



**Joint Interim Investigation Report
on Very serious marine casualty 3/19**

**Loss of containers on board MSC ZOE
in the Traffic Separation Scheme
Terschelling – German Bight
on 1 and 2 January 2019**

12 December 2019

Pursuant to art. 14 para 2 of the Directive 2009/18/EC of the European Parliament and the Council of 23 April 2009 for laying down the principles for the investigation of accidents in maritime shipping, Dutch Safety Board, Netherlands, and the Bundesstelle für Seeunfalluntersuchung, Germany, published this Interim Investigation Report, since it was not possible to prepare the final investigation report within the time period of 12 month because of the complexity of the investigation.

This interim report should not be used in court proceedings or proceedings of the Maritime Board.

The English text shall prevail in the interpretation of this interim report.

Dutch Safety Board
Lange Voorhout 9
2514 EA The Hague
P.O. Box 95404
2509 CK The Hague

Bundesstelle für Seeunfalluntersuchung
Bernhard-Nocht-Str. 78
20359 Hamburg

Head: Jeroen Dijsselbloem
T +31 70 333 7000
scheepvaart@onderzoeksraad.nl
www.onderzoeksraad.nl

Head: Ulf Kaspera
T +49 40 3190 8300
posteingang-bsu@bsh.de
www.bsu-bund.de



1 Factual Information

1.1 Photo MSC ZOE



Figure 1: MSC ZOE, Aerial photo CCME

1.2 Ship's particulars

Name of ship:	MSC ZOE
Type of ship:	Container vessel
Nationality/Flag:	Panama
Port of registry:	Panama
IMO-number:	9703318
Call sign:	3FQA
Owner:	Xiangxing International Ship Hong Kong
Operator:	MSC Mediterranean Shipping Co. Switzerland
Year built:	2015
Ship yard/yard number:	Daewoo Shipbuilding & Marine Engineering Co. Ltd./ 4279
Classification society:	China Classification Society
Length o.a.:	395.46 m
Breadth o. a.:	59.00 m
Gross tonnage:	192237
Deadweight:	258359 t
Draught (max):	16.00 m
Engine rating:	62500 kW
Main engine:	MAN-B&W, Hyundai Heavy Industries Co. Ltd.

Speed: 22,0 knots
Hull material: Steel

1.3 Voyage particulars

Port of departure: Sines
Port of call: Bremerhaven
Type of voyage: Merchant shipping / International
Cargo information: 8062 containers
Draught at the time of the accident: 12,4 m
Manning: 22

1.4 Information on the occurrence

Type of accident: Very serious marine casualty
Date/time: 01/01/2019 / approx. 2300 ¹, 02/01/2019 0134 Uhr
Location: 1) N of Ameland, 2) N of Borkum
Latitude/Longitude: Approx. φ 53°39,5'N λ 005°52,0'E, ca. φ 53°46,9 λ 006°33,2'E
TSS Terschelling – German Bight
Consequences: 342 containers fell overboard, heavy pollution

