



National Transportation Safety Board

Marine Accident Brief

Collision between Cargo Vessel *Manizales* and Bulk Carrier *Zen-Noh Grain Pegasus*

Accident no.	DCA16FM018
Vessel name	<i>Manizales</i> and <i>Zen-Noh Grain Pegasus</i>
Accident type	Collision
Location	Belmont Anchorage, Mississippi River, mile marker 153 near Hester, Louisiana
Date	January 17, 2016
Time	1631 central standard time (coordinated universal time – 6 hours)
Injuries	None
Property damage	\$2.2 million est.
Environmental damage	None
Weather	Overcast, winds 22 mph gusting to 28 mph, air temperature 45°F, relative humidity 80 percent, pressure 1016 mb
Waterway information	The Mississippi River has a project depth of 45 feet from Southwest Pass, near the entrance to the Gulf of Mexico, to mile marker 233.4, about 135 miles above New Orleans at Baton Rouge, Louisiana. On the accident date, the river was at high water with a strong current.

On January 17, 2016, about 1631, the 390-foot-long cargo vessel *Manizales* collided with the 623-foot-long bulk carrier *Zen-Noh Grain Pegasus* on the Mississippi River at mile marker (mm) 153 near Hester, Louisiana. Before the collision, the *Manizales* had anchored in the Belmont Anchorage just upriver from the *Zen-Noh Grain Pegasus*. Within 30 minutes of dropping both of its anchors, the cargo vessel's anchors dragged. The *Manizales* drifted downriver toward the bulk carrier and became entangled in the larger ship's port and starboard anchor chains. The *Manizales* incurred over \$2.2 million in damages from the collision, and the *Zen-Noh Grain Pegasus* lost its starboard anchor. No pollution or injuries were reported.



Cargo vessel *Manizales*. (Photo courtesy of Mr. George Leblanc)

* All miles in this report are statute miles.

Note: This report was reissued on April 3, 2017, with corrections to page 9.

NTSB/MAB-17/03

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Accident Events

The accident occurred during a period of high water on the Lower Mississippi River, with the increased water volume resulting in a corresponding increase in the river current. Because of the high-water conditions, the Board of New Orleans-Baton Rouge Steamship Pilot Examiners for the Mississippi River requested that pilots navigating southbound vessels between mm 233 and mm 90.5 transit during “daylight only.”¹ This request was communicated to the New Orleans-Baton Rouge Pilots Association (NOBRA) in a letter dated January 6, 2016—11 days before the accident.

At noon on January 17, a NOBRA pilot boarded the anchored *Manizales* at mm 175 near Darrow, Louisiana, expecting to immediately get under way and take the vessel all the way to sea. However, his planned departure was delayed twice. The ship was still taking on cargo when he arrived, and when the ship tried to get under way at the completion of cargo operations, it took the crew 45 minutes to break the port anchor free from the mud bottom. The ship eventually began heading downriver at 1420.

Before getting under way, the pilot determined that he could not transit the 85 miles necessary to reach the end of the “daylight only” restriction zone before dusk, so he discussed a change of destination plan with the *Manizales’s* master and called the NOBRA office to arrange an anchorage along the route. He was instructed to use the Belmont Anchorage, the only available location.

The Belmont Anchorage was an area 1.1 miles in length along the left descending bank of the river extending from mm 152.9 to mm 154.² The width of the anchorage was 300 feet.³ The pilot said that when anchoring in the Belmont Anchorage, he anchored the *Manizales* as close to the left bank as he could to avoid the main stream of the current. The pilot said, “The further over you get away from the current, the better they usually stay...the closer to the bank you can get them in this high river, the better off they are.” An integrated tug and barge was anchored upstream of the *Manizales’s* intended position, and two ships were anchored downstream. The *Zen-Noh Grain Pegasus* was immediately downstream of the *Manizales*.

