SPEC COLL
GC
1552
.P75
A35
1990
no.20-22

VOLUME 20

STATE OF ALASKA

IN THE SUPERIOR COURT AT ANCHORAGE

In the Matter of:	
STATE OF ALASKA	Case No. 3ANS89-7217
versus	Case No. 3ANS89-7218
JOSEPH J. HAZELWOOD	

Anchorage, Alaska

February 28, 1990

The above-entitled matter came on for trial by jury before the Honorable Karl S. Johnstone, commencing at 8:36 a.m. on February 28, 1990. This transcript was prepared from tapes recorded by the Court.

APPEARANCES:

On behalf of the State:

BRENT COLE, Esq.

MARY ANN HENRY, Esq.

On behalf of the Defendant:

DICK L. MADSON, Esq.

MIKE CHALOS, Esq.

PRO-TYPISTS, INC.

Professional Transcription Service

(202) 347-5395

ARLIS
Alaska Resources
Library & Information Services
Anchorage Alaska

C O N T E N T S

- - -

E X H I B I T S

- - -

P R O C E E D I N G S

(Tape C-3633)

THE CLERK: -- Karl S. Johnstone presiding is now in session.

JUDGE JOHNSTONE: Thank you, you may be seated. We'll resume with the cross examination of Captain Beevers and you're still under oath, sir.

Whereupon,

ROBERT A. BEEVERS

having been called as a witness by the State, and having previously been duly sworn by the Clerk, was examined and testified as follows:

CROSS EXAMINATION

BY MR. MADSON:

Q Good morning. Is it Captain or Mr. Beevers? How do people normally address you, sir?

A In professional matters, Captain.

Q By the way, have you ever testified in Court before at all?

A I've testified in Court, not in a criminal case, not in front of a jury. I've testified in Court on civil matters with company business, yes.

Q But not as an expert witness, is that correct?

A No, not as an expert.

Q Is this your first time. By testifying, I mean in

Court, whether it's just the judge or the jury, but to decide facts in a particular case. Have you ever testified in that sense?

A As an expert witness. I've testified in company matters when I was ashore, where they hired me independent of my master's duties as a consultant to testify, yes.

Q On behalf of your company.

A On behalf of the companies, yes.

Q How many times was that, sir?

A I don't know, a few.

Q But this is your first time as a hired consultant in a regular --

A Oh, to testify -- yes, in something like this, the first time I've testified as an outside consultant in a Court, yes.

Q Okay, then, Captain Beevers, let me go back to the question of pilotage. We talked a little bit about that yesterday. And let me ask you this, first of all, sir. When you retired, it was in 1987.

A '87, yes.

Q When did you last make a transit in Prince William Sound prior to your retirement?

A Just the -- I was on my northbound leg from Panama when I retired, so within the month. It takes about a month for a round trip, so within some time, the first of

March.

Q And that was your last trip, then, was to Prince William Sound.

A Yes.

Q Okay. You were presumably aware of the Coast Guard and its -- call it regulations or Captain of the Port Orders concerning pilotage --

A Yes.

Q -- prior to retirement, right?

A Yes.

Q Now would you agree, sir, that it's changed since 1980?

A It's changed somewhere in there. I'm not sure just what the year. It has changed from whatever it originally was, yes.

Q Would you say from what it originally required was, what, a pilot could be on board at Cape Hinchinbrook and go all the way into Port Valdez?

A My understanding is you need a pilot from Cape Hinchinbrook all the way into the berth, yes.

Q And at some point in time, that was changed.

A Not completely. What was changed was exceptions were made for vessels that did not have --

Q What I'm getting at, sir --

MR. COLE: Judge, I object. He started to explain

it. He should be allowed to explain it.

MR. MADSON: He certainly can, but I think we're not communicating, what I'm trying to get at.

BY MR. MADSON: (Resuming)

Q I'm not trying to interrupt you, sir. What I was going to ask you was the change in pilotage from Cape Hinchinbrook into Port Valdez was a state pilot at one time, that was a requirement, was it not?

A Oh, way back, yes.

Q Yes, way back.

A Before -- as long as I've been up here, federal pilotage could come from Rocky Point inbound. The state pilots always picked them up off of Rocky Point.

Q Rocky Point was a state pilot station.

A Yes.

Q And there came a time when the state pilots no longer went out to Cape Hinchinbrook, correct?

A Yes, that was some time earlier, yes.

Q And then you had the federal pilotage endorsement --

A Yes.

Q -- or may not have the federal pilotage endorsement, right, and certain changes were made in that regard?

A Yes.

Q On that point, then, first of all, the Coast Guard said, well, for daylight passages, you didn't need pilotage and if you didn't have a pilotage endorsement, then with certain other restrictions, you still could transit Prince William Sound, right?

A Yes.

Q Then in 1986 -- did you know Captain McCall, by the way? Were you going in and out of there?

A No.

