

Report on the investigation of
the grounding of

Astral

on Princessa Shoal,

East of Isle of Wight

10 March 2008

CONTENTS

	Page
GLOSSARY OF ABBREVIATIONS AND ACRONYMS	
SYNOPSIS	1
SECTION 1 - FACTUAL INFORMATION	3
1.1 Particulars of <i>Astral</i> and accident	3
1.2 Narrative	4
1.2.1 Background	4
1.2.2 Anchoring	4
1.2.3 Events at anchor	6
1.2.4 Events during dragging	8
1.2.5 Events after the initial grounding	12
1.2.6 Other vessels	14
1.3 Ship damage	14
1.4 The Nab anchorage	15
1.5 Vessel traffic system	16
1.6 Princessa Shoal	16
1.7 Environmental data	17
1.7.1 Ship's weather forecasts	17
1.7.2 VTS weather forecast	17
1.7.3 Actual weather	18
1.7.4 Tides	18
1.8 Manning	18
1.8.1 Structure	18
1.8.2 Crew employment	20
1.8.3 OSM employment procedures	20
1.8.4 Training	21
1.8.5 Watchkeeping	21
1.8.6 Deck officers	21
1.9 Conduct of the anchor watch	23
1.9.1 Bridge equipment and passage planning	23
1.9.2 Anchor watchkeeping routine	23
1.9.3 Anchors and cables	25
1.9.4 IACS requirements	25
1.9.5 Guidance on anchoring	27
1.10 The ship owner and manager	28
1.10.1 Rederi AB Veritas Tankers	28
1.10.2 Organisation	28
1.10.3 Veritas procedures	28
1.10.4 Veritas internal audits	29
1.10.5 OCIMF SIRE programme	29
1.10.6 Swedish Maritime Authority	29
1.11 Previous accidents	30
1.11.1 <i>Pasha Bulker</i>	30
1.11.2 <i>Young Lady</i>	30
1.11.3 Statistics	31

SECTION 2 - ANALYSIS	32
2.1 Aim	32
2.2 Fatigue	32
2.3 Anchoring procedures	32
2.3.1 Master's anchorage selection	32
2.3.2 Bridge procedures during anchoring	32
2.3.3 Position monitoring at anchor	32
2.4 Response to the deteriorating weather	33
2.4.1 Response to the weather forecast	33
2.4.2 Night orders	33
2.4.3 Main Engine Readiness	34
2.4.4 Reliance on anchoring equipment	34
2.5 Performance of the 2/ON on watch	35
2.5.1 Recruitment of the 2/ON	35
2.5.2 Monitoring of the 2/ON	35
2.5.3 Conduct of the anchor watch	35
2.6 Emergency response	36
2.7 Safety management	37
2.7.1 Safety management system	37
2.7.2 Auditing	37
2.8 VTS	37
2.8.1 Allocation of anchorage	37
2.8.2 Information flow and advice	37
2.8.3 Control of the anchorage	38
2.9 Knowledge and awareness of safe anchoring procedures	38
SECTION 3 - CONCLUSIONS	40
3.1 Safety issues directly contributing to the accident which have resulted in recommendations	40
3.2 Other safety issues identified during the investigation also leading to recommendations	41
SECTION 4 - ACTION TAKEN	42
SECTION 5 - RECOMMENDATIONS	43
Annex 1 Met Office Daily ABP Southampton Forecast	
Annex 2 Bramble Bank remote weather station data	
Annex 3 IACS Requirements concerning mooring, anchoring and towing	
Annex 4 Admiralty Manual of Navigation, Volume 1 - Extract	
Annex 5 Veritas Safety of Navigation Policy and Anchoring Procedures	
Annex 6 Veritas Revised Procedures, implemented following the accident	
Annex 7 MAIB Flyer to the Shipping Industry	

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

2/ON	-	Second Officer - Navigation
2/OS	-	Second Officer - Safety
AB	-	Able bodied seaman
ADO	-	Automotive Diesel Oil
AMETIAP	-	Association of Marine Educational and Training Institutes Asia-Pacific Regions
ATSB	-	Australian Transport Safety Bureau
BA	-	British Admiralty
BTM	-	Bridge Team Management
BV	-	Bureau Veritas
CHA	-	Competent Harbour Authority
DCPSO	-	Duty Counter Pollution and Salvage Officer
DoC	-	ISM Document of Compliance
DPA	-	Designated Person Ashore
EBL	-	Electronic Bearing Line
ECDIS	-	Electronic Chart Display and Information System
ETV	-	Emergency Towing Vessel
GPS	-	Global Positioning System
IAMI	-	International Association of Marine Institutes
ICS	-	International Chamber of Shipping
ISF	-	International Shipping Federation
ISM	-	International Safety Management Code
kg	-	kilogram
kts	-	knots
Mb	-	Millibar
MCA	-	Maritime and Coastguard Agency
NI	-	Nautical Institute

nm	-	Nautical mile
m	-	metre
mm	-	millimetre
OCIMF	-	Oil Companies International Marine Forum
OOW	-	officer of the watch
OSM	-	OSM Group
QHM	-	Queen's Harbour Master
SHA	-	Statutory Harbour Authority
SIRE	-	Ship Inspection Report Programme (OCIMF)
SMA	-	The Swedish Maritime Administration (The Flag State authority)
SMC	-	ISM Safety Management Certificate
STCW95	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 as amended
T	-	tonnes
UHF	-	Ultra High Frequency
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency
VRM	-	Variable Range Marker
VTs	-	Vessel Traffic Services
VTsO	-	Vessel Traffic Services' Officer
Cable	-	0.1 nautical mile – 185.2m
Navtex	-	Narrow band, direct printing system for transmission and reception of navigational and meteorological warnings
Shackle	-	90 feet or 27.7m of anchor cable

All times used in this report are UTC+1 hour unless otherwise stated

SYNOPSIS



On 10 March 2008, the Swedish registered tanker *Astral* dragged her anchor in severe weather and grounded on the Princessa Shoal, east of the Isle of Wight. *Astral* sustained indentations to her hull and extensive damage to her rudder and steering gear; there was no pollution and the vessel remained watertight.

Astral had anchored at the Nab Anchorage, 0.9 mile south of the Princessa shoal on 7 March to await a berth at Fawley Marine Terminal to discharge a cargo of diesel oil.

On 9 March, increasingly severe weather forecasts were received predicting gale force winds from the south. Later that evening the duty Vessel Traffic Services Officer (VTSO), monitoring the anchored vessels' positions by radar, advised all the vessels at anchor of the weather forecast and recommended that their engines should be available if required.

During the early morning of 10 March the weather deteriorated as the wind increased to southerly force 10. At 0650 *Astral* started to drag anchor to the north. The officer of the watch (OOW) alerted the master at 0710 and requested the main engines, which were on 10 minutes notice, to be made ready for use. The master arrived on the bridge 7 minutes after being called and dispatched the anchor party forward. The engines were available for use at 0721 and the master applied power ahead, however the vessel continued to drag northward and grounded on the Princessa Shoal at 0725. *Astral* continued to drag and drift northward until her anchor held at 0855. The vessel was taken under tow at 0958 by the tug *Anglian Earl*.

The managers of *Astral* have taken action to improve anchoring procedures on their vessels, and to conduct an additional pre-employment assessment of all officers recruited via manning agencies. The local harbour authorities have taken action to improve the information available to seafarers about the tenability of anchorages in their harbour areas and approaches.

Recommendations have been made to the operators, to conduct checks to ensure their staff are familiar with, and comply with, their new procedures; to the ICS and NI to bring the lessons from the accident to the attention of their members; and to the local harbour authorities to provide guidance to the VTSOs on the style and conduct of their communication, to reduce the possibility of misunderstanding by non-native English speakers.



Astral

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *ASTRAL* AND ACCIDENT

Vessel details

Registered owner	:	Rederi AB Veritas Tankers
Manager(s)	:	Rederi AB Veritas Tankers
Port of registry	:	Donsö
Flag	:	Swedish
Type	:	IMO Type II chemical tanker and oil tanker
Built	:	2006
Classification society	:	Bureau Veritas
Construction	:	Steel – Ice class 1A
Length overall	:	129.75m
Gross tonnage	:	7,636
Engine power and/or type	:	4320kW: MAK 9M32C
Service speed	:	13.9 kts
Other relevant info	:	Single, variable pitch propeller. Fish tail rudder.

Accident details

Time and date	:	0725, 10 March 2008
Location of incident	:	50° 39.9N 001° 01.9W Princessa Shoal, east of the Isle of Wight
Persons on board	:	13
Injuries/fatalities	:	No injuries
Damage	:	Structural damage to rudder, steering gear and hull

1.2 NARRATIVE

1.2.1 Background

Astral departed from Oil Tanking Jetty No.3 in Amsterdam at 1615 on 6 March 2008, loaded with 9,800t of diesel oil (ADO10) for discharge at the Esso refinery at Fawley, Southampton Water. The voyage was made in moderate conditions with south-westerly Beaufort force 5-6 winds.

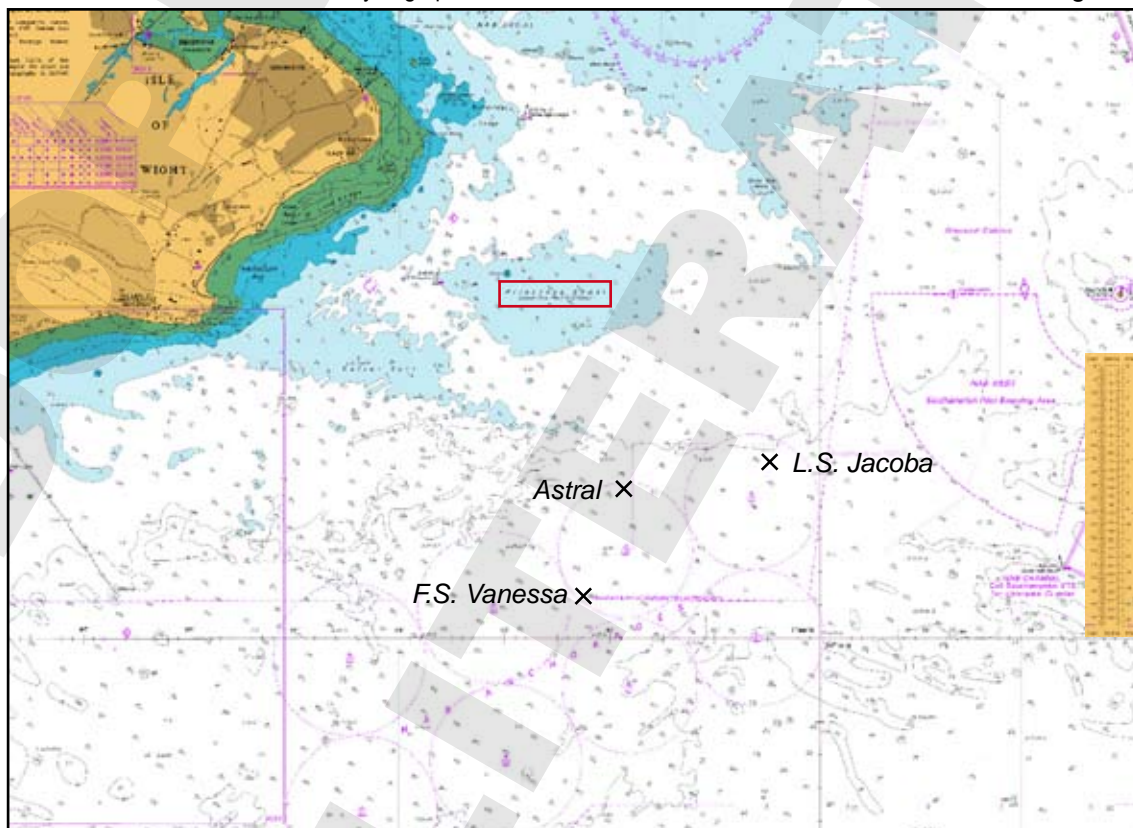
1.2.2 Anchoring

On 7 March, *Astral*'s master contacted Southampton Vessel Traffic Services (VTS) 3 hours prior to arrival at the pilot station and was advised by the Vessel Traffic Services' Officer (VTSO) that the berth was unavailable, probably until 13 March. As *Astral* approached the anchorage the master was advised to anchor at the Nab anchorage No.3, and that *Astral* might remain at anchor for several days until a berth became available.

There were two vessels at anchor nearby as *Astral* made her approach to the No.3 anchorage. The 143m long tanker *LS Jacoba*, which was also scheduled to berth at the Esso terminal, was already anchored in the adjacent Nab anchorage No.4. The chemical tanker *FS Vanessa* was at anchor south of the boundary of No.2 and No.3 anchorages (**Figure 1**).

Reproduced from Admiralty Chart BA 2037 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 1



Position of anchored vessels when *Astral* dropped anchor at 1545, 7 March 2008

Astral anchored in a charted depth of 15.6m on a seabed of gravel, sand and shell. The maximum tidal range was 4.3m. *Astral's* draught was 6.9m forward, 7.6m aft on arrival.

Reproduced from Admiralty Chart BA 2037 by permission of
the Controller of HMSO and the UK Hydrographic Office

¹ Said of a ship when she rides to her anchor after dropping it. C.W.T. Layton – Dictionary of Nautical Words and Terms

On arrival at the anchorage the range and bearing of Nab Tower was 070° by 3.2nm and the bearing was observed to change between 068° and 071° as the vessel swung to wind and tide (**Figure 1**).

1.2.3 Events at anchor

The duty watch officers maintained an anchor watch alone on the bridge, with the watch AB available by UHF radio if required. While at anchor, until the evening prior to the accident, the wind remained between south and south-west and force 5 to 7. The Navtex 24 hour weather forecast issued by the Met Office at 0700 on 9 March, received on board *Astral* at 0844, stated:

Wight Portland – W5 to 7 to sev gale 9. Perhaps Storm 10 later. Mod or Rough incr very rough or high, shwrs then rain. Good becmg mod or poor.

At 1045, following receipt of the forecast, the master increased the scope of the port anchor cable to 8 shackles in the water. At around 1930 the duty VTSO contacted *Astral* and advised the OOW of the forecast weather, and recommended that their engines be available if required. The VTSO contacted all vessels at anchor in the approaches to the Solent and relayed the same weather information and guidance to them.

The master considered the ship's position, 9 cables from the closest danger of the Princessa Shoal, with the chief officer, and they agreed that there was sufficient time to start the main engine, weigh anchor and safely depart should the vessel start to drag her anchor. The master briefed the officers in the mess room during the evening of 9 March, on the weather forecast, and informed both engineers that the engine should be ready to start if required.

Later that evening the master wrote in his Night Order Book (**Figure 3**):

Check anchor position frequently. If dragging call master and duty engineer immediately. Listen CH12 and 16 all time. Have a good watch.

The chief officer handed over the watch to the 2/OS at midnight. Shortly after midnight a Navtex weather forecast was received (**Figure 4**) that predicted:

Southerly storm force 10 expected soon.

The 2/OS acknowledged receipt of the forecast and placed it on the clip on the aft bulkhead of the bridge.

At around 0200 the master awoke and looked out of his cabin window at the weather conditions. He did not go to the bridge as he considered the weather conditions tolerable.

Figure 3

M/T Astral NIGHT ORDERS

Time	Task	READ BY		
		Chief Officer	2nd Officer	3rd Officer
2/3	Follow instructions, take up the 1st			
2/3	2nd TSS watch			
3/3	Follow instructions, take up the 1st			
3/3	Check & check regularly, take up the 1st			
4/3	Follow instructions, take up the 1st			
4/3	Check & check regularly, take up the 1st			
6/3-08	Follow passage planning and master's standing orders. Keep sharp lookout all time. Call Dover Coastguard at Reporting line. Have a good watch.			
7/3-08	Check anchor position frequently.			
8/3-08	Listen CH 12 Southampton VTS and CH 16 all time. Have a good watch.			
11/3-08	Check anchor position frequently. If dragging call master and duty engineer immediately. Listen CH 12 and 16 all time. Have a good watch.			

Astral Master's night-orders for 9 March 2008

Figure 4

FOR SHANNON FASTNET AND IRISH SEA. WINDS WILL DECREASE STRG TO GALE FORCE ON THURSDAY AND TO BELOW LIMITS BY FRIDAY N OF 50N NNNN

518kHz Error Rate: 0.0%
 Received MAR 10 2008 00:41:12
 Position 50°39'N 1°02'W

ZCZC EB54
 EB54
 NITONRADIO
 GALE WARNING SUNDAY 09 MARCH
 2207 UTC

THAMES DOVER NIGHT
 SOUTHERLY STORM FORCE TO EXPECTED SOON

PLYMOUTH
 STORM FORCE TO VEERING WESTERLY AND INCREASING VIOLENT STORM FORCE 11 SOON

LUNDY
 STORM FORCE TO VEERING WESTERLY SOON
 NNNN

Chapman - p.w.d.

Weather forecast received 0041 on 10 March

At 0300 on 10 March, the 2/OS handed over the watch to the second officer - navigator (2/ON), who acknowledged the master's night orders, noted the weather forecast, and then monitored the vessel's position on the starboard radar, recording the ship's position in the logbook each hour.

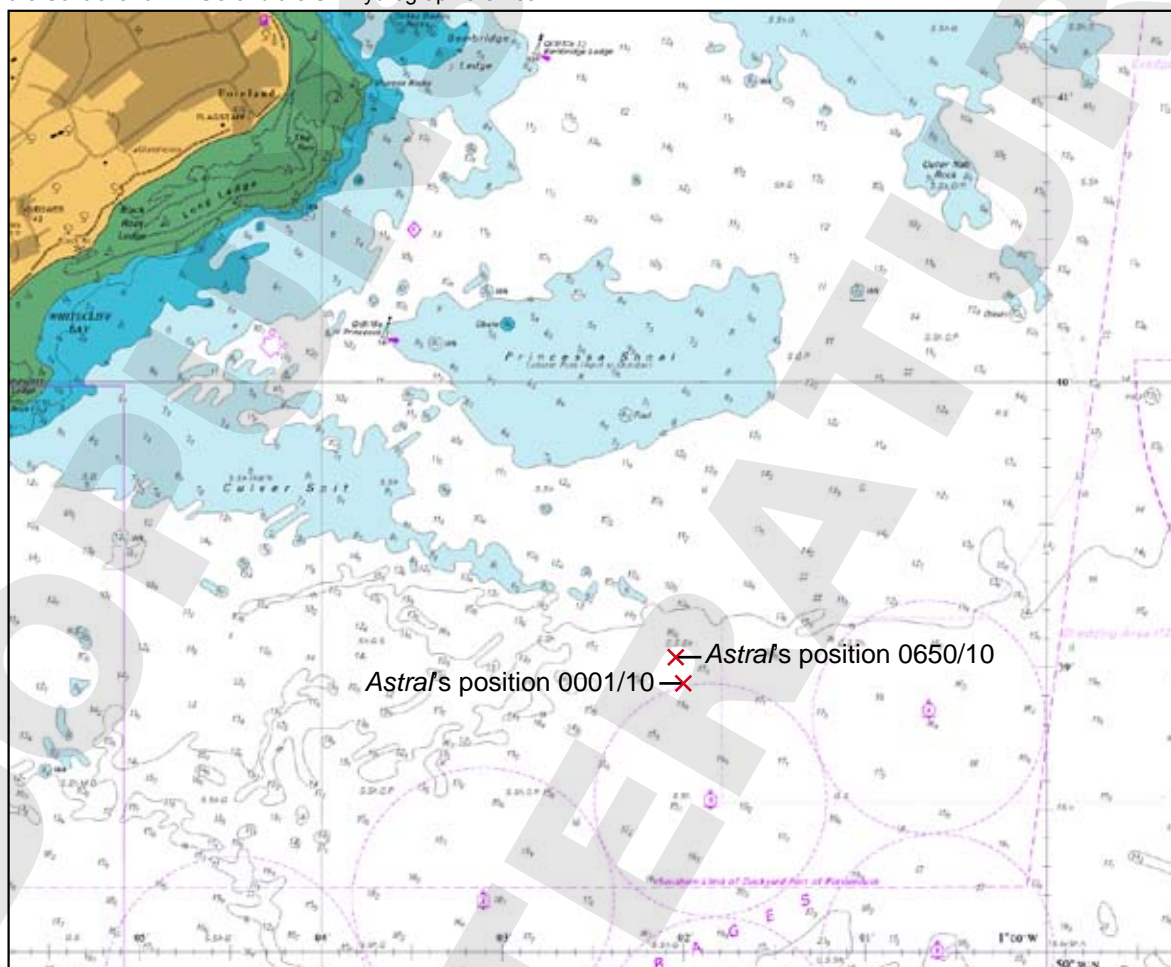
At 0600 the 2/ON recorded in the logbook the range and bearing of Nab Tower from the radar cursor as $070^{\circ} \times 3.42\text{nm}$; the weather was recorded as south force 10 with very rough seas.

