

I. ADDENDUM

Master Pilot Exchange:

The SF Bar pilot was logged aboard the *Cosco Busan* at 0620 on the 7th of November 2007 for a scheduled departure of 0630. On the VDR the pilot can be heard introducing himself and being introduced to the master. During the aforementioned greetings the pilot produced and offered a Pilot Card¹ to the Master of the vessel. In his interview with the Safety Board the pilot produced and drew particular attention to the pilot card and its contents. In fact he read the pilot card start to finish and emphasized certain particular phrases. No comment from the ships master can be heard commenting on the card or its information. Just a general acceptance when it was handed over to him.

In the APA's paper on Master Pilot Exchanges on page 1, section 2, the third bullet reads "The card should supplement, not substitute for, the master-pilot information exchange." When asked about the MPX (Master Pilot Exchange) card the pilot replied, " I handed him the document, and he took it, and I, I think he read it, but I don't recall him discussing it with the mates or the helmsman. I didn't even know what he did with it, to be perfectly honest, but, you know, I handed it to him and was expecting him to read it. It says right on it, if you have any questions ask." To which an investigator queried "and did he?" "No," was the pilot's reply.

The Master-Pilot Information Exchange Card was provided by the pilot to the *Cosco Busan's* master and was accepted without comment. The Pilot Card was provided to the pilot from the *Cosco Busan* and the pilot signed the document "rcv'd only." The vessel's Master/Pilot Information exchange checkoff list was filled out and dated the day of the accident and signed by the 3rd officer and Master. All three items are in the docket.

Bridge Resource Management:

The pilot and Master cannot be heard discussing intended route or speed. The pilot does let the San Francisco VTS know his intended route through the D and E span but there is no verification if the vessel master was made aware of this. The paper chart was on the chart table with the courses laid out for the outbound voyage from berth 56 through the D and E span, east and then north of Alcatraz Island and then west through the Golden Gate Bridge to sea. There were 2 VDR audio microphones in the area just to the left and right of the chart table.² No conversation regarding the paper chart or the intended route can be heard over the VDR. Specifically the pilot and the master of the *Cosco Busan* are never heard to be talking about or referencing the paper chart until after the allision. Neither is their any conversation captured on the VDR between the pilot and any other member of the bridge team referencing the intended route through the D and E span.

¹ Established and printed by the SF Bar pilots and containing pertinent information of the harbor, such as radio frequency channels, local distances, and procedures of instruction while the pilot is aboard.

² See VDR factual for specific microphone location data.

No discussion of intended speed through the transit is captured on the VDR, either with the pilot and captain or any other member of the bridge team.

The pilot is heard on the VDR calling the master of the tug *Revolution* and letting him know he will be “keeping him until the Bar Channel,” and then letting him go.

Waterway (additional)

The vessel departed from berth 56 at the Oakland Marine Terminal. The estuary has a controlling depth, on average, of about 40 feet measured at MLLW (mean lower low water). For a length of about 1 nautical mile until the end of the estuary and the start of the inner harbor entrance channel, the width of the estuary is approximately 275 yards, or 0.14 nautical mile, across. This is the measured distance of land across the estuary. The navigable width of the estuary is smaller at approximately 180 yards across. The approximate course out of the estuary is 286° true and then a course to the left of 286° as per pilot instruction through the Bar Channel to line up for a course to pass under the span of the Bay Bridge between the D and E towers which is approximately 310° true. The span of navigable water between the D and E towers is approximately 2,210 feet. Buoys on either side of the D tower mark the preferred channel. These are green and red buoys, with the top mark being red, a middle band green and lower band red to the waterline. The D and E spans other distinguishing characteristic is the RACON, which is at the center of the span and produces the morse code symbol yankee or (dash, dot, dash, dash) once a vessel’s radar has interrogated it.