Q Were you aware of the Captain of the Port Order in 1986 that he issued which basically eliminated the daytime requirement and said visibility was the criteria?

A Yes.

Q Did you ever see a Notice to Mariners or the actual Captain of the Port Order, itself?

A No, I didn't.

Q Is this kind of word of mouth? Is this how you heard about it?

A I really can't recall now just how I heard about it, but I don't recall ever seeing, a Notice to Mariners on it, no.

Q When a Captain of the Port Order is issued, would you not assume or believe that the way to get the notice out to somebody would be by written notice to all the captains?

A It may well have been sent out and, at this time, I don't remember. But I don't recall ever getting a notice, no.

Q In your evaluation of the materials you looked at and examined before testifying here, in Court, did you also look at what's known as the Alamar Letter, that is a letter that was sent to the Exxon people from their shipping agent in Valdez?

A I saw a note, basically a note I think it was, but I saw something, a message from Alamar, yes.

MR. MADSON: Excuse me, Your Honor, I need to see, make sure we're talking about the same thing if I could approach him, first. I think it's Exhibit B, Defendant's Exhibit B.

BY MR. MADSON: (Resuming)

Q Okay, Captain, let me hand you Exhibit B and ask you if that's the note that you did look at.

A I don't remember this. It seems to me that I looked at something that was written, you know, a written note. I don't remember seeing --

Q Do you know who the note was from or who it went to?

A No. I do know that it was something from Alamar. Now just who, I don't remember. I remember looking at it. Just where I got that at that point, I don't know.

Now in regards to this -- I haven't read this through. May I take the time?

Q Oh, certainly. I was just trying to make sure that's the one you were talking about. Apparently it isn't.

A I don't recall ever seeing this. I've seen a note about it and I called the Coast Guard in Valdez right after the grounding, when I first came up, and talked to who I assume was Commander McCall, if I remember right, and we went over this. He went over all this information and it's still -- my understanding of what he had to say was the same as this, but what this means is that the pilotage that is -- if you have pilotage, it's the same as always. If you do not have pilotage, you follow -- you comply with this and you can come into the Bligh Reef area and pick up the state pilot at Bligh Reef.

Q Would you agree, sir, that that letter is at least somewhat ambiguous as to what changes were made?

A It seems straightforward to me. However, you know, I'm not an attorney and I'm looking at it more from a shipboard point of view. It seems pretty straightforward. Maybe to an attorney or maybe to someone that's uninvolved in the maritime industry, there may be some confusion.

Q You believe that anybody involved in the maritime industry would find that straightforward and easy to

understand, no question that there's no policy changes or waivers of pilotage endorsement?

A I didn't get that from it, no.

Q There's no question about there's any difference between sailing under registry and sailing coastwise.

A It doesn't mention that, I don't believe, here. I'd have to reread it, but I didn't see anything offhand about that, no.

Q Assume you got this, sir, and at the same time, you also knew that the Coast Guard was in the process of changing the regulations involving -- not regulation. It isn't a regulation, is it? It's a Captain of the Port Order, right?

A Yes.

Q -- Captain of the Port Order involving pilotage endorsement and you knew the Coast Guard was trying to or was in the process of eliminating that. Did you know that at the time?

A I knew they were --

MR. COLE: I object.

JUDGE JOHNSTONE: Don't answer the question, please, when there's an objection. Wait until we resolve it.

MR. COLE: I object to that not being in the evidence, irrelevant.

JUDGE JOHNSTONE: The objection is --

MR. MADSON: Your Honor, I think as an expert witness, I think I'm entitled to examine him to see if he would change his mind or opinion, based on facts and circumstances he may be aware of and may have very well been aware of at the time.

JUDGE JOHNSTONE: Objection sustained.

BY MR. MADSON: (Resuming)

Q You said you talked to Captain McCall about the contents of this letter.

A I believe that's who I talked to because when I first came up and this came up about, "Well, they no longer require a pilot," I didn't -- I'd never heard that, so I called the Coast Guard and asked if I could talk to someone that could explain it. And if my memory is correct, they transferred me to Commander McCall and he went over this over the phone with me. And in effect, what he said is --

Q Well, I'm not asking you what he said.

A Okay, yes.

Q But what I'm saying to you, sir, and asking you is at the time you had this conversation, you had already been hired by the State, right?

A Yes.

Q You were under contract with them at the time.

A Yes.

Q And this was an issue they asked you to examine, right?

A I don't recall they asked me to. As soon as I saw there was a question in it, I called the Coast Guard to check on it, yes.

Q Under the scope of the assignment that was given to you --

A Yes.

Q -- you knew there were certain things you had to look for and should look for, right?

A Yes.

Q Possible defects that Captain Hazelwood might have, right, such as whether pilotage was an issue or not?

A I don't know if we got in that depth or that was under my -- the scope of my employment was more advising them on how ships operate and what's expected of people on the ship and what the ship would do and various documents on the ship. As far as Captain Hazelwood's defense, I don't think that I really got too much into that.

