

# The TAI SHAN HAI

*This bulletin was prepared to share lessons learned with industry and interested public, and to make recommendations to prevent similar occurrences. The company operating the M/V TAI SHAN HAI at the time of the incident was invited to provide comment on this bulletin. They did not provide comment.*

## OVERVIEW

On December 27, 2002 at about 0600 (all times are approximate Pacific Standard Time), the M/V TAI SHAN HAI approached the Columbia River entrance on a ballast voyage from San Francisco, California to Longview, Washington. A winter storm was in progress. Informed by the Bar Pilot that an inbound transit across the Columbia River Bar would not occur immediately, the Master of the ship attempted to bring the ship about and head for open sea. The ship could not be brought about, and was pushed northeast toward shore by wind and sea. At 0740, the Master of the ship ordered both anchors deployed as the ship crossed the entrance channel. The anchors fetched up (grabbed and held the bottom) just north of the channel, preventing the ship from going aground on the Washington shore and potentially being wrecked in the surf. A variety of factors were found to have contributed to as well as prevent this near-grounding event.

*Figure 1. The TAI SHAN HAI at berth in Longview, Washington.*



## VESSEL INFORMATION

The TAI SHAN HAI was a 190-meter bulk carrier built in 1986. The ship's main engine was a 6,789 KW (9,230 BHP) direct-drive diesel with a single propeller. The ship's deadweight tonnage was 47,665 metric tonnes. Drafts were 4.0 meters forward and 7.4 meters aft. Freeboard for the voyage was 9.2 meters.

