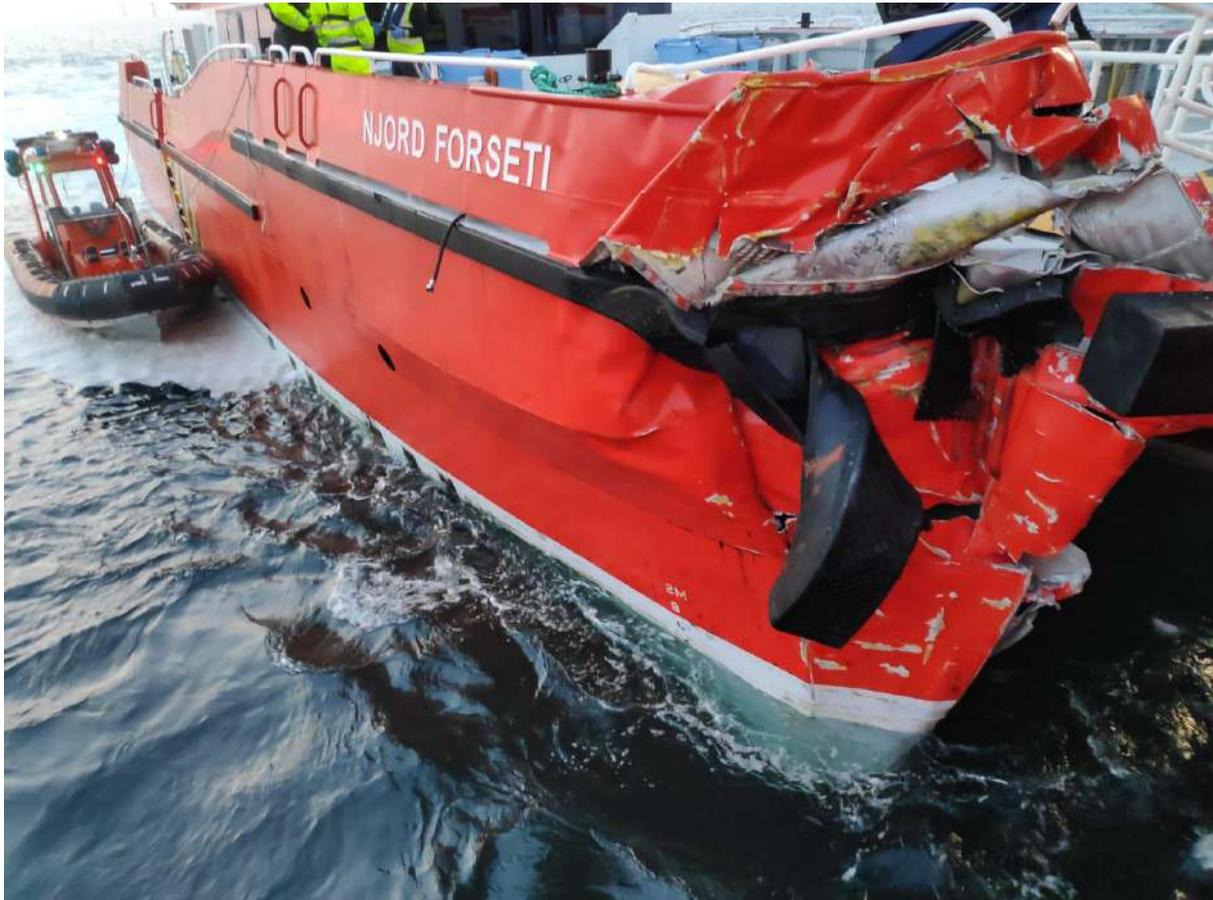


**INVESTIGATION INTO THE CAUSES OF AN ALLISION BETWEEN THE WINDFARM SUPPORT VESSEL
NJORD FORSETI AND A WINDFARM TOWER IN THE SOUTHERN NORTH SEA ON 23RD APRIL 2020.**



FINAL REPORT

By

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Chief Marine Surveyor

Jersey Maritime Administration

The Jersey Maritime Administration, on behalf of the appointed Minister, conducts marine safety and other investigations on ships flying the flag of the Bailiwick of Jersey and ships which are not flying the Jersey flag which are within Jersey waters in accordance with the obligations set forth in international conventions to which Jersey is a party (either directly or through the United Kingdom).