Q Well, as far as what should or should not be done on a ship --

A Yes.

Q -- is one of the things you were looking at, right?

A Yes.

Q And you reached this conclusion regarding this letter after you were contracted by the State of Alaska and hired by them.

A Yes.

Q Now are you aware or did you examine any particular state statutes regarding pilots, pilotage, when it's necessary and things like this?

A I don't -- I think, years past, I have and I think that I don't remember anything about the state. Well, I saw one sheet of paper and this --

Q Let me ask you -- this is, by the way, Defendant's Exhibit S -- and ask you -- this is only referring to this particular stature here.

A Oh.

Q Have you seen that before?

A I think I've seen this before. I don't know just when, though. Let's see --

Q Well, was that recently or some years in the past?

A Oh, I'm sure it would be back some. I don't --

Q Would you read that, please?

MR. COLE: Objection.

THE WITNESS: Read it out loud?

BY MR. MADSON: (Resuming)

Q Yes, it's in evidence.

JUDGE JOHNSTONE: Is it in evidence?

MR. MADSON: Yes, it has been admitted.

JUDGE JOHNSTONE: What is the exhibit number, please? Is there a tag on it?

THE WITNESS: Yes.

JUDGE JOHNSTONE: Go ahead and read it out loud.

THE WITNESS: "Certain licensed pilots required for oil tankers. Any oil tanker, whether enrolled or registered, of 50,000 dead weight ton or greater shall, when navigating in state waters beyond Alaska pilot stations, either, one, employ a pilot licensed by the state under this chapter or, two, utilize a federally licensed pilot whose duty has been on that tanker throughout that specific voyage," and, B, "A pilot required in A of this section shall control the vessel during all docking operations."

BY MR. MADSON: (Resuming)

Q According to that state statute, then, when does a pilot have to, when is he required to control the vessel?

A A state pilot is required to control the vessel during all docking operations.

Q Now it says "referred to in A of this."

A That's --

Q Okay, what does -- A includes either a state pilot or a federally endorsed pilot, does it not?

A Let's see, A. According to this, yes.

Q Okay. And by "control," that means actually being in physical control of giving the orders when docking?

A Yes, to me, that would mean that, yes.

Q It's safe to say, sir, that that state law does not require a captain to be on the bridge at any given time, does it?

A It says, "The pilot required in A of this section shall control the vessel during all docking operations, according to the law."

Q Excuse me, except for docking operations.

A It says it shall employ a pilot.

Q It says master, too, does it not, company or master?

A It doesn't say anything about a master here.

Q Well, read on down a little further.

A Oh, here, down further here. Do you want me to read it out loud or --

Q Let me just ask you, sir, isn't it true what this law really says is that a large tanker, such as the Exxon Valdez, shall either have a state pilot or a federally licensed pilot whose duty station has been on board throughout that period of time, that transit, right, that's what's required?

A That's what it says, yes.

Q Then it goes on to say either one of those two

shall -- must control the vessel during docking operations.

A Yes.

Q And it doesn't refer to or make any requirements as to when a master should be on the bridge.

A I don't know any --

Q I'm only asking you to read it. If you can't answer, sir, I don't want to -- I'm not trying to force you to say something.

A No, I can read it and that's what it says here, yes.

Q Now let me ask you a few questions about -- well, the operation of a vessel you went into in some detail yesterday and the day before. I don't want to go into that again at the same length. But, generally, would you say that the master of a vessel, when he's on duty, usually assumes the direction and control of the vessel?

A By direction and control, you're talking about conning on the bridge.

Q I don't know. Does that mean necessarily conning or does it mean directing control without conning?

A For the navigation of the vessel, the way it is always done on a ship is there's a definite person in charge of the navigation of the vessel at any one time, in other words, during the direct conning of the vessel, putting positions down, et cetera. Now if -- a master

doesn't necessarily have to be at the conn all the time.

Q No.

A What they have to do is have an exchange so that when you're at sea, if a master leaves the bridge and the watch officer has accepted the conn, then the watch officer will do the conning with, of course, the obligation to call the master at any time. And then if the master comes up to the bridge, he will take over the conn when he sees fit.

But in close waters where the pilotage is required, normally you don't leave a man without pilotage at the conn.

Q You went into that a lot yesterday. But, first of all, did you review Captain Murphy, the pilot's testimony in this trial?

A No, I haven't, yet, no.

Q So you don't know what he said about, in his opinion, these were not dangerous waters, Valdez Arm?

A I didn't know that he'd said that, no, but that's --

Q Would you agree with that?

A That's a matter of opinion. Under normal circumstances, any place these tankers operate is not dangerous. When you get into unusual circumstances is when you get into the danger.

Q My question is would you agree with it or not,

sir?

A Whether Valdez Arm --

Q Yes, Valdez Arm is dangerous waters?

A Not in normal circumstances, no.

