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**Oppama Spirit alongside at Gove**



# Summary

On 12 May 1993, the fully laden, 81,248 tonnes deadweight Bahamas flag tanker Oppama Spirit grounded at Gove, Northern Territory. The ship had been manoeuvring to go alongside the berth, when it experienced a total power loss as a result of the seawater cooling system becoming blocked. While under tow to the anchorage, the ship took a sheer and grounded forward.

The ship was pulled clear by one of the tugs after less than one hour, and towed to the anchorage without further mishap.

No damage was sustained by the ship and no oil pollution occurred as a result of the grounding.

The incident was investigated by the local AMSA marine surveyor, resident in Darwin, on behalf of the Marine Incident Investigation Unit.

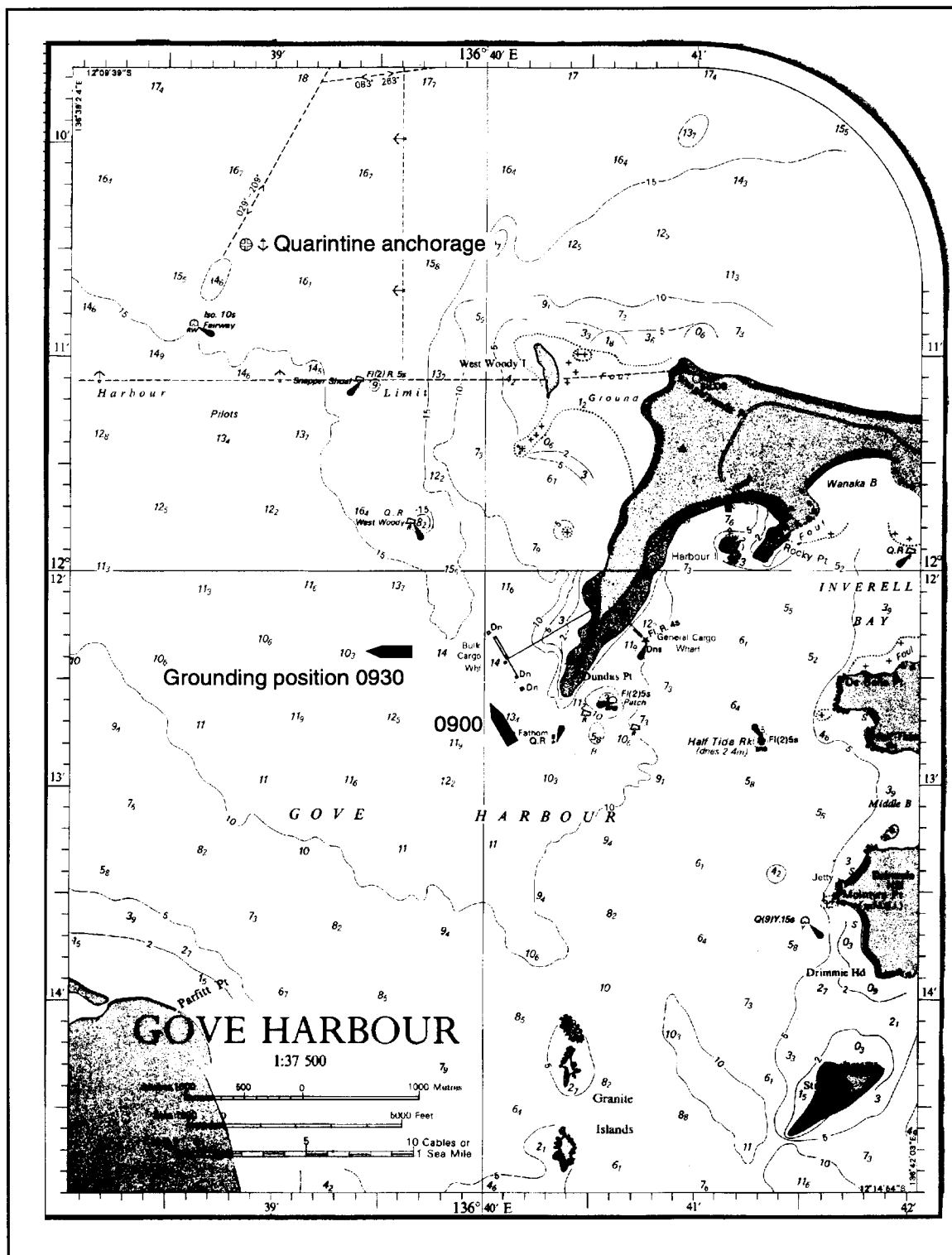
# Information sources

Master and Chief Engineer of  
Oppama Spirit.

Harbour Master, Gove.

## **Acknowledgment:**

Portions of charts Aus 411 and  
Aus 715 are reproduced by the  
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Office, RAN.



**Plan of Gove Harbour part of chart Aus 715  
showing position of grounding**

# Sequence of events

The 81,248 tonnes deadweight, Bahamas flag tanker Oppama Spirit arrived off the port of Gove, Northern Territory, in the early hours of 12 May 1993, to discharge a cargo of 78658 tonnes of fuel oil, that had been loaded at Mina Abdulla, Kuwait. In accordance with standard practice, the Master advised the Chief Engineer that the anchorage and port approaches were in shallow water, and during the final approach the engineers changed over from the low to the high sea-water cooling suction.