1.2.4 Events during dragging

At around 0650 on 10 March *Astral* started to drag her anchor (**Figure 5**).

Reproduced from Admiralty Chart BA 2037 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 5



Astral's position at start of dragging anchor

At 0654 the master of the vessel *Alice*, now anchored to the west of *Astral*, notified VTS that *Alice* was dragging anchor, that her main engine was running, and that the vessel would depart the anchorage.

At 0703, *Astral's* speed over the ground was 2 knots in a northerly direction towards Princessa shoal.

At 0704 the 2/ON observed the range and bearing of the Nab Tower from the radar cursor as 077° x 3.16nm (**Figure 6**), and wrote this in the logbook as the 0700 position, but did not plot this on the chart. The 2/ON believed that the discrepancy between this position and his previous position was due to the cable stretching² in the deteriorating weather, moving the ship's position to the north.

At 0705 the duty VTSO called *Astral* by VHF radio channel 12 and asked the 2/ON if he was "happy with your position". The 2/ON replied that he would check the position, and reported the range and bearing of Nab Tower to VTS. The VTSO then asked "confirm you are not dragging", but no confirmation was given by the 2/ON.

At 0710 the 2/ON telephoned the master and told him the vessel was probably dragging, then contacted the first engineer, who was the duty engineer at the time, to advise him that the ship may be dragging anchor and to ask him to prepare the engine. The first engineer quickly dressed and went to the engine room.

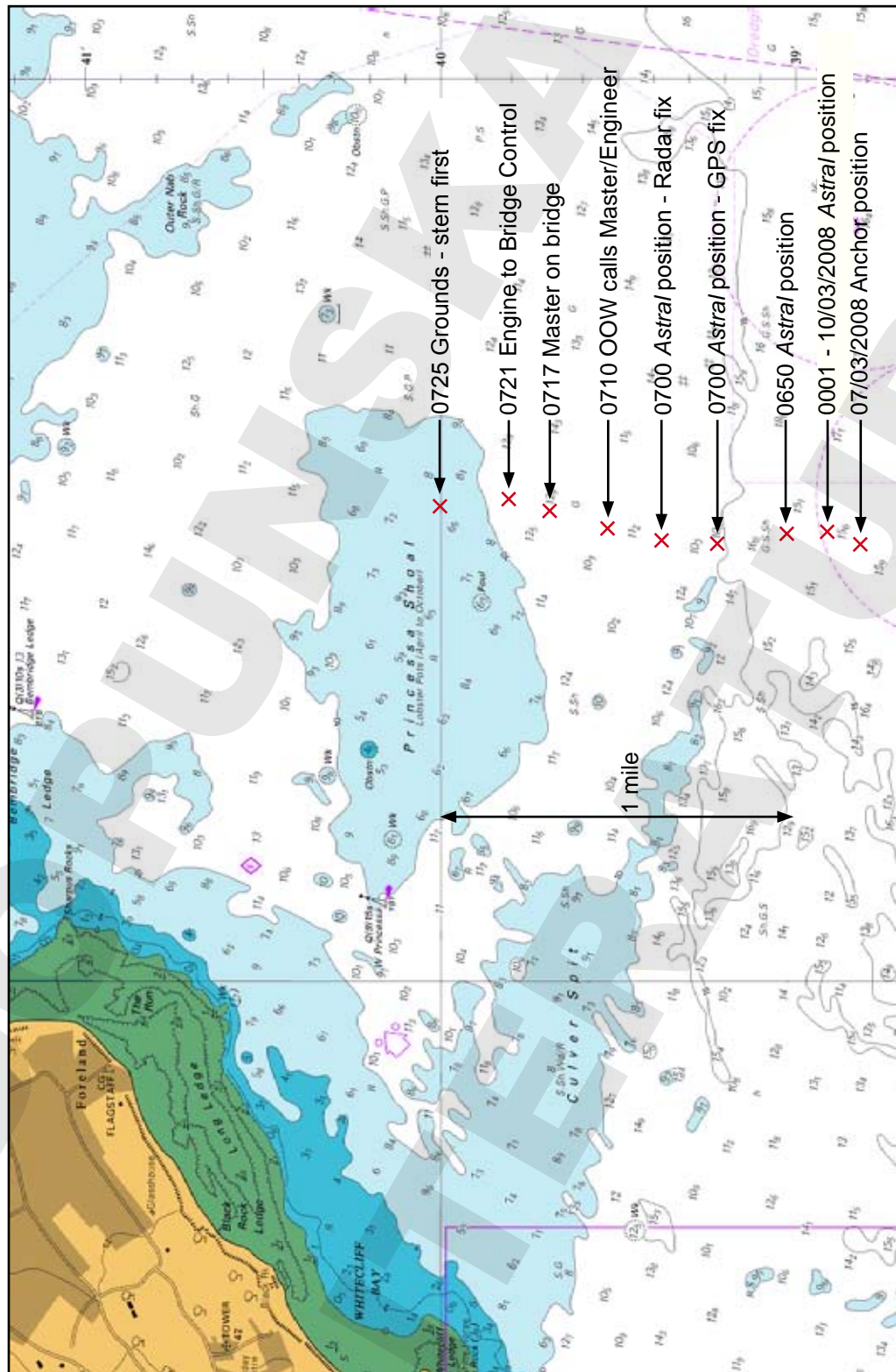
At 0717 the master arrived on the bridge and expressed his surprise to the 2/ON as to how much the ship had moved out of position. The master immediately sent the 2/ON and the watch AB forward to prepare the anchor for heaving. The master then phoned the engine room to order the first engineer to start the main engine as soon as possible.

The engine needed to be blown over on air prior to starting, as it had not been recently started and was occasionally prone to cooling water collecting inside some of the cylinders. At 0720, *Astral's* engine was started and both steering motors were running. The bow thrusters, usually fed by power provided by the shaft generator, could not be started as the shaft generator could not be synchronised with the main electrical distribution board.

At 0721 the VTSO again contacted *Astral*, as the control of the engine was transferred to the bridge, asking the master to confirm his intentions; the master replied that he had started his engine and he would proceed to sea. The master applied 38% pitch ahead which, in calm conditions, would have produced a speed through the water of around 5kts, aware that the engine had recently started and was not yet at the correct operating temperature. The master considered that dropping the second anchor would hinder, rather than help his current situation, by increasing the risk of fouling the anchors.

² Stretching cable is the extension of the anchor cable along the seabed as the ship pulls the cable tight.

Figure 6

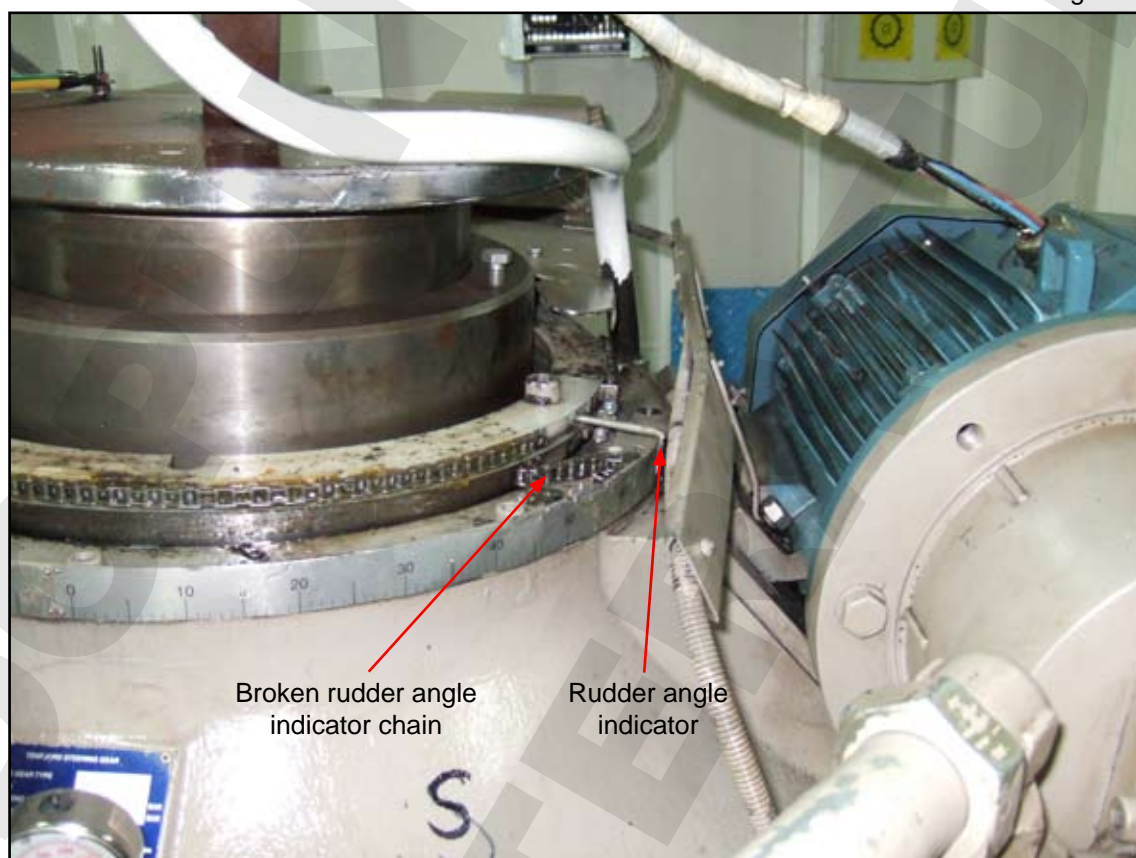


Astral's bow remained pointing to the south as the vessel dragged northward, taking seas over the bow as the vessel pitched and rolled moderately in the southerly seas and short swell. The waves steepened as the vessel entered the shallower water.

Astral grounded stern first at 0725 and again at 0726 in charted depths of between 6.5 and 8m (**Figure 6**). At 0726, the master called VTS by VHF radio, stating that *Astral* was aground and requested tug assistance.

It was immediately apparent to the master that the vessel had lost steering and the rudder indicated hard over to starboard, an angle of 72° (**Figure 7**). An inspection by the chief engineer showed substantial damage to the steering gear, the steering motor and the adjacent hull structure, with no water ingress evident. As the rudder angle indicator chain arrangement had been snapped by the impact it was not possible to identify the actual position of the rudder.

Figure 7



Damaged rudder indicator

The condition of ballast tanks was monitored remotely, and indicated that the vessel was watertight. The master then advised the Rederi AB Veritas Tankers' (Veritas) Designated Person Ashore (DPA) and directors of his situation.

1.2.5 Events after the initial grounding

Astral continued to drag anchor northwards over the Princessa Shoal, manoeuvring with engine only as the port anchor was slowly recovered. The wind was recorded at Bramble Bank, sheltered to the north of the Isle of Wight as gusting 62.5 kts from the south. At 0730 Solent Coastguard contacted *Astral* to co-ordinate assistance, and advised Queen's Harbour Master (QHM) Portsmouth of the incident. QHM Portsmouth dispatched the tug *Bustler* (**Figure 8**), manned only for harbour towage, from within Portsmouth Harbour.

The off duty Emergency Towing Vessel (ETV) *Anglian Earl* (**Figure 8**) was anchored off Yarmouth Harbour in the western Solent, and Solent Coastguard requested its help in assisting *Astral*. The Port of Southampton's duty harbourmaster permitted *Anglian Earl* to transit the Solent area without a pilot on board. The Maritime and Coastguard Agency's (MCA) duty counter pollution and salvage officer (DCPSO) was kept informed throughout and co-ordinated the commercial contract between both vessels' operators.

At 0748 *Astral's* port anchor was aweigh, with power now provided to the bow thrust unit from an additional auxiliary engine.

As *Astral* continued to drift northwards, east of the Bembridge ledge buoy, the master manoeuvred the ship with main engine and bow thruster, believing that the rudder was hard over to starboard.

At 0817 the port anchor was let go to 7 shackles on deck, and the vessel continued to drift northwards over the Nab Shoal, west of the New Grounds (**Figure 9**). The rising spring tide prevented *Astral* from subsequently re-grounding. Bembridge lifeboat arrived on scene at 0820 and reported that there was no visible sign of pollution.

The coastal oil tanker *Rathrowan*, which was anchored in the Saint Helens Road anchorage, started her engines and prepared to weigh anchor as her master became aware of the approaching *Astral*.

At 0843 *Bustler* rendezvoused with *Astral* and stood by.

At 0855 *Astral's* port anchor held at the north-west extremity of the New Grounds. *Anglian Earl* arrived at 0925, and with her own wire made fast to *Astral* at 0958. *Astral* weighed anchor and was taken in tow to the north east, clear of the bank, to await the arrival of a pilot and an additional tug. At 1045 the manual sounding of all *Astral's* tanks was complete and the ship was confirmed as watertight.

The harbour pilot boarded at 1110 and the harbour tug *Lady Madeleine* was made fast aft at 1323. *Astral* was then towed through the Solent and Southampton water to berth alongside, with harbour tug assistance, at berth 40/41 in Southampton.

Image courtesy of FotoFlite

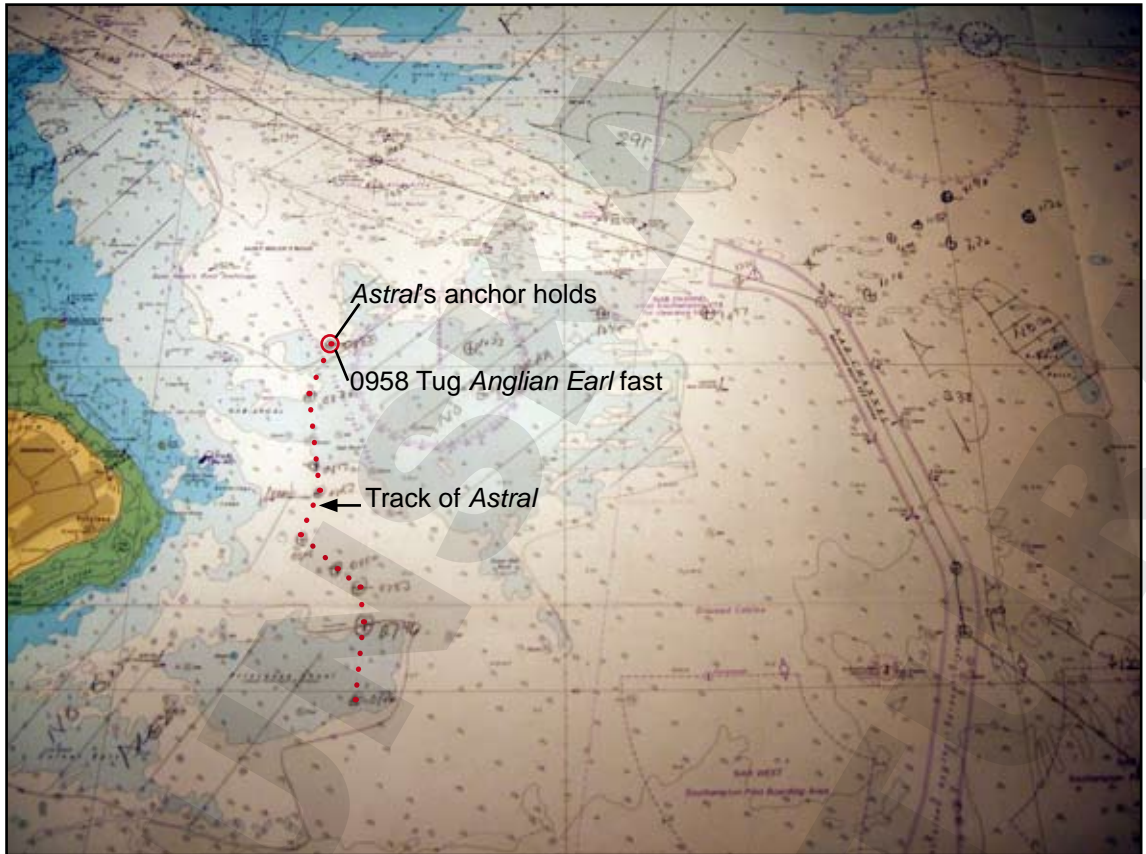


Tug Bustler

Image courtesy of FotoFlite



Anglian Earl



Copy of chart showing *Astra's* positions following grounding

In accordance with Veritas' procedures, the master and senior officers were tested for drugs and alcohol when the vessel arrived alongside, with none detected.

Astral subsequently transferred to Fawley Marine Terminal to discharge her cargo and gas-free the tanks.

1.2.6 Other vessels

Of the four vessels anchored in the Nab anchorages 1-8 that night, only *Anemos 1*, south of *Astral*, remained at anchor through the night, both *Alice* and *Mare Adriacum* dragged anchor prior to *Astral*. Two other vessels, anchored at the Saint Helens anchorage, also dragged their anchors, and steamed clear of danger. All the vessels that dragged anchor communicated their plans and actions with VTS, on VHF channel 12.

1.3 SHIP DAMAGE

Extensive damage was caused to *Astral's* fish tail rudder, which was cracked on both sides along 80% of its length. Her steering gear had been lifted vertically from its mountings and landed back on the mounting bolts, stripping the threads or shearing all the securing bolts. The steering gear room shell structure, shell

plating and frames were significantly damaged (**Figure 10**) as the rudder was thrust upwards. The rudder was removed and placed on deck before the vessel was towed to Denmark for repairs.

The Bureau Veritas (BV) Survey report in the Fredericia Shipyard in Denmark, between 27 March and 16 April noted that the vessel's bottom plating had severe indents and scratches in several places. Bottom plating, totalling around 84m² and damaged frames were replaced (**Figure 10**).

There was no pollution and the ship remained watertight.

Figure 10



Damage to *Astral*

1.4 THE NAB ANCHORAGE

The Nab anchorage was developed by the Port of Southampton and the Dockyard Port of Portsmouth to manage the anchoring of waiting vessels, and to keep them from anchoring directly in the approaches to the pilot boarding position at the Nab Tower. Twelve designated anchoring positions, 8 inner and 4 outer anchorages (**Figure 11**), are situated between 2.5 and 6.5nm south-west of Nab Tower in depths between 15 and 27m. Of the 8 inner anchorages, 1 lies entirely within, and 4 lie partially within the Dockyard Port of Portsmouth Statutory Harbour Area (SHA) (**Figure 5**).