In accordance with the IMO Casualty Investigation Code, mandated by the International Convention for the Safety of Life at Sea (SOLAS) Regulation XI-1/6, investigations have the objective of preventing marine casualties and marine incidents in the future and do not seek to apportion blame or determine liability.

It should be noted that provisions in the Shipping (Jersey) Law 2012 require Masters, Officers and Owners of vessels to provide such information as is reasonably required by those appointed to conduct such investigations.

If the contents of a report were subsequently submitted as evidence in court proceedings relating to an accident there is a risk that this could offend the principle that individuals cannot be required to give evidence against themselves.

It is for this reason that the Minister is prevented under the above law from authorising publication of a report until a decision has been made not to prosecute any individual in connection with the incident concerned or any prosecution including any appeal has been completed.

The Jersey Administration makes this report available to any interested individuals, organizations, agencies or States on the strict understanding that it will not be used as evidence in any legal proceedings anywhere in the world. You must re-use it accurately and not in a misleading context. Any material used must contain the title of the source publication.

The obligation to publish accident and incident reports in accordance with the IMO Casualty Investigation Code and the International Convention for the Safety of Life at Sea (SOLAS) Regulation XI-1/6, is an acceptable reason for publication of this report in its current format under data protection legislation.

1. Vessel and Company details

Vessel Name: Njord Forseti

IMO: 9786669

FLAG: Jersey

MMSI: 235116578

CALLSIGN: 2JKA7

TONNAGE: 137GT

LOADLINE LENGTH: 23.8M

TYPE: Windfarm Support Vessel – Aluminium Catamaran

CLASSIFICATION: DNVGL +1A HSLC Service R2

CERTIFICATION REGIME: Workboat Code / HS OSC Code

OPERATOR: Njord Offshore Ltd, Mauds Court, Tendring, ESSEX. CO16 0BG

1.1 Njord Forseti holds statutory certification issued by DNVGL on behalf of the Jersey Maritime Administration which allows operation under two separate certification regimes: the UK Workboat Code and the Interim High-Speed Offshore Service Craft Code (HS OSC Code). At the time of the incident the vessel was operating under the requirements of the Workboat Code.

1.2 The vessel is fitted with an electronic chart system, but the primary means of navigation is by paper charts.

2. Narrative Summary

2.1 On 23rd April 2020 Njord Forseti was operating at the Merkur Windfarm in the Southern North Sea, having departed from the base port of Emshaven earlier in the morning.

2.2 Shortly after 1800 local time, the vessel was released from duties on the windfarm and at 1811 departed for the return passage to the base port. Aboard the vessel were three crew members, Master, Deckhand and Engineer together with one windfarm technician who was being transferred back to shore. Sea conditions were calm with light winds and low swell. Weather was fair with good visibility.

2.3 Whilst transiting between the windfarms Borkum Riffgrund 1 and Borkum Riffgrund 2 at an approximate speed of twenty knots, Njord Forseti hit a windfarm tower (QO5 of the Borkum Riffgrund 1 windfarm). The impact resulted in serious damage to the vessel. Two crew members were evacuated by air to hospital, and the third was required to have a subsequent medical examination. Immediate assistance was provided by the offshore construction vessel Siem Barracuda which was located within the Merkur windfarm and undertaking associated duties. A relief crew from another crew transfer vessel (Windcat 43) who were aboard the Siem Barracuda at the time also provided assistance. The Njord Forseti returned to Emshaven under her own power with temporary crew members provided by the sister vessel Njord Zephyr which was despatched from Emshaven to provide assistance. Those crew members admitted to hospital were released within 24 hours.

3. Summary of Findings.

3.1 For an indeterminate period between departure from the windfarm until the collision occurred, the vessel was not keeping a proper look out as required by Rule 5 of the International Regulations for Preventing Collisions at Sea (COLREGS).

3.2 The primary reason why a proper lookout was not being kept was because the Master, who had the conduct of the vessel was distracted from this primary role.

3.3 It is possible that the Master was distracted from his primary role as he may have been adjusting of settings on the VHF radio which is mounted immediately to starboard of his seat. However, this has not been positively determined and distractions caused by other means cannot be ruled out.

3.4 At the time of the incident the vessel was not following the established passage plan from the Merkur Offshore Windfarm to Emshaven but was undertaking an alternative route between Borkum Riffgrund 1 and Borkum Riffgrund 2 windfarms. Whilst this route was safe, ineffective monitoring of the vessels track, position and proximity to navigational hazards contributed to the incident.