¹ (a) A pilot is retained by the ship to provide local knowledge of the waterway, familiarity with tides and currents in the area, understanding of local procedures, and a thorough knowledge of the topography of the waterway. Pilots usually operate by issuing maneuvering instructions (such as heading, rudder angle orders in degrees to port or starboard, and speed orders) to the crew under the supervision of the master or the officer in charge of the navigation watch, or both. (b) The Board of New Orleans-Baton Rouge Steamship Pilot Examiners for the Mississippi River is an organization chartered by the state of Louisiana to develop, examine, and assess river pilots, and to make recommendations for the safe navigation of the river.

² The banks of the Mississippi River are referred to as left and right when traveling downstream. Thus, when the river is oriented north to south, the east bank of the Mississippi River is its left bank and the west bank is its right bank. To avoid confusion, commercial river traffic often calls the left bank the left descending bank and the right bank the right descending bank. (Source: US Coast Guard)

³ The parameters of Belmont Anchorage are defined in 33 *Code of Federal Regulations* (CFR) 110.195.

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With the assistance of two tugboats, the pilot anchored the *Manizales* using both anchors, placing one off the port bow and one off the starboard bow at the ten and two o'clock positions, respectively. He used four shots (360 feet) of chain for the port anchor and three shots (270 feet) for the starboard anchor. The pilot stated that he chose the length of chain based on the high-water conditions and the size of the *Manizales*. He said the difference in the length of chain was required to keep the ship parallel with the river based on the river bottom contour. Automatic identification system (AIS) data show that the pilot turned the vessel up into the river at approximately 1542.⁴ Based on bridge team audio captured by the *Manizales*'s voyage data recorder (VDR), the vessel dropped the port anchor at 1556 and the starboard anchor at 1600.⁵

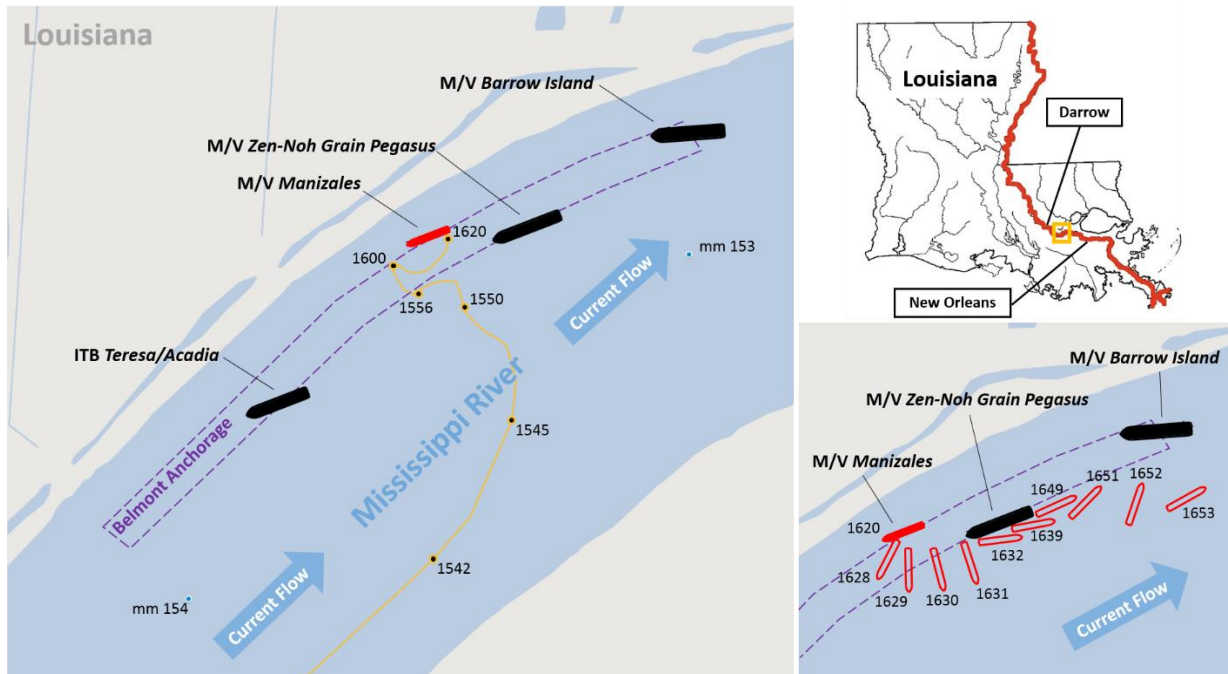


Image on the left shows AIS data of *Manizales*'s approach to the anchorage until it appeared to be holding anchor at 1620. Lower right image shows the path of *Manizales* as it dragged anchor and collided with *Zen-Noh Grain Pegasus*. Upper right image shows the accident area, outlined in yellow, in the Louisiana section of the Lower Mississippi River. (Background by Google Maps)