Extract from chart No. 50 BSH²

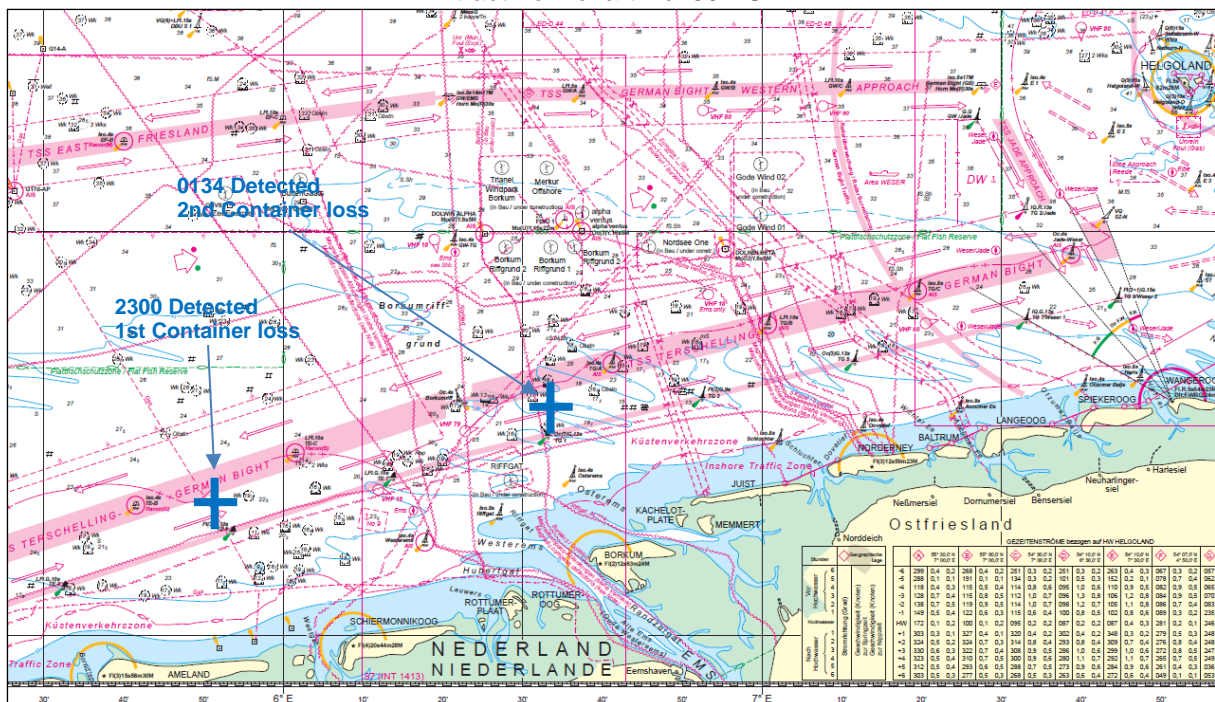


Figure 2: Scene of accident 1 January and 2 January 2019

¹ All accident times stated in the investigation report, unless otherwise states CET = UTC + 1 hour

² BSH = Bundesamt für Seeschifffahrt und Hydrographie (German Federal Maritime and Hydrographic Agency).

1.5 Shore authority involvement and emergency response

Agencies involved:	Vessel Traffic Services German Bight, Wilhelmshaven, Central Command for Maritime Emergencies (CCME) Cuxhaven, Waterways Police Bremerhaven, Hansestadt Bremisches Hafenamts (Hanseatic Harbour master's office), KMR Marine Surveyors Bremerhaven, Eurogate Containerterminal, Ahlers & Vogel Lawyers Hamburg by order of MSC, Kustwacht Netherlands, Rijkswaterstaat Netherlands, Wasserstraßen und Schifffahrtsamt (Waterways and Shipping Office) Emden, Direccion General De Marina Mercante Panama (PMA), Dutch Safety Board The Hague (DSB), Bundesstelle für Seeunfalluntersuchung (BSU) Hamburg, as well as local public social aids.
Resources used:	Survey vessels, public authority vessels and planes, tugs, supply vessels and other lifting vessels
Actions taken:	Locating and salvaging of the containers and cargo residues and cleaning of the beaches, respectively
Results achieved:	Altogether 1047 containers damaged, 342 containers fell overboard, 45 of which in German territorial waters, polluted beaches on several German and Dutch Wadden islands and coast

2 SUMMARY

At about 2300 on 1 January 2019, the crew on MSC ZOE (18,400 TEU) noticed for the first time the loss of containers fallen overboard and the tilt of the deck cargo in several bays. The Panamanian flagged MSC ZOE carrying 8062 containers (118,291,4 t) was en route from Sines to Bremerhaven transiting the Traffic Separation Scheme Terschelling - German Bight. The swell came from abeam port and the MSC ZOE rolled 5-10° towards every side in heavy swell, north-north-westerly winds with a force of 8-10 Bft and a wave height of approx. 5.5 m with a wave period of 12-13 seconds, a heading of 61° (HdG) and a course over ground of 72° (COG) and a speed over ground of 10.6 knots (SOG). The current set with 1 knot 270°. The loss of cargo was detected north of Ameland, when all of a sudden six successive stronger rolling motions were reported by the crew.

