, then you have to ask insurance broker always first!!!"

Shortly after receiving the advice above, the master informed the company that *Thea II* was aground. Having been unable to speak to the master by phone, the DPA's appreciation of the vessel's situation was limited by the master's brief emails. As a result, believing there was plenty of time, his advice to the master was not to ask for assistance from tugs, nor sign LOF, while the insurance brokers sourced suitable towage assets to recover the vessel.

As high water approached, the master's emails became more urgent. He repeatedly asked *Thea II*'s managers for their intentions to tow his vessel to safety. Once *Thea II* was afloat, the frequency of the master's requests for advice increased and the tone of his emails became more anxious. These email exchanges indicate that the managers still did not fully appreciate their vessel's predicament. They were unaware of the exact location of the grounded *Thea II*, the severity of the weather, and the limited tidal window available to recover their vessel. They were also unaware that *Thea II* was aground in an environmentally sensitive area. In part, this was due to the limited detail contained in the master's concise emails and a lack of verbal communication directly with the master. However, it was also as a result of *Thea II*'s managers' focus on the commercial aspects of the tow, at the expense of them seeking a detailed understanding of their vessel's situation. It was difficult to gain such an understanding while operating from home, without access to a full set of navigational publications that would have been available in their office.

A further issue that delayed *Thea II*'s salvage was the managers' instruction to the master not to engage tugs, nor sign LOF, without their permission. This approach undermined the master's authority. When the harbourmaster issued his special direction, *Thea II*'s master, aware of his vessel's precarious situation, wanted to take tugs' lines but did not feel empowered to do so. He was very conscious that the tide was falling and, unless his vessel was under tow by approximately 0130, it was likely that *Thea II* would re-ground. Furthermore, the only tugs close enough to assist were *Yeoman* and *Irishman*, already at the scene. However, despite the master's repeated requests, the managers took a further 1 hour 24 minutes before they granted approval for *Thea II* to take tugs' lines; a delay that meant the ship was towed clear of the bank with an estimated 20 minutes to spare before it would have re-grounded.

For *Thea II*'s managers, this accident probably presented them with one of the most demanding emergency situations that they had faced. Unable to speak to the master by phone, they had to gather as much information as possible about their vessel's situation from the master's brief emails, but they did not seek out other information sources such as AIS or local information. Their priority was agreeing the best possible terms with tugs and salvors without fully appreciating the full situation faced by the crew of *Thea II*. They had to balance the safety of the crew, marine environment and the ship and cargo. To successfully do so required a well-established and exercised emergency response organisation that had as much information as possible at its disposal. In this case, their organisation, operating remotely, did not grasp the seriousness of the situation, the need for urgent action, or the potential environmental risk posed by their vessel.

2.5.3 Emergency response by the SOSREP and the DCPSO

Humber coastguard kept the DCPSO informed of *Thea II*'s situation throughout the incident. When it became clear that, despite direction *Thea II* had not taken tugs' lines, the DCPSO began to actively lobby the vessel's owners/insurers to persuade them to take urgent action to safeguard their vessel. These discussions culminated with the DCPSO informing *Thea II*'s insurers that if the vessel had not taken tugs' lines by 0100 on 16 December, the SOSREP would issue a 'formal direction' for the vessel to do so.

The DCPSO's approach followed the intent of the UK NCP. This required the harbourmaster to take the lead for managing accidents within their port area, keeping the SOSREP informed so that he could tacitly approve the actions being taken. However, when the harbourmaster's special direction failed to elicit the required response, the DCPSO's threat that the SOSREP would intervene had the desired effect, causing the insurers to agree that the container vessel should be salvaged under LOF.

The DCPSO's threat of action by SOSREP worked and ultimately ensured that *Thea II* was towed clear into safe water. Importantly, this accident and the grounding of *Kuzma Minin* (see 1.13.2), demonstrate the importance of SOSREP's regular engagement with the ports' industry and other stakeholders to promote his role in counter-pollution and salvage operations around the United Kingdom coast.

2.6 THE TOW TO THE ANCHORAGE

At approximately 2200, *Svitzer Josephine* jettisoned its tow and got underway. This left *Thea II* with 130m of heavy, 80mm towline attached to its forecastle, which needed to be cleared before *Yeoman*'s line could be made fast.

Having examined the 43m of towline recovered from *Yeoman*'s propellers, it appears that *Thea II*'s crew attempted to recover *Svitzer Josephine*'s hawser. However, having brought the first 43m on board, the crew made the decision to cut and jettison the remaining 87m. Subsequently, as conditions moderated once *Thea II* was clear of the Binks, the crew made the decision to dispose of the remaining 43m of towline.

This remnant of the towline was probably thrown overboard just before 0200. While the 80mm hawser sank, the buoyant 15m messenger did not, and it was drawn into *Yeoman's* propellers. This caused the tug to lose the use of both its ASDs. Fortunately, *Irishman* was able to control the tow until the tug *Pullman* arrived on scene and took over the tow from the disabled *Yeoman*.