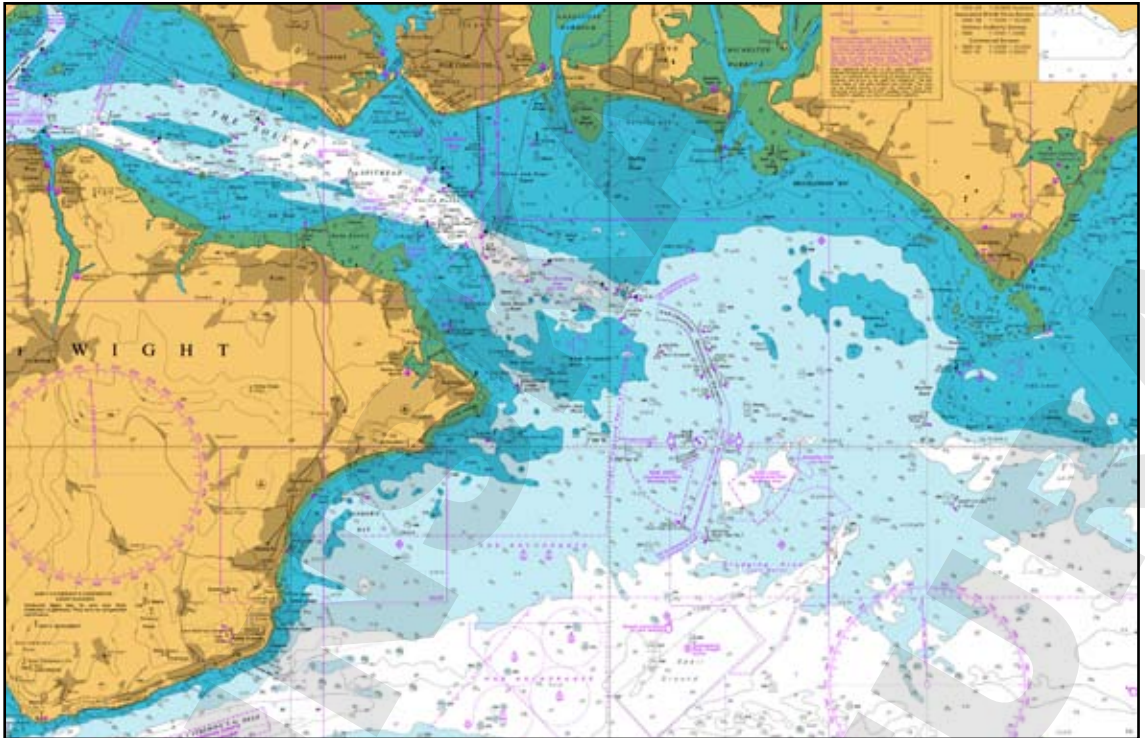


Chart showing overview of NAB anchorages

NAB anchorage No.3 has a minimum charted depth of 15.5m and is designated for use by vessels up to 250m in length.

Tankers arriving at Fawley Marine Terminal routinely anchor in the Nab anchorage waiting to berth, occasionally for several days during busy periods.

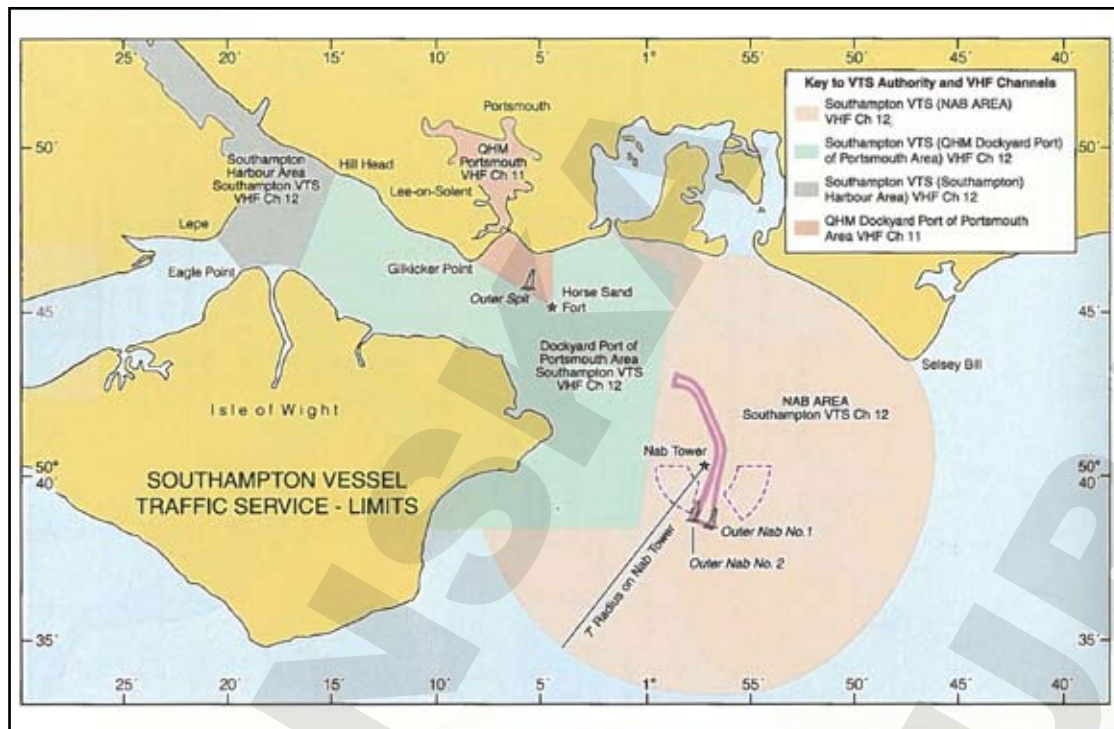
1.5 VESSEL TRAFFIC SYSTEM

The eastern approaches to the Solent lie in the Dockyard Port of Portsmouth's SHA, but as the channel is primarily the approach to the Port of Southampton, following an agreement between the two ports, ABP Southampton is the VTS Authority and the competent harbour authority (CHA) for the area (**Figure 12**).

Vessels at anchor within the Nab anchorage are monitored by Southampton VTS. The VTSO manually marks a circle around a target and visually monitors the target to identify when a vessel is dragging. When a vessel reported to be at anchor moves from the circle, the vessel is contacted by the VTSO and advised accordingly. The vessel's course and speed are tracked and can be relayed to the vessel.

1.6 PRINCESSA SHOAL

Princessa Shoal (**Figure 6**) lies 1nm east of the Isle of Wight shore line and 1nm north of the most northern Nab anchorages. Marked on its west side by the West Princessa Light-buoy, it has a least charted depth of 6.4m. The seabed is rock.



CHA areas

1.7 ENVIRONMENTAL DATA

1.7.1 Ship's weather forecasts

The Met Office sea area forecast for the 24 hours from 0500UTC Sunday 9 March 2008 for sea area Wight predicted:

Westerly 5 to 7 backing southerly 7, occasionally Gale 8, perhaps severe Gale 9 Later. Moderate or rough increasing very rough or high. Showers then rain. Good becoming moderate or poor.

The Navtex weather forecast received on the bridge of *Astral* at 1800 on 9 March predicted *south west winds Force 8-9 later* for the Wight area.

The Navtex weather forecast received at 0041 on 10 March stated:

Southerly storm force 10 expected soon (Figure 4).

1.7.2 VTS weather forecast

The bespoke Met Office forecast received by the Port of Southampton VTS office for the Solent, Spithead, Southampton Water and the Docks issued at 0524 on 9 March (**Annex 1**) stated:

General situation : Showers will die out during the evening ahead of a front, which will bring heavy rain and gales, perhaps severe, to the Southampton area overnight and through tomorrow [10th]

The forecast for 0700 on 10 March was for:

S'ly winds of 40 knots, gusting 60 knots.

Specifically from 1800 9 March to 0700 10 March:

Wind: Southwest force 3 or 4 (10 to 15 Kn) backing southerly force 7 to severe gale 9 (30 to 45kn gusts 45 to 60kn) tonight and veering southwest force 6 to gale 8 (25 to 30 kn gusts 35 to 45 kn) after dawn.

1.7.3 Actual weather

The weather recorded on board *Astral* showed that at midnight, prior to the accident, the weather was recorded as *cloudy, slight seas, good vis, wind ssw'ly force 5-6, barometer 1004mB.*

At 0400 the weather was recorded as *overcast sky, very rough seas, good vis, wind s'ly force 10, barometer 998.*

The wind recorded at the remote weather monitoring station at Bramble Bank in the Solent (**Annex 2**), showed that at 0545 UTC, 0645 ship's time, the wind increased to 40kts with gusts of 48kts. It is likely that the wind speeds at the more exposed Nab anchorage were greater than those recorded at the monitoring station.

1.7.4 Tides

The spring tide had occurred the day before the accident, with the tide being one of the lowest predicted for the year.

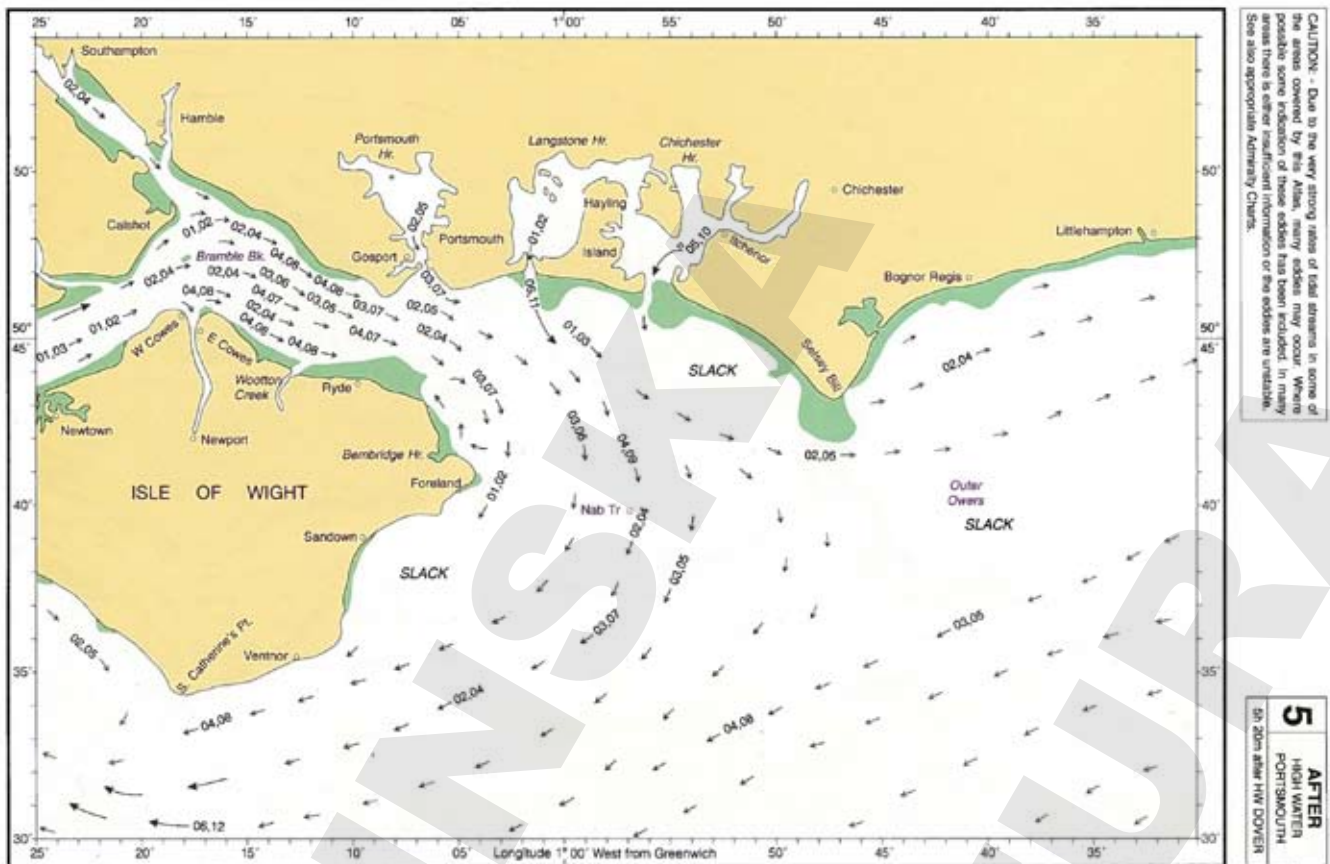
Low water in the approaches to Bembridge harbour, Isle of Wight occurred at 0713 on 10 March with a predicted height of 0.6m above chart datum. A tidal surge caused by the low pressure weather system increased the height of low water by 0.9m above the expected tide providing 1.5m of tidal height at low water and 1.6m at the time of the grounding.

The Admiralty tidal stream atlas for The Solent and Adjacent Waters is shown for 0644 and 0744 on 10 March (**Figure 13**). The tide can be seen to change from slack water to a NNE'ly flow of around 1kt at the time *Astral* started to drag anchor.

1.8 MANNING

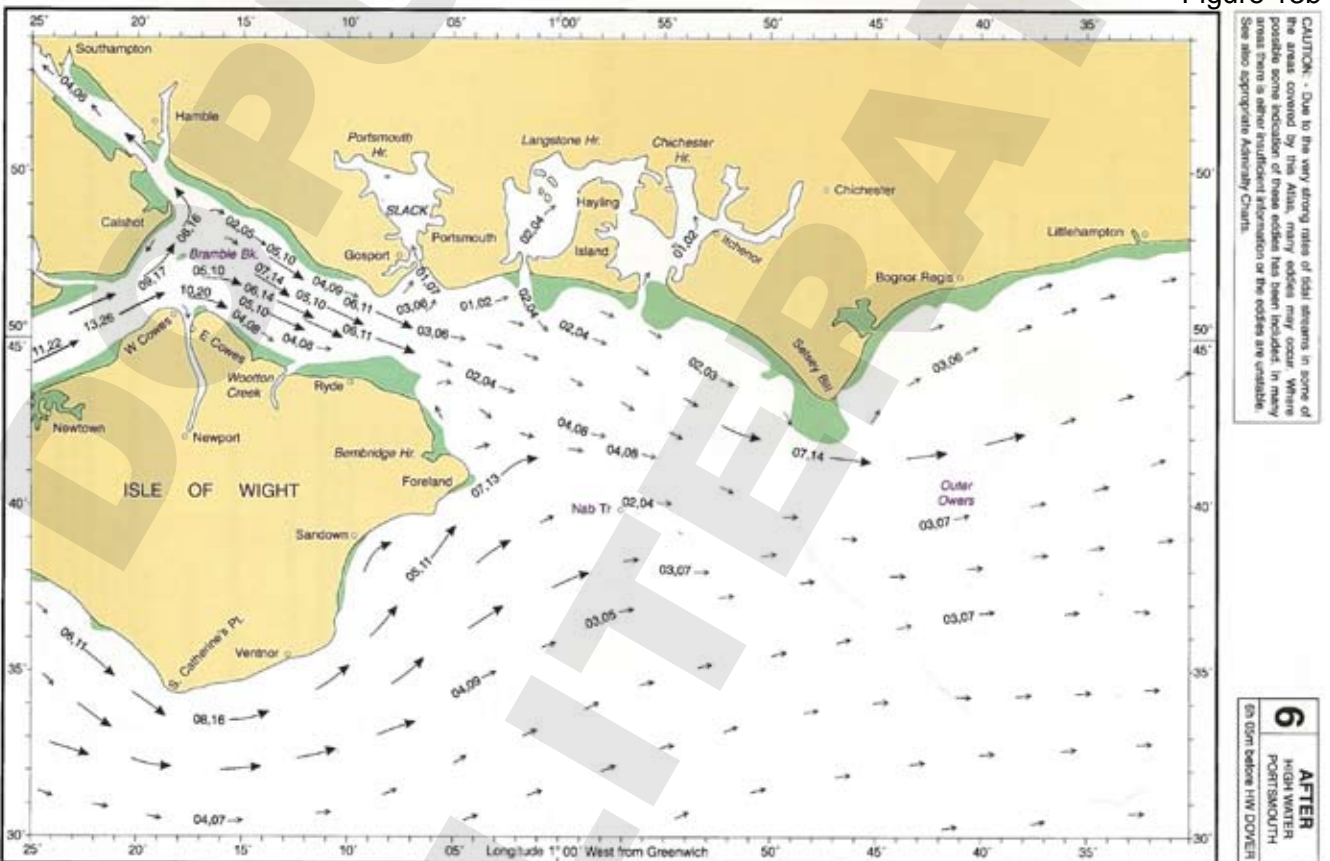
1.8.1 Structure

Astral, with a minimum manning requirement for 10, was manned by 13 crew. The senior officers were Swedish, with the exception of the first engineer, who was a Polish national. The junior officers and crew were Filipino. The master, chief engineer, chief officer and first engineer worked 4 weeks on, 4 weeks off, while the Filipino officers usually worked on board for 5 months. Veritas operated a zero tolerance policy on the consumption of alcohol on board its vessels.



Tidal flow at 0644 (ship's time)

Figure 13b



Tidal flow at 0744 (ship's time)

As the Veritas fleet had expanded from two vessels to three, the employment and retention of suitably qualified officers had proved difficult and it was taking time to place desirable, permanently employed, officers on each of the company's vessels. On board *Astral*, the temporary 2/ON had been employed to fill a gap prior to the permanent officer returning to the vessel, the search for a third permanent second officer was ongoing.

1.8.2 Crew employment

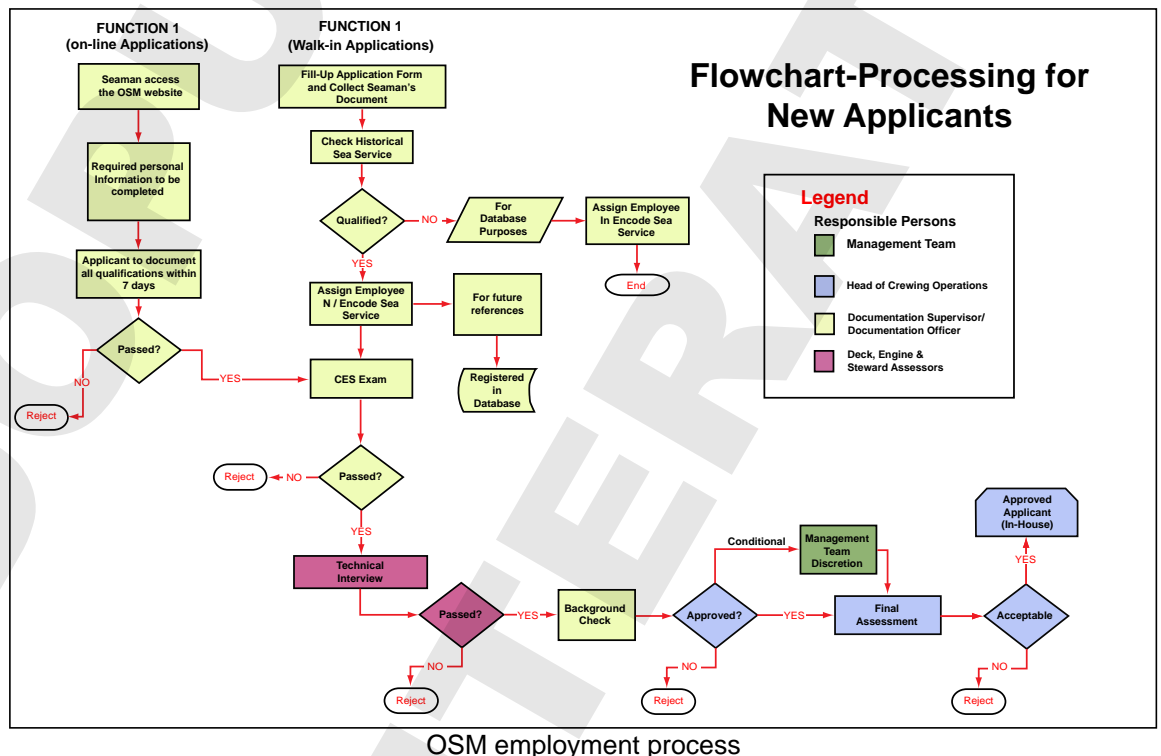
The European crew were employed directly by Veritas. The Filipino crew were employed through the manning agents OSM group (OSM).