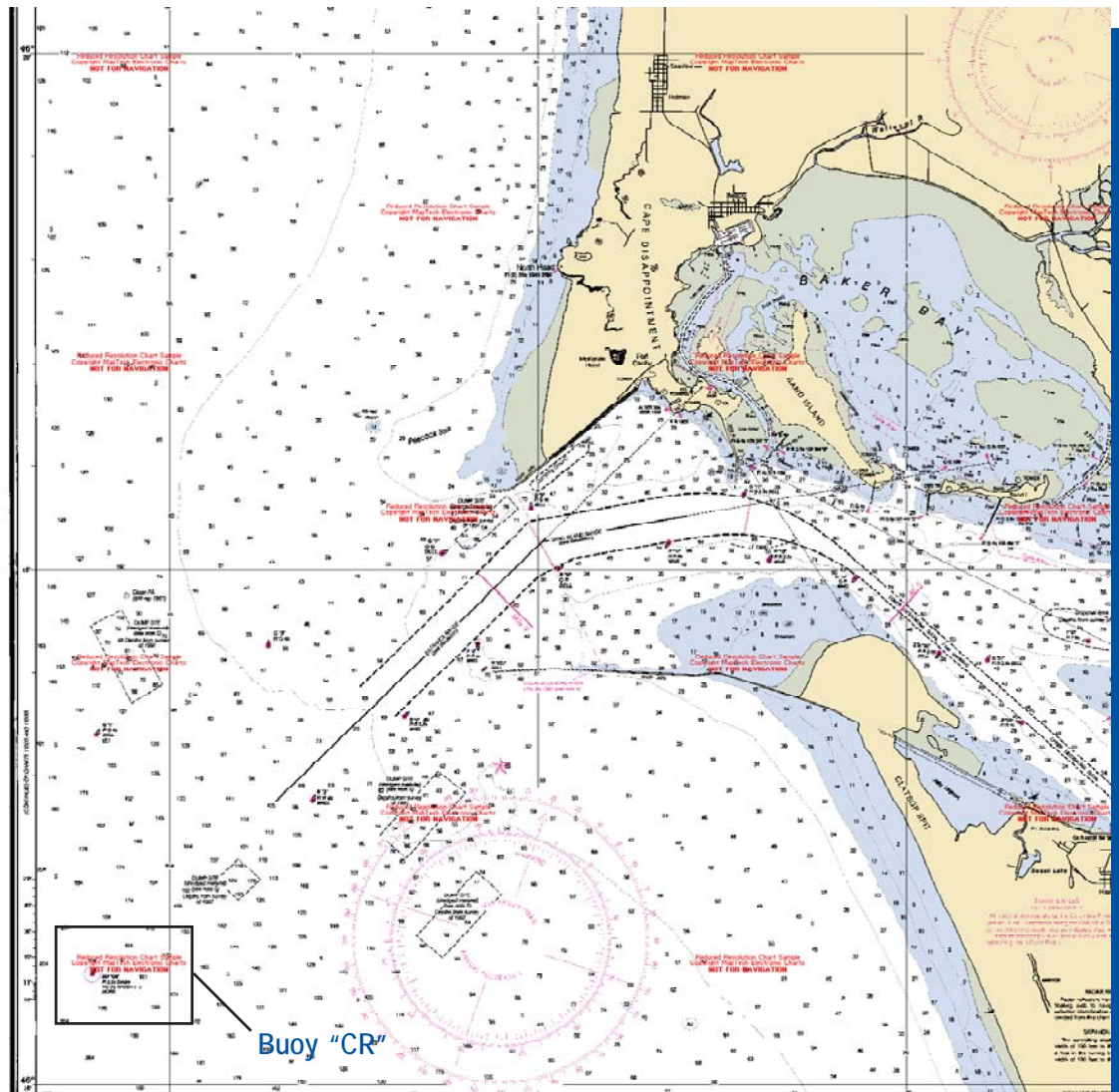
## ENVIRONMENT

Many ships have wrecked at the entrance to the Columbia River in years past. The following is excerpted from the 36<sup>th</sup> Edition of the U.S. Coast Pilot, Volume 7:

*...Caution.—The Columbia River bar is reported to be very dangerous because of sudden and unpredictable changes in the currents often accompanied by breakers. It is reported that ebb currents on the N side of the bar attain velocities of 6 to 8 knots, and that strong NW winds sometimes cause currents that set N or against the wind in the area outside the jetties. In the entrance the currents are variable, and at times reach a velocity of over 5 knots on the ebb; on the flood they seldom exceed a velocity of 4 knots. The current velocity is 3.5 knots, but this tidal current is always modified both as to velocity and time of slack by the river discharge. On the flood there is a dangerous set toward Clatsop Spit, its direction being approximately ESE; on the ebb the current sets along the line of buoys. Heavy breakers have been reported as far inside the entrance as Buoy 20, N of Clatsop Spit....*

*...Pilotage across the Columbia River bar and up or down the river is compulsory for U.S. vessels enrolled or sailing under Registry and all foreign vessels, except foreign recreational or fishing vessels not more than 100 feet in length or 250 gross tons international...*

Figure 2. Chart section showing Columbia River entrance. Note Columbia River entrance buoy "CR" at lower left. Cape Disappointment and Peacock Spit lie north of the entrance and Clatsop Spit lies to the south. [Not for navigational use.]



## CHRONOLOGY

The TAI SHAN HAI departed San Francisco, California in ballast on Wednesday, December 25, 2002. The ship sailed under a National Weather Service (NWS) offshore forecast (60 to 250 Nm offshore) that warned of gale conditions, and possible storm conditions from northern California to southern Washington State on Thursday night and Friday. The forecast since Monday, December 23 had been for a "VERY DEEP LOW AND ASSOCIATED COLD FRONT" for the Oregon and Washington offshore waters on Thursday night and Friday, and for a "RAPIDLY INTENSIFYING LOW" and associated cold front affecting offshore waters of northern California on Thursday night.

The Master of the TAI SHAN HAI reported that all his ballast tanks were full, except the forepeak tank, which was half-full. The Master said he elected not to fill the No. 3 hold with ballast water so that it would be ready to load cargo (petroleum coke, also known as pet-coke) on arrival in Longview.

By the early morning of Friday, December 27, 2002, the TAI SHAN HAI was off the northern Oregon coast inbound for the Columbia River. The December 27 NWS forecast, issued at 0230, for the coastal waters (out to 60 Nm) of southern Washington and northern Oregon stated:

*"A 990 MB [millibar] LOW PRES [pressure] CENTER ABOUT 150 NM W [west] OF TILLAMOOK [Oregon] EARLY THIS MORNING WILL CONTINUE MOVING NE [northeast]. THE LOW IS EXPECTED TO BE NEAR VANCOUVER ISLAND BY LATE MORNING." A storm warning and a high surf advisory were in effect. Conditions were forecast thus: "TODAY...S [south] WIND 50 KT [knots] THROUGH LATE MORNING WITH GUSTS TO 65 KT. WIND DECREASING TO SW [southwest] 35 KT AROUND NOON...THEN TO W [west] 20 KT BY LATE AFTERNOON. COMBINED SEAS 20 TO 24 FT...SUBSIDING TO 16 FT BY LATE AFTERNOON. DOMINANT [wave] PERIOD 10 SECONDS. RAIN IN THE MORNING THEN SHOWERS." The Columbia River Bar Forecast issued at the same time called for "IN THE MAIN CHANNEL...COMBINED SEAS WILL BE AROUND 18 FT THIS MORNING THEN SUBSIDE TO 12 FT BY EARLY SAT [Saturday] MORNING. BREAKERS CAN BE EXPECTED DURING EBB CURRENTS. THE EBBS WILL OCCUR AROUND 1100 AM AND 1100 PM TODAY."*

The storm warning for Thursday night and Friday had first been headlined in the NWS coastal waters forecast at 2030 on December 25.