On 2 January, while the crew assessed the damages, the MSC ZOE continued her voyage. At about 0130, shortly afterwards, strong rolling motions occurred again and the next loss of containers was noticed north of the island of Borkum. At this time, the heading stood at 60°, with a COG of 73° and a SOG of 7,8 knots. The current set with 250° and 0.7 – 0.8 knots furthermore west. Further container stacks collapsed and containers fell overboard. Then the MSC ZOE turned about with a northwesterly heading and reduced her speed to 6 knots. The VTS German Bight Traffic was notified of the loss of containers. At 1400, the voyage to the TSS German Bight Western Approach to Bremerhaven was continued where the MSC ZOE moored safely at the Eurogate Terminal at 0100 on 3 January in the night.

Altogether 342 containers were lost, 297 of which in Dutch territorial waters and 45 in German territorial waters. The fall from height and the swell destroyed the containers and they foundered in the Coastal Sea. Cargo residues were washed on the Frisian islands. Full recovery of all containers and content is not completed yet. For this purpose, the affected sea area was searched with side-scan sonars. No lubricants and/or bunkers of the MSC ZOE escaped and nobody was harmed.

3 INVESTIGATION

3.1 Survey Bremerhaven

The loss of cargo on board the MSC ZOE attracted considerable public interest in the Netherlands as well as in Germany. On Sunday, 6 January 2019, the accident investigators of the affected Flag States Panama (Directorate General of Merchant Mairne), Netherlands (Dutch Safety Board) and Germany (Bundesstelle für Seeunfalluntersuchung) met on board the MSC ZOE in Bremerhaven for the first time and initiated the accident investigation. The accident investigation bodies agreed to designate Panama as Flag State to lead the investigation and the Netherlands and Germany to join as Coastal States.

The ship's owner and the crew were represented by attorneys-at-law and were very cooperative. Extensive material was secured. The VDR data had already been saved by a service company of the manufacturer and later on made available to the investigators through a safe network connection. The damages were inspected. Furthermore, statements made by the crew, data of the loading computer, lashing programme, stowage plan, stability handbook, log book extracts, other documents and photos of the damage were saved.