OSM is an independent marine-services provider offering high-quality offshore and ship management and consultancy services as well as navigation and engineering solutions and financial planning. OSM is based in Norway and has offices in Sweden, Poland, Lithuania, Latvia, Croatia, Russia, Greece, Germany, Hong Kong, the Philippines, India, China, Singapore and USA³.

1.8.3 OSM employment procedures

OSM's employment acceptance procedures are illustrated in the flow diagram shown at **Figure 14**.

Figure 14



³ www.osm.no

1.8.4 Training

Officers who were permanently employed by Veritas were provided with Bridge Team Management (BTM) training. While the master and chief officer had attended a BTM course, the 2/ON in temporary employment had not received this training. However, he had attended a Bridge Resource Management Course and Ship Simulator and Bridge Teamwork training in February 2000, with a previous employer.

Onboard training was provided by a Seagull training system which delivered specific computer based training for each rank. This training included instruction in the use of electronic charts and navigation for all deck officers.

1.8.5 Watchkeeping

The chief officer and two second officers kept the three bridge watches. They worked a slight variation on the 4 on 8 off system, in accordance with the company's Safety Management System (SMS) as detailed below.

Rank	Watch Times	Watch Times
Chief Officer	0800 -1200	2000 - 2400
Second Officer (Safety)	1200 -1700	2400 - 0300
Second Officer (Navigator)	1700 -2000	0300 - 0800

1.8.6 Deck officers

- **The master**

The 49 year old master had been in rank for 8 years, the last 3 years with Veritas. When his previous employment had come to an end he had been headhunted by the managing director of Veritas as a suitable master. The master had served exclusively on smaller tankers during his 26 years at sea, mainly on the 2,907 GRT 1972 built *Dalanäs*. The master rejoined *Astral* in Amsterdam, a few days prior to the accident, when he took command following a half day handover from his predecessor.

The master had been on leave for 4 weeks prior to joining. During his previous contract he had noted that the 2/ON, on watch at the time of the accident, required careful monitoring in some navigational duties, and spent time on the bridge with him when he perceived the need to assist the officer.

- **The previous master**

The master of *Astral* prior to the vessel's departure from Amsterdam was not usually employed by Veritas and had been retained on a temporary basis. During his time on board *Astral* he maintained a "hands on" approach with the bridge team, remaining on the bridge whenever he felt it necessary to monitor the navigation of the ship.

- **The chief officer**

The chief officer held an STCW II/2 certificate of competence and had 10 years experience on tankers; he joined Veritas in June 2007 as chief officer on board *Astral*.

- **The second officer (navigator)**

The 2/ON, who was on watch at the time of the accident, held an STCW II/3 certificate of competence as a bridge watchkeeper. He had been employed on a temporary basis for 2 months while the vessel's permanent second officer took leave. He was the ship's navigator and was responsible for passage planning. This was his first contract as a second officer on tankers, having previously served as third officer on tankers and as a second officer on bulk carriers, trading primarily deep sea.

During his time on board he had been assisted in his watchkeeping duties by the master and in his navigation and other duties by the 2/OS. His performance had been considered weak by the master on board at the time of the accident. The previous master had not considered it necessary to specifically supervise the 2/ON, but he routinely spent significant periods of time on the bridge with the officers. Both masters had provided assistance to the 2/ON during busy periods of watchkeeping. However, the incumbent master felt that any shortfalls in the performance of the officer were manageable, especially given that the 2/ON was due to be relieved shortly. In coming to this view, the master also took into account that a replacement for the 2/ON was unlikely to be provided ahead of the scheduled return to the vessel by the vessel's permanent 2/ON.

The 2/ON was a light sleeper, who required around only 4 hours sleep per night.

During the selection process conducted by OSM, the 2/ON was noted as giving a "very good" general impression during his interview in October 2007 and noted as being "re-hireable".

Despite recording a "below average" score for intellect, the officer passed OSM's selection criteria for the position with Veritas due to his age being over 50. Had he been under 50 years old, an "average" score would have been required.

OSM's report on the 2/ON also noted that while he scored "average" in 17 of the 19 categories of "personality traits and characteristics", he scored low in the "relaxed" and "assertive" categories.

The selection process had also included:

- A Marlins International Shipping Federation (ISF) English Language Test for Seafarers in which he scored 76%
- A computer based test at Operational Level for an oil tanker deck officer in which he scored the following marks, achieving a Total Test Score of 57%
 - Cargo Handling - 65%
 - Control function - 50%
 - Fire Fighting - 50%
 - Navigation - 50%
 - Survival - 86%
- A psychological test and interpretation by an accredited clinic that included:
 - Sack's sentence completion test
 - Draw a person test
 - Intelligence Test (IQ)
- **Second officer (safety)**

The officer, who was off watch at the time of the accident, had been on board for 4 months; his first contract with Veritas. He had 10 years experience working on tankers similar to *Astral*.

1.9 CONDUCT OF THE ANCHOR WATCH

1.9.1 Bridge equipment and passage planning

The bridge was fitted with a Furuno Integrated Bridge system. The electronic chart system was not an ECDIS, and a fully corrected paper chart folio was carried. Passage planning, berth to berth, was mainly carried out on the electronic chart and transferred to the paper charts. The anemometer was not working at the time of the accident.


1.9.2 Anchor watchkeeping routine

Once at anchor, the routine followed by the OOWs on board *Astral*, was that the ship's position was to be monitored to determine whether the anchor had dragged. If the vessel dragged anchor, the master was to be informed, the

engine started, and the anchor recovered if necessary. The master had used this method previously and had successfully recovered a dragging anchor on several occasions in a range of weather conditions.

Each OOW monitored the vessel's position by two methods of their choosing, in compliance with the company and master's instructions. An *anchoring and anchor watch* checklist was completed during each watch (**Figure 15**), and each OOW noted the range and bearing to Nab Tower in the bridge logbook each hour.

Figure 15

			Rederi AB Veritas Tankers		
Safe Management System (ISM)					
Revision No: 2		Replacement for revision No: 1		Valid from: 2008-02-27	
Chapter: Anchoring and Anchor watch Checklist					Page:
					7.36.2 (2)
Approved by: _____					

To be checked while at anchor, the officer on watch should:

- ☒ Determine and plot the ship's position on the appropriate chart as soon as practicable.
- ☒ When circumstances permit, check at sufficiently frequent intervals whether the ship is remaining securely at anchor by taking bearing of fixed navigation mark or readily identifiable shore objects.
- ☒ Ensure that inspection rounds of the ship are made periodically
- ☒ Ensure vessel access control precautions are maintained in respect of vessels security
- ☒ Observe meteorological and tidal conditions and the state of the sea.
- ☒ Notify the Master and undertake all necessary measures if the ship drags anchor
- ☒ Ensure that the state of readiness of the main engine and other machinery is in accordance with the masters instructions.
- ☒ If visibility deteriorates, notify the Master
- ☒ Ensure that the ship exhibits the appropriate lights and shapes and the appropriate sound signals are made in accordance with all applicable regulations.
- ☒ Take measures to protect the environment from pollution by the ship and comply with applicable pollution regulations.

Remarks:
0200/1423

The chief officer monitored the vessel's position history by reference to the electronic chart radar range and bearing of Nab Tower using the Variable Range Marker (VRM) and Electronic Bearing Line (EBL), and by occasionally plotting the ship's position on the paper chart. He also set the GPS anchor drag alarm on the vessel's position at the start of his watches.

The 2/OS also used the electronic chart to monitor the ship's position, and plotted *Astral's* position on the paper chart. He also monitored the radar range and bearing of Nab Tower using the VRM and EBL.

The 2/ON monitored the vessel's position by noting the range and bearing of Nab Tower by the radar cursor, and visually monitored the GPS position. He did not plot the ship's position on the chart. **Figure 16** shows the radar display used by the 2/ON, showing the position of the cursor and the relative position of the VRM, EBL and the Nab Tower as the vessel drags anchor until the time the 2/ON calls the master and duty engineer.

None of the bridge watchkeepers had plotted a bridge swinging circle on the chart, and no clearing bearings or ranges had been established. The GPS anchor drag alarm had been set at 1 cable from the vessel's position when used, rather than at the anchor position.

1.9.3 Anchors and cables

Astral was fitted with two Bureau Veritas (BV) approved 4050kg M Spek anchors, with 56mm common stud link chain. Nine shackles of cable were carried on the starboard side, and 10 shackles on the port side.

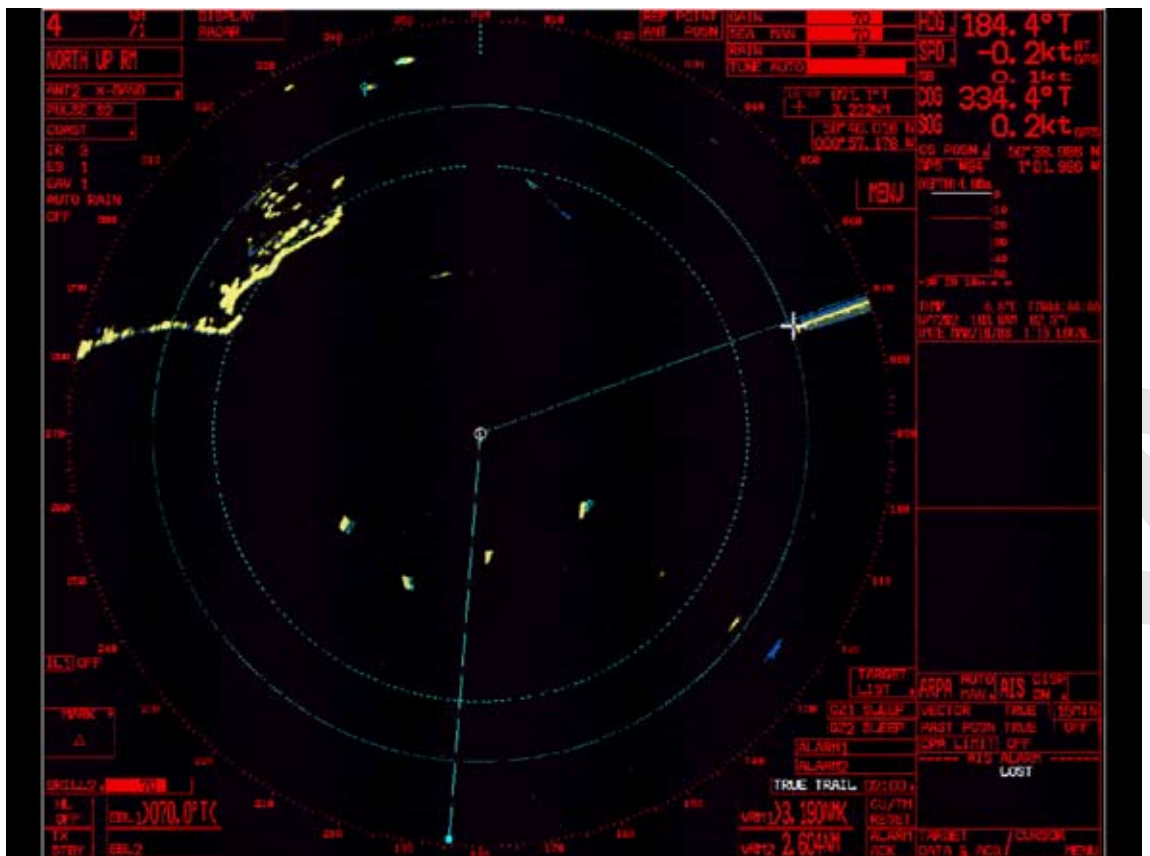
1.9.4 IACS requirements

The International Association of Classification Societies (IACS) *Requirements concerning mooring, anchoring and towing (Annex 3)* states:

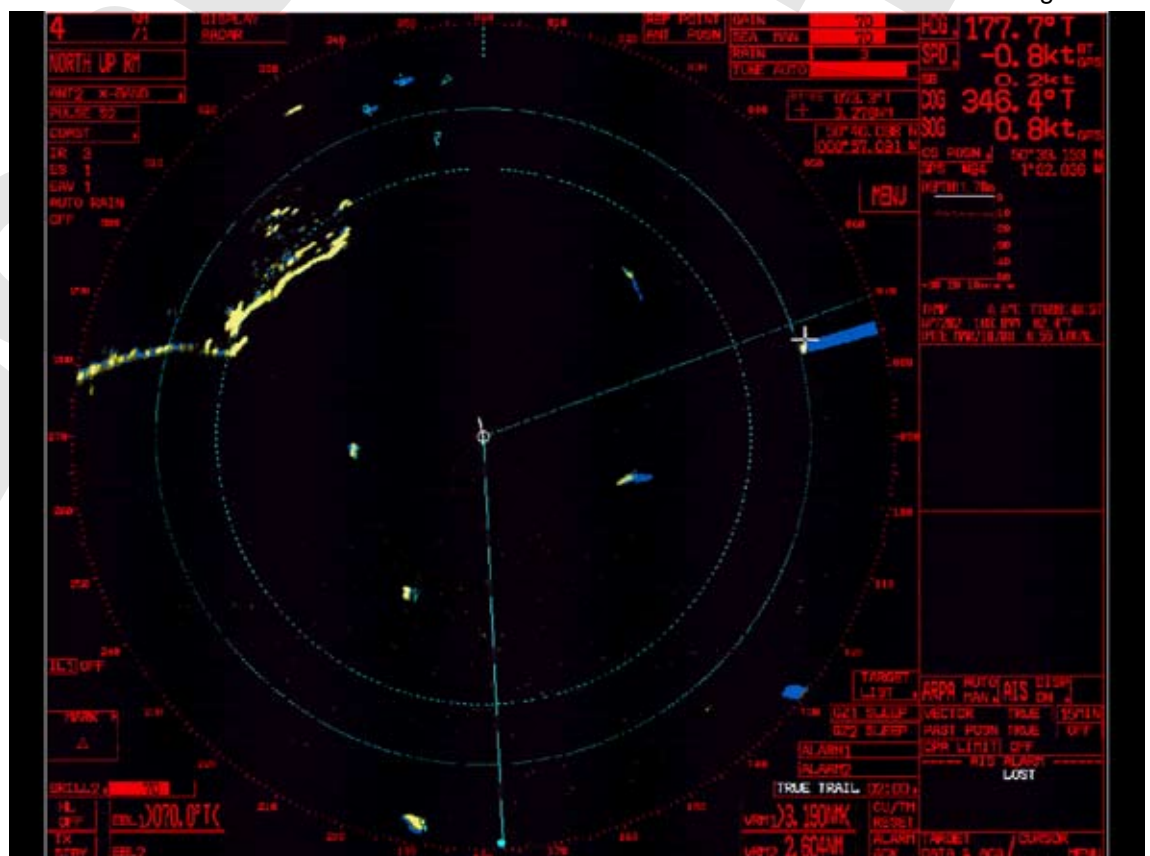
The anchoring equipment required herewith is intended for temporary mooring of a vessel within a harbour or sheltered area when the vessel is awaiting berth, tide, etc.

The equipment is therefore not designed to hold a ship off fully exposed coasts in rough weather or to stop a ship which is moving or drifting. In this condition the loads on the anchoring equipment increase to such a degree that its components may be damaged or lost owing to the high energy forces generated, particularly in large ships.

The anchoring equipment presently required herewith is designed to hold a ship in good holding ground in conditions such as to avoid dragging of the anchor. In poor holding ground the holding power of the anchor will be reduced.



At anchor



Astral starts to drag anchor at 0655

1.9.5 Guidance on anchoring

On anchoring, a fix on the drop position should be made and the ship's swinging circle ascertained, based on the length of cable in use....

The master should be immediately notified if the ship drags her anchor, and if sea conditions or visibility deteriorate.

MGN 315(M), issued by the Maritime and Coastguard Agency (MCA) gives information and guidance on the keeping and maintenance of a safe navigational watch in accordance with the requirements of STCW 95. It states that while at anchor:

The OOW shall determine and plot the vessel's position on the appropriate chart as soon as practicable.

Further guidance is provided in seamanship text books and extensively in the Admiralty Manual of Navigation, Volume 1, which provides an example of best practice for establishing an anchor watch. A copy of the relevant section is at **Annex 4**.

1.10 THE SHIP OWNER AND MANAGER

1.10.1 Rederi AB Veritas Tankers

Originally founded in 1926, Rederi AB Veritas tankers (Veritas) is a family owned shipping company with its origin in the bunkering trade based in Donsö, Sweden. Veritas owned and operated three similar sized product tankers that traded mainly in the Baltic and North Sea. *Astoria*, built for Veritas in 1999, and *Astina*, purchased in 2006 were both on long term time charter to Finnish Neste. *Astral*, purchased 6 months after completion in April 2007, was time chartered to Clearlake Shipping.

1.10.2 Organisation

Veritas' headquarters is situated on the Swedish Island of Donsö. The managing director, who is a master mariner, is the grandson of the company's founder. He is the DPA and is responsible for the company ISM and Vetting. The managing director's brother is the deputy managing director and the crew manager. Also in the office of six managers was a master mariner, who assisted with auditing, acted as relief master on occasions, and who had recently re-written the company's SMS.

1.10.3 Veritas procedures

The company's re-written SMS was implemented during the early part of 2007.

The Veritas 'Night Order Book' contained the *Veritas Safety of Navigation Policy*, signed by the managing director (**Annex 5**), which stated that:

While masters bear the ultimate responsibility, the safety of navigation policy requires all officers and crew members to prevent situations arising, which may endanger those onboard the ship, her cargo, or the environment.

A separate document, the company's *Shore Management Bridge Standing Orders* (**Annex 5**), with regard to anchoring stated:

A proper bridge watch shall be maintained by a certified Deck Officer when the ship is at anchor.

The ship's position shall be fixed at the time of anchoring and checked frequently thereafter. The swinging circle of the ship is to be charted, centred on the position of the anchor. Particular attention is to be paid to the ship's movements during the change of tidal direction and changes in weather conditions. The master is to be informed immediately if there is any suspicion that the ship is dragging anchor or if the charted position falls outside the charted swinging circle.

A copy of the *Shore Management Bridge Standing Orders* was contained in the Night Order Book, the ship's copy of which was signed as being acknowledged by the master and OOWs.

The overarching SMS manual provided an additional procedure for *watchkeeping at anchor* (**Annex 5**) stating that the:

Officer of the watch checks the following:

- *Position with more than one means of fixing method*
- *Anchor shapes and lights*
- *Movement of other anchored ships in relation to own ship*
- *Weather sea and tide*
- *VHF channel 16 and other channels for the actual traffic area and telex*

1.10.4 Veritas internal audits

Internal reviews of the SMS were carried out annually in accordance with the ISM Code, by the managing director or the deputy auditor, the office-based master. The most recent audit was completed on 27 October 2007.

The SMS review process required the company's internal auditor to establish the following:

Have all the present bridge officers read and signed the Master's standing orders and company bridge standing orders?

The current master and the on leave chief officer had not signed the Company Bridge Standing Orders, and a corrective action was raised to add this requirement to the handover checklist for each officer on board.

An Internal Navigation Review, with the auditor on board, was carried out on 11 October 2007 during which no observations were made regarding *Astral's* anchoring procedures.

1.10.5 OCIMF SIRE programme

The Oil Companies International Marine Forum's (OCIMF) 6-monthly Revised Ship Inspection Report (SIRE) Programme was carried out by Preem Petroleum AB on 4 May 2007, with no navigational deficiencies noted.

1.10.6 Swedish Maritime Authority

The ISM Document of Compliance (DoC) and Safety Management Certificate (SMC) were issued by the Swedish Maritime Authority; the vessel's SMC was issued on 2 November 2007.

1.11 PREVIOUS ACCIDENTS

1.11.1 *Pasha Bulker*

The Australian Transport Safety Bureau Report⁴ investigated the grounding of *Pasha Bulker*. The main conclusions of the report are summarised as follows.