At 0245, the NWS issued a Marine Weather Statement for northern Oregon and southern Washington. The statement read, in part:

*A HIGH SURF ADVISORY REMAINS IN EFFECT THROUGH EARLY THIS AFTERNOON FROM CAPE SHOALWATER...WASHINGTON TO FLORENCE...OREGON. COMBINED SEAS OF 20 TO 24 FEET WILL AFFECT THE COASTLINE AND SURF ZONE...THEN SUBSIDE TO AROUND 16 FEET LATER IN THE AFTERNOON. AT 200 AM PST, THE STONEWALL BANK AND CAPE BLANCO BUOYS REPORTED SEAS OF 21 AND 23 FEET...RESPECTIVELY. SEAS HAD YET TO DEVELOP ALONG THE NORTH OREGON AND SOUTH WASHINGTON COAST...BUT WILL BUILD RAPIDLY DURING THE NEXT FEW HOURS DUE TO STORM FORCE WIND ASSOCIATED WITH A STRONG PACIFIC STORM SYSTEM.*

The ship's Second Officer reportedly made first contact with the Columbia River Bar Pilots via their dispatch office at 0300 when the ship was approximately 35 Nm south-southwest of the Columbia River Entrance Buoy (Buoy "CR"), and was told to call back when the ship was 15 Nm from Buoy "CR." By 0400, the Chief Officer had assumed the navigation watch aboard the TAI SHAN HAI.

Within the confines of the Columbia River, the Columbia River Bar Pilot scheduled for the TAI SHAN HAI boarded the containership HYUNDAI ADMIRAL bound for sea. He was aware of the weather forecast for a frontal passage at Astoria between 0400 and 0500. After crossing the bar outbound aboard the HYUNDAI ADMIRAL, he was to transfer to the TAI SHAN HAI to guide the ship inbound across the Columbia River Bar (a "routine assignment" in his words). He understood the arrival time for the TAI SHAN HAI at the pilot station was estimated to be 0600, its arrival time having been advanced from an initial estimate of 0900.

Aboard the TAI SHAN HAI, southerly winds had reached Beaufort Force 9 (41 to 47 knots) and seas were up to 10 meters (33 feet). This put the winds and seas off the stern of the ship as it approached Buoy "CR" from the southwest. The bridge watch of the TAI SHAN HAI called standby engines (prepare for

maneuvering) to the engine room at 0430, and the Chief Engineer began preparing to switch to a lighter fuel. There was radio discussion between the TAI SHAN HAI and the Bar Pilots regarding the use of the helicopter for the transfer of the pilot from the HYUNDAI ADMIRAL to the TAI SHAN HAI. The Bar Pilot dispatcher indicated that he took the 15 Nm check-in radio call from the TAI SHAN HAI, told the ship the helicopter would be used, and that the helicopter would call the ship with further instructions. The Chief Officer of the TAI SHAN HAI recalled the Master was told to proceed to the pilot station.

The TAI SHAN HAI's Master recalled that he began to have doubts that the Pilot would take his vessel across the bar due to "large waves and white caps" stretching across the river entrance. The Master said he began to look for an anchorage area on the chart north of the Columbia River entrance in case the Pilot closed the bar.

At 0500, U.S. Coast Guard Air Station Astoria (located adjacent to the Astoria Regional Airport in Warrenton, Oregon) recorded that the station had lost electrical power causing the loss of a lighted landing area required by regulation. The Bar Pilot dispatcher was called by the duty helicopter personnel who informed him that they could not fly due to the power outage. The Bar Pilot assigned to the TAI SHAN HAI recalled that he understood from his dispatch office that the Astoria Airport lost electricity, and that the pilots' helicopter, SEAHAWK, could not be used.

At 0510, the Captain of the pilot boat COLUMBIA, after hearing the radio traffic that the power was out at Warrenton and that the SEAHAWK would likely not be flying, self-dispatched to take the Bar Pilot off the outbound ship HYUNDAI ADMIRAL. At about the same time, U.S. Coast Guard Air Station Astoria recorded the electrical power was restored and the Bar Pilots dispatch got a call from the helicopter personnel saying they could fly. The pilot boat COLUMBIA got underway outbound for the Columbia Bar at 0515.

At 0525, with the ship's main engine running on diesel oil, the TAI SHAN HAI's engine room, under supervision of the Chief Engineer, was on standby for maneuvering. The ship's main engine speed was reduced due to main engine over-speed trips occurring (overspeeding triggers automatic protection devices to reduce engine speed). These over-speed trips occurred when the TAI SHAN HAI's propeller came out of the water due to the ballast condition (low submersion depth of the propeller) and wave action.