Berthing at Gove is restricted to daylight hours and Oppama Spirit was brought to anchor, in the Quarantine Anchorage off the sea buoy, at 0130, to await daylight and the pilot.

The ship's draught was calculated by the Chief Officer as being 12.69m forward and 12.72m aft.

The engine and steering gear were tested at 0700, preparatory to getting under way for berthing. The pilot boarded at 0730, the anchor was aweigh at 0736 and the ship proceeded inwards to the berth. The morning was cloudy but fine, with good visibility, the wind force two from the north-north-

east. The tide was flooding at 3 knots from the north.

The distance to the berth was two miles and the Pilot took the ship in with the engine on slow ahead. Speed was reduced to dead slow ahead at 0802 and the tugs were made fast at 0808 - the 2000 horsepower (1492 kW) Gulf Explorer (bollard pull 30 tonnes) forward and the 700 horsepower (522 kW) Gulf Investigator (bollard pull 10 tonnes) aft.

Oppama Spirit arrived off the berth at 0817, the Pilot putting the engine astern, building up through slow and half to full astern, to bring the ship to a stop. The engine was stopped at 0820, when the ship was stopped two cables off and parallel to the berth.

During the approach to the berth, the Chief Engineer was standing on the main deck, from where he noticed that as the engine was going astern, a great deal of mud was being churned up from the bottom by the propeller. He received an urgent call from the First Engineer, on duty in the engine-room, who told him that the deck steam condenser was overheated and was releasing a lot of steam. Going to the engineroom, he found the cooling water side of the condenser was completely filled with mud. He

ordered the engineers to shut the steam supply to the deck machinery - anchor windlass and mooring winches - and informed the Master of the situation.

Further investigation showed that the whole auxiliary sea-water cooling system, comprising the pump strainers, the main air compressor cooler, the deck steam condenser, the lubricating oil and air coolers of the two diesel generators and the turbo alternator, the gland sealing cooler of the turbo alternator, and all of the associated pipework, was blocked. The strainers were blocked with coarse-grain sand and shells, and the piping with a mixture of fine sand and mud of a clayish texture.

The Pilot continued procedures for berthing, directing the tugs to turn the ship around through 180 degrees, to stem the tide. The tugs then held the ship in position, off the berth, while the engineers endeavoured to clear the clogged cooling system.

The Chief Engineer kept the two diesel alternators running, despite rising lubricating oil and cooling water temperatures, to maintain ship mobility, and the engine was put on Dead Slow Ahead at 0853. However, at 0857, the alternators cut out, all power thus being lost, and the engine stopped.

The Chief Engineer advised the Master that to clear the whole cooling system could take up to 24 hours, so the Master decided to abort berthing. After discussion between the Master and the Pilot, the decision was made to tow the ship back out to the anchorage. Gulf Explorer was made fast through the centre lead forward, to perform the tow, and Gulf Investigator was made fast on the port shoulder, to assist in maintaining the correct course.

After proceeding only about a quarter of a mile, the ship took a sheer to port, which the tugs were unable to control, and at 0930 Oppama Spirit grounded forward, in soft mud.

Gulf Explorer was transferred to aft, in order to pull the ship off. The first two attempts failed, when the tow line parted on each occasion, but a third attempt was successful, the ship being pulled free at 1015. Soundings of the fore peak indicated no ingress of water and, due to the soft nature of the seabed, no damage was anticipated.

The engineers were able to clear the sea-water cooling lines to No 1 alternator and its associated lubricating oil and air coolers, allowing power to be restored for lighting and ventilation at 1022.



The tow to the Quarantine Anchorage was resumed and effected without further incident, the ship being brought to anchor at 1148.

Clearing of the system took until 2300, after which the full plant was

run up and found to be operating satisfactorily, apparently no damage having been sustained.

Oppama Spirit subsequently berthed on 13 May 1993, having lost about 28 hours due to the incident.

# Comment

Oppama Spirit grounded while being towed to anchorage after a complete engine shut-down brought about by blockage of the sea-water cooling system. It is, therefore, necessary to look at the cause of the blockage of the cooling system, whether the decision to abort the berthing and proceed back to anchorage under tow was appropriate, and the loss of control by the tugs.

## The blockage

Oppama Spirit had undergone periodic dry-docking and repairs at Singapore between 19 March and 7 April 1993. During that time, all sea suctions had been opened up and cleaned and a considerable amount of piping in the sea-water cooling system had been renewed. The system was said to be clear on departure from Singapore and there is no reason to doubt this as being so.

The ship then proceeded to Mina Abdulla, Kuwait, in the Arabian Gulf, a relatively deep water port, arriving and loading a full cargo of fuel oil for Gove on 19 April 1993.

It is, therefore, accepted that Oppama Spirit's sea-water cooling system was clear before the ship arrived off Gove.