About 1617, the pilot (as recorded on the VDR) reported that the anchor chains had become taut. At this time, the stern of the *Manizales* was about 500 feet from the bow of the *Zen-Noh Grain Pegasus*. The pilot remained on the bridge of the *Manizales* until 1626, when the crew boat that was to take him ashore approached. Just as the pilot was going to board the crew boat, the *Manizales*'s bow swung into the river. AIS data showed that the *Manizales*'s initial

⁴ The automatic identification system (AIS) is a maritime navigation safety communications system. At 2- to 12-second intervals on a moving vessel, AIS automatically transmits vessel information, including the vessel's name, type, position, course, speed, navigational status, and other safety-related information, to appropriately equipped shore stations, other vessels, and aircraft. The rate at which AIS information is updated depends on vessel speed and on whether the vessel is changing course. AIS also receives information from similarly equipped vessels.

⁵ A voyage data recorder (VDR) maintains a continuous, sequential record of data relating to a ship's equipment and its command and control; it also captures bridge audio from certain areas on the bridge and bridge wings.

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heading change occurred at 1628, with the bow swinging 33 degrees in 90 seconds. The pilot returned to the bridge soon after.

By the time the pilot reached the bridge, the ship was almost perpendicular to the river. At 16:29:50, the VDR captured the pilot on the bridge saying, “She’s coming out. Half ahead and starboard.” These commands directed the crew to apply forward propulsion to the ship and turn the rudder to starboard. However, after an inaudible conversation on the bridge, the pilot was recorded saying, “I told you not to. I told you not to stop it.” The pilot told investigators that the engines were not in standby and thus were not available to provide the ordered propulsion power. Conversely, the vessel’s chief officer stated that the engines were operating and that he saw propeller wash prior to the collision. Investigators could not determine the actual status of the engines at the time of the accident because only audio data were recovered from the VDR; other data, such as engine parameters, were corrupted and not available for review. Regardless, the ship was not able to overcome the force of the river current as its anchors dragged.

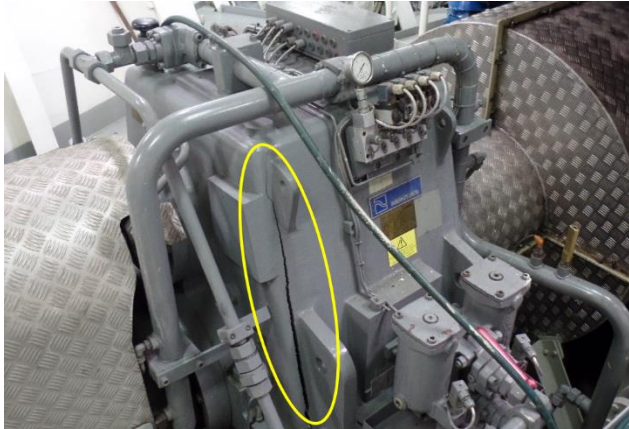
A few seconds later, at 16:30:00, the pilot said, “Captain, we are going to hit the ship, we can’t fix it.” The pilot radioed the two tugboats that had been assisting during the anchoring, requesting that they quickly return. He then used the ship’s whistle to sound the danger signal and warn other vessels of the impending collision.



