



National Transportation Safety Board

Marine Accident Brief

Fire aboard Vehicle Carrier *Courage*

Accident no.	DCA15RM024
Vessel names	<i>Courage</i>
Accident type	Fire
Location	North Sea in the approaches to the English Channel, about 57 miles* east-northeast of Harwich, United Kingdom, 52°04.8' N, 002°48.0' E
Date	June 2, 2015
Time	2215 British summer time (coordinated universal time + 1)
Injuries	None
Damage	\$10 Million in vessel damage, \$90 Million in cargo loss
Environmental damage	None
Weather	Visibility unrestricted at night, winds 34–40 knots, seas 24 feet
Waterway information	The English Channel and its approaches from the east and west are some of the busiest waterways in the world, providing access to Europe's largest ports; there was significant vessel traffic on the night of the accident

About 2215 local time on June 2, 2015, the US-flagged roll-on roll-off (ro-ro) vehicle carrier *Courage* was transiting from Bremerhaven, Germany, to Southampton, United Kingdom, when a fire broke out in its cargo hold. The accident resulted in extensive damage to the vessel's hold as well its cargo of vehicles and household goods. As a result of the damage, estimated at \$100 million total, the vessel's owners scrapped the vessel.

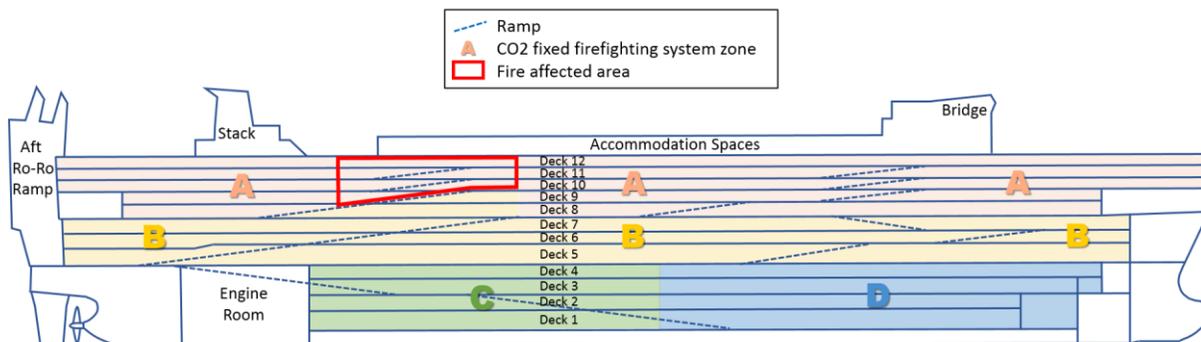


***Courage* just after the accident, with scorch marks on the starboard aft side as a result of the fire. (Photo by US Coast Guard)**

* Unless otherwise noted, all miles in this report are nautical miles (1.15 statute miles).

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The *Courage* was a 653-foot-long car and truck carrier that operated between various ports in the US and Europe. It had 12 cargo decks connected by ramps throughout the vessel. Decks 3, 5, and 8 were hard decks that were gas tight. All other decks were moveable. The vessel carried a cargo of new production vehicles (Mercedes-Benz and BMW), military vehicles, personally owned vehicles for military and government personnel, and household goods shipments, also for military and government personnel. The cargo decks were protected by a low-pressure CO₂ fixed firefighting system that was divided into four zones designated A–D. Each deck had two loops of smoke detectors in series, one forward and one aft.



Simplified diagram of *Courage* cargo decks with CO₂ fixed firefighting system zones.

At midnight on June 1, the *Courage* departed Bremerhaven, Germany, en route to Southampton, United Kingdom (UK). The vessel experienced heavy weather after departing Bremerhaven, with winds 34–40 knots and seas about 24 feet, but otherwise the transit was uneventful through the day on June 2. On that day, the third mate, who stood the 1800 to midnight watch, arrived on the bridge between 1720 and 1725 to relieve the chief mate. The watch team was comprised of the third mate and an able-bodied seaman (AB) at the helm.

About 2215, a smoke alarm sounded from the panel on the bridge. The third mate checked the panel and found the alarm was number 11, which indicated Deck 10 aft. The third mate instructed the AB to investigate the alarm. The AB departed the bridge after obtaining a radio and conducting a radio check. He travelled from the bridge down to the weather deck and went to the access trunk aft on the starboard side of the vessel. The access trunk, near the stack, contained a forward ladderway and elevator and an aft ladderway. The two ladderways were completely separate, but there were cutovers on certain decks.

The AB told investigators that as he got to the entrance of the ladderways he began to smell smoke. He passed the elevator, went down a ladderway one deck to Deck 12, and saw heavy smoke coming up from below. He immediately radioed up to the bridge, informed the mate about the smoke, and told him to sound the alarm. He then exited the space and returned to the bridge.

The mate sounded the general alarm to get the attention of the crew and then called the master. After the mate told the master that there was smoke and likely a fire, the master came immediately to the bridge. At 2230, the master re-sounded the general alarm. All crew reported to their muster stations, and those assigned to fire teams began dressing out to fight the fire. Once dressed out, fire teams led by the chief mate approached the ladderway. As they approached, the chief mate noted that the smoke changed from grey to dark black and started coming out more forcefully. The chief engineer also reported paint bubbling on the weather

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decks. Due to the intensity of the smoke, the fire teams closed the watertight door from the weather deck to the ladderway and retreated to set up boundary cooling while the master ordered CO₂ released in Zone A.