3.5 Reports of the actions taken by the vessel and company immediately following the incident is considered appropriate to the circumstances.

4. Recommendations

4.1 The company should emphasise the importance of compliance with COLREGS, and particularly Rule 5 to the Masters of all its vessels.

4.2 The company should identify tasks, equipment and functions that may give rise to possible distractions for the person having the conduct of the vessel whilst underway. The company should implement measures to ensure that the safe conduct of the vessel is not impaired by these or other factors.

4.3 The company should review the methods by which masters monitor the safe progress of a vessels passage and make changes as necessary to its procedures. Where necessary additional training should be provided to masters and other relevant personnel in the associated techniques applicable to these vessels.

4.4 Under the Workboat Code, other than the need for at least one person to ensure the safe conduct of the vessel whilst underway, there is no specified minimum number of (deck) watchkeepers required. However, the various operating modes of the company's vessels should be assessed and policies updated where necessary to ensure that the wheelhouse is always sufficiently and appropriately manned. Where appropriate, specific guidance should be provided to the Master in exercising his / her judgement in setting the wheelhouse manning level during the course of a voyage.

4.5 The company should develop the principals and techniques of crew resource management (CRM) within its crews to ensure that whilst underway the conduct of the vessel is carried out in the most effective and efficient means possible regarding the circumstances of the passage or operation being undertaken.

5. Jersey Maritime Authority Investigation – Introduction

5.1 The company reported the incident to representatives of the Jersey Maritime Authority by email at 21:35 on 23rd April 2020. The Jersey Maritime Administration provided formal acknowledgement and direction to the vessel during the morning of 24th April 2020.

5.2 The company provided information to facilitate the investigation to the undersigned. This has been used together with remote interviews of crew members and discussions with the company management. A full list of documentation and other information sources considered during this investigation is provided in section 12.

5.3 Due to travel restrictions imposed during the current Coronavirus pandemic and the associated risks present to personnel who might be exposed to the virus, the Jersey Maritime Administration has conducted the investigation remotely.

5.4 The company has appointed an independent specialist and Master Mariner to investigate the accident and a preliminary report has been produced accordingly. This has been considered by the undersigned, but it should be noted that this investigation has been undertaken separately.

5.5 This report concentrates on the events leading up to and including the incident. No specific analysis has been made of the events following the incident resulting in the vessels recovery.

5.6 This investigation has been undertaken with the support of the Coastal State (Federal Republic of Germany) and Port State (Kingdom of the Netherlands).

6. Consideration of Documentation

6.1 The vessels operating records show that on the 23rd April the vessels crew commenced work at 0800 LT. On the 22nd April, the vessel operated for 11 hours 15 minutes, finishing operations at 19:30. On the 21st April the vessel was not in use due to high winds. Between 20th – 18th April, records indicate that the vessel was not in use for more than 12 hours per day. Subject to the emergence of other evidence to the contrary, it is considered that the vessels programme in the days prior to the accident would have allowed the crew members to obtain sufficient rest prior to taking up their duties on 23rd April.

6.2 Records show that the vessels Master holds a Spanish STCW Certificate of Competency for vessels up to 1600GT (Master) and an associated UK Certificate of Equivalent Competency. His certificate excludes work on vessels fitted with ECDIS, however he does hold an ECDIS (generic) training certificate issued by the Spanish Maritime Administration. The Deck hand has a Navigational Watch Rating Certificate issued by UK authorities and an Approved Engine Course Certificate. The engineer is qualified with an STCW OOW (deck) and has an associated UK Certificate of Equivalent Competency. In summary, the certification held by all crew members, especially the Master and Engineer is significantly higher than the minimum requirements specified in the Workboat Code.

7. Crew Interviews

7.1 During the afternoon of 25th April 2020 the undersigned interviewed all crew members by video link. At this time all had been released from hospital and were found to be coherent and able to answer questions adequately.

7.2 Interviews with the vessels master and deckhand revealed that neither could remember the events immediately prior to the incident (both were knocked unconscious by the force of the impact).

7.3 The deckhand reported that it was usual to have two people in the wheelhouse during passages to / from the windfarm. Around the time of departure from the windfarm he remembered cleaning the accommodation. Following this he went to smoke in the designated outside area aft of the bridge.