At 0530, with the ship about 4 Nm southwest of the pilot station (which is about 1 Nm east of the "CR" Buoy), the Master of the TAI SHAN HAI recalled being told to remain 3 miles south of the pilot station. The Bar Pilot dispatcher recalled that he told the Master of the TAI SHAN HAI to remain 5 Nm off shore. At 0530, the HYUNDAI ADMIRAL, with the Bar Pilot assigned to the TAI SHAN HAI aboard, was in the Columbia River entrance channel just west of a line between the north and south jetties, roughly abeam of Buoy "6."

Between 0530 and 0600, the main engine speed aboard the TAI SHAN HAI continued to vary between dead slow ahead and full ahead due to continuing problems with propeller immersion. At 0538, the pilot of the helicopter SEAHAWK took the helicopter out of service just as it was about to lift off from the Astoria Regional Airport en route to take the Columbia River Bar Pilot from the HYUNDAI ADMIRAL. The SEAHAWK was taken out of service due to a "chip light" indication on one of the metal fragment sensors in the helicopter's main gear box. The Bar Pilot dispatcher received a call from the helicopter operator and was told the helicopter was out of service. He said he then called the pilot boat to 'crank up' and go. The Captain of the COLUMBIA, underway since 0515, continued taking his vessel outbound toward the Bar.

At 0600, the Columbia River Bar Pilot aboard the HYUNDAI ADMIRAL requested via radio that the TAI SHAN HAI's Master move his ship, now within a mile southwest of the pilot station, out of the way so that the HYUNDAI ADMIRAL could swing to provide a lee so he could disembark to the COLUMBIA once the pilot boat crossed the Bar and arrived on-scene. The Bar Pilot recalled he requested that the TAI SHAN HAI come to starboard, pass south of Buoy "CR," and return to sea to await further instructions. The Bar Pilot recalled telling the Master of the TAI SHAN HAI to get 10 miles offshore and stay there, but the Master of the TAI SHAN HAI continued to request a pilot. Another Bar Pilot monitoring the radio traffic reported, "Later, I heard [the Bar Pilot] who was piloting an outbound ship, contact the TAI SHAN HAI and give instructions to stay well to the west of the 'CR' buoy."

The Chief Officer of the TAI SHAN HAI recalled the ship's Master requested he go to the bow to prepare the anchors. The pilot boat COLUMBIA reached the Columbia River entrance range outbound to pick up the Bar Pilot from the HYUNDAI ADMIRAL.

The Chief Officer of the HYUNDAI ADMIRAL reported that the Master of the TAI SHAN HAI spoke very poor English and that the Bar Pilot had trouble understanding him. The Chief Officer of the HYUNDAI ADMIRAL said that he and the Master of the HYUNDAI ADMIRAL helped the Bar Pilot understand the Master of the TAI SHAN HAI.

The Master of the TAI SHAN HAI recalled he initially attempted to bring his ship about to port and move offshore, but could he not do so.<sup>1</sup> The Master of the TAI SHAN HAI could not get the vessel's bow around into the high wind and seas. The Master said he felt that without enough forward momentum, he could not get the ship's bow across the wind. The Master recalled he then attempted to bring his ship about to starboard. After observing (via radar from the bridge of the HYUNDAI ADMIRAL) TAI SHAN HAI's repeated failures to come to starboard, the Bar Pilot called the Master of the TAI SHAN HAI via radio to suggest he come to port because his ship was getting too close to shore. The Master began attempting to maneuver his ship to port.

At 0630, with the TAI SHAN HAI still unable to fully utilize the power of their main engine due to the propeller uncovering in heavy seas, the TAI SHAN HAI and the HYUNDAI ADMIRAL passed each other. The HYUNDAI ADMIRAL was now west of the "CR" Buoy and the TAI SHAN HAI (which was moving northeast) was east-northeast of the "CR" Buoy. The Bar Pilot recalled that his initial plan to disembark east of Buoy "CR," per normal operations with the pilot boat, had to be abandoned when it became apparent that the TAI SHAN HAI could not maneuver effectively.

The Captain of the pilot boat COLUMBIA recalled, "Large 20- to 25-foot plus swells and stronger southerly winds, 50 knots and higher, were pushing the TAI SHAN HAI closer to the Oregon beach and into dangerous waters."

The Bar Pilot recalled "...I asked the captain [of the TAI SHAN HAI] if he could see the HYUNDAI ADMIRAL, and when he replied in the affirmative, I advised him to head his ship toward me and try to hit me. I felt certain he would understand what I was attempting to tell him and at that time, I was west-southwest of the CR or sea buoy." The Master of the TAI SHAN HAI attempted for the next hour to swing the ship to port, without success. During this time, the Bar Pilot, using the HYUNDAI ADMIRAL as a stable platform with good radar and radio capabilities, urged the Master of the TAI SHAN HAI to move his ship farther offshore.