On 23 May 2007 the Panamanian Registered bulk carrier *Pasha Bulker* anchored along with more than 50 other bulk carriers to await berthing to load coal in Newcastle, on the east coast of Australia. At midday on 7 June the master veered more cable on receipt of a gale warning. During that evening seven ships put to sea. At midnight, the first of 49 ships at anchor started to drag its anchor as the weather deteriorated and the wind increased to gale force, with 8m seas, onto the lee shore of Nobbys beach.

At 0625 on 24 May, *Pasha Bulker* started to drag anchor and the master decided to weigh anchor. Once underway, in 45kt winds, the master tried to turn the ship away from the coast, but was unable to control the turn. The master then turned towards the coast, only 8 cables away, and with insufficient sea room to complete the turn, and with significant leeway, the vessel grounded.

The ATSB investigation found that the majority of masters expected to receive stronger guidance from the VTS operator as to when the anchorage was no longer tenable. The report also concluded that the highest level of good seamanship was shown by those masters who weighed anchor on the receipt of gale warnings, rather than those who waited for the weather conditions to deteriorate or wait for the ship to drag her anchor in gale force conditions.

1.11.2 *Young Lady*

On 26 June 2007, the 105,000 tonnes deadweight crude oil tanker *Young Lady* dragged her anchor in Tees Bay, in a wind speed in excess of 40kts and a heavy swell. The master decided to weigh anchor and depart, but during the operation the windlass hydraulic motor exploded and the cable ran out to the bitter end. The vessel dragged her anchor for an hour, during which the anchor flukes temporarily snagged a gas pipeline, until she passed over a shoal patch and the anchor held. The pipeline was out of action for over 2 months.

The MAIB investigation found that the master was aware that the anchorage was not recommended in the forecast conditions, and the decision to remain at anchor was inappropriate.

The snagging of a gas pipeline as *Young Lady* dragged her anchor in gale force winds showed again the reliance on anchors and anchor equipment, in conditions for which the equipment was neither intended, nor approved. When

⁴ ATSB Marine occurrence Investigation No.243.

the equipment failed in these conditions the master found himself unable to recover, or slip, the anchor and was therefore heavily restricted in his ability to manoeuvre.

1.11.3 Statistics

The MAIB database shows that since 1992 there have been 21 accidents in United Kingdom territorial waters involving merchant vessels of over 500 gross tons dragging their anchor and subsequently grounding. Weather conditions contributed to 19 of these accidents, the anchoring position was relevant to 16, and in 7 cases the engines were not ready when needed.

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 FATIGUE

The 2/ON indicated a moderate chance of fatigue mainly due to his own inability to sleep when the opportunity to do so was provided. There is no evidence that fatigue was a significant factor in this accident.

2.3 ANCHORING PROCEDURES

2.3.1 Master's anchorage selection

Prior to arrival in the approaches to the Solent, the master had been advised by VTS that Nab anchorage No.3 was available. The master accepted the anchorage and headed for the position. Although only a recommended anchorage, the master did not challenge the allocation, nor did he see any reason at the time to do so. The master chose to anchor to the north of the centre of No.3 anchorage, positioning *Astral* closer to the closest danger of Princessa Shoal, to increase the distance between *Astral* and FS *Vanessa*, which was anchored nearby. The master could have waited for FS *Vanessa*, which was in the process of weighing anchor, to depart the anchorage, or discussed an alternative anchorage with the VTSO. In electing to anchor towards the edge of the recommended anchorage, the master reduced the distance between his vessel and the nearest hazard.

2.3.2 Bridge procedures during anchoring

When *Astral* anchored, the master was on the bridge with the helmsman. The master conned and navigated to the anchor position by himself, and ordered the anchor to be dropped when he was content that *Astral* was clear of the other anchored vessel. *Astral's* position was not plotted until after 7 shackles of cable had been veered, the anchor position was not determined, and no bridge swinging circle was produced.

2.3.3 Position monitoring at anchor

Over the 2½ days *Astral* was at anchor, each of the three watch officers monitored the ship's position in their own way. No set procedure, instructions from the master, or best practice as to how they should identify the anchor was dragging were established. During the period between *Astral* anchoring and the accident, none of the watchkeepers attempted to determine the anchor position or draw a bridge swinging circle. Consequently, while their fixing methods varied in effectiveness, all relied on noticing an unusual amount of lateral movement to alert them to the possibility the vessel was dragging.

The 2/ON, who was on watch at the time *Astral*'s anchor dragged, was monitoring the position of the vessel solely by radar, observing and recording the range and bearing of Nab Tower as indicated by the cursor display on the radar. This method did not alert him when *Astral* started to drag anchor, with the consequence that valuable time was lost which could have been used to get the ship underway.

Had a bridge swinging circle been established⁵, limiting danger lines and ranges could have been set to alert the OOW that the vessel had dragged its anchor once the defined limits were exceeded.

2.4 RESPONSE TO THE DETERIORATING WEATHER

2.4.1 Response to the weather forecast

On 10 March, as the weather forecast deteriorated, the master directed that another shackle of cable be veered. Later that day, on receipt of the gale warning and advice from the VTSO, the master and chief officer reviewed the situation, and the master concluded that the ship's position continued to be appropriate. The master considered that he had taken sufficient action by veering an additional shackle of cable and checking that the duty engineer was aware of the need to start the main engine quickly if required.

The master was of the opinion that if the vessel dragged anchor, he would have sufficient time to start *Astral*'s engine, recover the anchor and manoeuvre the vessel from the danger. The master's previous experience, primarily on vessels smaller than *Astral*, had shown this procedure to be effective. The success of his plan relied on the early detection of dragging, prompt engine availability, sufficient sea room to the nearest danger and the ability of the anchor windlass to recover the anchor in time.

2.4.2 Night orders

The master was aware the weather forecast predicted gale force and possibly storm force winds overnight, although at the time of writing his night orders the weather remained moderate.

In writing his night orders, the master only considered the requirement to act should *Astral* begin to drag her anchor, and he did not include other limiting criteria that could have assisted him in making the decision to depart the anchorage earlier than he did. Specifically, the master could have included in his night orders a requirement for the OOW to inform him if:

- The wind speed increased or the weather deteriorated beyond certain levels.
- Worsening weather forecasts were received.

⁵ The Admiralty Manual of Navigation Volume 1, 2008 edition, provides guidance on anchoring and the use of safety swinging circles. An extract is at Annex 4.

- The vessel departed from its bridge swinging circle.
- Specified bearings and/or ranges exceeded pre-defined limits.
- Other vessels nearby dragged anchor, or departed due to heavy weather.

The OOWs did not call the master, notwithstanding receipt of a NAVTEX weather forecast at 0041 on 10 March which predicted a southerly storm force 10 “soon”, the advent of worsening weather conditions, or the incidence of several vessels dragging their anchors in the adjacent anchorages.

A more detailed set of night orders might have prompted the OOWs to inform the master as soon as it became clear that the weather conditions were likely to deteriorate. However, it is surprising that the potential severity of the situation was not appreciated by the OOWs and the master called to the bridge despite the absence of orders to do so.

2.4.3 Main Engine Readiness

The master considered that with the duty engineer resting in his cabin, the time taken to start the engine would be sufficient, provided that he was advised early of the dragging anchor. However, this calculation did not allow for any delay in detecting the vessel was dragging, the potential rate of drift given the proximity of danger, and any delays that could occur starting the engine and, subsequently, recovering the anchor.

Had the main engine been running or been at immediate readiness, and therefore available to the master 10 minutes earlier, it is possible the grounding could have been averted.

2.4.4 Reliance on anchoring equipment

The master’s confidence in *Astral*’s anchor system was influenced by his previous experience in smaller vessels. Had he been fully aware of the IACS guidance that anchoring equipment is not suitable for gale force conditions on an exposed lee shore, he might have chosen differently. Specifically, he was expecting the anchor to hold in conditions above its designed limits and, should it drag, for the windlass to be able to recover it in those conditions.

Had the master elected to depart the anchorage on receipt of the gale warning, or when the weather conditions started to deteriorate during the early hours of 10 March, *Astral* would have been well clear of the lee shore in good time. Specifically, she would have been underway before heavy weather made recovering or slipping the anchor difficult.

It is MAIB’s experience, following the investigation of *Young Lady*, reinforced by the findings of ATSB’s *Pasha Bulker* investigation, that masters are either unaware of their anchor system limitations, or choose to ignore them in the hope the anchor will hold. Should their confidence prove unfounded, and their

vessel drag, these masters are potentially risking the lives of the crew charged with operating on the exposed foredeck to recover the anchor, and face the possibility that, should anything else go wrong, there is a real risk of their vessel stranding.

2.5 PERFORMANCE OF THE 2/ON ON WATCH

2.5.1 Recruitment of the 2/ON

Veritas had engaged the 2/ON through the OSM manning agency recruitment system. OSM had conducted its normal recruitment screening process, but had also made allowances for the officer's age and, through this dispensation had deemed him suitable for the post offered by Veritas. Following the 2/ON's endorsement by OSM, Veritas undertook no confirmatory checks that could have identified potential weaknesses in his performance, particularly his experience and aptitude for operations in the coastal waters of the Baltic and North Sea.

A better awareness of the recruiting agency's procedures could have alerted the company to the need to impose stricter recruiting criteria, or to conduct their own validation checks on potential officers.

2.5.2 Monitoring of the 2/ON

The 2/ON's performance had been closely monitored by the master at the time of the accident, and by his predecessor. Both regarded the 2/ON as a "deep sea" officer, experienced on larger vessels, but whose performance was weak and required monitoring and assistance when navigating in confined waters. Knowing that the 2/ON was on board for a limited time, until the permanent officer could rejoin *Astral*, the master was prepared for the officer to remain on board, but to monitor his performance closely.

Although the master had found it necessary to assist and monitor the 2/ON during sea watches, the same level of supervision was not provided at anchor and he had not, therefore, identified that the officer was not effective in conducting an anchor watch.

2.5.3 Conduct of the anchor watch

The 2/ON was monitoring *Astral's* position using the radar EBL and VRM to observe the range and bearing of Nab Tower, which he was recording in the log. The 0700 range and bearing differed significantly from the previous record, but while the 2/ON convinced himself that this was because the cable was stretching, he did not plot the vessel's position to check this was the case. Had he done so, the discrepancy with the previous fix would have been immediately evident.

As the weather deteriorated, the two vessels closest to *Astral* dragged anchor. This did not alert the 2/ON to the significance or the vulnerability of *Astral's* situation. The 2/ON did not, and was not required to, increase the vessel's readiness as the situation around him deteriorated.

When the VTSO called *Astral* by VHF to check the OOW was happy with the vessel's position, the 2/ON was not alerted to the possibility that the vessel was dragging, nor that he should be concerned. Believing that he needed to be "sure" that the vessel was dragging before calling the master, the OOW gave no answer when the VTSO called *Astral* again to request confirmation the vessel was not dragging. The 2/ON's uncertainty and lack of appreciation of the proximity of danger resulted in him delaying his call to the master, and then the duty engineer, until 20 minutes after the vessel started to drag anchor. By then, *Astral* was moving at over 2 kts and had covered half the distance between the initial anchor position and the Princessa Shoal.

2.6 EMERGENCY RESPONSE

The master arrived on the bridge 7 minutes after he was called, believing that he would be unable to take action until the main engine was running. When he did arrive, he was surprised to see how far the ship was out of position. By delaying his arrival on the bridge, the master denied himself time in which to assess the situation and consider his options. Consequently, once the engine was available, the master set only sufficient power to take the weight off the cable, and he did not consider increasing the engine power sufficiently to make ground away from Princessa Shoal.

After sending the OOW and the watch AB forward to recover the anchor, the master was left alone on the bridge. Additional personnel were subsequently informally called to the bridge. However, without an effective handover and with limited assistance, the master was unable simultaneously to monitor the vessel's position, manoeuvre it effectively, check the height of tide, respond to VHF traffic, and take charge of the situation. Specifically, he hoped that the vessel would pass over the bank as he recovered the anchor, and had not realised that at Low Water Springs the depth of water was limited. He therefore did not take sufficient action to prevent *Astral* grounding, 35 minutes after starting to drag anchor.

Had the master arrived on the bridge earlier, he would have been better able to assimilate the vessel's situation. He might then have used the general alarm to summon additional officers to the bridge quickly and warned the remaining crew of the developing emergency. He could also have used the time to better acquaint himself with the proximity of danger, and detail others to carry out essential tasks. Then, once the main engine became available, had power been increased sufficiently to drive the vessel ahead and away from danger, even at this late stage, the grounding could have been prevented.

Thirty five minutes elapsed between *Astral* starting to drag anchor and her grounding. In this period, the OOW took 20 minutes to appreciate the situation, alert the master and initiate engine readiness. The engine starting process and transfer to the bridge took the anticipated 11 minutes, leaving the master only 4 minutes to attempt to avoid grounding once engine power was provided.

The emergency response was ineffective. Although the failure to detect the dragging early on, and the time taken to start the main engine had eroded most of the safety margin, the grounding could have been prevented by decisive action once the engine was available. The master's delay in arriving on the bridge and, without assistance, his becoming overwhelmed such that his manoeuvring was ineffective, removed the remaining margin and the vessel grounded.

2.7 SAFETY MANAGEMENT

2.7.1 Safety management system

The Veritas SMS included *Company Shore Management Bridge Standing Orders* which stated that a *swinging circle of the ship is to be charted, centred on the position of the anchor*. However, this was not common practice on board, and the managers ashore did not consider it necessary. Conversely, a section in the company's SMS manual entitled *watchkeeping at anchor* only required the ship's position to be plotted. The anchor checklist, completed by the watch officers, which was copied from the ICS Bridge Procedures Guide, referred to the less onerous SMS manual requirements, and it was these instructions the master and officers chose to adhere to.

Notwithstanding improvements made during the company's 2007 re-write of the SMS, these conflicting instructions had not been detected and resolved.

2.7.2 Auditing

ISM and Navigational Audits had been carried out by one of the company's ex masters. However, the procedure for 'navigation at anchor' was not fully checked, so the audits had not detected that *Astra's* master and OOWs were following the less onerous anchoring procedure in the SMS manual rather than the more robust requirements of the *Shore Management Bridge Standing Orders*.

2.8 VTS

2.8.1 Allocation of anchorage

The Nab anchorages at the approaches to the Solent are provided for use by waiting vessels. Although advised by VTS, there is no requirement for vessels to accept the given anchorage or to remain there. The master did not question the proposed anchorage, and during the vessel's stay there had been time to re-anchor or leave had he believed the weather forecast made *Astra's* position untenable.

2.8.2 Information flow and advice

Once the weather forecast began to deteriorate, the VTSO called all vessels which were anchored in the area and advised them of the forecast and the need to have their engines available if required. The VTS also provided all vessels in its area with updated weather forecasts as they became available.

On the morning of the accident, the VTSO's enquiries into *Astral's* circumstances were delivered in a conventional, but understated manner. While the inference of the VTSO's language would normally be understandable to a native English speaker, the implications of the operator's questioning were not recognised by the Filipino 2/ON, and vital minutes were lost before he took effective action.

During the investigation, it had been apparent that many foreign mariners expect VTS operators to use clear, plain language in their communications. This finding is consistent with that of ATSB's *Pasha Bulker* report. In this case, the terminology suggested in the IALA VTS Manual (2008) Chapter 17 would likely have stimulated the 2/ON with a more rapid and positive response, e.g. "WARNING vessel *Astral*, VTS radar indicates you are dragging your anchor. Check your condition and confirm your intentions."

2.8.3 Control of the anchorage

While most of Nab anchorage No.3 lies outside Portsmouth harbour limits, *Astral* had anchored within these limits, the pilotage of which is controlled by ABP Southampton as VTS Authority and CHA for the area. Both SHAs and CHAs often have extensive powers for controlling navigation in their areas. However, they are often reluctant to order vessels to leave an anchorage, even if the weather forecast indicates the anchorage could become untenable, to avoid potential liability issues should a vessel get into difficulties after leaving. In most harbour areas, the responsibility to decide whether to sail or stay at anchor therefore remains with the master, but the SHA or CHA will provide such advice and guidance as it can.

Ultimately, masters are responsible for the safety of their vessels. However, harbour authorities should ensure that masters are fully alert to the dangers they may face within the CHA's waters and approaches.

2.9 KNOWLEDGE AND AWARENESS OF SAFE ANCHORING PROCEDURES

In conducting their risk assessments, harbour authorities and others are reliant on masters taking effective responsibility for the safety of their vessels.

In this accident, none of the four vessels occupying the Nab anchorage got underway before the weather deteriorated, and three subsequently dragged their anchors with *Astral* grounding. In all of the *Pasha Bulker*, *Young Lady* and *Astral* accidents, the masters elected to remain at anchor, off a lee shore with poor or moderate holding ground, and only get underway once their vessels were dragging anchor. In this, they showed a fundamental lack of understanding of the limitations of their vessel's anchoring systems, the forces and dynamics involved, and the practices of good seamanship.

In this accident, there was also an absence of basic navigational practices by *Astra's* deck officers, which were essential to ensure that any dragging was detected in sufficient time for remedial action to be taken.

This accident, following closely on from the *Pasha Bulker* and *Young Lady* accidents, would indicate the possibility of an absence of knowledge among many deck officers in the seamanship and navigation procedure required for safe anchoring.

DOPUNSKA
LITERATURA

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE RESULTED IN RECOMMENDATIONS

- The watchkeepers were unable to determine with any accuracy whether *Astral* was dragging her anchor, because the position of the anchor had not been obtained when the vessel anchored, and a bridge swinging circle had not been generated. [2.3.2]
- In the absence of clear instructions, the watchkeepers were left to choose their own methods for monitoring the ship's position, some of which were ineffective. [2.3.3]
- In electing to remain at anchor, the master did not take account of the limitations of the vessel's anchor system, nor the difficulties he would face recovering the anchor in bad weather if the anchor dragged. [2.4]
- In choosing not to get underway until the vessel dragged anchor, the master did not allow sufficient margin for the rate of drift, the time it would take for the OOW to detect the anchor dragging, or for the main engine to become available. [2.4, 2.5]
- The 2/ON's performance had been identified as weak, and while he had been appropriately supervised when the vessel was on passage, this supervision had ceased to be effective when the vessel had anchored. [2.5]
- Had the master arrived on the bridge earlier, he would have been better able to absorb the vessel's situation, and could have used the main engine more effectively once it became available. [2.6]
- As a consequence of not using the general alarm to rouse the crew, the master was alone on the bridge immediately before the vessel grounded, and was unable to cope effectively with the developing situation. [2.6]
- Veritas' audits had not detected that anchoring practice on board *Astral* fell well short of the *Shore Management Bridge Standing Orders* requirements in the company's SMS, or that these orders conflicted with the instructions in the SMS manual. [2.7]
- Nab No. 3 anchorage was appropriate when *Astral* anchored, but was not suitable during storm force winds from the south. [2.4, 2.5, 2.8.1]
- While the VTS operator's language was understandable to a native English speaker, the implications of the operator's questioning were not recognised by the second officer, and vital minutes were lost before he took effective action. [2.8.2]

- This accident, following closely on from the *Pasha Bulker* and *Young Lady* accidents, would indicate the possibility of an absence of knowledge among many deck officers of the seamanship and navigation procedures required for safe anchoring. [2.9]

3.2 OTHER SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION ALSO LEADING TO RECOMMENDATIONS

- Masters of vessels at anchor in the Nab Anchorage were not provided with all the available information required to assess the tenability of the anchorage in southerly gale force winds.[2.8.2]

SECTION 4 - ACTION TAKEN

4.1.1 Veritas Tankers has:

- Introduced procedures to monitor the effective use of bridge swinging circles during their annual navigation reviews.
- Introduced written procedures recommending that masters depart anchorages prior to the onset of heavy weather that may make the anchorage untenable (**Annex 6**).
- Introduced new procedures to interview all officers, in addition to the manning agency requirements, prior to their employment.

