



# National Transportation Safety Board

## Marine Accident Brief

### Sinking of Tank Barge *Nash*, Towed by Towing Vessel *Calvin*

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<b>Accident no.</b>	DCA14LM010
<b>Vessel name</b>	Tank barge <i>Nash</i>
<b>Accident type</b>	Sinking
<b>Location</b>	Pacific Ocean, 3 nautical miles west of Point Conception, California 34° 26.998' N, 120° 32.352' W
<b>Date, time</b>	June 8, 2014 1805 Pacific daylight time (coordinated universal time – 7 hours)
<b>Injuries</b>	None
<b>Damage</b>	Est. \$1 million: total loss of barge and 3,900 metric tons of liquid magnesium chloride cargo
<b>Environmental damage</b>	Release of 110 gallons of diesel fuel and lube oil
<b>Weather</b>	Northwest winds at 15 knots, clear skies, visibility 6 nautical miles, swells 8 to 10 ft, air temperature 65° F
<b>Waterway information</b>	North Pacific Ocean

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The tank barges *Nash* and *Kenny* were fully loaded with liquid magnesium chloride and being towed by the uninspected towing vessel *Calvin* from Guerrero Negro, Mexico, to British Columbia, Canada, when the *Nash* began to list noticeably to its starboard side about 1145 on June 8, 2014. Listing and trimming by the stern increased over the next 6 hours, and the US Coast Guard directed the *Calvin* captain to tow the *Nash* to a nearby anchorage. About 1805, the *Nash* sank stern first in 240 feet of water, about 3 nautical miles west of Point Conception, California. About a week after the sinking, a salvage team partially refloated the *Nash* and towed it to its disposal location about 17 nautical miles from shore.

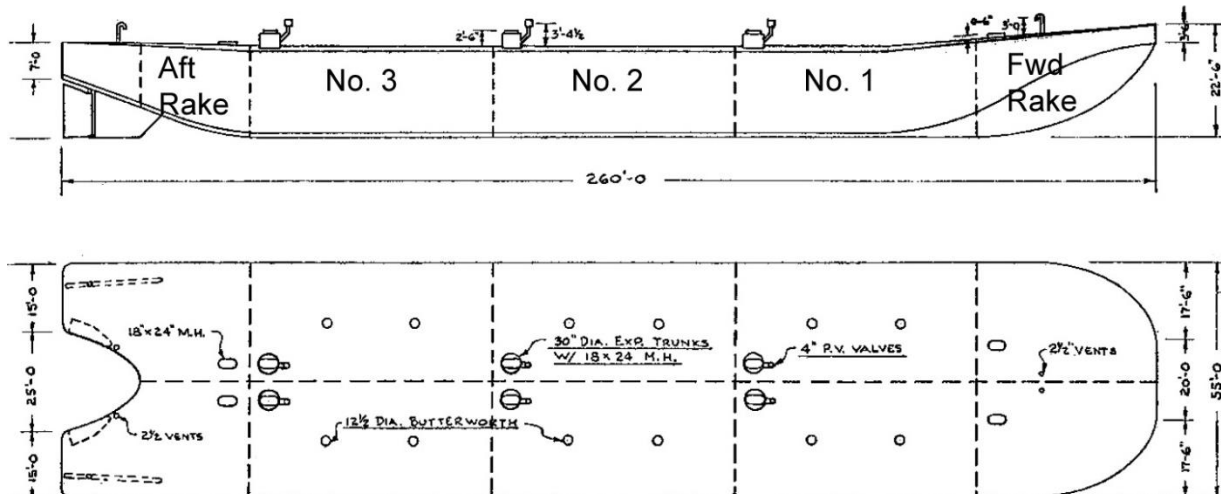


Barges *Nash* (left) and *Kenny* under tow on the afternoon of the accident. The *Nash* is heeled to its starboard side. (Photo by Salmon Bay Barge Line)

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### Barge History

The *Nash* was a single-hull tank barge built in 1969 and operated as a bunker barge by Foss Maritime, its previous owner. Salmon Bay Barge Line Inc. (SBBL) purchased the barge in December 2013 to carry magnesium chloride from Mexico to Canada. The barge had six cargo tanks—nos. 1, 2, and 3, port and starboard—and four void (rake) tanks located at the forward and aft ends of the barge.



Original general arrangement of barge *Nash*, showing location of cargo tank nos. 1, 2, and 3 and void (rake) tanks forward and aft. Not shown in the drawings are a 1,500-pound boom crane and two small deckhouses. (Drawing from Foss Maritime, previous operator of the *Nash*.)

After purchase, SBBL asked the American Bureau of Shipping (ABS) to survey the barge while afloat in Long Beach, California, for renewal of its load line certificate, which had expired while the previous owner had the barge in a laid up (nonoperational) status. Through visual and ultrasonic testing, the topside hull was found to have areas of corrosion and pitting, principally on the aft deck area. The *Nash* was later towed from Long Beach to Ensenada, Mexico, for a drydock inspection and repair of the identified deficient areas of deck plating.