Emergencies require rapid decisions to be taken, the consequences of which are often not fully understood at the time. In this case, *Svitzer Josephine's* towline being jettisoned by *Thea II's* crew disabled *Yeoman* and almost undermined the integrity of the towing operation to salvage the vessel. Had *Thea II's* crew made a proactive decision to recover the towline on board, instead of simply jettisoning it, the disabling of *Yeoman* could have been avoided.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT THAT HAVE BEEN ADDRESSED OR RESULTED IN RECOMMENDATIONS

1. *Thea II* lost propulsion due to the failure of its main engine governor central processing unit. [2.3.1]
2. *Thea II*'s crew could not repair the main engine. As a result, *Thea II*'s master had no choice but to anchor and request tug assistance. [2.3.1]
3. It was unsurprising that *Thea II* dragged its anchor in the severe weather conditions. However, had *Thea II*'s master deployed a second anchor and/or increased the scope of the anchor already deployed, it would have slowed, and might have arrested the vessel's rate of drift towards the Binks shoal, allowing more time for a tug to secure a towline. [2.3.2]
4. While VTS Humber had earlier advised *Thea II* not to deploy a second anchor, it was the master's concern - that a second anchor would become entangled with the first - that resulted in his decision not to deploy the starboard anchor. [2.3.2]
5. *Svitzer Josephine*'s master did not fully appreciate the level of risk he was exposing his vessel to when he took the tug out of the main channel to attend *Thea II*. [2.4.1]
6. *Svitzer Josephine* grounded because the master, focused on passing the towline to *Thea II*, lost navigational positional awareness and did not appreciate the rate of drift of both vessels towards the Binks shoal. [2.4.1]
7. The assistant harbourmaster and his VTS team had the tools necessary to estimate the time of *Thea II* grounding. Had they done so, this would have allowed the time available to secure *Svitzer Josephine* to be calculated, enabling a more informed decision or additional precautions to be taken. [2.4.2]
8. While responsibility for the safety of the tug rested with its master, timely advice from VTS Humber might have prompted him to take action to prevent *Svitzer Josephine* grounding. [2.4.2]
9. The harbourmaster correctly assessed that if not towed clear during this tidal cycle, it is likely *Thea II* would have been blown on to the Spurn peninsula, risking potential damage to several environmentally sensitive sites. [2.5.1]
10. The harbourmaster used his powers of special directions appropriately and, when *Thea II* did not take the tugs' lines, successfully engaged the Secretary of State's Representative to ensure *Thea II* was towed into safe water. [2.5.1]
11. Transmitting the harbourmaster's special direction by email, as well as by radio, to *Thea II*'s master, agent and managers would have ensured that all of the key decision makers understood the significance of the direction, the gravity of the situation and the need to take urgent action. [2.5.1]
12. The vessel's managers' instruction to *Thea II*'s master, not to take tugs' lines without their prior approval, undermined his authority to act in the best interest of his ship and crew. [2.5.2]

13. It is estimated that *Thea II* was only 20 minutes from re-grounding on a falling tide when the vessel's managers agreed that the master could accept a tow under Lloyd's Open Form. [2.5.2]
14. *Thea II*'s managers, operating remotely from home, did not fully appreciate the seriousness of the situation, the need for urgent action, or the environmental risk posed by their vessel. [2.5.2]
15. The duty counter-pollution and salvage officer's threat of action by the Secretary of State's Representative worked, and ultimately ensured that *Thea II* was towed clear into safe water. [2.5.3]

3.2 OTHER SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT⁸

1. The remnant of the towline discarded by *Thea II*'s crew, subsequently fouled the tug *Yeoman*'s propellers, disabling it. Fortunately, *Irishman* was able to control the tow until the tug *Pullman* replaced *Yeoman*. [2.6]

⁸ These safety issues identify lessons to be learned. They do not merit a safety recommendation based on this investigation alone. However, they may be used for analysing trends in marine accidents or in support of a future safety recommendation

SECTION 4 - ACTIONS TAKEN

ABP Humber has:

- Conducted an internal investigation into this accident.
- Reviewed relevant risk assessments.
- Ensured local tugs are carrying relevant charts.
- Reviewed:
 - Fire tug arrangements; and,
 - The Memorandum of Understanding between ABP and the Humber coastguard.

Svitzer Marine Ltd has:

- Conducted an internal investigation into this accident and delivered several recommendations to:
 - Review the use of echo sounder and electronic chart systems.
 - Improve the governance of, and preparation for, 'special service' and 'non-routine' towing operations.
 - And it has reiterated the requirement to produce passage plans when operating outside the tug's normal area of operations.

TS-Shipping GmbH & Co. KG. has:

- Reviewed the safety critical engine spares carried on *Thea II* with the engine manufacturer.

SECTION 5 - RECOMMENDATIONS

TS-Shipping GmbH & Co. KG. is recommended to:

2020/128 Review the company's emergency response organisation and procedures with the aim of improving decision making and the clarity of advice provided to its vessels.

Safety recommendations shall in no case create a presumption of blame or liability