4.1.2 ABP Southampton and QHM Portsmouth have:

- Improved the information and guidance available to mariners on charts and publications as to the tenability of anchorages within their harbour authority and approaches.

4.1.3 MAIB has:

- Published a Safety Flyer on best anchoring practice for dissemination by the International Chamber of Shipping and the Nautical Institute to circulate to their members.

SECTION 5 - RECOMMENDATIONS

The International Chamber of Shipping and the Nautical Institute are recommended to:

2009/102 Circulate the MAIB's Safety Flyer on anchoring procedures to all their members.

Associated British Ports Southampton and Queen's Harbour Master Portsmouth are recommended to:

2009/103 Provide guidance to their VTSOs on the language and terminology used, particularly to non English speakers, in communicating with ships' masters and officers to minimise the possibility of misunderstanding or confusion and, where appropriate, to issue masters with clear instructions.

Rederi AB Veritas Tankers is recommended to:

2009/104 Review its SMS instructions and enhance its auditing procedures to ensure that masters and ships' officers:

- Are provided with, and are familiar with, correct and clear anchoring procedures.
- Understand the limitations of their vessel's anchoring systems.
- Understand the company's emergency response procedures and are implementing these plans effectively.

International Association of Marine Institutes and Association of Marine Educational and Training Institutes Asia-Pacific Regions are recommended to:

2009/105 Encourage their members providing training to deck officers, to conduct a full review of the study programmes delivered to ensure that deck officers gain effective instruction on:

- Navigation planning for anchoring, including the construction of swinging circles, holding ground, and position monitoring while at anchor.
- The strengths, weaknesses and limitations of vessels' anchoring systems.
- Command considerations for safe anchoring, including wind and tide effects, yawing, when to depart an anchorage and actions to take to prevent dragging, and to take when dragging is detected.

**Marine Accident Investigation Branch
Statens havarikommission
January 2009**

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

Met Office Daily ABP Southampton Forecast

Daily Forecast

Tel: 0870 900 0100 www.metoffice.gov.uk

ABP (Ref: M01)

Page 1 of 2

Forecast Issued on Sunday, 09 March 2008 at 05:24

Forecast for the Solent, Spithead, Southampton Water and the Docks.

General Situation:

Showers will die out during the evening ahead of a front, which will bring heavy rain and gales, perhaps severe, to the Southampton area overnight and though tomorrow.

Wind (Southampton Docks):

	Sunday Mar 9 2008							Monday Mar 10 2008			
Time	0600	0900	1200	1500	1800	2100	2400	0300	0600	0900	1200
Degrees	230	240	280	240	250	240	200	190	180	240	230
Speed /kn	12	12	12	15	12	12	20	30	40	25	30
Gusts /kn	17	17	17	25	17	17	30	45	60	35	45
Temp	6	7	9	11	7	4	6	7	7	7	8

Forecast valid from 0700 until 1800 hours Today, Sunday.

Wind (General for Solent, Spithead, Southampton Water and the Docks):

Southwest force 3 to 5 (10 to 15kn gusts 25kn in or near showers) veering west to northwest for a time

Weather:

Occasional showers, some heavy, otherwise fair.

Visibility:

Good.

ABP (Ref: MO1)

Forecast Issued on Sunday, 09 March 2008 at 05:24

Forecast valid from 1800 today until 0700 hours tomorrow, Monday.

Wind:

Southwest force 3 or 4 (10 to 15kn) backing southerly force 7 to severe gale 9 (30 to 45kn gusts 45 to 60kn) tonight and veering southwest force 6 to gale 8 (25 to 30kn gusts 35 to 45kn) after dawn.

Weather:

Rain developing, heavy at times.

Visibility:

Moderate or good

Sea area forecast for the 24 hour from 0500 UTC Sunday 09 March 2008**DOVER**

SOUTHWEST BACKING SOUTH 5 TO 7, OCCASIONALLY GALE 8, PERHAPS SEVERE GALE 9 LATER. MODERATE OR ROUGH, OCCASIONALLY VERY ROUGH. SHOWERS. MODERATE OR GOOD

WIGHT PORTLAND

WESTERLY 5 TO 7 BACKING SOUTHERLY 7 TO SEVERE GALE 9, PERHAPS STORM 10 LATER. MODERATE OR ROUGH INCREASING VERY ROUGH OR HIGH. SHOWERS THEN RAIN. GOOD BECOMING MODERATE OR POOR

PLYMOUTH

WESTERLY 5 TO 7 BACKING SOUTHERLY 7 TO SEVERE GALE 9, OCCASIONALLY STORM 10 LATER. ROUGH OR VERY ROUGH INCREASING HIGH OR VERY HIGH. RAIN OR SQUALLY SHOWERS. GOOD BECOMING MODERATE OR POOR

To contact Met Office Aberdeen:

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Web: www.metoffice.gov.uk

Authorised for issue by Mo Scollay at 0524 UTC 09/03/2008

Bramble Bank remote weather station data

BRAMBLEMET Archive

The abbreviations are:

- WSPD
- Wind Speed in knots
- WD
- Wind Direction in degrees
- GST
- Maximum Gust in knots
- ATMP
- Air Temperature in degrees C
- WTMP
- Water Temperature in degrees C
- BARO
- Barometric Pressure in millibars
- DEPTH
- Water depth in metres
- AWVHT
- Average Wave Height in metres
- MWVHT
- Maximum Wave Height in metres
- WVHT
- Significant Wave Height in metres
- APD
- Average Wave Period in seconds

DATE	TIME	WSPD	WD	GST	ATMP	WTMP	BARO	DEPTH	AWVHT	MWVHT	WVHT	APD
10/03/2008	00 00	22.3	199	29.9	08.1	08.6	990.5	5.05	0.03	0.03	-1000.00	-1000.00
10/03/2008	00 05	23.1	196	30.9	08.1	08.6	990.1	5.07	0.03	0.04	-1000.00	-1000.00
10/03/2008	00:10	23.0	196	30.2	08.1	08.6	990.1	5.07	0.03	0.03	-1000.00	-1000.00
10/03/2008	00:15	21.1	195	26.7	08.0	08.5	989.9	5.07	0.03	0.03	-1000.00	-1000.00
10/03/2008	00 20	20.7	194	26.5	08.0	08.5	989.9	5.06	0.03	0.03	-1000.00	-1000.00
10/03/2008	00 25	21.3	196	32.3	08.0	08.5	989.6	5.06	0.03	0.03	-1000.00	-1000.00
10/03/2008	00 30	22.9	196	29.9	08.1	08.5	989.5	5.06	0.04	0.04	-1000.00	-1000.00
10/03/2008	00 35	22.6	193	28.8	08.0	08.5	989.3	5.06	0.04	0.04	-1000.00	-1000.00
10/03/2008	00:40	23.2	194	29.8	08.1	08.5	989.0	5.06	0.04	0.04	-1000.00	-1000.00
10/03/2008	00:45	25.8	189	34.0	08.1	08.5	988.8	5.06	0.04	0.04	-1000.00	-1000.00
10/03/2008	00 50	25.3	190	33.1	08.1	08.5	988.7	5.05	0.03	0.04	-1000.00	-1000.00
10/03/2008	00 55	23.7	190	33.1	08.0	08.5	988.7	5.04	0.03	0.04	-1000.00	-1000.00
10/03/2008	01 00	24.0	186	31.7	07.9	08.4	988.1	5.03	0.04	0.04	-1000.00	-1000.00
10/03/2008	01 05	24.4	184	29.9	08.0	08.4	987.8	5.02	0.03	0.04	-1000.00	-1000.00
10/03/2008	01:10	24.4	182	29.1	07.9	08.4	987.7	5.01	0.04	0.04	-1000.00	-1000.00
10/03/2008	01:15	25.2	182	29.1	07.9	08.4	987.4	5.00	0.04	0.05	-1000.00	-1000.00
10/03/2008	01 20	26.0	183	35.2	07.9	08.4	987.2	4.99	0.04	0.05	-1000.00	-1000.00
10/03/2008	01 25	27.2	185	34.7	07.9	08.4	986.8	4.99	0.04	0.05	-1000.00	-1000.00
10/03/2008	01 30	22.8	186	31.6	07.9	08.4	986.7	4.99	0.04	0.04	-1000.00	-1000.00
10/03/2008	01 35	24.3	183	31.0	07.9	08.4	986.3	5.00	0.04	0.05	-1000.00	-1000.00
10/03/2008	01:40	25.4	182	32.3	07.8	08.4	986.1	5.00	0.04	0.04	-1000.00	-1000.00
10/03/2008	01:45	26.4	180	38.5	07.8	08.4	985.8	5.00	0.04	0.04	-1000.00	-1000.00
10/03/2008	01 50	26.1	184	34.0	07.7	08.4	985.5	5.00	0.05	0.05	-1000.00	-1000.00
10/03/2008	01 55	26.9	183	37.1	07.8	08.4	985.2	5.01	0.04	0.05	-1000.00	-1000.00
10/03/2008	02 00	27.6	185	36.0	07.7	08.4	985.1	5.01	0.04	0.04	-1000.00	-1000.00
10/03/2008	02 05	28.0	182	35.4	07.7	08.4	984.7	5.01	0.05	0.05	-1000.00	-1000.00
10/03/2008	02:10	25.4	183	33.0	07.7	08.4	984.3	5.01	0.04	0.05	-1000.00	-1000.00
10/03/2008	02:15	29.4	180	38.1	07.6	08.4	983.9	5.01	0.04	0.04	-1000.00	-1000.00
10/03/2008	02 20	30.0	182	40.4	07.6	08.3	983.5	5.02	0.05	0.05	-1000.00	-1000.00
10/03/2008	02 25	28.1	179	41.1	07.6	08.3	983.4	5.02	0.05	0.05	-1000.00	-1000.00
10/03/2008	02 30	27.0	179	41.1	07.5	08.3	983.5	5.01	0.05	0.06	-1000.00	-1000.00
10/03/2008	02 35	29.3	178	40.9	07.4	08.3	982.7	5.00	0.05	0.05	-1000.00	-1000.00
10/03/2008	02:40	27.9	179	36.6	07.4	08.3	982.6	4.99	0.05	0.06	-1000.00	-1000.00
10/03/2008	02:45	29.2	176	37.4	07.4	08.3	982.1	4.97	0.04	0.05	-1000.00	-1000.00
10/03/2008	02 50	27.6	176	35.4	07.3	08.3	982.1	4.94	0.05	0.06	-1000.00	-1000.00
10/03/2008	02 55	27.9	176	36.1	07.3	08.3	981.7	4.91	0.06	0.06	-1000.00	-1000.00
10/03/2008	03 00	28.8	176	35.8	07.2	08.3	981.5	4.86	0.05	0.06	-1000.00	-1000.00
10/03/2008	04 00	33.8	169	42.5	07.3	08.3	976.9	3.66	0.08	0.09	-1000.00	-1000.00
10/03/2008	04 05	32.1	170	44.3	07.3	08.3	976.4	3.51	0.08	0.08	-1000.00	-1000.00
10/03/2008	04:10	32.5	172	44.4	07.4	08.3	976.2	3.37	0.08	0.09	-1000.00	-1000.00
10/03/2008	04:15	31.2	172	43.8	07.3	08.3	976.2	3.23	0.08	0.09	-1000.00	-1000.00
10/03/2008	04 20	33.3	173	48.7	07.3	08.3	975.9	3.08	0.08	0.09	-1000.00	-1000.00
10/03/2008	04 25	33.4	173	46.1	07.3	08.3	975.1	2.94	0.08	0.08	-1000.00	-1000.00
10/03/2008	04 30	33.6	173	43.0	07.3	08.3	974.9	2.81	0.07	0.09	-1000.00	-1000.00
10/03/2008	04 35	32.2	171	41.1	07.4	08.3	974.5	2.69	0.09	0.09	-1000.00	-1000.00
10/03/2008	04:40	33.9	172	44.8	07.2	08.3	974.5	2.56	0.08	0.09	-1000.00	-1000.00
10/03/2008	04:45	34.3	172	44.8	07.4	08.3	974.0	2.48	0.09	0.09	-1000.00	-1000.00
10/03/2008	04 50	32.4	170	45.6	07.4	08.3	973.3	2.37	0.09	0.09	-1000.00	-1000.00
10/03/2008	04 55	31.7	171	47.0	07.4	08.3	973.2	2.25	0.09	0.10	-1000.00	-1000.00
10/03/2008	05 00	36.9	172	45.3	07.5	08.3	972.6	2.16	0.10	0.10	-1000.00	-1000.00
10/03/2008	05 05	35.3	174	48.7	07.4	08.3	972.7	2.08	0.09	0.10	-1000.00	-1000.00
10/03/2008	05:10	36.0	174	48.7	07.3	08.3	972.3	2.02	0.09	0.09	-1000.00	-1000.00
10/03/2008	05:15	36.6	173	47.5	07.3	08.3	971.7	1.93	0.10	0.10	-1000.00	-1000.00
10/03/2008	05 20	37.3	176	49.8	07.2	08.3	971.5	1.87	0.10	0.10	-1000.00	-1000.00
10/03/2008	05 25	41.6	174	55.6	07.0	08.3	970.4	1.81	0.12	0.14	-1000.00	-1000.00
10/03/2008	05 30	39.1	175	51.9	06.9	08.3	970.7	1.77	0.12	0.13	-1000.00	-1000.00
10/03/2008	05 35	40.1	174	48.8	06.8	08.3	970.8	1.73	0.12	0.12	-1000.00	-1000.00
10/03/2008	05:40	40.6	174	48.8	07.0	08.3	970.5	1.71	0.12	0.14	-1000.00	-1000.00
10/03/2008	05:45	40.8	175	48.2	07.0	08.3	970.1	1.70	0.11	0.13	-1000.00	-1000.00
10/03/2008	05 50	39.0	175	48.2	07.0	08.3	969.9	1.70	0.11	0.12	-1000.00	-1000.00
10/03/2008	05 55	40.8	177	57.0	07.3	08.3	968.9	1.71	0.11	0.12	-1000.00	-1000.00
10/03/2008	06 00	37.8	178	47.9	07.4	08.3	969.2	1.71	0.10	0.10	-1000.00	-1000.00
10/03/2008	06 05	40.2	178	47.9	07.3	08.3	969.3	1.73	0.10	0.11	-1000.00	-1000.00
10/03/2008	06:10	38.3	176	49.8	07.5	08.3	969.0	1.77	0.11	0.12	-1000.00	-1000.00

IACS Requirements concerning mooring, anchoring and towing

A1 Equipment

(1981)
(Rev. 1
1987)
(Rev. 2
1992)
(Rev. 3
1994)
(Rev. 4
Aug.
1999)
(Rev. 5
June
2005)

A1.1 Design of the anchoring equipment (1981)

A1.1.1 The anchoring equipment required herewith is intended for temporary mooring of a vessel within a harbour or sheltered area when the vessel is awaiting berth, tide, etc.

A1.1.2 The equipment is therefore not designed to hold a ship off fully exposed coasts in rough weather or to stop a ship which is moving or drifting. In this condition the loads on the anchoring equipment increase to such a degree that its components may be damaged or lost owing to the high energy forces generated, particularly in large ships.

A1.1.3 The anchoring equipment presently required herewith is designed to hold a ship in good holding ground in conditions such as to avoid dragging of the anchor. In poor holding ground the holding power of the anchors will be significantly reduced.

A1.1.4 The Equipment Numeral (EN) formula for anchoring equipment required hereunder is based on an assumed current speed of 2.5 m/sec, wind speed of 25 m/sec and a scope of chain cable between 6 and 10, the scope being the ratio between length of chain paid out and water depth.

A1.1.5 It is assumed that under normal circumstances a ship will use only one bow anchor and chain cable at a time.

A1.1.6 Manufacture of anchors and anchor chain cables is to be in accordance with UR W29 and UR W18.

A1.2 Equipment number and anchoring equipment table (for vessels of unrestricted service) (1981) (1999)

The equipment of anchors and chain cables is to be as given in Table 1 and is to be based on an "Equipment Number" calculated as follows:

$$EN = \Delta^{2/3} + 2,0 hB + \frac{A}{10}$$

Where:

Δ = moulded displacements, in tonnes, to the Summer Load Waterline

B = moulded breadth, in metres

h = effective height, in metres, from the Summer Load Waterline to the top of the uppermost house; for the lowest tier " h " is to be measured at centerline from the upper deck or from a notional deck line where there is local discontinuity in the upper deck.

$$h = a + \sum h_i$$

Where:

a = distance, in metres, from the Summer Load Waterline amidships to the upper deck

h_i = height, in metres, on the centerline of each tier of houses having a breadth greater than $B/4$

Note:

Rev.5 of this UR is to be uniformly implemented by IACS Societies on anchors and anchor chain cables the manufacturing of which is commenced on or after 1 January 2007.

Admiralty Manual of Navigation, Volume 1 - Extract
(Crown Copyright)

ANCHORING

SECTION 1 - ANCHORING A SINGLE SHIP

1410. Selection of Anchor Berth

In many ports or harbours, the shore or local harbour authority allocates anchor berths. However, there are numerous occasions when the NO is called on to select and pilot the ship to a suitable berth, particularly in out-of-the-way places visited by RN warships and RFAs.

a. **Choosing a Position in which to Anchor.** A number of factors have to be considered when choosing a position in which to anchor. The choice is governed very largely by matters of safety, but administrative or operational factors may also have to be taken into account. These factors are:

- The depth of water and the navigational difficulty involved.
- The length and draught of the vessel.
- The 'minimum' *Limiting Danger Line (LDL)* and (tidal) *Range*.
- The amount of cable available.
- The type of holding ground.
- The proximity of dangers (eg shoal waters, rocks, underwater cables / obstructions etc).
- The *Scale* of the chart.
- The strength and direction of the *Tidal Stream*.
- The strength and direction of the prevailing or forecast wind.
- The shelter from the weather given by the surrounding land.
- The proximity of adjacent ships at anchor.
- The proximity of landing places.

(1410) b. **The ‘Minimum’ LDL.** There must be an adequate depth of water under the vessel at all times. If the stay is to last for more than a few hours, this safe depth must be available at all stages of the *Tide*. Before selecting the anchor position and the tracks to it, the ‘minimum’ *LDL* must, therefore, be drawn for the anchorage area, taking into account the lowest *Height of Tide (HOT)* during the stay (see Fig 14-1 and Example 14-1 below). The *Underkeel Clearance* necessary should be decided using the criteria at Para 1213 with particular attention to the following considerations:

- The reliability of the bathymetric data.
- The accuracy of *HOT* predictions.
- Validation of the vessel’s draught (especially for variable draught vessels).
- The nature of the seabed.
- Proximity to adjacent hazards / shoal dangers.
- Any *Scend* or *Swell* in the anchorage.