***Zen-Noh Grain Pegasus* at Belmont anchorage. (Photo by Coast Guard)**

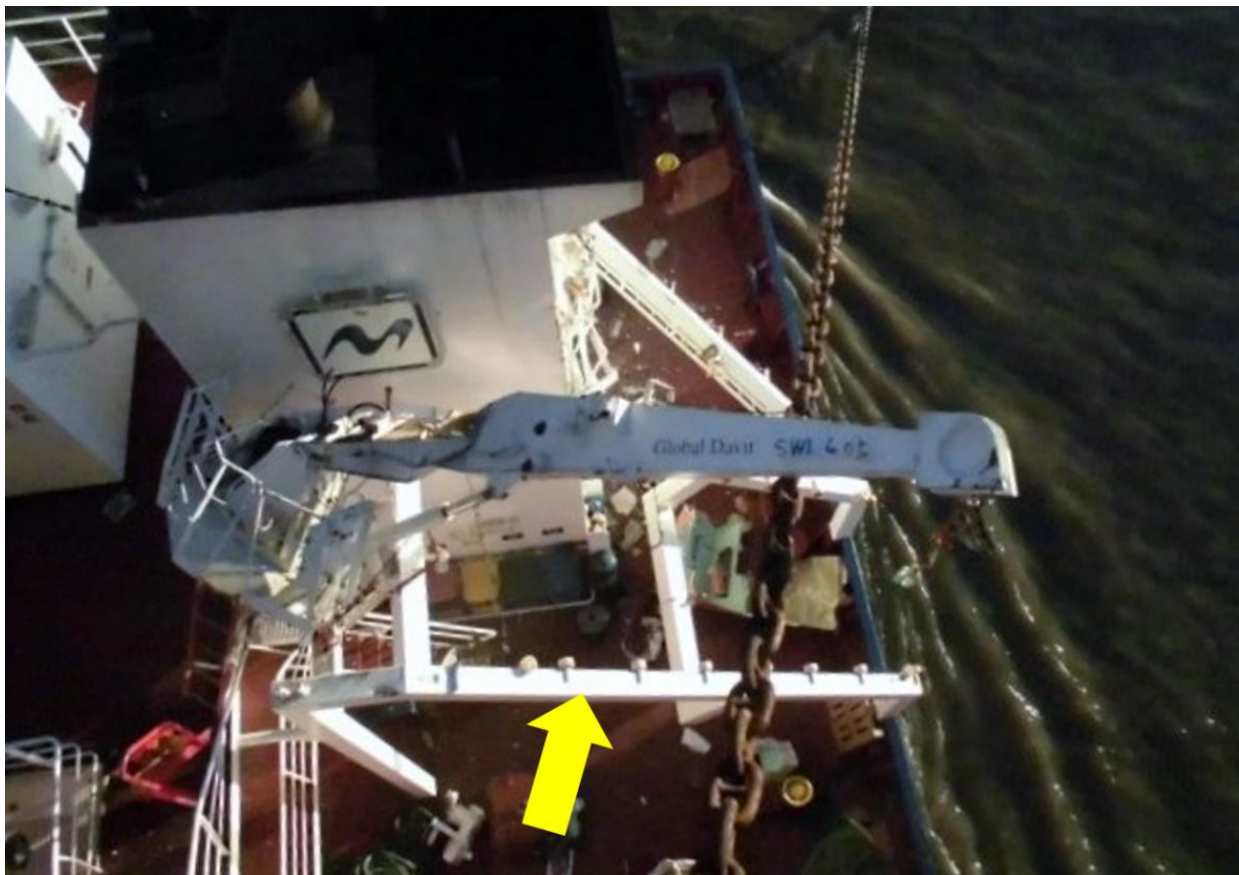
At 16:31:24, carried by the current, the *Manizales* reached a speed of 5.5 knots on a course over the ground of 94.7 degrees. The vessel continued to drift until its propeller caught the starboard anchor chain of the *Zen-Noh Grain Pegasus*. The entanglement pulled the *Manizales*’s propeller shaft outward 6 inches, damaging reduction gears and cracking the gear box.