At 0700, the pilot boat COLUMBIA reached the "CR" Buoy. The Master of the TAI SHAN HAI recalled asking the Bar Pilot for tug assistance and was told that conditions were too rough for tug assistance. He recalled he was told his situation was dangerous and he needed to use his "Captain's judgment" to remove the ship from danger. The Master of the TAI SHAN HAI requested his Chief Officer to ready both anchors. The TAI SHAN HAI moved into the Columbia River Entrance channel.

Ashore, a second Bar Pilot was dispatched and informed of a vessel in trouble on the bar. The second Bar Pilot requested that his office dispatcher contact the helicopter operator and have the pilot get the helicopter SEAHAWK in service because it was an emergency. The second Bar Pilot diverted directly to the Astoria Regional Airport to meet the helicopter pilot and U.S. Coast Guard personnel.

The Bar Pilot recalled he contacted the U.S. Coast Guard to report on the TAI SHAN HAI'S situation. At 0730, U.S. Coast Guard Air Station Astoria received a radio call from the TAI SHAN HAI regarding the developing incident.

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<sup>1</sup> According to the Bar Pilot assigned to the TAI SHAN HAI, the attempts that he initially observed via the automated radar plotting aid (ARPA) from his vantage point aboard the HYUNDAI ADMIRAL were for the TAI SHAN HAI to come to starboard, not to port as the Master of the TAI SHAN HAI stated.

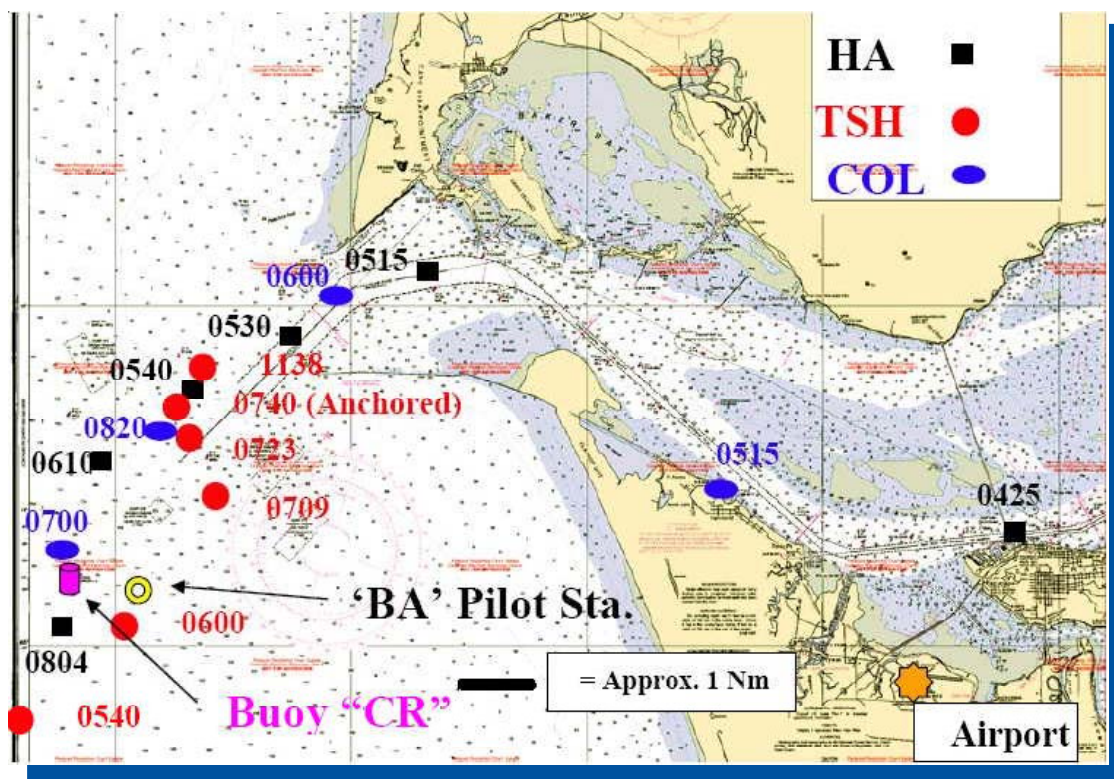
Having failed to move his ship farther offshore and still moving northeast toward the Washington coast, the Master of the TAI SHAN HAI ordered that both anchors be dropped simultaneously at 0740 in about 20 meters (66 feet) of water. The anchors were dropped with the ship on a northerly heading. The ship's GPS (Global Positioning System) position was recorded as just north of the charted Columbia River entrance channel. The ship's northeast movement was stopped and the ship swung to a heading of 188 degrees.