Q Now getting back to my earlier question on direction and control, assume the master has the conn, but leaves the area, say goes in the chart room, but doesn't turn over the conn to the watch officer. He still has direction and control, according to what you're saying.

A Yes.

Q Suppose he goes into the bathroom, he's there for 15 minutes?

A Under normal procedure, if you're going to be --

Q I didn't ask you normal procedure. I just asked if you can --

MR. COLE: Judge, I object to Mr. Madson arguing with the witness. If he's going to ask a question, allow him to answer the question.

JUDGE JOHNSTONE: I think he was responding to your question, so if you could let him answer.

MR. MADSON: Let me rephrase, withdraw that.

BY MR. MADSON: (Resuming)

Q Can you respond to the question without talking about normal procedure or is that necessary in or explanation?

A I don't think it's a yes or no answer. I think I need to tell you what my answer is.

Q Then if the master goes into the bathroom and is there 15 minutes, but doesn't say anything to the watch officer, "You have the conn," my question is who has direction and control?

A The master went in the -- well, that's, like I say, if a watch mate is up there and there's a problem, he's obviously going to say something to the master or do something, even though -- because the vessel's been left unattended. If a master has the conn and has to step in the bathroom for 15 minutes, he's certainly going to say to the watch officer, "Keep an eye on things. I've got to step back here and use the bathroom." Now that's --

Q I mean that's kind of common sense.

A Yes, sure.

Q Right, he's going to say, "I'm going to be gone for awhile. Keep it on this course or, you know, keep it steady," or something like that.

A Yes.

Q And presumably -- you're familiar with the chart of the area of the Exxon Valdez bridge -- not the chart, but the diagram, the layout?

A Yes.

Q Okay, there is a bathroom up there, right?

A Yes.

Q And it presumably would take maybe 15 seconds or so, if the master were in there and there was an emergency and he had to come out.

A It would be less than that, but, yes, you could rush right out of there, you know. That's depending --

Q Well, I don't want to speculate too much on this, but -- ten seconds, would you give me that?

A But, yes, he could rush right out if there's a problem, yes.

Q Okay, do you know where the captain's quarters are on the Exxon Valdez with respect to the bridge?

A Yes.

Q Would you disagree with the opinions that have been related here today that he could be there in ten or 15 seconds?

A I think I walked from his office up to the bridge in 12 seconds, if I'm not mistaken.

Q And you were walking, right?

A Yes.

Q So you don't disagree with that at all.

A It's in that -- yes, depending on the person, it would vary a little, but --

Q And if the master went down below, didn't turn the conn over to the watch officer, but said keep it on a

particular course and goes down below, "Call me if you need me. I'll be right down below," has he turned over this direction and control or is this another one of those iffy situations?

A The way I've always understood it, if you leave the bridge area, you have to turn the conn over to leave the bridge area. A person that's operating the vessel, navigating the vessel, has to be in the bridge area, as far as the way I understand it.

Q Now how about the way Mr. Cousins understood it. You reviewed his testimony, did you not? Do you recall his testimony to the effect that he did not understand and believe that he had the conn, but that Captain Hazelwood still was the conn and had the conn, was giving directions and control?

MR. COLE: Judge, I object to that. I don't believe that was the testimony.

MR. MADSON: I believe it was.

JUDGE JOHNSTONE: Well, I don't recall and you can ask him to form an opinion, but asking him what Mr. Cousins said, if he believes what Mr. Cousins said is not a proper question of this witness.

BY MR. MADSON: (Resuming)

Q Well, assuming in any situation the watch officer said, "My understanding was the captain still had direction

and control and did not turn the conn over to me."

A It's my understanding that any time you leave the bridge, you turn the conn over to the watch mate. I mean that's normal procedure, tradition, and the watch mate would call the captain if he needed help. But as far as -- the watch officer would accept the conn if the captain left the bridge and told him if he -- there's an exchange of who's controlling is always done and if it's not done, it always leaves a cloudy point.

Q Well, if a watch officer, again, were to say, "I didn't have any misunderstandings. I know what I was supposed to do. He was right down below. He must still give me the directions and orders and I was simply carrying them out as if he was standing right on the bridge" --

A But from understanding of the way ships operate, the mate on watch would have the conn. The captain, if he went below, would not have the conn.

Q What rule, regulation or statute requires this? Is there any rule?

A Well, there again, I'm not -- I haven't delved into the law. I mean we don't at sea, but this is my understanding that this is the way it's done and my understanding that it's standard practice in the industry.

Q It's fair to say you don't know of any, is that right, any laws, regulations that specifically relate to

this --

A No, I don't.

Q -- and say particularly, in detail, when or when a master must turn over the conn or leave the bridge or anything like this.

A No, I don't. I mean I'm not an attorney, so I don't study all this. I just -- my career is what I'm basing this on, is what I've seen in tradition and standard practice in the industry is that the conn is always left with the officer on the bridge.