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Left image shows *Manizales* cracked gear box. Right image shows *Zen-Noh Grain Pegasus* port anchor chain draped across *Manizales* crane and lifeboat. (Photos by Coast Guard and *Zen-Noh Grain Pegasus* crew)

Subsequently, the *Manizales* drifted toward the port anchor chain and bow of the *Zen-Noh Grain Pegasus*. The *Zen-Noh Grain Pegasus*'s port chain caught and then wrapped around the *Manizales*'s stern crane, holding the vessel in place as the current pivoted it around the bow of the bulk carrier. The highest point on the *Manizales*'s aft deckhouse was well below the main deck of the *Zen-Noh Grain Pegasus*, and at some point as the ships collided, the bridge wing of the smaller vessel was torn off.



Zen-Noh Grain Pegasus port anchor chain draped across the stern of *Manizales*. The yellow arrow points to the empty free fall lifeboat cradle below the stern crane. (Photo by *Zen-Noh Grain Pegasus* crew)

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The *Zen-Noh Grain Pegasus* did not have a pilot onboard; however, its engine was on line and watchstanders were stationed on the bridge. At 1643, the *Zen-Noh Grain Pegasus* began to maneuver under power. The *Manizales* pilot told investigators that the bulk carrier was coming ahead, pulling the *Manizales*, and causing it to list. He said, “At one point I thought she was going to flip over.” After receiving a call from the *Manizales* pilot on VHF radio, the *Zen-Noh Grain Pegasus* master moved his rudder from port to midships and used his engine to prevent the *Zen-Noh Grain Pegasus* from swinging out into the main river channel.

With no propulsion, the bridge wing torn off, the ship listing, and the *Zen-Noh Grain Pegasus* anchor chain still wrapped around the stern, the *Manizales* crew mustered on their vessel’s main deck near the cargo hatch covers. The list became so great that the decision was made to abandon the ship, so the crew stepped onto one of the tugboats. About 1 to 2 minutes later, the *Manizales* came free of the anchor chain when its crane broke from the deck. Once released from the chain, the *Manizales* floated free, and the crew returned to their ship as it drifted down the port side of the *Zen-Noh Grain Pegasus*. The vessel continued to drift downriver for 2300 feet until it was corralled by five towing vessels.

Additional damage to the *Manizales* included the destruction of the free fall lifeboat and other steel fixtures on the deck aft of the wheel house. The anchor chain of the *Zen-Noh Grain Pegasus* was severed, resulting in the loss of the starboard anchor.



Manizales drifting down the port side of the anchored *Zen-Noh Grain Pegasus*. (Photo by *Zen-Noh Grain Pegasus* chief mate)

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Analysis

Due to fluctuations in rainfall, snowmelt, and other natural causes, the Lower Mississippi River maritime community anticipates high-water conditions that could cause vessels to drag and lose anchors. The Coast Guard, the US Army Corps of Engineers, the National Oceanic and Atmospheric Administration, and industry associations assessed previous periods of high water to develop best practices and decide when to implement system controls to address hazards. These best practices were published in 1997 in the Mississippi River Crisis Action Plan. The plan included the following statements:

Timely, well designed interventions by waterway managers will bring order to the chaos surrounding a flood, drought or other marine incident and will limit economic impact on local and regional economies. The management of marine traffic during emergencies requires a clear set of goals and a focused plan of action to address associated complex issues.

Waterway managers must continually monitor hydrological and meteorological reports and the frequency of vessel casualties as indices of navigating conditions. By analyzing developing trends, they can decide when system controls must be implemented to maintain an acceptable level of safety.

High-water or flood conditions will be marked by deterioration of navigating conditions due to swift currents, heavy debris flow, and the degradation of the [Aids to Navigation] system. These conditions often result in an increase in vessel casualties, pollution incidents and barge breakaways.

The plan also described high-water hazards, including 23 vessel-anchoring problems during a 1997 high-water event. Past high-water experience described in the plan showed that when the Carrollton Gauge, which provides a measure of the river height, was between 12 and 15 feet and rising, “pilots may begin to experience an increase in ships dragging anchor in anchorages and midstream facilities.” When the Carrollton Gauge was 17 feet or more, “in anchorages, more scope is put out on each anchor.” The Carrollton Gauge recorded a river stage of 16.8 feet at the time of this accident.