At 0750, the pilot boat COLUMBIA took the Bar Pilot from the HYUNDAI ADMIRAL, which swung a lee (turned the ship to create a calmer area alongside) to accommodate his departure. At sunrise, the TAI SHAN HAI hoisted their anchor ball and extinguished their anchor lights. The Master of the TAI SHAN HAI remained on the bridge as the ship experienced southwest seas of 9 to 14 meters (30 to 46 feet). The anchors were reported to be holding.

The Bar Pilot and the Captain of the COLUMBIA decided against attempting to put the Bar Pilot aboard the TAI SHAN HAI. With the rolling of the vessel, the lack of way on the ship, and its inability to swing a lee, such an attempt was deemed too dangerous. Seas were reported as running at 9 meters (30 feet), with sustained winds of 50 knots, and the tide was beginning to ebb from the Columbia River (increasing the danger of breaking seas). As the COLUMBIA passed the anchored TAI SHAN HAI, the Bar Pilot noted the anchor chains had "adequate space between them," but were under "excessive" strain (to the point of being "near parting"), and that the ship did not have its propeller turning. The Bar Pilot called the Master of the TAI SHAN HAI and suggested he take some strain off the anchors by putting his engines ahead, and that he station someone on the bow to monitor the anchor chains. The Bar Pilot noted compliance to his suggestion to use the main engines to relieve the strain on the anchor chains by a "puff of smoke from the TAI SHAN HAI's stack..."

The helicopter SEAHAWK was returned to service at 0800 with no metal having been found in the main rotor gear box (an apparent false alarm). The second Bar Pilot arrived at the U.S. Coast Guard office with helicopter pilot and met with U.S. Coast Guard personnel. The second Bar Pilot stated his intentions "...to assess vessel situation, hold at anchor till [sic] weather subsides if possible, and plan, if unable to hold at anchor, route of egress and communications schedule." He also requested and was given two Coast Guard VHF radios as backup communication.

Figure 4. Section from NOAA chart number 18521 showing composite approximate positions of HYUNDAI ADMIRAL (HA), TAI SHAN HAI (TSH), and Pilot Boat COLUMBIA (COL). [Not for navigational use.]



The pilot boat COLUMBIA arrived back at the boat basin at Astoria to disembark the Bar Pilot at 0900. Fifteen minutes later, the second Bar Pilot was aboard the helicopter SEAHAWK with a pilot and co-pilot en route to the TAI SHAN HAI.

At 0925, the helicopter pilot put the SEAHAWK down briefly on the deck of the TAI SHAN HAI, which was rolling heavily, to disembark the second Bar Pilot. The helicopter pilot recalled winds were about 70 knots and that just after he lifted off, he saw green water over the deck where he had landed. The ship was taking water broadside over the main deck. The helicopter pilot recalled he lost sight of the second Bar Pilot and waited nearby to ensure he was okay. He said the second Bar Pilot had made it to the shelter of the ship's house and called him via radio to let him know he was safely aboard.

The second Bar Pilot indicated he arrived aboard the TAI SHAN HAI, assessed the situation, set up his GPS system, contacted his office, and set up communications. He reported, "Vessel steaming at various speeds to attempt sea keeping into the swell, at times rolling hard on the stbd [starboard] bow, with swell breaking on deck."

The following is the second Bar Pilot's description of what he found aboard the TAI SHAN HAI:

*Master very concerned over position, and very aware of present situation....Master stated said [sic] both anchors were dropped but had a good spread. I could not see how this could be possible if they were both dropped at once. Went to forecandle to view anchors. Personal inspection showed both anchors leading together with one or the other taking all the strain. I had hoped for the spread and without it, the concern was present both for the ability to hold and the chance of fouling both anchors. While on the forecandle, we took green water on deck and I was completely soaked. The Chief Mate forward impressed me as being competent and able to understand the gravity of the situation, and I was hoping he had the ability, knowledge, and conviction to slip the anchor should an emergency maneuver warrant. The boatswain and A.B. were hiding under the fair-weather and I had less hope for their abilities should the need warrant. Freeboard 30'-04" by Master's calculation. Position ascertained and monitored, with occasional use of full maneuvering to maintain position. Through forecast reports and weather monitoring, especially barometric pressure, experience front passing with forecast for seas monitoring [(sic), moderating] by 1400.*

By 1138, the TAI SHAN HAI had dragged anchor approximately 0.6 Nm to the northeast of its original anchor position. Winds at noon were recorded aboard the TAI SHAN HAI to be Force 7 (28 to 33 knots), with a 4 to 6 meter swell. By 1300, the second Bar Pilot noted a "marked reduction in swell and sea condition," though he still considered conditions "marginal." He decided to maintain the planned 1400 departure time, despite strong initial insistence from the Master that they depart sooner. The second Bar Pilot maintained communications with the U.S. Coast Guard.