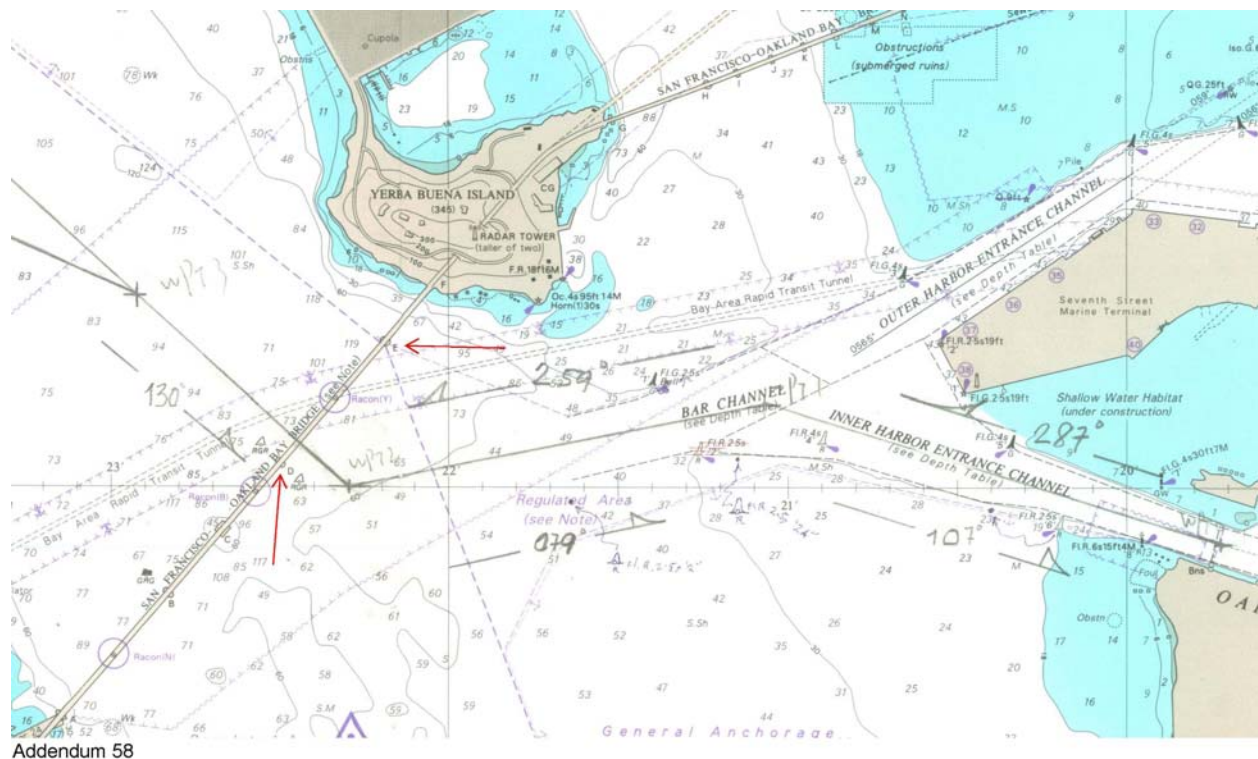
Verification of these navigational aids was accomplished on scene by the following reports. A United States Coast Guard report of the buoys is in the public docket and states that both buoys were “on station and working properly.” As a point of fact neither buoy at the time of the accident were equipped with lights. An additional report documents the service history of the RACON between the D and E spans is also in the docket and denotes the service history of the RACON and identifies the RACON as working properly at the time of the accident. Visual verification of the RACON emitting its characteristic signal is also attainable in the Factual Report of the VDR group chairman located in the public docket. The RACON “fires” or emits a signal continuously every 30 seconds while receiving or being “interrogated” by a vessels radar. Two interviews conducted by the Safety Board while on scene are in the docket also verifying the functionality of the RACON. These were interviews of the bridge’s electrical supervisor and the U. S. Coast Guards Bridge Administrator. The interviews state that after the accident bridge personnel confirmed that the RACON was functioning properly and that there had been no previous reports within the last 6 months of any problems with the RACON on the D and E span.

Passage Plan – chart

The chart below (British Admiralty chart No. 588, Edition 5, Edition date 29th Nov 2001, corrected through NM 38/07) was on the chart table of the *Cosco Busan* on the morning of November 7, 2007 prior to departure and during the transit up to and including the allision. The ships crew, prior to entering San Francisco harbor, constructed the chart lines and courses for the route to and from the berth. The crew was not interviewed so it can not be determined why a single line was drawn through the D and E span for both the inbound and outbound transit.

US Coast Pilot No. 7 2008, 40th edition, chapter 7, page 345, paragraph 175 states in reference to vessel movements in and around San Francisco Harbor and specifically when transiting the area around the San Francisco – Oakland Bay Bridge that inbound vessels on a southerly course should proceed through the NE (northeast) side of the A and B span and outbound vessels or those on a northerly heading should proceed through the SW (southwest) side of the D and E span.

The charted course of 310 degrees true for the outbound transit of the *Cosco Busan* shown below is measured at approximately 350' off the bridge pier to the northeast. The course line is drawn in conjunction with an inbound course of 130 degrees true which then connects with two additional courses that are used as reciprocal courses for the in and outbound transits.



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