Q But certainly, sir, as a tanker captain of years' experience, you know that there are numerous Coast Guard regulations governing activities of not only oil tankers, but all commercial vessels, right?

A Yes, right.

Q Now let me ask you something else. Is it true that -- you know, certain traditions seem to carry over for years and years and maybe the one people long remember is the captain standing at the wheel or next to the wheel and a guy steering it, you now, old sailboats, for instance. Is that somewhat true today? In other words, is that tradition still carried on, that the captain doesn't manually, physically steer the vessel?

A No, you don't. Neither the master, nor the watch officer, manually steers the vessel. You have a seaman

that turns the wheel under your direction.

Q Is there any reason for that, other than just tradition?

A Yes, there is a reason for that, because when you're navigating a vessel, you need to take bearings, you need to watch the radar, you need to answer the VHF phone, you need to plot positions. There's numerous duties that the watch officer is doing, so he has to have the freedom to move from bridge wing to bridge wing, chart room, bridge areas, as a lookout and navigating officer, so he cannot be left at the wheel. That's why you have a helmsman.

Q So the watch officer would have other duties other than just steering, right?

A Oh, sure, yes. The only part of the steering that's his duty is to see that -- is to give the orders and see that it's done right.

Q See that it's carried out.

A Yes.

Q If the watch officer were to say, "Ten degrees right rudder," he should make sure that order is carried out.

A Right.

Q So it's true, then, that the captain or officer never has actual physical control of a vessel, such as the Exxon Valdez. By "physical," I mean he is physically

turning the wheel, maneuvering the --

A I won't say never because, occasionally, one of them may step up to make a course change out of preference or maybe the helmsman has been sent to clean the windows or something. It's not -- never is a pretty strong statement. But under a general rule, the master or neither the watch officer steers the vessel or changes the course physically, they direct it to be done.

Q Now, for instance, in the rare situation, say the master were to become mentally incapacitated --

A Okay.

Q -- the watch officer could disregard officer if it was an obvious one that placed the vessel in danger, isn't that true?

A You're bordering on something that would have to be such an extreme case that such -- the penalties are so severe for not following a master's orders that I --

Q What are they?

A Imprisonment, loss of license. If you refused, you could be chained up on board.

Q How about keel hauling, do they still have that one?

A No, they don't have that. There are a lot of old ones and a lot of things and so it would be very hard for a third mate say, or second mate, or even a chief mate to

say, "Ah, the old man's not acting right today. I'll take over the ship." This just isn't done.

Q They call it mutiny, right?

A Yes.

Q I'm talking extremes, certainly.

A Yes.

Q Let's suppose the captain came on and he said, "I want you to set this vessel course at 245," and there's an obvious cliff or rock right in front of you and you know that this vessel could not possibly turn and avoid that rock, once it's set on that course. In that extreme example, wouldn't you say that the watch officer --

A Would do something, yes.

Q -- would do something?

A Yes.

Q You also testified yesterday about I think crew size and I think you got a little bit into demanning, the term was demanning or something like that, right?

A Something of that sort.

Q I believe you said that in recent years, the crews on the tankers have been reduced in size.

A That's correct.

Q How does a reduction in crews come about?

A That's -- the Coast Guard sets the minimum standard, the minimum required personnel, and this comes

about from input from the various interested parties, which usually ends up as the companies that are involved in trying to reduce their crews and various other agencies and various other things that want to keep more people on the ship and it's discussed and kicked around awhile and the Coast Guard then decides to set the manning scales and that's the way it's done.

Q It sounds like it's kind of a contest between economics on the part of the ship owner and safety on the part of the Coast Guard, is that correct?

A Yes.

Q And in between there, some balance is struck.

A Well, not lately, but hopefully that's the way it goes, yes.

Q Did this occur when you were still a captain, sir?

A Yes, we were -- from the time I started to sea, they've been continually reducing the crews.

Q And did you feel that this affected the safety of your vessel or vessels?

A From -- at the start, no, because we had -- the ships changed. Originally when I started, we were up, usually, the normal merchant crew, in the 40s. In fact, the first ship I was on was 65. But they've reduced down and reduced down and it reached a point at about 30 people on an average tanker. From that point on down, I felt that

they were taking too many people off the ship.

Q Reducing 30 to what?

A Well, the last one I was on had 24 and now they're down below that on most of them, so --

Q And that means everybody has to work harder and longer hours and more fatigue.

A That's correct, there's more stress, there's more chance of having a problem, due to being short of crews. It's just continually more of a problem, yes.

Q And I think you also said, for instance, the chief mate is the captain's righthand man, right?

A Yes.

Q He normally is in charge of the cargo loading?

A Yes.

Q Normally, that is a competent -- usually, it's a competent person, is it not?

A You certainly hope so, yes.

Q For instance, on the Exxon Valdez, in the material you reviewed, you became somewhat familiar with Mr. Kunkel.

A From reading about him, yes. I've never seen or met the man, but, yes.

