



# National Transportation Safety Board

## Marine Accident Brief

### Collision of Cargo Vessel *Ocean Freedom* with Tank Barges

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<b>Accident no.</b>	DCA16FM003
<b>Vessel names</b>	<i>Ocean Freedom</i> and Kirby barges 28044, 29103, and 29125
<b>Accident type</b>	Collision
<b>Location</b>	Port of Corpus Christi, Texas 28°48.8' N, 97°24.7' W
<b>Date</b>	October 29, 2015
<b>Time</b>	2226 central standard time (coordinated universal time – 5 hours)
<b>Injuries</b>	Minor
<b>Property damage</b>	\$750,000 est.
<b>Environmental damage</b>	None reported
<b>Weather</b>	Visibility clear, winds southeast at 10–13 knots
<b>Waterway information</b>	Located in the western Gulf of Mexico, the Port of Corpus Christi has a main shipping channel maintained to a 45-foot depth. The inner harbor's main turning basin has a maximum width of 800 feet.

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On the night of October 29, 2015, at 2226 local time, the US-flagged cargo vessel *Ocean Freedom* collided with a tier of moored empty tank barges while entering the Port of Corpus Christi, Texas. One crewmember, who was working on one of the barges, received non-life threatening injuries. Although no environmental damage was reported, the *Ocean Freedom* and the three tank barges sustained structural damage estimated at \$750,000.

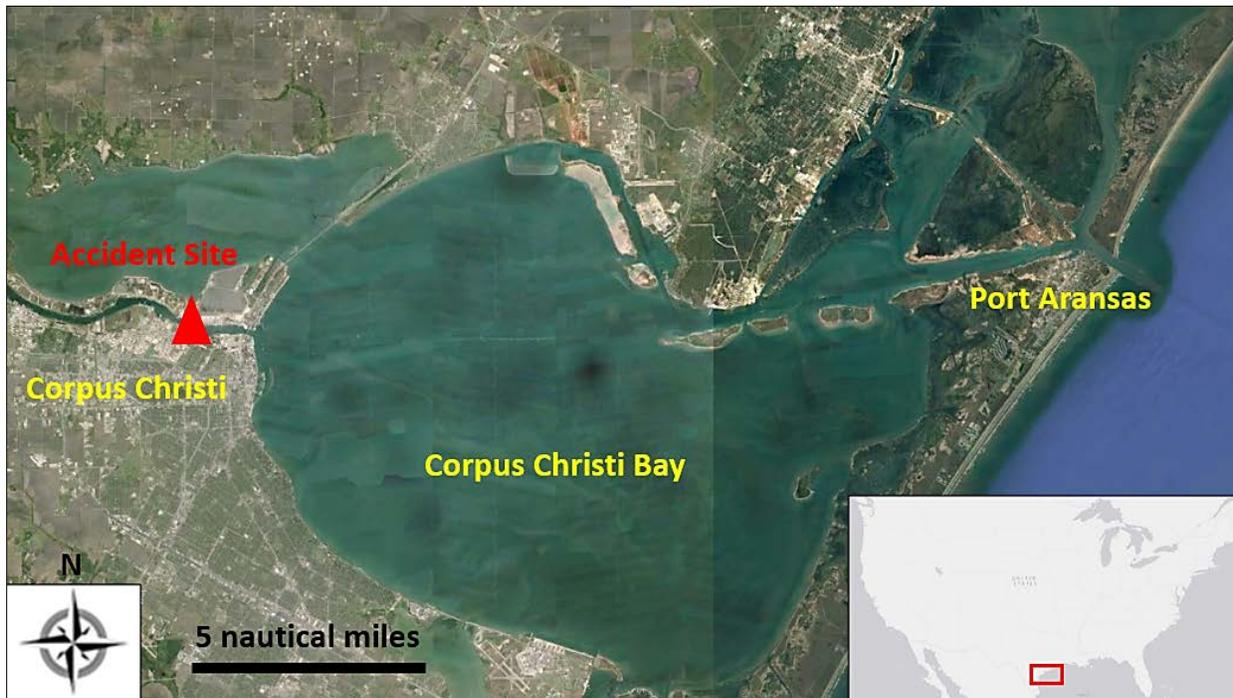


Cargo vessel *Ocean Freedom*. (Photo by Rick Comeau)

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The *Ocean Freedom* was a heavy-lift cargo vessel operated by Crowley Technical Management. Built in 2010, it had two heavy-lift deck cranes located on its port side and one smaller crane on the starboard side aft, which allowed for a wide range of cargo-carrying capabilities. Both the wheelhouse and the accommodations were located at the forward end of the ship, with its main cargo deck aft.