The high sea suction is situated about 28m forward of the 5.99m diameter propeller and 2.7m above the keel; this location, in normal circumstances, being sufficient to prevent influx of sediment during astern movements.

The Master stated that he advised the Chief Engineer of the shallow water at Gove, and the Chief Engineer stated that he followed standard practice and the engineers changed over to the high-level sea suction prior to arrival at the anchorage. Although there were no entries in the engine-room log book to this effect, it is accepted that this was done.

The charted depth of the anchorage is 16.1m. When Oppama Spirit arrived to anchor, the state of the tide was one hour after high water, with a height of tide of 2.8m. This provided an under-keel clearance of 6.18m. It is, therefore, considered unlikely that there would have been much disturbance of the sea bed during the anchoring operation, when only dead slow astern and slow astern movements were used.

The charted depth off the berth is 14m. At 0818, when the engine was run astern off the berth, the height of tide was about 0.85m, providing an under-keel clearance of 2.13m. The sea bed off the berth is soft mud, sand and shells/shale, and from the

observations of the Chief Engineer, when the engine was going astern, there was considerable disturbance of the sea bed, evidenced by mud churned up to the surface around the after end of the ship.

When the sea-water cooling system was opened up, the strainers were found to be clogged with sand and shells/shale and the pipes full of fine sand and mud.

It is considered that the blockage of the sea-water cooling system was caused by mud, sand and shells/shale, churned up from the bottom and drawn into the system, during the period that the engine was going astern off the berth.

### **Operational decisions**

On 12 May, high water was not until 1330, with a height of tide of 2.6m. Therefore, a greater under-keel clearance was available later in the day. However, at that time of year the wind freshens considerably after 0900, and berthing is restricted to winds below 15 knots and to a flooding tide. Therefore berthing could not have been programmed for a later time.

Very soon after the blockage occurred, the Chief Engineer had to shut off the deck steam supply. This deprived the ship of power to the mooring winches and therefore even had the tugs pushed the ship alongside the berth, the crew would have been unable to haul on the

lines after they had been run. The decision to abort berthing was therefore appropriate.

Had the anchor been let go, in an attempt to stop the sheer to port, the lack of steam to the windlass would have meant that the ship would have had to remain at anchor, in that position, until such time as deck steam was restored. With the northerly wind and flooding tide, it is possible that the ship would have swung so that the stern grounded, rather than the bow. It is considered that the Master and Pilot were correct in not letting go an anchor.

### **The sheer**

When stopped, a laden tanker tends to lie across wind, with the stern slightly down wind of the bow. Due to the relatively low power of Gulf Explorer, compared with the load displacement of approximately 97,000 tonnes of Oppama Spirit, the increase in speed, from being stopped in the water, would have been slow. Until such time as steerage way had been attained, there would have been a natural tendency for Oppama Spirit, with the wind on the starboard bow, to sheer to port.

### **Tugs**

The two tugs stationed at Gove are of relatively low power, but are adequate for berthing the "handy"

to "panamax" sized bulk carriers (25000 to 65000 tonnes deadweight) arriving in ballast, within the wind and tide restriction parameters. They are not really adequate for handling large (80000 to 100000 tonnes deadweight) laden tankers, particularly if some untoward event occurs.

For towing the "dead" ship, the Pilot used the Gulf Explorer, as the more powerful of the two tugs, to actually tow the ship, and the lower powered Gulf Investigator on the port shoulder, to assist in maintaining course. In the restricted channel, this

configuration is considered to have been appropriate to the particular circumstances. However, neither Gulf Investigator, pushing on the port shoulder, nor Gulf Explorer, moving out to pull on the starboard bow, were able to arrest the sheer to port.

It is considered that the tugs were unable to prevent Oppama Spirit from grounding due to their being underpowered for the task in hand.

Since the incident, the lower powered Gulf Investigator has been replaced by the tug Biloela, which has a bollard pull of 43 tonnes.

# Conclusions

It is considered that:

1. The blockage of the sea-water cooling system, which resulted in a total power failure, was caused by mud, sand and shells churned up from the sea bed and drawn into the system while the engine was being run astern off the berth at Gove.
2. The decision to abort the berthing and tow the ship out to the anchorage was appropriate.
3. The decision not to use an anchor to stop the sheer to port was appropriate.
4. The two tugs stationed at Gove were under-powered for the task in hand and were unable to stop either Oppama Spirit's sheer to port or the grounding.

## **Details of ship**

Name:	Oppama Spirit
Lloyd's Number:	7913983
Ship type:	Oil tanker
Flag:	Bahamas
Owner:	Teekay Shipping Ltd, Nassau
Charterer:	Nabalco P/L, Australia
Year of build:	1980
Yard:	Sumitomo Heavy Industries Ltd Oppama Shipyard, Yokosuka, Japan
Main engine:	Sulzer 6RLA90 15005 kW
Speed:	16 knots
Gross tonnage:	51810
Nett tonnage:	25900
Summer deadweight:	81248
Length overall:	233m
Beam:	42.02m
Moulded depth:	19.61m
Summer draught:	12.705m
Classification Society:	Nippon Kaiji Kyokai