Q Just reading about him, there's nothing in there that would lead you to believe that he was not a good first officer.

A Not that I could see, no.

Q In fact, he had a master's license, did he not?

A Yes, I believe he did.

Q And he would normally take charge of the loading and have people working for him.

A Yes, I think he'd probably lay out a plan of how he wanted to do it and how he was going to do it and probably discuss it with the captain and make sure that met with his approval and then use a second and third mate and crew members to carry this out, yes.

Q Normally, the captain, the master doesn't have to be there every minute to see that the first mate is carrying out his duties properly.

A No.

Q And the chief mate, in turn, can assign duties to other officers or able bodied seamen to see that these things are carried out and doesn't have to be there every second to watch them.

A Sometimes. That's the way it's supposed to work, yes. You know, from the step -- from the master on down, sometimes there's failure and you know that you do have to watch them, but basically that's the way it works, yes.

Q By the way, do you know how many crew members the Exxon Valdez had on that voyage?

A I believe 19.

Q At one time, according to what you said, it would

have been 30?

A Yes, sir. Of course, now, they've done some automation since then, but that's -- certainly that was the smallest crew on a tanker that I've seen, yes.

Q And you said that when this crew was there when you came on board the ship, you couldn't, maybe like the old days, pick and choose who you wanted to be on your vessel, right?

A No, no, you -- the way it goes now is you have the people on board. The only option you have -- well, I don't know with Exxon what option you have, but on the ships I was on the option you had was refusing a crew member when he'd come aboard and sending him back and this entails, of course -- the ships I was on had unions. This involved company-union negotiations and labor relations in all of this and it can be done. But it's certainly, through the years, it's gotten to the point where it's harder to do this, but it still can be done.

Q Would you agree that because of the demand, the unions may be more aggressive as far as any captain refusing to have somebody, a union member on board the vessel would file a grievance or things like this that were done?

A I don't know if there are any more, but they do try to, you know, try to force whoever they do send to you

onto the vessel, yes.

Q And I think you just said you don't know what could be done in the case of Exxon.

A I don't know what their company policy was on manning, no.

Q So you don't know what a master working for Exxon, what his options were or what they were not as far as who he'd get to sail with, what he would do.

A I know what he can do legally, but I don't know what the company would approve of, no. That's --

Q One example you gave in your direct testimony was, for instance, if someone was known to you, as a master, to be let's say very poor at steering or incapable or incompetent at steering, you could say, "Well, I'm not going to have you steer this vessel," right?

A That's correct.

Q You could put him on lookout.

A Yes.

Q The ABs usually alternate between lookout and steering the vessel, don't they?

A Yes.

Q Of course, you would have to have some knowledge of that particular individual, such that it would raise this level of concern to the point where you would say, "Gee, I just can't leave this guy at the wheel," right?

A Yes, you'd have to -- to make that decision of whether you wanted him on the wheel or not, you would have to have knowledge of his steering, yes.

Q On the other hand, if you had seen him steer before and he seemed to be following orders competently and quickly enough, you'd leave him at the wheel.

A If I had seen him at the wheel and had confidence in his ability, yes, I would.

Q And even if he were not competent at the wheel, you made him a lookout, a lookout is a rather necessary person on the ship, too, isn't it?

A That's correct.

Q And if he's not competent to steer a vessel, he may or may not be competent as a lookout.

A That's true. But it could work either way. A person that's a good helmsman might be a poor lookout or vice versa. But the lookout is something that you have a backup with the radar, you have a backup with your watch mate and the helmsman is a man that's directly -- of the two, I would prefer to have a man that could steer, rather -- I'd rather have a poor lookout and a good helmsman in a close situation than the other way around.

Q At the same time --

A I'd rather have both of them good, but --

Q -- a lookout could be out there and he has to look

for navigation aids, lights, possible other vessels to avoid collisions, all these things.

A Yes.

Q Now, by the way, in the access to the materials that you had that were given to you by the state, did you review anything regarding Mr. Kagan?

A I read his --

Q His statements?

A -- his statements. And as far as -- I've read what other people said about him. Whatever was in there that referred to Mr. Kagan I read about, yes.

Q But you didn't read or review or listen to any of the testimony in this trial concerning his ability or the lack of it as a person to steer, who could steer.

A No, I don't remember reading anything about him, no.

Q And, of course, you don't know then what Captain Hazelwood really knew or did not know about Mr. Kagan?

A I know what I read in the reports that the chief mate had made a comment about Kagan's ability and I believe one other officer made a comment about his ability.

Q Do you recall reading in there about what Captain Hazelwood's response was, that he had seen him steer before and he did okay?

A Yes.

Q Now is there a difference between steering and carrying out a simple order command?

A There's a difference because the order -- you mean commands on the wheel?

Q Yes, I'm sorry.

A They basically go together. A person can certainly comply with a ten-degree right rudder instruction when he can't steer very well.