In addition to the main conning station inside the bridge, the *Ocean Freedom* had control stations on both the port and starboard bridge wings for the vessel's direct-drive, slow-speed diesel propulsion and bow thruster. The bridge wings were used mostly for docking maneuvers but were used also for viewing the ship's sides at the extreme ends of the wings.



Satellite image of Corpus Christi Bay and the accident site. (Background by Google Earth)

Visibility in the Port of Corpus Christi on the night of October 29 around the time of the accident was reported to be good, with winds from the southeast at 10–13 knots; there were no reports of any adverse weather in the area. According to the pilot on board the *Ocean Freedom*, there was a flood tide with a current estimated at about 1.5 knots, but the current did not have much effect on the ship at the site of the accident.

The *Ocean Freedom* arrived at an offshore anchorage outside Aransas Pass, Texas, on October 24 from its last port of call in Rugao, China, with a cargo of about 200 tons of steel piping. Five days later, on October 29, the *Ocean Freedom* got under way about 1942 toward the entrance to Aransas Pass and picked up an Aransas-Corpus Christi pilot, as required. On the bridge was the master, who was in command; the officer of the watch (third mate); and a helmsman. According to the master, the officer of the watch was responsible for complying with propulsion control orders from the pilot, confirming the pilot's commands, and monitoring the vessel's position.

About 2028, the pilot met with the master on the bridge to conduct a master-pilot information exchange, which consisted of a brief dialogue about the working condition of the vessel's equipment, the ship's air draft for passage under the Corpus Christi Inner Harbor Bridge,

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the number of tugboats to be used, and the engine and bow thruster particulars. There was no detailed discussion about the inbound passage plan, however. When the pilot asked if the vessel was responsive, the master confirmed that it was and that it required only one tugboat for the current weather conditions. About 1 minute later, the pilot ordered full ahead and began directing the movement of the vessel into the channel entrance.

The pilot told investigators that as he commenced giving helm and propulsion orders to align the ship with the first set of range lights inbound he noticed that the ship was “a little bit to handle.” He said that he had to use “a lot of rudder” to bring the ship to the next course line while approaching the first large course change at the Harbor Island intersection. Once he had steadied up to the course line, he commented to the master that the turn was “terrible” and questioned the handling characteristics of the ship. The master assured him that the vessel “handles pretty good,” telling the pilot that the ship had adequate power with an effective bow thruster and that monitoring the stern provided a “good indicator” of the vessel’s movement and rate. The pilot said he then informed the master and bridge team members that ships like the *Ocean Freedom* (ships whose wheelhouses were located at the bow rather than at the stern) were “specialty ships” and were not handled often in the Port of Corpus Christi. He asked them to let him know if he was oversteering or if they saw anything out of the ordinary about his handling of the vessel.