At about 1400, both anchors were heaved in. The second Bar Pilot described his experience:

*Maneuvered to successfully bring home both anchors and made way for seaward of CR Buoy. Eventually called for maneuvering [engines] full, to no avail, found it very difficult to keep on course, and without considerable maneuvering, the vessel would have again gone broadside to the swell. I obtained only 56 RPM on my outbound transit. Maneuvering should have been at least in the low 90's. The Master had been informed by me several times before our departure, and often during this underway passage, the need for maximum RPM and the need to insure the Chief Engineer had a complete appreciation for the vessel's situation. This effort was to no avail and I determined from the lack of horsepower to the propeller, the lack of proper ballast to keep the propeller and rudder in the water, and the apparent lack of understanding between the engine and deck departments, that the vessel was unsafe to pass across the Bar at this time and should proceed to sea to a safe distance away from the ground effects of near coastal waters upon the sea and swell, and await more favorable swell and sea conditions, forecast for the following day.*

The Master of the TAI SHAN HAI indicated, "Because winds were 12 m/s [about 24 knots] and wave swell [sic] still had three meters high, the main engine's RPM still could not stable [sic] and fluctuate [sic] up and down accordingly," confirming the second Bar Pilot's concern regarding main engine power availability.

The ship headed to sea, changed over diesel fuel to heavy fuel oil, and disembarked the second Bar Pilot, who was hoisted to the SEAHAWK at 1550 and returned to the Astoria Regional Airport at 1605. Sunset occurred at 1637.

The TAI SHAN HAI remained offshore until the next day (December 28) under a U.S. Coast Guard order that supported the second Bar Pilot's decision not to cross the Columbia River Bar on December 27. Captain of the Port Order (COTP) issued by MSO Portland stated:

*Your vessel, M/V TAI SHAN HAI does not have sufficient power for safe maneuvering across the Columbia River Bar under current weather conditions...*

*1) You are hereby directed to remain offshore until approval for entry is granted. Pending this approval, the vessel must not approach any closer than twelve (12) nautical miles from land. The vessel must not attempt to anchor or make an approach on the Columbia River Bar. The vessel should maintain her head to the prevailing seas and must not turn toward land at any distance closer than twelve (12) nautical miles. You are directed to maintain a communications watch with Coast Guard Astoria Group...*

*2) The following conditions must be met before the vessel to be considered for approval to approach the Columbia River Bar:*

*a. Wind less than twenty (20) knots.*

*b. Swells less than six (6) feet.*

*c. The pilot must board the vessel no closer than twelve (12) miles from land.*

*d. The vessel must be able to demonstrate to the pilot that it can adequately maneuver and that it can operate at sustained Sea Speed.*

The next day at about 1300, a third Bar Pilot boarded the TAI SHAN HAI via the helicopter SEAHAWK. The third Bar Pilot noted that the port side pilot ladder aboard the ship was damaged. The third Bar Pilot conducted propulsion and handling tests of the ship. He noted that the ship was not carrying extra ballast, but could have taken additional ballast in the No. 3 hold.

With input from the Third Bar Pilot, the U.S. Coast Guard lifted the COTP Order on the TAI SHAN HAI, clearing it to cross the Columbia River Bar. This information was relayed by the U.S. Coast Guard Duty Officer to the TAI SHAN HAI via radio. The ship crossed the bar without further incident and made its way to berth at Longview, Washington.

## ANALYSIS PROBABLE CAUSE

The near-stranding of the TAI SHAN HAI occurred because the Master of the ship did not adequately consider the gravity of taking his in-ballast ship toward a lee shore during a winter storm for a dangerous bar crossing, and when indications of handling difficulty arose under the existing environmental conditions, he did not take early action to turn his vessel seaward and either slow or abort his approach. Contributing factors included:

- Wind and Sea State. The high winds and seas generated by the winter storm system and an associated frontal passage contributed to the ship handling problems and drove the ship northeast toward the Washington shore.
- Communication. If the Master of the ship had communicated the problems with propeller immersion and the main engine over-speed trips that were occurring when they began, the Bar Pilot would likely have begun urging him earlier to turn and remain farther offshore. The extra time and sea room may have given the ship the necessary margin to get offshore without resorting to anchoring on an emergency basis.
- Language. The Master of the ship was unable to understand that his vessel would not be boarded promptly at 0600 and the ship continued its approach.
- Intentional Deviation from Procedure – Commercial considerations appear to have overcome a prudent and well-established course of action for the master of the ship – to more fully ballast his ship to improve its handling capabilities in anticipation of storm conditions that were forecast prior to his ship departing San Francisco. The result was that the ship, with the effectiveness of its main engine reduced and little sea room, could not come about through the trough and into the wind.



## 'WHAT WENT RIGHT'

While both accidents and near-misses provide good information regarding lessons learned, near-misses also provide insight about what 'went right' to prevent an incident from becoming an accident.