To address the hazards to anchored vessels, the Coast Guard Captain of the Port for New Orleans issued a Marine Safety Information Bulletin (MSIB) on January 6, 2016, requiring vessels to use two anchors and keep their propulsion systems on standby. The master of the *Manizales* used two anchors, but the status of his engines was disputed. Though not applicable to the *Manizales*, another MSIB, issued on January 12, 2016, recommended keeping a pilot on board an anchored vessel with a draft of more than 30 feet.

The area on the Lower Mississippi River between Baton Rouge and New Orleans is a busy section of the waterway, with many ships and tows transiting the area. As soon as one ship finishes loading, facility operators want to load another immediately. Anchorages and berths operate near capacity, with vessels often waiting for a loading berth. The Belmont Anchorage was established in 2013 at the urging of the Lower Mississippi River Waterway Advisory Committee to double the available anchorage area in that section of the river and relieve the impacts of increased vessel volume. The anchorage was originally designed for three vessels and was normally occupied by two vessels. At the time of the accident, there were four vessels anchored in the area.

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The Coast Guard Captain of the Port is the ultimate decision maker for marine safety on the river, ensuring that waterway users safely fulfill their missions. In high-water conditions, ships are susceptible to dragging anchor and, recognizing this fact, the Captain of the Port and pilots implement measures so ships' crews can stay in control of their vessels. The Captain of the Port and pilots must balance commerce and increased risk of casualties when making decisions, and they receive input from pilot associations; maritime industry representatives, including the Lower Mississippi River Waterway Safety Advisory Committee (a federal advisory committee); and daily conferences held by the Port Coordination Team during periods of high water.

After the *Manizales* collision, NOBRA, the association that manages the movement of self-propelled commercial vessels when their pilots are on board (including when and where to anchor), assessed the risk in the Belmont Anchorage during the high-water period and decided to limit occupancy to one vessel. Had this strategy been in place when the *Manizales* anchored, the collision would not have occurred.

Anchoring several large vessels in close proximity during high-water conditions—when anchor dragging often occurs—increased the likelihood of an accident. The nearness of the *Zen-Noh Grain Pegasus* (as close as 500 feet) did not allow the *Manizales* crew enough time to gain control of the vessel before its propeller was caught in the anchor chain of the *Zen-Noh Grain Pegasus*.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the collision between the *Manizales* and the *Zen-Noh Grain Pegasus* was the decision by the New Orleans-Baton Rouge Pilots Association to assign the *Manizales* to the Belmont Anchorage during high-water conditions with three other vessels already anchored in the area.

Anchoring in High-Water Conditions

As this accident illustrates and historical information confirms, the risk of dragging anchor is substantially increased during periods of high water and strong currents. Mariners should adhere to Coast Guard advisories and pilot association guidance for the prevailing conditions and be able to respond effectively to an anchor-dragging situation. Mariners should consider measures such as increasing the scope of anchor chains, stationing navigation and engineering watches, keeping propulsion and steering systems at the ready, and retaining a pilot on board.

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Vessel Particulars

Vessel	<i>Manizales</i>	<i>Zen-Noh Grain Pegasus</i>
Owner/operator	Navesco S.A.	Tamai Steamship Co., Ltd.
Port of registry	Madeira	Panama City
Flag	Portugal	Panama
Type	Cargo	Bulk Carrier
Year built	2011	2010
Official number (US)	NA	NA
IMO number	9567257	9402017
Construction	Steel	Steel
Length	389.7 ft (118.8 m)	623.1 ft (189.9 m)
Draft	25.8 ft (7.9 m)	22.2 ft (6.8 m)
Beam/width	50.2 ft (15.3 m)	105.8 ft (32.2 m)
Gross and/or ITC tonnage	4951 ITC tons	30619 ITC tons
Engine power; Engine Manufacturer	5364 hp (4000 kW); Wärtsilä	11007 hp (8208 kW); Kawasaki
Persons on board	12	22

NTSB investigators worked closely with our counterparts from Coast Guard Sector New Orleans throughout this investigation.

For more details about this accident, visit www.nts.gov and search for NTSB accident ID DCA16FM018.

Issued: January 5, 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).