The chief engineer released the CO₂ at 2250. The master stated that the smoke intensified for a short period before stopping completely. The crew continued boundary cooling and monitored space temperatures through the next morning.



The English Channel and approaches. The red X shows the *Courage's* approximate location when the fire started. (Background by National Geographic MapMaker Interactive)

At 2253, the master contacted Dover (UK) Coast Guard via VHF radio to notify them of the emergency. The *Courage* was eventually instructed to continue on to Southampton where it anchored offshore about 1100 on June 3. The vessel was permitted to enter the Southampton port that evening and tied up pierside about 2200. The crew spent the next several days working with the Coast Guard and port officials to develop a plan to carry out ventilation of the affected cargo spaces.

Fire Analysis

Fire investigators hired by the vessel owner and working with the US Coast Guard examined the affected spaces and identified the likely origin to be a ramp on the starboard side, aft, from Deck 8 to Deck 10 (the moveable Deck 9 was almost completely pressed up to the bottom of Deck 10). Vehicles on this ramp were completely destroyed by fire, and there was substantial damage to the ramps from Deck 10 to Deck 11 and from Deck 11 to Deck 12 that were immediately above this area.

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Left photo shows exterior damage to *Courage* starboard side in the vicinity of the fire. Right photo shows damaged ramp and destroyed vehicles near the origin of the fire. (Photos by Coast Guard)

The vehicles on the ramp from Deck 8 to Deck 10 were all personally owned vehicles and included a 2002 Ford Escape SUV. Model years 2001 through 2004 Ford Escapes and Mazda Tributes (which shared the same chassis and many components as the Escapes) were the subject of recalls in 2007 and 2010 due to non-crash related fires or thermal events in the vehicles' engine compartments. Brake fluid leaking from the master cylinder reservoir cap had been reported to enter the vehicles' Automatic Braking System (ABS) wiring harness electrical connectors causing short-circuits, melting, and fires. As of early 2012, the National Highway Traffic Safety Administration (NHTSA) was aware of 260 vehicles that had experienced non-crash related fires or thermal events.¹ The Ford Escape that was destroyed by the fire in the *Courage* cargo hold had not been serviced to replace the faulty parts that were the subject of the Ford recalls. The owner had been overseas for a number of years and was not aware of the recalls prior to the accident.



ABS module from 2002 Ford Escape, where the fire likely started on board *Courage*, pictured next to a sample undamaged module. (Photo courtesy of Minton, Treharne & Davies Ltd.)

Fire investigators recovered the ABS module for the Ford Escape along with other evidence from the vehicles on the ramp where the fire was believed to have started. A joint forensic examination of this evidence was conducted in Bremerhaven in January 2016. Visual examination of the module was inconclusive and additional tests were planned.

In March 2017, the ABS module was examined using CT scans during testing conducted at Southampton University in the UK. CT scan images provided to NTSB fire investigators

¹ Investigation EA10-002, NHTSA, <http://www-odi.nhtsa.dot.gov>, closed February 29, 2012.

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clearly showed that the two end connectors (a positive and a negative) of the ABS module had significant localized arcing damage, while other wiring in the module was relatively undamaged. The amount of localized arcing damage was consistent with electrical arcing/shorting in this area and not external exposure to a fire. Thus, fire investigators concluded that the ABS module was the likely source of the fire.

The actions of the crew in combatting the fire were timely and appropriate. The crew was mustered and fire teams were manned soon after the general alarm was sounded. The master, chief mate, and chief engineer properly assessed the danger and activated the CO₂ fixed firefighting system, quickly extinguishing the fire. The fire teams performed boundary cooling and monitored space temperatures. They did not attempt to re-access the space, which could have caused a reflash. No lives were lost and the vessel was able to continue to port.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the fire on the vehicle carrier *Courage* was electrical arcing in the automatic breaking system (ABS) module of a vehicle carried on board.

Vessel Particulars

Vessel	<i>Courage</i>
Owner/operator	Fidelio Limited Partnership/American Roll-on Roll-off Carrier Group, Inc.
Port of registry	Wilmington, Delaware
Flag	United States
Type	Roll-on roll-off vehicle carrier
Year built	1991
Official number	367063050
IMO number	8919922
Classification Society	Lloyd's Register
Construction	Steel
Length	652.9 ft (199.0 m)
Draft	38.1 ft (11.6 m)
Beam/width	105.8 ft (32.3 m)
Gross tonnage	52,285 gross tons
Engine power; manufacturer	16,782 hp (12,514 kW) B & W 8L60MC direct drive diesel
Persons on board	24

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NTSB investigators worked closely with our counterparts from Coast Guard Activities Europe throughout this investigation.

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA15RM024

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The NTSB has authority to investigate and establish the probable cause of any major marine casualty or any marine casualty involving both public and nonpublic vessels under 49 United States Code 1131. This report is based on factual information either gathered by NTSB investigators or provided by the Coast Guard from its informal investigation of the accident.

The NTSB does not assign fault or blame for a marine casualty; rather, as specified by NTSB regulation, “[NTSB] investigations are fact-finding proceedings with no formal issues and no adverse parties and are not conducted for the purpose of determining the rights or liabilities of any person.” 49 Code of Federal Regulations, Section 831.4.

Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by conducting investigations and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. 49 United States Code, Section 1154(b).