Q Just so we understand what the difference is, if you're a master on the ship and there's a helmsman at the wheel, you could say to him, "Come about to a course of 270, hold it steady," or something like that.

A Well, I'd be a little more precise, but, yes, you can do that. And if you do that, you would expect him to be able to put the rudder on, have the ship swing to the course that you've given him, have him check the swing of the vessel, steady up on that course, yes. And that's -- almost any able seaman should be able to do this.

Q That's not very difficult, is it?

A No.

Q But it takes a little skill and practice.

A It's something that you -- a rank beginner wouldn't do it. It's something that a person with experience and practice, they get to do quite well, yes.

Q And to do that -- I mean the skill and practice

comes about because when you turn the wheel, the ship's heading turns, but you have to correct the turn, don't you, the turn before it gets to the compass point.

(Tape changed to C-3646)

THE WITNESS: Yes, what you do is what we call you check the swing by putting -- if you're swinging right, you put left wheel on it to check the vessel's swing. And the trick to being a good helmsman is determining when to put the counter rudder on to stop the swing so that you stop on your heading and aren't continually trying to correct, to get to the correct course.

BY MR. MADSON: (Resuming)

Q You used the term counter rudder. That's turning the rudder back in the opposite direction to check the swing.

A Yes.

Q So if a person was learning to steer and had trouble with it, he could sometimes do what's called chasing the compass, go too far one way, go the other way.

A They can do almost anything, yes. That's a common failure. A common failure is to go the wrong way, yes.

Q On the other hand, as the master of a vessel, you could give the helmsman an order like ten degrees right rudder, right?

A You could, yes.

Q And that's a real simple order, right?

A Yes.

Q About as simple an order as you can give to a helmsman.

A Yes.

Q He has to know, what, two things? He has to know right from left.

A Yes, and he has to be able to read the ten.

Q He has to read ten, okay. And there's something right in front of him that says when it's on ten.

A Right.

Q And then there's -- and you said the duty of the watch officer would be, after that order is given, to make sure it was carried out.

A That's correct.

Q And to make sure it's carried out, you have a number of assets, such as rudder indication.

A Yes, on that particular vessel, you have a rudder angle indicator on the forward bulkhead. You have one overhead that you can see from about any direction in the wheelhouse. You have a rudder angle indicator on each bridge wing. You have an indicator right in the steering station, so --

Q So virtually any place you're at there on the bridge, you could easily determine whether the rudder is

turned or not.

A Yes.

Q Now, sir, I want to get into what I think you determined were judgment calls on the part of Captain Hazelwood that you said were examples of bad judgment. For instance, when you were asked questions by Mr. Cole about returning to the ship late -- do you recall that?

A Yes.

Q Did you know from your investigation that the sailing board was changed?

A Yes, I did. It had been moved ahead two hours I believe from what it had originally been set.

Q Originally, it was set for what time?

A 2200, I believe.

Q What was that?

A 2200, is that right?

Q Would that be 10:00 o'clock our time?

A 10:00 p.m., yes.

Q And it was moved up to --

A To 8:00 p.m.

Q Now a tanker is not like a bus or a plane or something. It doesn't have a printed schedule --

A No.

Q -- that says it leaves at 12:38 a.m. every day.

A No.

Q When it's loaded, you go, right?

A Pretty much, yes.

Q Excuse me, it's pretty dry in here. Do you want some water, by the way?

A No, that's fine.

Q So it isn't critical whether a tanker leaves at an exact time.

A It's not like a bus schedule or a train schedule, but everybody wants to leave as soon as possible and they want to leave as soon as they're loaded. And when the board is posted, you wouldn't post the board for 8:00 o'clock and then hang around until 11:00 before you decided to leave, unless there was a reason.

Q Well, that reason could be, "Yes, I want to wait and get more update on ice reports, if I can."

A Yes, that you could do. That would be a reason, yes, you know, any legitimate business reason. You could change it then. But, normally, you try to sail on your sailing time.

Q The master decides when that's going to be, right?

A Yes.

Q He has discretion.

A A lot of times, you'll let your chief mate set the sailing board because he knows when he's going to finish cargo, but the master can certainly change that at any time

he wants to.

Q And you said that because he came back, and you said late, he needed -- he had less time to review such things like ice reports, right?

A Yes. By late, this is what I meant. He was there before the ship sailed, naturally, but there's certain obligations in jobs that a master has and one of them is determining if it's safe to sail and if he wants to sail, if his crew is all back, this is -- you know, various things of that sort, and he should be there to do that.

Q So he normally, in a normal situation, wouldn't run around and say, "Oh, my God, I've got to leave in five minutes and I've got all this stuff to do," and just dash through it.

A Not in the normal situation.

Q He could take his time and make sure that he evaluates the situation, considered all the options and leave when he's ready, even though it might be not 10:00 o'clock or 8:00 o'clock, but 8:30 or 9:00.

A Whenever he's ready, yes.