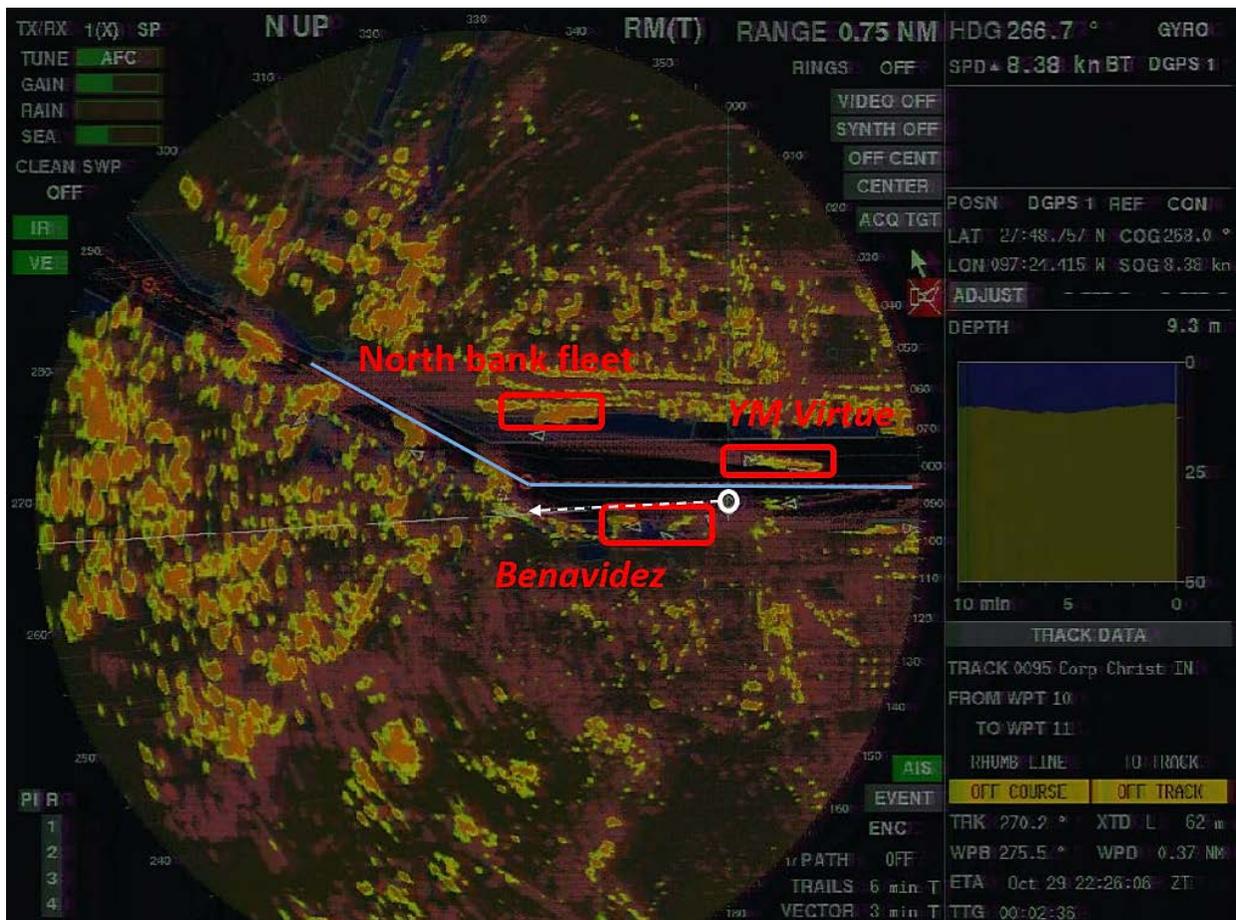
At 2218, the *Ocean Freedom* passed under the Inner Harbor Bridge at half-ahead speed on a westerly heading into the turning basin. The pilot had an arrangement with an outbound grain ship, the *YM Virtue*, for a starboard-to-starboard meeting. With that passing arrangement, the *Ocean Freedom* was to favor the south side of the channel and the larger *YM Virtue* and its escort tug the north side. Moored on the south side of the channel was the ro-ro vessel United States Naval Ship (USNS) *Benavidez*.



Satellite image of Corpus Christi Inner Harbor and the accident site, with positions of the Kirby north bank fleet (barge positions are not actual for the accident date) and the *Benavidez* identified in red. (Background by Google Earth)

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With the vessel's speed at about 6 knots, the pilot ordered full ahead at 2223, which was about the same time the *Ocean Freedom* passed the *YM Virtue*. Recognizing the *Ocean Freedom*'s position on the south side of the channel relative to the moored *Benavidez*, the pilot commented to the master, "I don't like the look of this," and went to the port bridge wing with the master to monitor their vessel's proximity to the *Benavidez*. From the bridge wing they looked aft to view the 459 feet (140 meters) of ship behind them. At 2224, the pilot ordered in quick succession, "Right ten," followed in seconds by "Right twenty," and then "Hard right." Both the third mate and the helmsman acknowledged the helm orders: the rudder was put to right. The pilot told investigators that his intention was to turn or "lift" the *Ocean Freedom*'s stern away from the *Benavidez*.