After arriving in Ensenada in late April 2014, a different ABS surveyor ordered additional ultrasonic testing of the barge hull and further repairs were required. The additional visual and ultrasonic testing revealed more areas of pitted and thinned hull and about 280 feet of wasted weld seams at various locations of the bottom plating. The ABS surveyor required that these areas of plating be cropped out and new sections of plate installed. At the aft end of the barge (the transom), several areas of the hull were found to be pitted, and they were repaired by building-up with weld material (clad weld). Also at the stern, the ABS surveyor found that the vent pipe for the aft starboard void tank was holed and that the ball was seized within the gooseneck. (The aft void tanks' vent pipes were of the gooseneck type with the inverted ball checks to prevent the intrusion of water into the void space.) The seized ball was freed, and the affected section of pipe was cropped, renewed, and tested for watertight integrity. A deckhouse fitted at the aft starboard-side end of the barge was permanently removed. Finally, four of six cargo expansion trunks were found to be wasted beyond ABS limits and were renewed.

According to the president of SBBL, about 20,000 pounds of steel had been purchased in the United States for use in the shipyard. However, this amount was not sufficient to complete needed work; additional steel was required to complete the repairs. SBBL employed an experienced contractor to oversee the shipyard work on the company's behalf, and this contractor spent most of his time over a 4-week period supervising the repairs. After the work was completed, shipyard personnel air-tested all of the barge's cargo and void tanks for leaks. The

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local ABS surveyor witnessed the shipyard's testing and approved all hull repairs. The barge was re-launched on May 29, and ABS issued a new load line certificate.



**Barge *Nash* in the Ensenada shipyard during renewal of main deck plating. (Photos by SBBL)**

At the end of the *Nash*'s shipyard period, the president of SBBL visited the shipyard to review the work that had been done on the barge and to meet with the ABS surveyor who had overseen the repairs. The president was satisfied with the work performed by the shipyard and with the quality of the ABS surveys done in Ensenada, stating that the inspection was at least as diligent as any ABS inspection that SBBL had been through with any of its vessels. The repairs completed in Ensenada cost about \$1 million in addition to the \$325,000 SBBL paid for the *Nash*.

While in Ensenada, the SBBL president also met with crewmembers of the company's towing vessel *Calvin* to discuss his expectations regarding how the barge should be loaded, telling them that, while loading, no more than 2 feet of difference in tank soundings should exist between any tanks and that the barge should have about 2 feet of trim by the stern so that the barge would "tow straight."

## Accident Voyage

The tug *Calvin*, with the barge *Kenny* in tow, arrived in Ensenada from San Francisco, California, on May 27, and stood by waiting for the drydock work to be completed on the *Nash*. After the *Nash* was re-launched on May 29, the *Calvin* took the barges *Nash* and *Kenny* under tow to the cargo loading terminal in Guerrero Negro, about 275 nautical miles southeast of Ensenada, where it arrived on May 31. While in port on June 1 and 2, terminal employees fully loaded (by weight) both barges with a total of about 8,437 metric tons of liquid magnesium chloride, of which 4,357 metric tons were loaded on board the *Nash*.

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Following repairs to the *Nash* in Ensenada, Mexico, barges *Nash* and *Kenny* were loaded in Guerrero Negro, Mexico, and then began the voyage to British Columbia, Canada, towed by the *Calvin*. After the *Nash* took on a starboard list, the Coast Guard directed the tow to anchorage near Point Conception, California.

Due to the specific gravity of the cargo, the barge tanks were not loaded to their full capacities by volume. The captain and mate of the *Calvin* checked the barges to ensure they were not loaded below their ABS load lines and that they were ready for sea. The *Calvin* crew checked the level in each cargo tank to verify that no more than a 2-foot difference existed between any of the six cargo tank levels on each barge and that the tank hatch openings were securely closed. However, the crew did not check that the void tank hatches were securely closed as part of the ready-for-sea checks. The crew was not aware of any written company procedures or checklists regarding barge loading or the steps needed to prepare the barge for sea.

The *Calvin*, towing the barges *Kenny* and *Nash*, began the accident voyage on the afternoon of June 2. The liquid cargo was destined for two separate locations in British Columbia. The captain arranged the barges in a tandem-tow configuration, with the *Kenny* as the lead barge on one towline and the *Nash* about 400 feet behind the *Kenny* on a second towline from a second winch. The first 5 days under way were uneventful, other than rough seas that limited the transit speed to about 3 knots. Later, the seas abated and the *Calvin*'s speed was increased to nearly 5 knots.

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Towing vessel *Calvin* after the accident.