Example 14-1. What is the ‘minimum’ *LDL* for a ship of draught 7.1m with a minimum *Underkeel Clearance* of 2.0m and a minimum *HOT* during the stay of 1.7m?

$$\text{‘Minimum’ LDL} = 7.1\text{m} + 2.0\text{m} - 1.7\text{m} = 7.4\text{m}$$

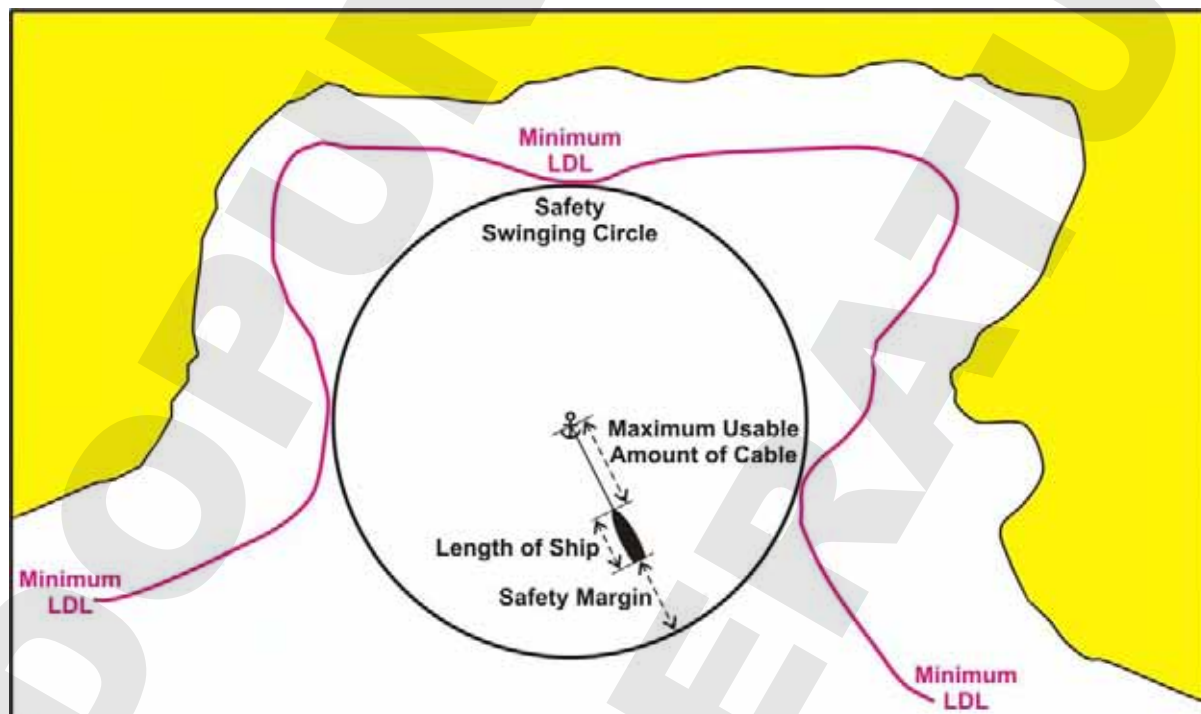


Fig 14-1. Minimum LDL and the Safety Swinging Circle

c. **Swinging Room when at Anchor.** A vessel at anchor must have room to swing clear of all dangers.

- **Charted Dangers.** To be safe from charted dangers, an anchorage must be chosen so that the *Safety Swinging Circle* (see details at Para 1410d opposite) is clear of the ‘minimum’ *LDL* (see Fig 14-1 and Example 14-1 above).
- **Ships.** The anchorage position must also provide room to swing clear of adjacent ships at anchor that are also swinging (see details at Para 1412).

(1410) d. **Charted Dangers - The Safety Swinging Circle.** The radius of the *Safety Swinging Circle* (see Fig 14-1 opposite and Example 14-2 below) is **independent of Minimum Swing Radii (Para 1412)** and may be obtained as follows:

- **Maximum Usable Cable.** Add the maximum usable amount of cable which can be veered on the selected anchor (the last shackle of cable will normally be inboard of the hawse pipe). This allows for additional cable to be veered if the weather deteriorates, while still maintaining an adequate safety margin.
- **Length of Vessel.** Add the length of the vessel.
- **Safety Margin.** Add a safety margin. The safety margin will vary with circumstances but as a starting point for single anchor, it is usual to allow at least one cable (0.1 *n.mile*), increased as necessary, to allow for:
 - ▶ **Navigational Inaccuracy.** The possibility that the ship may not 'Let Go' exactly in its intended anchoring position.
 - ▶ **Time Inaccuracy.** There is a time interval between 'Let Go' and the anchor hitting the bottom (usually only relevant if veering cable in deep water). An anchor should take about 3 seconds to reach the bottom in 30m of water (eg If the time from 'Let Go' to the anchor hitting the ground is 6 seconds, a ship moving at 2 kn will move 6m in that time).
 - ▶ **Holding Inaccuracy.** The anchor may drag before digging-in and holding, due to the nature of the sea bed.
 - ▶ **Dragging.** The factors at Para 1410g (below) may increase the likelihood of dragging. A fouled anchor may also result in dragging.

Example 14-2. What is the *Safety Swinging Circle* radius for a ship of length 155m, with 10 shackles (275m) of usable cable and a 1½ cable (275m) margin of safety?

Safety Swinging Circle radius 155m + 275m + 275m 705m (or 770yds, 3.85 cables).

e. **Reduced Safety Margin.** Rigid application of the considerations at Para 1410d (above) would preclude some anchorages which would be quite safe in benign weather conditions or for a short duration. In such circumstances, it may be appropriate to accept a smaller margin of safety, consistent with prudence.

f. **Anchorage of Varying Navigational Difficulty.** Anchoring by day in perfect visibility using a large-*Scale* chart in a flat calm with a conspicuous *Headmark* and *Beam Marks* should not present any great difficulty even to an inexperienced officer. The possibility that the ship may not achieve its intended position is slight. But achieving the planned anchorage position on a small-*Scale* chart, at night, in a gale, with difficult marks when the final run-in is only 1 or 2 cables, is an entirely different matter. These factors must all be taken into account when choosing a position in which to anchor.

g. **Dragging.** The likelihood of dragging the anchor is dependent on:

- **Weather.** The prevailing wind strength and direction.
- **Shelter.** Whether the anchorage is open or sheltered.
- **Tidal Stream.** The strength and direction of the *Tidal Stream*.
- **Sea Bed.** The nature of the sea bed.
- **Anchor.** The holding power of the anchor and amount of cable veered.

1411. Amount of Cable to be Used and Holding Power of Anchors

The amount of cable to be used (as opposed to the amount available) depends on a number of factors, including the type of cable and anchor, the windage of the vessel, the holding ground, and the strength and direction of the wind and *Tidal Stream*. The majority of RN warships are fitted with forged steel cable and one or two 'AC 14' anchors, although mine-clearance vessels are usually fitted with aluminium silicon bronze anchors and cable.

- a. **Forged Steel Cables.** Assuming the maximum *HOT* expected during the time the vessel is at anchor, the amount of forged steel cable required for various depths (**based on a fine-hulled vessel in calm conditions experiencing up to 5 kn of *Tidal Stream* or *Current*** - but see Para 1411c below) may be calculated by the following approximate formulae, which allow a slight safety margin over the actual minimum necessary. **In strong winds or in very strong *Tidal Streams*, more cable will usually be required.**

$$\text{Amount of cable required (in shackles)} = 1 \frac{1}{2} \sqrt{\text{depth (in metres)}} \quad \dots 14.1$$

$$\text{Or,} = 2 \sqrt{\text{depth (in fathoms)}} \quad \dots 14.2$$

- b. **Aluminium Bronze Cables.** For the heavier aluminium bronze cable, which requires less cable for the depth of water, the equivalent approximate formulae are:

$$\text{Amount of cable required (in shackles)} = \sqrt{\text{depth (in metres)}} \quad \dots 14.3$$

$$\text{Or,} = \sqrt{1.3 \text{ depth (in fathoms)}} \quad \dots 14.4$$


- c. **Safety Factor.** Comparative analysis indicates that when employing formulae (14.1 / 14.2 / 14.3 / 14.4), the cable length could be reduced by 60% and still be effective in holding the vessel at anchor in 15-20 knots of wind with *Tidal Stream* / *Current* at less than 2 kn. Thereafter the safety margin reduces rapidly.

- d. **AC 14 Anchors - Holding Power.** In good holding ground such as clay, soft chalk, sand, sand and shingle, the holding power of the 'AC 14' anchor is approximately 10 times its own weight. In very good holding ground such as a mixture of sand, shingle and clay or very heavy mud, the holding power may be as much as 12½ times. In poor ground such as soft silty mud or shingle and shell, holding power may be as little as 6 times. Rock, coral and weed are particularly bad types of holding ground.

- e. **Holding Parameters.** The ideal anchorage situation is to have an anchor well bedded into the bottom with a length of cable lying flat on the sea-bed providing a horizontal pull on the anchor, thus bedding it in even deeper. Provided the combined holding power of this combination exceeds the load imparted by the combined effects of *Tidal Stream* / *Current* on the hullform and wind on the hull / superstructure, the vessel should not drag. The cable nearest the ship also provides a catenary that damps out movement of the ship. The usual result is that the cable near the anchor lies flat on the sea-bed and thus prevents the anchor stock being twisted or lifted, either of which will cause it to break out and drag. Thus there should be a length of cable nearest to the anchor that hardly moves and the vessel will swing about that static part of the cable.

- (1411) f. **Movement of the Cable.** If a vessel at anchor experiences a 180° change in *Tidal Stream / Current*, or of the wind predominates over *Tidal Stream / Current* and changes direction markedly, the cable will be moved across the seabed and will probably slowly reposition the anchor; it is at this stage, particularly if the *Tidal Stream / Current* or wind are strong, some dragging may occur before the anchor beds in again. Thus, when anchored for prolonged periods, during a swing or significant change of prevailing conditions, the safety limits and state of the cable should be monitored very closely.

Veritas Safety of Navigation Policy and Anchoring Procedures

		Rederi AB Veritas Tankers	
Safe Management System (ISM)			
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10	
Chapter: SHORE MANAGEMENT BRIDGE STANDING ORDERS			Page: 2.20.1 (6)
Approved by: Ove Johnsson			


SHORE MANAGEMENT BRIDGE STANDING ORDERS

It is the policy of Red AB Veritas Tankers AB to navigate its ships in the safest manner possible and to give priority to safe navigation before speed and economic considerations and *the safety of life and the safety of the ship take precedence over all other considerations.*

Adequate navigation equipment and suitable training is provided to ensure the fulfilment of this policy.

International and local rules of navigation shall be complied.

While the Master bears the ultimate responsibility, the safety of navigation policy requires all officers and crew members to prevent situations arising, which may endanger those onboard, the ship, her cargo, or the environment.

		Rederi AB Veritas Tankers	
Safe Management System (ISM)			
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10	
Chapter: SHORE MANAGEMENT BRIDGE STANDING ORDERS			Page: 2.20.2 (6)
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SHORE MANAGEMENT BRIDGE STANDING ORDERS

1. The Watch Officer is on no account to leave the Navigating Bridge when the ship is underway, unless properly relieved by the Master or another certified Deck Officer. **A pro-per bridge watch shall be maintained by a certified Deck Officer when the ship is at anchor.**
2. The Officer taking over the watch must not be under the influence of alcohol or drugs and must be fully alert.

PRIOR TO TAKING OVER THE WATCH THE RELIEVING OFFICER MUST FAMILIARISE HIMSELF WITH THE FOLLOWING:

- 1) the orders of the master, as detailed in the Passage Plan or in the Bridge Night Order Book. (The Master’s orders should be signed when read and understood. Should there be any doubt as to the requirements of the orders, clarification should be obtained from the Master.)
- 2) the present geographic position, course, speed and draught
- 3) the general weather forecast, wind and tidal conditions
- 4) the operational status of all aids of navigation and manoeuvring system in use
- 5) the traffic situation, location of other ships, their characteristics, course and speed and/or navigation marks in the vicinity of the ship.

Only when the Officer is satisfied that all the above requirements have been complied with, is he/she to take over the Navigation Watch.

		Rederi AB Veritas Tankers	
Safe Management System (ISM)			
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10	
Chapter: SHORE MANAGEMENT BRIDGE STANDING ORDERS			Page: 2.20.3 (6)
Approved by: Ove Johnsson			

3. The change of watch is not to take place when the ship is, or is about to be, engaged in a collision, avoidance manoeuvre or a navigational alteration of course.


THE OFFICER TO BE RELIEVED SHALL NOT HAND OVER THE NAVIGATION WATCH UNTIL HE/SHE IS SATISFIED THAT THE RELIEVING OFFICER IS:

- 1) not under the influence of alcohol or drugs.
- 2) fully alert and vision has adjusted to the prevailing conditions.
- 3) aware of the present geographic position, course, speed and draught
- 4) aware of the general weather forecast, wind and tidal conditions
- 5) aware of the operational status of all aids of navigation and manoeuvring system in use
- 6) aware of the traffic situation, location of other ships, their characteristics, course and speed and/or navigation marks in the vicinity of the ship.

Only when he/she is satisfied with all the above items, is the watch to be handed over.

4. The ship is at all times to be navigated in compliance with the “International Regulations for Preventing Collisions at Sea” and any local Regulations relating to navigation, which may be in force. Any actions taken should be positioned and taken in sufficient time. The Watch Officer must not leave other ships in doubt as to his/her intentions.
5. The position of the ship when underway shall be frequently verified. Whenever possible and appropriate at least two different methods should be used to fix the position. When in sight of land or charted navigation marks, use should be made of visual bearings in addition to the use of other Aids to Navigation.

Any discrepancy in the ship’s position or speed between position determination shall be brought to the immediate attention of the Master.

 <div style="text-align: center;"> Rederi AB Veritas Tankers Safe Management System (ISM) </div>		
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10
Chapter: SHORE MANAGEMENT BRIDGE STANDING ORDERS		Page: 2.20.4 (6)
Approved by: Ove Johnsson		

6. The ship's position shall be fixed at the time of anchoring and checked frequently thereafter. The swinging circle of the ship is to be charted, centred on the position of the anchor. Particular attention is to be paid to the ship's movements during the change of tidal direction and changes in weather conditions. The Master is to be informed immediately if there is any suspicion that the ship is dragging anchor or if the charted positions falls outside the charted swinging circle.

7. Unless otherwise stated, the course to steer will be given as a Gyro Course. A frequent check is to be maintained on the corresponding course by Standard Compass.

 The Gyro steering repeater shall be checked against the Master Gyro at the commencement of each watch. The remaining Gyro Repeaters will then be checked against the Gyro steering repeater.

 Checks at frequent intervals are to be made throughout the watch between the Gyro steering repeater and the Standard Compass.

 Whenever conditions permit, the errors on the Standard Compass and Gyro Compass shall be ascertained each watch..

 If more than one course is steered, then an error for each course shall be determined.


 Details of all compass errors shall be entered in a Compass Observation Book.

8. The Gyro Off-Course alarm is to be used at all times the ship is underway and steady on a course.

9. The Officer of the Watch will observe the course and distance as laid down in the Voyage Plan or otherwise approved by the Master. This should not prevent the Officer of the Watch from taking action under the "international Regulations for Preventing Collisions at Sea" or of taking action necessary to avoid casualty to the ship or its crew.

 The Master is to be informed immediately if any deviation from the Passage Plan should become necessary.

10. Over reliance must not be placed on the automatic steering. Although the automatic pilot may under many circumstances be the most accurate means of keeping course, a qualified helmsman must be available on the bridge whenever the ship is in restricted waters. At no time should the Officer of the Watch, be without assistance and required to steer, when such actions may lead to a break in the continuity of the lookout from the ship.


 <div style="text-align: center;"> <h2>Rederi AB Veritas Tankers</h2> <h3>Safe Management System (ISM)</h3> </div>		
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10
Chapter: SHORE MANAGEMENT BRIDGE STANDING ORDERS		Page: 2.20.5 (6)
Approved by: Ove Johnsson		

11. If fog or other conditions of restricted visibility occur or are suspected, all radars must be brought into operation and the ship's speed adjusted to that of a safe speed. The Bridge is to be manned in accordance with the requirements. Full plotting of radar targets is to be carried out.
12. The Officer of the Watch must maintain a proper lookout at all times. This implies anticipation of any possible danger and the taking of appropriate action to avoid a dangerous situation developing. The Officer of the Watch should not place undue reliance on any Aid to Navigation over the need to keep a good lookout by sight and hearing.
13. When a watchman is posted as an additional lookout to the Officer of the Watch he/she shall not be called upon to carry out any other duty which may interfere with the keeping of a proper look-out.


During periods when it is not necessary for a watchman to be positioned on the Bridge and keeping a look-out, he/she should be on immediate call.
14. The Master is to be advised immediately of all equipment failures, which may be relevant to the safety of personnel, ship or cargo.
15. Full use is to be made of the Echo Sounder or other Aids to Navigation, which may determine the depth of water. When it is practical to do so, a check should be maintained on the depth of water when navigating in coastal waters. Full use should be made of any depth alarm facility (if fitted).
16. At those times when the Master takes over the command of the ship, he/she shall clearly indicate this fact to the Officer of the Watch.

Until this procedure has been completed, the Officer of the Watch is to continue to carry out his duties as if the Master were not present.

When the Master takes command, the Officer of the Watch should continue to carry out the duties, or as required by the Master.
17. The Master and all Officers of the Watch are to familiarise themselves with all local regulations and the nautical advice contained in the relevant Sailing Directions and other nautical publications carried onboard.


		Rederi AB Veritas Tankers Safe Management System (ISM)	
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10	
Chapter: SHORE MANAGEMENT BRIDGE STANDING ORDERS			Page:
Approved by: Ove Johnsson			2.20.6 (6)

18. The presence of a pilot on the Bridge as an advisory capacity in no way reduces the responsibilities of the Master or Officer of the Watch in ensuring the ship is navigated in a safe manner.
19. Officers of the Watch are to be familiar and comply with their duties as defined in other sections of this Manual or as required by the Master.
20. Where the Master may on occasions act as the Officer of the Watch he/she shall comply with all the requirements of the Officer of the Watch. The Master must summon an additional certified Deck Officer to the Bridge to assist in navigating the ship when required.
21. Persons not directly concerned with the immediate navigation of the ship shall not be permitted on the Navigating Bridge without the permission of the Officer of the Watch.
22. These Standing Orders may not be amended without authority from Shore Management. The Master shall also issue his own Standing Orders in addition to the Shore Management Standing Orders.
23. Nothing in these Standing Orders shall be construed as relieving the Master or any Officer or Rating of his/her responsibilities, as defined by law or governmental regulations, or from the exercise of sound judgement. The prime consideration in the minds of all must be the safety of life and the protection of the environment and property.
24. Deck Officers shall sign the copy of any additional Standing Order issued by the Master, contained in the "Night Order Book" prior to standing his/her first sea watch signifying that he/she has read them and understands their meaning.


	Rederi AB Veritas Tankers Safe Management System (ISM)	
Revision No: 1	Replacement for revision No: 0	Valid from: 2007-11-20
Chapter: ANCHORING		Page: 4.6.1 (2)
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ANCHORING

1. The Master chooses suitable anchorage. At choice of anchorage consideration should be given to water depth, sea bed, wind stream and other ships in the area. If possible check with pilots.
2. Complete SMS 7.36 Anchoring checklist
3. Notify the engineroom about the anchoring.
4. The Master takes over the manoeuvring of the ship in good time before anchoring. The Officer is informed about which anchor shall be used and how many shackles he shall let go.
5. Reduce speed in good time before anchoring.
6. Start the echo sounder.
7. The AB releases both anchors and prepares lowering of the anchor which shall be used.
8. The Officer and the AB are ordered to the Forecastle to be stand-by for anchoring. Check that contact with walkie-talkie is working between Forecastle and Bridge.
9. Lower the anchor upon order from the bridge. (Usually via UHF)
10. When the agreed number of shackles are out and the chain is first tightened and then slackened, the Officer informs the Master over walkie talkie.
11. The Master checks the position of the anchorage with radar, GPS or other means of position fixing. The position is entered onto the chart.
12. Brake and secure the anchor.
13. Switch on anchor light and deck light. During daytime an anchor sign is raised.

	Rederi AB Veritas Tankers Safe Management System (ISM)		
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10	
Chapter: ANCHORING			Page: 4.6.2 (2)
Approved by: Ove Johnsson			

14. Switch off navigation lights.
14. Control the input in the AIS equipment.
15. Notify “finish with engine” with the engine telegraph.
16. The routine according to SMS 4.10 Watch keeping at anchor applies.