Radar image from the voyage data recorder of the *Ocean Freedom* at 2224 with all vessels indicated in red, the *Ocean Freedom* and its heading in white, and the intended track line in blue.

At a speed of about 9 knots and a heading of about 267 degrees, the ship's rate of turn began to increase to starboard as the vessel began to head in a northwesterly direction. The pilot, who was still on the bridge wing with the master looking aft, noticed that the stern of the *Ocean Freedom* was closing in on the *Benavidez*, which was not his desired effect. He contacted the *Chloe K*, the *Ocean Freedom*'s escort tugboat located aft of the vessel, to ensure they would clear the *Benavidez*; the skipper confirmed they would. According to an estimate by the master and the pilot, the *Ocean Freedom*'s stern cleared the *Benavidez* at an estimated distance of 100–150 feet.

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Upon hearing that they cleared the *Benavidez*, the pilot and the master re-entered the bridge where, by this time, the ship's rate of turn to starboard was high (about 64 degrees per minute) and the vessel's heading was changing rapidly to the northwest in the direction of the north side of the channel. At 2225, the voyage data recorder (VDR) recorded a sequence of shouted orders of "Midships! Hard left! Full thruster to port!" followed by the movement of the propulsion to emergency astern. The master confirmed later that he communicated these orders and handled the propulsion lever.

As the *Ocean Freedom* moved across the approximately 800-foot-wide channel at about 9 knots directly toward a fleet of tank barges moored to the north bank, the pilot ordered the sounding of five short blasts on the ship's whistle. Aware of the impending collision, he announced on VHF radio that there was an "emergency on the north bank" as the *Ocean Freedom* headed toward the barges. The crew on two tugboats tending the barges, the *Nueces* and the *Pecos*, having heard the whistle and radio calls, maneuvered clear of the *Ocean Freedom*. Just before 2226, the *Ocean Freedom*'s bow impacted the *Kirby 28044*, the outermost of the three moored tank barges, at about 8 knots on a heading of about 320 degrees. The barge's starboard bow was lodged between the stem and the bulbous bow of the *Ocean Freedom* just above the waterline.

A crewmember from the *Nueces* was on board the *Kirby 28044* conducting preloading checks when he heard both the *Ocean Freedom*'s whistle and the *Nueces* operator making a radio announcement to evacuate the barge. While trying to escape, the crewmember fell and injured himself. He suffered a broken left rib and knee injury, which required a brief hospital stay.

Following the collision, the pilot first made a mayday call for help from nearby vessels and harbor control. But with the *Ocean Freedom* blocking the channel and unable to maintain position within, the pilot then radioed harbor control requesting to moor at the open dock next to the Kirby barge fleet. Within minutes, there were multiple vessels on scene to help the vessel maneuver back to the dock where it was secured.



Impaled by the bow of the *Ocean Freedom*, the starboard bow of the *Kirby 28044* is lodged just above the vessel's bulbous bow. In the background is the USNS *Benavidez*. (Photo by Coast Guard)