Barge *Nash* after loading at Guerrero Negro, Mexico.  
(Photo by Exportadora de Sal, SA)

On the morning of the barge's sinking, June 8, the sea state increased, and the captain reduced speed slightly, to about 4 knots. About 1130, the captain noticed that the *Nash* was not recovering normally from its rolls and was listing to starboard. About 1145, the captain alerted the Coast Guard of the situation and repositioned the *Calvin* so that he could have a closer look at the condition of the *Nash*. The captain wanted to board the barge to determine the nature of the flooding, but the swells were too high to safely attempt going alongside the barge.

The Coast Guard directed the captain to take the barge to San Luis Obispo, California, about 40 nautical miles to the north of the tow's present location. About 1430, the Coast Guard contacted the owner of SBBL, and the destination was changed to Cojo Anchorage, near Point Conception, about 20 nautical miles to the southwest. As the tow approached Point Conception, the trim by the *Nash*'s stern had progressed to the point that the aft portion of the barge was submerged. About 1805, the *Nash*'s bow extended about 60 feet above the water, and the barge then sank vertically in 240 feet of water about 3 nautical miles from Point Conception. As the

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*Nash* began to sink below the sea surface, the *Calvin* was pulled astern, and the captain released the winch brake to allow the towline to unspool from the winch. The stern of the barge came to rest on the sea bottom with its bow protruding 15–20 feet above the sea.



Dive boat *Danny C* (right) engaged in salvage operations of the *Nash* and the bow of the *Nash* (left) protruding vertically about 15 feet above the sea.

Salvage operations to refloat the *Nash* began the day after its sinking. On June 10, the salvage team deployed a remotely operated vehicle (ROV) to assess the condition of the barge. The ROV dive operation first detected the signs of hull damage at a water depth of 117 feet, about 131 feet aft of the bow. The side shell of the hull at the no. 2 port-side cargo tank was observed by remote camera and sonar readings to be significantly deflected inward. Further aft along the hull, at a water depth of 150 to 165 feet, tears in the side shell and a 15-foot-long fracture along the turn of the bilge were observed.

At a 176-foot water depth, the main deck was seen to be compressed downward into the hull about 5 feet, and at a 214-foot water depth, the side shell was completely compressed inward. The extent of the damage to the side shell indicated failure of the transverse bulkheads between port-side cargo tanks nos. 2 and 3, as well as the bulkhead between portside cargo tank no. 3 and the aft port-side void tank.

The salvage company also sent divers into the water to connect compressed air lines to the tanks, and they noticed that both of the hatches to the forward void tank were open. The divers could not verify, however, whether the aft void tank hatches were open or closed due to depth of water and structural damage. A deckhouse structure was found detached from the hull about 30 feet from the barge.

Because of the extent of the damage, the barge was declared a total constructive loss. The salvage operation became an effort to partially refloat the barge and tow it to deep water for disposal. After the salvage team increased the buoyancy of the barge by injecting compressed air into the no. 1 cargo tanks port and starboard, the barge was partially refloated on June 16 and towed to its disposal site about 17 nautical miles to the southwest. The *Nash* was sunk in about 2,500 feet of water.

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The salvage company performed a damage stability study during the salvage operation and found that the barge would trim by the stern and then nearly fully sink if both the port and starboard-side aft void tanks flooded; the buoyancy provided by the forward void tanks would prevent the vessel from sinking completely. The Coast Guard performed a similar study and found that the barge would nearly fully sink even if only the starboard-side aft void tank flooded to greater than about 95 percent capacity.

### Probable Cause

The National Transportation Safety Board determines that the probable cause of the sinking of tank barge *Nash* was flooding of the aft starboard-side void tank. The mechanism for entry of flooding water to this tank could not be determined because the barge was not salvaged and was not available for examination after it sank.

### Vessel Particulars

Vessel	Barge <i>Nash</i>	Tug <i>Calvin</i>
Owner/operator	Salmon Bay Barge Line, Inc.	Salmon Bay Barge Line, Inc.
Port of registry	Portland, OR	Portland, OR
Flag	United States	United States
Type	Tank barge, single hull, unpowered, unmanned	Uninspected towing vessel
Year built	1969	1960
Official number (US)	523804	281757
IMO/ABS number	6913223 (ABS)	5234981
Construction	Steel, single hull	Steel
Length	260.0 ft (79.25 m)	99.2 ft (30.24 m)
Depth/draft	17.5 ft (5.33 m)	11.5 ft (3.51 m)
Beam/width	55.0 ft (16.76 m)	28.6 ft (8.72 m)
Tonnage	2,168 gross tons; 1,821 ITC* tons	195 gross tons; 271 ITC* tons
Engine power, manufacturer	N/A	3,000 hp (2,237 kW)
Persons on board	None	4 crew

\*Tonnage according to International Tonnage Convention

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NTSB investigators worked closely with our counterparts from US Coast Guard Marine Safety Detachment (MSD) Santa Barbara throughout this investigation.

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Adopted: June 16, 2015

For more details about this accident, visit [www.nts.gov](http://www.nts.gov) and search for NTSB accident ID DCA14LM010.

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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).

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