- The Master of the TAI SHAN HAI had the Chief Officer prepare the anchors for letting go ahead of the immediate need to use them. This preparation may have provided an additional, and perhaps critical, margin of time to prevent a stranding.
- During this incident, the Bar Pilot, though not aboard the TAI SHAN HAI, took great pains to remain in contact with the ship and urge its Master to take prompt and positive action to move the ship away from the danger it was standing into. After the ship anchored, the Bar Pilot checked on its condition and suggested use of the ship's engine to lessen the strain on the anchors.
- The HYUNDAI ADMIRAL proved an excellent platform from which the Bar Pilot could monitor the movements of the TAI SHAN HAI. The willingness of the HYUNDAI ADMIRAL's Master and Chief Officer to assist communication between the Bar Pilot and the Master of the TAI SHAN HAI is commendable.
- The Captain and deckhand of the pilot boat COLUMBIA undertook a dangerous bar crossing in high winds and seas, and safely transferred the Bar Pilot from the HYUNDAI ADMIRAL despite the adverse conditions.
- The second Bar Pilot undertook resolute actions to put himself aboard the TAI SHAN HAI to assist the situation, despite the danger posed by the storm. He assessed the status of the ship and resisted getting underway until he believed it was safe to do so. He oversaw the raising of the anchors of the ship, overcame ongoing maneuvering problems, and brought the ship to a safe distance offshore.
- The helicopter SEAHAWK's pilot skill in placing his helicopter down on the deck of a heavily-rolling ship that was taking green water over the bow, to safely deliver the second Bar Pilot is commendable.
- The U.S. Coast Guard undertook positive action in generating a COTP Order to back up the second Bar Pilot's assessment that the TAI SHAN HAI should remain offshore until weather conditions moderated substantially.

## LESSONS LEARNED

- Voyage planning should be accomplished from berth to berth in accordance with applicable guidelines and with the characteristics, condition, and operational limitations of the ship in mind. Portions of a voyage that have the potential to pose the greatest risk should receive additional review when developing a voyage plan, and the limits and conditions for undertaking those portions of the voyage set in advance.
- Bar crossings should receive additional and careful review when developing a voyage plan.
- Indications that a voyage is not occurring as planned or cannot be accomplished safely under existing conditions should be communicated honestly and quickly within the ship board management system. Adjustments to the voyage plan must be made accordingly and communicated effectively.
- Communication with pilots and local authorities regarding the operational condition of the vessel under the prevailing circumstances should be complete, honest, and prompt.
- Actions taken or omitted that reduce the safety of a vessel in order to serve commerce, may ultimately serve neither.
- The combined and ongoing efforts of many parties to prevent an incident from becoming an accident can prevail, but should not be counted on.

## PREVENTION RECOMMENDATIONS

To Vessel Owners and Operators:

- Ensure your company procedures adequately address voyage planning, and that those voyage planning procedures emphasize the necessity of the Master and bridge crew to be cognizant of the

forecast weather and the special environmental hazards that exist in areas they will transit. [See International Maritime Organization (IMO) Assembly Resolution A.893(21), "Voyage Planning Guidelines:"]

- Ensure your company procedures adequately address the importance of good communication with local pilots and, specifically, that any deficiencies or problems with the ship's handling or capabilities be communicated early and promptly.
- Ensure bridge watch standers aboard ships in your fleet receive adequate English language training (basic and refresher) so that they can effectively "...communicate with other ships and coast stations..." and "correctly interpret" any "English language navigational publications and messages relevant to the safety of the ship..." as required by the Seafarers' Training, Certification and Watchkeeping (STCW) Code, Section A-II/1.
- Ensure your company procedures emphasize the importance of properly ballasting a ship to ensure the best possible handling characteristics and safety.
- Ensure your company procedures provide guidance about special considerations for bar crossings.
- Ensure your company policies and procedures place safety over commercial considerations.
- Distribute the Oregon Department of Environmental Quality/Washington Department of Ecology publication "Safety Advisory Bulletin 99-02: Passage Planning for the Oregon & Washington Coasts: Special Considerations" to vessels in your fleet.
- Publicize this incident within your fleet, emphasizing lessons learned.

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## More Prevention Bulletins

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- PB 03-01: The OVERSEAS WASHINGTON (WDOE#03-08-001)
- PB 01-02: The ARCO TEXAS (WDOE#01-08-006)
- PB 01-01: The SUPER RUBIN (WDOE#01-08-002)
- PB 99-02: The MONCHEGORSK (WDOE#99-261)
- PB 99-01: The ANADYR (WDOE#99-250)
- PB 98-01: The ARCADIA (WDOE#98-253)
- PB 96-02: BARGE 101
- PB 96-01: The KEYSTONE CANYON
- PB 95-02: The VERBIER
- PB 95-01: The DONA V

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