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### Personnel

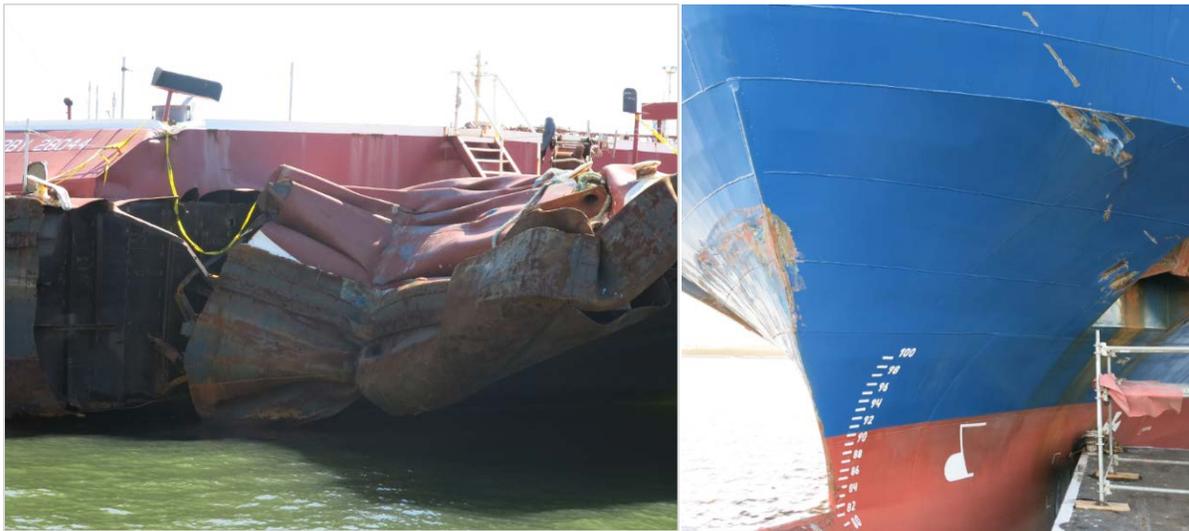
The pilot, master, and officer of the watch were found to be properly licensed for the capacities in which they were sailing. The pilot had been working as an Aransas-Corpus Christi pilot since 1995. The master had been sailing with the vessel's operating company for about 3 years in the capacity of master.

All three, including the helmsman, were tested for alcohol and drugs after the accident: the results were negative. Additionally, all provided documentation of their work/rest history for the 3 days leading up to the accident. Investigators did not identify any work/rest or fatigue issues.

### Damage

The *Kirby 28044* sustained damage to its starboard bow, causing penetrations, fractures, and cracks to its hull and inner tank. There was no report of fire or pollution; the barge, which was being prepared for a cargo of naphtha, was not loaded at the time of the accident. The two inner barges, *Kirby 29103* and *29125*, were also damaged, having sustained dents, scrapes, and fractures due to compression forces from the collision.

The *Ocean Freedom* incurred damage to its bow above the waterline, predominantly on the port side. There was a small penetration in the hull plating, with the remainder of the damage in the form of indentations and scrapes.



At left, damage to the starboard bow of the *Kirby 28044*. At right, damage to the port bow of the *Ocean Freedom*.

### Analysis

According to the pilot, the channel where the *Ocean Freedom* and the *YM Virtue* met each other had no restrictions, so it was acceptable for vessels to meet starboard to starboard in that location in accordance with a meeting arrangement. Just before the two vessels met, the *Ocean Freedom* was lined up in the center of the channel after passing under the Inner Harbor Bridge. With the bulk carrier approaching, the pilot on the *Ocean Freedom* ordered a course change to port to bring his ship to the south side of the channel, while the *YM Virtue* remained closer to the north side. This arrangement, however, not only led to the *Ocean Freedom* being

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flanked by the *YM Virtue* and the *Benavidez*, which was moored on the south side, but it led to the *Ocean Freedom* being positioned closer to the *Benavidez* while passing through the channel.

To steer clear of the *Benavidez*, the pilot intended to “lift” the *Ocean Freedom*’s stern away from the moored ship, which a rudder order to *left* would have accomplished. Instead, he gave a rudder order to *right*, consequently moving the stern closer to the *Benavidez*. The master told investigators that, later, during a discussion with the pilot about the events of the accident, the pilot asked, ““Did I say, “Hard to *starboard*?” I meant hard to *port*.”” This error set the *Ocean Freedom* on a northwesterly track toward the fleet of tank barges moored just ahead. Although the pilot was able to clear the *Benavidez*, his preoccupation with the maneuver distracted him from monitoring the vessel’s quick momentum turn toward the north bank barges, with which the *Ocean Freedom* would collide seconds later.