	<div>Rederi AB Veritas Tankers</div> <div>Safe Management System (ISM)</div>	
Revision No: 0	Replacement for revision No:	Valid from: 2007-04-10
Chapter: WATCH KEEPING AT ANCHOR		Page: 4.10.1 (1)
Approved by: Ove Johnsson		


WATCH KEEPING AT ANCHOR

1. The Master marks the position on the chart and makes a note in the Log book. (Positioning with optical cross bearings, radar, GPS, Decca navigator etc.)
2. The Master notifies Officer of the watch about ship's anchoring position.
3. Radar is adequately activated for position fixing and to detect dragging.
4. Anchor No 2 is prepared for lowering.
5. Officer of the watch checks the following:
 - position with more than one means of fixing method
 - anchor shapes and lights
 - movement of other anchored ships in relation to own ship
 - weather, sea and tide
 - VHF channel 16 and other channels for the actual traffic area and telex
6. Master's standing orders as well as chapter **At Anchor** in the Bridge Instructions issued by the Swedish Club shall be followed.
7. Fire rounds are done in accordance with routines at sea.

If the ship should start to drag:

1. Immediately notify Engineer on duty and Master.

Veritas Revised Procedures, implemented following the accident

	Rederi AB Veritas Tankers Safe Management System (ISM)		
Revision No: 0	Replacement for revision No:	Valid from: 2008-05-01	
Chapter: Guidance for anchoring or staying at anchor in heavy weather			Page: 5.4.1 (1)
Approved by: Ove Johnsson			

Vessel at anchor when heavy weather are expected

We strongly advice that you will leave any anchorage and go out to sea when heavy weather are expected, even if this will cost additional money for pilots etc it is preferred to stay at sea instead of at a anchorage in bad weather. When the vessel navigate out at sea is it important that you keep a good distance well clear of any shallow water or land during the heavy weather. The anchor shall preferably be hoisted before the bad weather starts as it always are difficult to hoist anchor during strong wind, current and heavy sea conditions. There is also a risk to damage winches etc when you hoist the anchor during bad weather.

When a vessel start to drift during bad weather at anchor, then the time factor for a quick response are very important. A vessel often drift with a speed of 3 knots or more which means that quick response is very important for saving the vessel for any immediate danger. Even with a quick response can the vessel face problem with taking up the anchor, which also can make it difficult to keep the vessel clear of any immediate danger. One possibility that you might use if you have problem getting up the anchor when the engine is running, is to release the anchor chain to avoid that the vessel will drift into any immediate danger. If there is time then it is preferable to attach a line with a buoy to the anchor chain, so that it can be recovered later. During strong wind, current and sea condition it is important that you use sufficient engine power to manoeuvre the vessel away from any immediate danger.

Vessel on the way to anchorage when heavy weather are expected

We strongly advice you to not drop the anchor if you expecting heavy weather. It is preferable to stay at sea instead of at anchorage in bad weather. When staying out at sea it is important that you keep a good distance well clear of any shallow water, land or any immediate danger during the heavy weather.

Vessel remaining at anchorage during heavy weather (not recommended)

If you remain at the anchorage during heavy weather it is important that you consider to declare the anchorage as unsafe and follow procedure in SMS 5.81

The OOW shall keep a constant watch and use all available means to check that the vessel not are dragging.

Above are guidance only and the final decision what to do is always decided by the Master of the vessel.



Rederi AB Veritas Tankers

Safe Management System (ISM)

Revision No: 0

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Valid from: 2008-04-14

Chapter: ENGINE WATCH AT UNSAFE ANCHORAGE

Page:

5.81.1 (1)

Approved by: Ove Johnsson

ENGINE WATCH AT UNSAFE ANCHORAGE

When a ship is at anchor on open sea or other place which is not protected, where the conditions are practically to be compared with those "at sea, or when the Master or OOW so request the Engineer on duty shall make sure that:

- effective watch is kept (Watch in engine room shall be kept)
- regular check is made of all propulsion- and stand-by machinery
- all fire-, safety- and surveillance systems are in good working order
- steps are taken and necessary regulations are followed to protect the environment from pollution from the ship.

Before anchoring, the bridge shall be contacted to receive information if the anchorage is considered as safe or unsafe, and which level of engine preparedness that shall be in force. Note the information from the bridge in the Engine logbook and the Engine Night order book. It shall be noted that a anchorage that previous was considered as safe, can be changed to unsafe if i.e. bad weather condition are expected. The Master or OOW are responsible to inform engine when the status are changed from Safe to Unsafe.


Below procedure shall be followed when a anchorage are considered as UNSAFE

A. Increased preparedness

1. Locate an engineer in the engine room
2. Keep ME running
3. Function test the telephone communication with the bridge

B. Normal preparedness – with possibility to start the ME quickly i.e. within two minute.

1. Stop ME. See SMS 8.22 Arrival in port
2. Keep the starting air to the ME open – air compressor on AUTO.
3. Keep the lub.oil- CPP- and gear pump running if possible to do so.
4. Keep the indicator cocks closed.
5. Blow engine once every second hour, to prevent water hammering in cylinders.
6. One engineer in the engine room all the time
7. Upon order to re-start, see applicable parts in SMS 8.21 Departure from Port.

		Rederi AB Veritas Tankers Safe Management System (ISM)	
Revision No: 1	Replacement for revision No: 0	Valid from: 2008-05-09	
Chapter: Master Navigational Review			Page: 7.124.1 (6)
Approved by: Ove Johnsson			

SHIP: M/T

DATE OF LAST REVIEW:

DATE OF PRESENT REVIEW:

Done by:

Master Navigational Review Instructions

The purpose of the Master Navigational Review is to carry out a general check on the procedures onboard the ship. The check list below has been produced to assist, and guide the in carrying out the review. In some cases due to Flag State regulations, certain questions will be N/A and should be indicated by an "F" in the N/A column. The remaining columns have been divided into, <25, <50, <75, 100. Therefore if you think a procedure is being carried out up to 50% of the time onboard, then please mark the column "<50" etc. **Procedures which are noted to be carried out <100% of the time should be commented on at the end of the checklist, and suggested corrective action in order to fully implement the procedure.** This review must be carried out at least twice a year as part of the Management Review.

In order to get a good overall view of the procedures onboard the reviews should be spaced as 6 month intervals as possible, but in such a way as to allow the sharing Masters to take part in one review every year.

Completed reviews (report and checklist with comments) should be then sent to DP.



Rederi AB Veritas Tankers

Safe Management System (ISM)

Revision No: 1	Replacement for revision No: 0	Valid from: 2008-05-09
Chapter: Master Navigational Review		Page: 7.124.2 (6)
Approved by: Ove Johnsson		

	Navigational Review	N/A	<25	<50	<75	<100
1	Has the present Master posted standing orders?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Have all the present bridge officers read and signed the Master's standing orders and company bridge standing order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Are the officers aware of when the Masters want to be called for bad visibility.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Are the bridge officer aware where to find requirements for U.K.C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Are the bridge office aware where to find that " <i>The safety of life and the safety of the ship take precedence over all other considerations</i> "	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Do the bridge officers understand the requirements of the Master's standing orders?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Is the bridge night order book appropriately used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Has a list of watch keepers and their work hours been posted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Is a passage plan available for the following?:					
a	Pilot to Berth & Berth Pilot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Pilot to Pilot.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Are the above completed for all ports?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Is a Squat calculation perform for all voyage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Are minimum under keel clearance noted in passage plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	When producing the passage plan, does the navigating officer indicate the following?					
a	Parallel indexing can be used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Danger areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Emergency anchorages.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	Go no Go areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	T&P notices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f	Reporting requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g	Max draft and air draft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h	Max speed due to squat if applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i	Navigational Warnings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Rederi AB Veritas Tankers

Safe Management System (ISM)

Revision No: 1

Replacement for revision No: 0

Valid from: 2008-05-09

Chapter: **Master Navigational Review**

Page:

7.124.3 (6)

Approved by: Ove Johnsson

	Navigational Review	N/A	<25	<50	<75	<100
14	Has the passage plan been done in accordance with company requirement?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Are all charts corrected until latest NTM received onboard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Are all publication corrected until Latest NTM received onboard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Is the passage plan verified signed by the Master and Nav.Off.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Are run charts updated with info about T&P notices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Are pre-arrival and pre-departure checks carried out at the appropriate times and signed in Log book?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Are steering gear tested before departure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	When arrival and departure tests are carried out, is the bridge and engine room staff working together?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Where appropriate, are UMS changeover done correct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Do the respective bridge watch keeping officers understanding the reporting requirements of the GMDSS?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Are all GMDSS test procedures carried out? Refer to instructions at the front of the GMDSS log and SMS procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Have position intervals been followed in accordance with the voyage plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Was hand steering tested during watch where the ship was manoeuvred by autopilot. Has it been noted in log book?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	Do the officer know where to find COLREG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Do the Officer in charge of emergency communication know how to operate the GMDSS equipments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Do the navigational officer know where to find all SMS procedures below, should be find in hard copy in SMS file	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a	Shore Management Bridge Standing Orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Quality of Navigational charts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Guidance for Voyage Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	Voyage Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	Correction of Charts and Publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Are position fixing times written in chart for each leg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	Are Sources for determine positions noted in the chart for each leg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	Are all Deck Officers aware where to find T&P notice, Navigational warnings for the charts, Check all officers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Rederi AB Veritas Tankers****Safe Management System (ISM)**

Revision No: 1

Replacement for revision No: 0

Valid from: 2008-05-09

Chapter: **Master Navigational Review**

Page:

7.124.4 (6)

Approved by: Ove Johnsson

	Navigational Review	N/A	<25	<50	<75	<100
33	Does the master issue a written statement at what wind force he want to be notified when the vessel are at anchor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	Is a swing circle marked in the chart during anchoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	Have it been noted in log book if anchorage are safe or unsafe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	Are the Master aware of SMS procedures for Safe / Unsafe anchorage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	Are the deck Officer aware of SMS procedures for Safe / Unsafe anchorage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	Are the engine Officer including Chief Engineer aware of SMS procedures for Safe / Unsafe anchorage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	Is there an written instruction beside each GPS how to switch on the anchor alarm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40	Are the Master aware of SMS 5.4 Guidance for anchoring or staying at anchor in heavy weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41	Are SMS 5.4 Posted at bridge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Rederi AB Veritas Tankers

Safe Management System (ISM)

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Page:

7.124.5 (6)

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COMMENTS



Rederi AB Veritas Tankers
Safe Management System (ISM)

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Chapter: **Master Navigational Review**

Page:

7.124.6 (6)

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OBJECTIVE & SCOPE:	THE REVIEW WAS CONDUCTED TO VERIFY COMPLIANCE WITH THE SHIP MANAGEMENT MANUAL AND OTHER SHIPBOARD PUBLICATIONS ASSIGNED TO THE VESSEL.
REVIEW TEAM:	
AUDITEES:	
SUMMARY OF REVIEW:	BELOW PLEASE COMMENT ON WHICH PROCEDURES YOU DO NOT CONSIDER ARE WORKING CORRECTLY <100%, AND WHAT YOU THINK SHOULD BE DONE TO CORRECT THE SITUATION. COMMENTS ON TRAINING AND HOW THE SYSTEM AFFECTS THE SHIP CAN ALSO BE MADE BELOW.
SUGGESTED CHANGE	
DISTRIBUTION LIST:	ORIGINAL: ONBOARD FILE (Internal Review); COPY TO DP OVE JOHNSSON
REVIEW TEAM SIGNATURES	
DP Verification	SIGNATURE DP OVE JOHNSSON

			Rederi AB Veritas Tankers Safe Management System (ISM)		
Revision No: 1		Replacement for revision No: 0		Valid from: 2008-05-09	
Chapter: Internal Navigational Review					Page:
					7.171.1 (6)
Approved by: Ove Johnsson					

SHIP: M/T

DATE OF LAST REVIEW:

DATE OF PRESENT REVIEW:

Done by:

Internal Review Instructions

The purpose of the Internal Navigational Review is to carry out a general check on the procedures onboard the ship. The check list below has been produced to assist, and guide the in carrying out the review. In some cases due to Flag State regulations, certain questions will be N/A and should be indicated by an "F" in the N/A column. The remaining columns have been divided into, <25, <50, <75, 100. Therefore if you think a procedure is being carried out up to 50% of the time onboard, then please mark the column "<50" etc. Procedures which are noted to be carried out <100% of the time should be commented on at the end of the checklist, and suggested corrective action in order to fully implement the procedure. This review must be carried out at least once year as part of the Management Review.

In order to get a good overall view of the procedures onboard the reviews should be spaced as max 12 month intervals as far as possible. This review shall preferably not be done in the same time as Internal review of SMS.

Completed reviews (report and checklist with comments) should be then sent to DP.



Rederi AB Veritas Tankers

Safe Management System (ISM)

Revision No: 1

Replacement for revision No: 0

Valid from: 2008-05-09

Chapter: Internal Navigational Review

Page:

7.171.2 (6)

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	Navigational Review	N/A	<25	<50	<75	<100
1	Has the present Master posted standing orders?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Have all the present bridge officers read and signed the Master's standing orders and company bridge standing order?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Are the officers aware of when the Masters want to be called for bad visibility.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Are the bridge officer aware where to find requirements for U.K.C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Are the bridge office aware where to find that <i>"The safety of life and the safety of the ship take precedence over all other considerations"</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Do the bridge officers understand the requirements of the Master's standing orders?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Is the bridge night order book appropriately used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Has a list of watch keepers and their work hours been posted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Is a passage plan available for the following?:					
a	Pilot to Berth & Berth Pilot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Pilot to Pilot.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Are the above completed for all ports?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Is a Squat calculation perform for all voyage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Are minimum under keel clearance noted in passage plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	When producing the passage plan, does the navigating officer indicate the following?					
a	Parallel indexing can be used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Danger areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Emergency anchorages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	Go no Go areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	T&P notices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f	Reporting requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g	Max draft and air draft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h	Max speed due to squat if applicable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i	Navigational Warnings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Rederi AB Veritas Tankers

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7.171.3 (6)

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	Navigational Review	N/A	<25	<50	<75	<100
14	Has the passage plan been done in accordance with company requirement.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Are all charts corrected until latest NTM received onboard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Are all publication corrected until Latest NTM received onboard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Is the passage plan verified signed by the Master and Nav.Off.?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Are run charts updated with info about T&P notices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Are pre-arrival and pre-departure checks carried out at the appropriate times and signed in Log book?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Are steering gear tested before departure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	When arrival and departure tests are carried out, is the bridge and engine room staff working together?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Where appropriate, are UMS changeover done correct	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Do the respective bridge watch keeping officers understanding the reporting requirements of the GMDSS?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Are all GMDSS test procedures carried out? Refer to instructions at the front of the GMDSS log and SMS procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Have position intervals been followed in accordance with the voyage plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	Was hand steering tested during watch where the ship was manoeuvred by autopilot. Has it been noted in log book?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	Do the officer know where to find COLREG	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	Do the Officer in charge of emergency communication know how to operate the GMDSS equipments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Do the navigational officer know where to find all SMS procedures below, should be find in hard copy in SMS file	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
a	Shore Management Bridge Standing Orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	Quality of Navigational charts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Guidance for Voyage Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d	Voyage Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e	Correction of Charts and Publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Are position fixing times written in chart for each leg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	Are Sources for determine positions noted in the chart for each leg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	Are all Deck Officers aware where to find T&P notice, Navigational warnings for the charts, Check all officers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Rederi AB Veritas Tankers
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Chapter: **Internal Navigational Review**

Page:

7.171.4 (6)

Approved by: Ove Johnsson

	Navigational Review	N/A	<25	<50	<75	<100
33	Does the master issue a written statement at what wind force he want to be notified when the vessel are at anchor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	Is a swing circle marked in the chart during anchoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	Have it been noted in log book if anchorage are safe or unsafe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	Are the Master aware of SMS procedures for Safe / Unsafe anchorage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	Are the deck Officer aware of SMS procedures for Safe / Unsafe anchorage.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	Are the engine Officer including Chief Engineer aware of SMS procedures for Safe / Unsafe anchorage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	Is there an written instruction beside each GPS how to switch on the anchor alarm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40	Are the Master aware of SMS 5.4 Guidance for anchoring or staying at anchor in heavy weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41	Are SMS 5.4 Posted at bridge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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7.171.5 (6)

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COMMENTS



Rederi AB Veritas Tankers
Safe Management System (ISM)

Revision No: 0	Replacement for revision No:	Valid from: 2008-05-09
Chapter: Internal Navigational Review		Page: 7.171.6 (6)
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OBJECTIVE & SCOPE:	THE REVIEW WAS CONDUCTED TO VERIFY COMPLIANCE WITH THE SHIP MANAGEMENT MANUAL AND OTHER SHIPBOARD PUBLICATIONS ASSIGNED TO THE VESSEL.
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MAIB Safety Flyer

FLYER TO THE SHIPPING INDUSTRY

Grounding of the product tanker *ASTRAL*, after dragging anchor off the Isle of Wight, England, on 10 March 2008



Astral

Narrative

On 10 March 2008, the Swedish registered tanker *Astral* dragged her anchor in Storm Force 10 winds and grounded on the Princessa Shoal, east of the Isle of Wight. The vessel sustained indentations to her hull and extensive damage to her rudder and steering gear; there was no pollution and the vessel remained watertight.

Astral had anchored at the Nab Anchorage, 0.9 mile south of the Princessa Shoal, on 7 March 2008 to await a berth at Fawley Marine Terminal to discharge a cargo of diesel oil. On 9 March increasingly severe weather forecasts were received predicting gale force winds from the south. Later that evening the duty Vessel Traffic Services officer advised all the vessels at anchor of the weather forecast and recommended that their engines should be available if required.

During the early morning of 10 March, the weather deteriorated as the wind increased to southerly Force 10. At 0650 *Astral* started to drag anchor to the north. The officer of the watch alerted the master at 0710 and requested the main engine, which was on 10 minutes notice, be started. The engine was available for use at 0721 and the master applied power ahead. However, the vessel continued to drag northwards and grounded on the Princessa Shoal at 0725.

The MAIB database shows that since 1992 there have been 21 accidents in United Kingdom territorial waters involving merchant vessels of over 500 gross tons dragging their anchor and subsequently grounding. Weather conditions contributed to 19 of these accidents, the anchoring position was relevant to 16, and in 7 cases the engines were not ready when needed.

Safety Lessons

The MAIB continues to see examples of vessels grounding, having dragged their anchors in heavy weather because the masters, in general, have:

- Not planned the anchorage sufficiently.
- Not ensured that the anchor position is obtained on anchoring, and the bridge and safety swinging circles have been plotted.
- Not instigated an effective anchor watch which ensures the vessel's position is frequently and effectively checked.
- Not ensured main engine readiness is appropriate to the circumstances.
- Following warnings and forecasts of adverse weather, not reviewed their precautions and taken further steps as necessary.
- Remained at anchor off lee shores or in the vicinity of hazards in conditions exceeding, or forecast to exceed, the limitations of their anchor equipment and their ability to get underway safely.

To try and prevent such accidents occurring in the future, **Owners and operators** are strongly advised to review their SMS procedures for anchoring to ensure they address the above safety issues and, specifically:

1. That masters have clear guidance on the capability of their vessel's anchoring system, including the:
 - Holding power of the anchor in various bottom types.
 - Strength of the anchor system components, including that of the windlass.
 - Effect of windage and yaw in various loading conditions.
2. The hazards to personnel working on the foc'stle or cable deck in adverse weather.
3. That although an anchorage might have been allocated by a harbour or VTS authority, the safety of the vessel and decision to sail remains the master's responsibility.
4. And, most importantly, that masters should not hesitate to get underway or to seek a more sheltered anchorage should the forecast or actual weather and sea conditions warrant it.

Further details on the accident and the subsequent investigation can be found in the MAIB's investigation report, which is posted on its website:

www.maib.gov.uk

Alternatively, a copy of the report will be sent on request, free of charge.

Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton, SO15 2DZ
Telephone 023 8039 5500

Email: maib@dft.gsi.gov.uk

January 2009