7.4 The ships engineer stated that he was in the wheelhouse for the passage back to Emshaven from the windfarm. He also stated that the vessel had previously experienced a failure of the port engine which had stopped without alarm or warning earlier in the day. To identify possible reasons for this, he was concentrating on the engine data screens located on the starboard side of the wheelhouse to identify any change to machinery parameters that may precede an involuntary shutdown. As such, whilst he knew that the Master was in the wheelhouse and had control of the vessel, he did not know what the Master was doing in the minutes leading up to the collision. At the moment of impact, the engineer reported that he saw the Master being thrown in the air. After the impact, upon proceeding to administer first aid to the Master, the engineer also found the deckhand lying on the deck near the aft access door to the wheelhouse.

8. Consideration of CCTV Coverage

8.1 The vessel is fitted with a CCTV system that allows observation of some of the areas of the wheelhouse, together with some of the external areas of the vessel and the surrounding sea.

8.2 CCTV coverage from the vessel clearly shows the vessel approaching the windfarm tower and the impact with the tower on the starboard bow.

8.3 CCTV coverage also shows the central part of the wheelhouse interior. Prior to the impact, the only person within shot is the Master who is seated at the centre console. However, the engineer is also seated on the starboard seat but is obscured from view by the seat back. This is commensurate with his report that he was looking intently at the engine screens in front of him. The positioning of these screens low down on the console suggests that a crouching position might be beneficial to gain a close view of these items. It is only at the point of impact that the CCTV shows the engineer being thrown out of his seat.

8.4 For the period of coverage sighted by the undersigned up to the point of impact (approx. 1 minute) the Master was seen to be leaning over the starboard side of his seat, with his attention being almost entirely taken by something in this area. It is not entirely clear for how long he had adopted this position. The company reports that CCTV coverage suggests that this posture was adopted for at least 2 minutes. Although he adjusts his position during the footage, it cannot be determined objectively what task the master was engaged in. In the seconds immediately before the impact the master's attention is drawn to the wheelhouse front and at the point of impact, the CCTV

coverage also shows him being thrown out of his seat. Shortly after the impact, the CCTV shows the engineer moving across the wheelhouse to check on the Master.

8.5 The CCTV shows no other persons in the forward part of the wheelhouse immediately prior to or at the time of the incident. Therefore, it is concluded that immediately prior to the incident, the only person undertaking lookout duties is the vessels master.

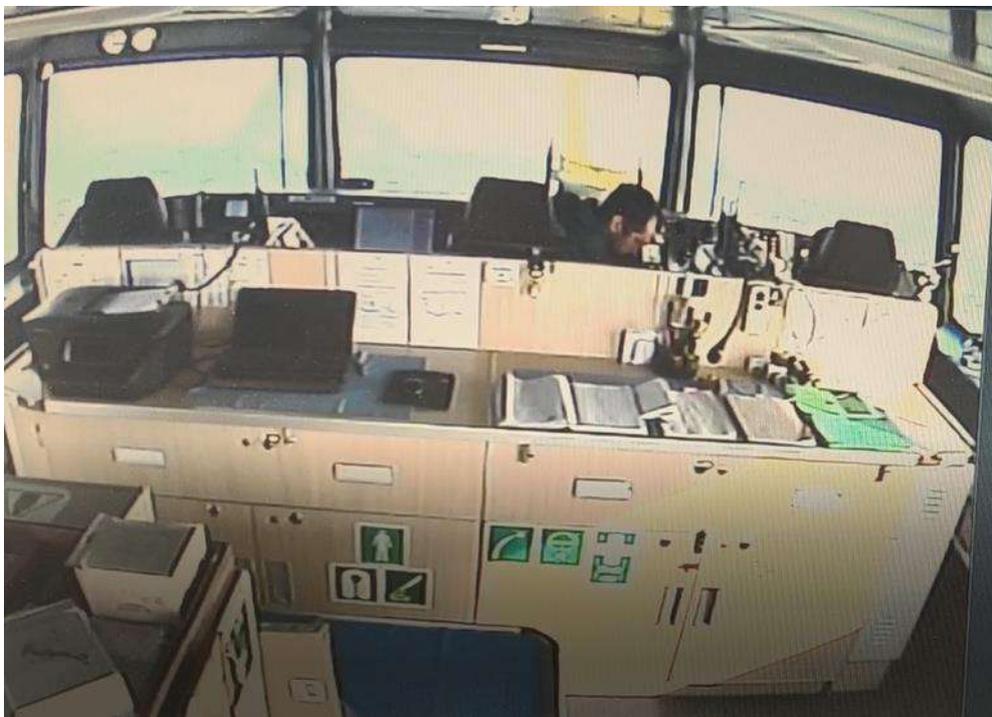
8.6 As has been acknowledged in the Njord commissioned incident report, CCTV footage of the turbine tower in the seconds before impact shows a slick orientated approximately in a WSW direction which suggests current flow in this general direction. It is therefore possible that when transiting between windfarms Borkum Riffgrund 1 and 2, insufficient allowance was made for this tidal set.