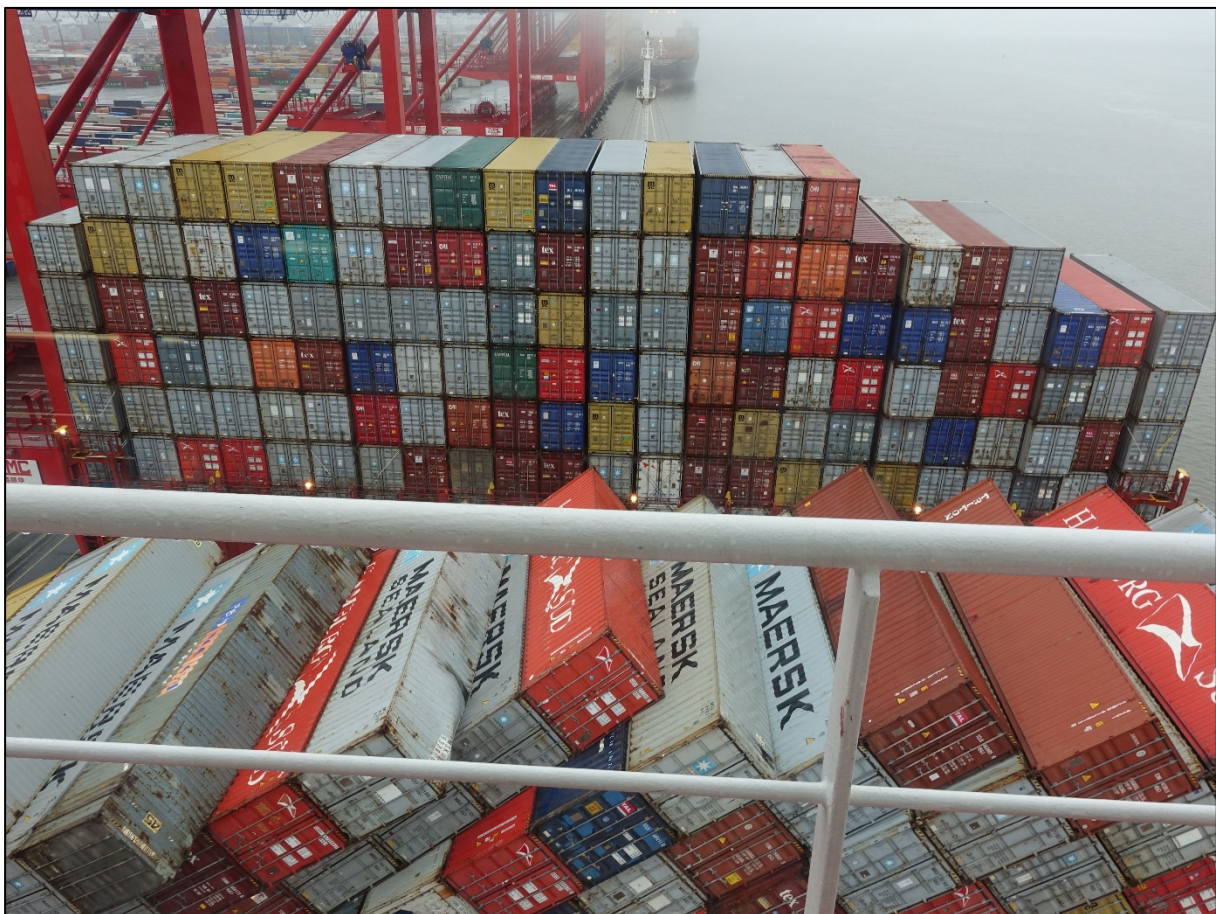


Figure 3: Bay 26, Foto BSU

The accident investigation bodies agreed upon a collaborative procedure. The Flag State Panama carries out an on-board investigation. DSB deals with questions

regarding the routing of container vessels comparable to MSC Zoe and the BSU with the ship's behaviour.

3.2 Further meeting of the investigative authorities

In order to come to an agreement about the intermediate results and the further procedure to be followed, joint meetings were held in The Hague, Hamburg and Naples with each of the involved states.

Meanwhile, the BSU and the DSB commissioned expert opinions. The BSU commissioned the Technische Universität Hamburg (TUHH) - Ship Design and Ship Safety - to clarify the following questions:

1. What is the probable root cause of the container loss and which roll angles did probably occur?
2. How large were the lateral accelerations on the cargo and are they sufficiently large to explain the container loss?
3. In how far do shallow water effects play a role for the container loss?
4. Are there any general conclusions which can be drawn from this particular accident with respect to the loss of containers?

The DSB commissioned the Maritime Research Institute Netherlands (MARIN) and Deltares to prepare an expertise on the question to what extent the sea area with the Vessel Traffic Separation Schemes and the track MSC ZOE sailed in heavy weather exerted influence on the loss of containers. In doing so, the connections between weather, sea bottom and wave formation are to be researched. Results are to be expected in spring next year.

4 SAFETY RECOMMENDATIONS

It is not possible to draft safety recommendations yet, as the investigation is still going on.