The command error resulting in the course alteration toward the barges may have stemmed from the pilot’s point of reference. The location of the wheelhouse was not typical of the cargo vessels the pilot was more accustomed to navigating in the Port of Corpus Christi: the *Ocean Freedom*’s was forward rather than aft. Thus, he was conditioned to piloting from the stern, where he could see most of the ship ahead. At the time the pilot issued the incorrect helm order he and the master were looking aft, in the opposite direction of the vessel’s movement.

Under an effective bridge resource management program, bridge team members are able to detect errors in order to prevent an undesired effect. On the *Ocean Freedom*, the master, who joined the pilot on the bridge wing, was occupied with observing the distance to the moored vessel. To him, a helm order to right made sense, based on his view of the direction to which the ship needed to head back toward the center of the channel. The other two bridge team members, the officer of the watch and the helmsman, were inside the bridge looking ahead. Although aware of the pilot’s concern about the proximity to the *Benavidez*, they were not aware of his intention to lift the vessel’s port quarter *before* returning the ship to the center of the channel. Nevertheless, there was no evidence of any bridge team member continuing to monitor the ship’s progress after complying with the orders of full-ahead speed and hard-right rudder. Data and audio from the ship’s VDR (audible from the clicking rate-of-turn indicator on the pilot’s portable pilot unit) indicate that the ship’s heading began to change rapidly after these orders were given. Although there was a short time to react—about 40 seconds from when the pilot issued the first right rudder order to when he discovered the error—no one raised concern with the rapid change of course or identified the risk of collision.

Moreover, the master was aware of the pilot’s challenges with handling the vessel but did not take measures to mitigate the risks associated with those challenges. Prior to the collision, there were early indicators that the pilot was having difficulty familiarizing himself with the handling or characteristics of the ship. At one point, he acknowledged to the master his dissatisfaction with a course change that he ordered and, at another time, he solicited the bridge team’s assessment of his handling of the ship. Although the master told investigators that he thought the pilot tended to use too much rudder, he did not identify as a risk the challenges the pilot was having in steering the vessel; he attempted only to assuage the pilot’s concerns.

### Probable Cause

The National Transportation Safety Board determines that the probable cause of the collision of the *Ocean Freedom* with the moored tank barges was the pilot’s rudder order in a direction opposite of which he intended. Contributing to the accident was the failure of the bridge team to identify the risk of collision and take appropriate action.

### **Bridge Team Management**

The presence of a pilot on board does not relieve bridge team members of their responsibilities for the safe navigation of the ship. The master and the officer of the watch must collaborate closely with the pilot to maintain an accurate check of the ship's position and movement. In addition, they must not hesitate to challenge or, if necessary, take appropriate action to prevent a collision, a grounding, or an allision.

The pilot and the bridge team should share the same mental model for the passage and fully understand the planned tasks and maneuvers. Communications should be open and, where circumstances permit, involve discussion of the intended maneuver or any deviations from the plan.

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### Vessel Particulars

Vessels	<i>Ocean Freedom</i>	<i>Kirby 28044</i>
Owner/operator	Crowley Technical Management	Kirby Corporation
Port of registry	New Orleans	N/A
Flag	United States	United States
Type	Multipurpose heavy-lift cargo	Tank barge
Year built	2010	2006
Official number (US)	1235626	1182249
IMO number	9506722	N/A
Construction	Steel	Steel
Length	504.6 ft (153.5 m)	297.5 ft (81.5 m)
Draft	23 ft (7.1 m)	2 ft (0.6 m)
Beam/width	76.1 ft (23.2 m)	54 ft (16.5 m)
Gross and/or ITC tonnage	12,810 gross tons / 5,938 ITC tons	1,619 gross tons
Propulsion	13,280 hp (9,960 kW); Wartsila 6RT	N/A
Persons on board	16	1

NTSB investigators worked closely with our counterparts from Coast Guard Sector Corpus Christi throughout this investigation.

For more details about this accident, visit [www.nts.gov](http://www.nts.gov) and search for NTSB accident ID DCA16FM003.

**Approved: April 20, 2017**

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 Title 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.” Title 49 *Code of Federal Regulations*, 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. Title 49 *United States Code*, 1154(b).