Vessel CCTV coverage showing Njord Forseti passing a turbine tower close to starboard shortly before impact with Tower Q05 (marked by the arrow).



Vessel CCTV coverage showing Njord Forseti approaching turbine tower Q05 shortly before impact. A slick most probably caused by tidal flow can be seen running from the turbine tower across the direction of travel of the vessel.



Vessel CCTV coverage showing the Master in the wheelhouse distracted by something to starboard of his seat in the seconds before impact. The turbine tower can be seen through the centre wheelhouse window.

9. Consideration of wheelhouse equipment

9.1 To the starboard side of the master's seat is a console to which engine and vessel controls are fitted. Engine panels are fitted at the high level on the vertical panel, and on the horizontal surface is fitted with a VHF radio. It is possible that the Master was distracted by this piece of equipment, although the CCTV coverage suggests that the Master was not using it for communication.

9.2 In the Njord commissioned incident report, the engineer reported that following the impact when he tried to use the VHF to summon assistance, the unit was not on its usual setting but was displaying a different screen. This supports the possibility that the Master may have been making adjustments to the settings of the set immediately prior to the incident.



Photograph of bridge front. The engineer's seat is to starboard, the Master's seat out of shot at the left-hand corner, the Masters console centre bottom with the VHF radio just out of shot.

10. Consideration of passage planning and monitoring

10.1 A generic passage plan exists for the transit between the base port of Emshaven and the Merkur windfarm. This forms part of the route plan for the vessel when operating in HS OSC Mode. The passage plan places a waypoint to the east of the windfarm and to the north east of the transit route between windfarms Borkum Riffgrund 1 and 2. Once on site and working within the windfarm there are no specific passage plans in place for moving around the area. This is most probably due to the large number of different towers and discreet locations visited during a typical day of operation.

10.2 Upon departing from the windfarm, the vessel attempted to transit between Borkum Riffgrund 1 and Borkum Riffgrund 2 windfarms.

10.3 Had the transit been successful it is assumed that the vessel would have joined the desired track specified by the generic passage plan at some point to the south east of Borkum Riffgrund 1.

10.4 The methods for monitoring the vessels position, course and track by visual means and using the vessels navigation aids prior to the incident have not been provided to the undersigned and therefore have not been positively determined. The extent to which the direction and strength of tidal current through the windfarm was known to the Master has also not been able to be determined.



Screen shot of the electronic chart system. The yellow arrow indicates Njord Forseti's outward track between Borkum Riffgrund 1 and 2 windfarms. The orange arrow indicates the return track to the Siem Barracuda following the collision. The consistent nature of the track suggests that tidal offset might not have been taken into account for the transit between windfarms, and that the effect of this offset has not been identified during the transit.

11. Consideration of vessel damage

11.1 The vessel suffered significant structural damage to the starboard hull in the forward area. Shock from the impact resulted in the fracturing of the mounting arrangements between accommodation structure and the deck. Bridge equipment was damaged due to the impact from the master and engineer being forcibly ejected from their seats by the impact. It is likely that other damage may be identified when the vessel is subject to repair.

12. Sources of Information used in this investigation – all provided by the vessel operator

12.1 Njord Forseti Official Logbook

12.2 Njord Forseti DPR Record 1st – 26th April 2020

12.3 Njord Forseti DPR diary 23rd April 2020

12.4 ECS Snapshot

12.5 AIS data trace of Njord Forseti's movements

12.6 Photographs of damage to Njord Forseti

12.7 Photographs of damage to the turbine tower

12.8 CCTV information extracted from Njord Forseti's onboard system

12.9 Incident report provided by the operator

12.10 Preliminary Incident Investigation report by Capt. J Cerjak, dated 20/04/2020 commissioned by the operator

12.11 Copies of crew members certificates of competency and other seafarer certification

12.12 HS OSC Route plan for Njord Forseti (passage plan - Emshaven to Merkur Offshore Windfarm)

D A Thorrington
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Jersey Maritime Administration
1st June 2020