Q And how long would you say it takes to review an ice report?

A Just a minute or two.

Q What if the ice report is merely, "Scattered small pieces of ice, but had to divert," or something like that,

and it's four hours old? Is it something, you know, you think about and say, "Well, we may have ice, we may not," right?

A Yes, I don't think I said that he had to spend any time on it. When I mentioned the ice report in my other testimony, that was just one of the things to consider before he sailed. What I was referring to about being rushed at that time was not the time to read the ice report, but the fact that he already had the pilot boarded and on board, the tug boats were in the area, the line handling crew from the terminal was ready to let him go. Everything had been set in process to undock at that time and that's what I was referring to.

Q Okay, so he came on board, reviewed ice reports, determined everything was ready to go, discussed the situation with the pilot and they proceeded to undock, right?

A Yes.

Q Did you review the undocking process?

A Yes.

Q Any criticism of the undocking process?

A No, certainly not.

Q He handled that competently, in your opinion, Captain Hazelwood that is?

A Yes, it seemed to go fine, yes.

Q Didn't seem rushed?

A Didn't to me, no.

Q And, of course, you've already indicated that Captain Murphy, in your opinion, was a good, competent pilot.

A Yes.

Q Did you know or have any knowledge of Captain Hazelwood's relationship with Captain Murphy, such that whether he would know or should know how good a pilot he is or anything?

MR. COLE: Objection, speculation.

MR. MADSON: I can only ask, Your Honor, if he knows from the material he reviewed.

JUDGE JOHNSTONE: Just answer yes or no to that and then you can tell him how you know this, if you do know.

THE WITNESS: Would you repeat the question?

BY MR. MADSON: (Resuming)

Q Did you, from the material that you examined, all the material, reach any conclusions as to whether Captain Hazelwood knew the competence of Captain Murphy as a pilot?

A No, I didn't reach any conclusions, no.

Q Did you review any such material?

A Yes.

Q But you didn't review any conclusions?

A I didn't come to a conclusion.

Q Oh, excuse me, that's what I meant.

A I had come to the conclusion that Captain Hazelwood knew Murphy, that's all. What he thought about Captain Murphy, I didn't -- that's for Captain Hazelwood to decide, not me.

Q That's one of those other judgment calls, right?

A That's right.

Q And you -- I'm getting to the point now where -- the transit through the Narrows, after the undocking process is completed and the tugs have left and the ship is now under a pilot, Captain Murphy.

A Yes.

Q Explain exactly what the pilot does. And maybe I can make it faster. The pilot basically tells the helmsman, "Set course at . . .," such and such, doesn't he, and speed?

A However he chooses to do it, yes, but basically he sets the speed and the course of the vessel, yes.

Q You've had Captain Murphy as a pilot before, right?

A Yes.

Q Is it fair to say that he generally has a track that he follows, pretty close?

A Yes, they follow as closely as they can the track

determined by the Coast Guard that's best to go through the Narrows.

Q Give an example, for instance, of what Murphy would say after you're ready to get up speed and head on out. Set course at what, what would he say?

A Well, when you get away from the dock, you normally swing out around -- well, from that dock, around 300 or so and get out where you can -- when you're clear, you're on a course of 270, normally, to 268, 270, depending on where you end up when you pull away from the dock and head out toward the Narrows.

Q And you reach a point where a course change has to be made, right?

A Yes, and eventually they end up coming around to about 225, 224, there again depending on where the vessel is.

Q And of course, you're also plotting fixes as you go along?

A The watch mate would do that. Usually, Captain Murphy have went in and out of there, the pilots went in and out enough that they normally have their range and bearings and positions in their head that they don't actually go and plot. It's up to each individual ship to have, if they decide to have the watch -- you should have the watch mate plot so that the vessel would know where

they're at, but that's not something the pilot would do. That would be something the watch officer would take care of.

Q Do pilots such as Murphy, in your opinion, do this so routinely they can almost do it with their eyes closed, is that --

A Not with their eyes closed. They do it routinely and, you know, they do it competently and they do it so often that they're more familiar with the area. That's why you use a pilot. So they don't go in and plot and determine, "Well, I'm here." They know in their head where they're at. However, the ships still, for their own benefit, plot their positions.

Q Is plotting required by the Coast Guard, the ETS system in that area?

A In that area, they do their own plotting with their own radar. It's not required specifically. The only thing I know of is, with the Coast Guard, is that's something they consider in a casualty, is how often you've plotted, but --

Q And when you leave -- and I think you said you go along a course of 270 and eventually you change course to --

A Roughly 225 to enter the Narrows, yes.

Q If you didn't make that course change, you would

run into rocks on the other side of the Valdez Port, would you not?

A You could do that, depend -- yes.

Q So you have to change your course --

A Yes.

Q -- to avoid shore, rocks, whatever. You reviewed all the material on the Exxon Valdez situation and the circumstances surrounding its leaving on the 23d, right?

A Yes.

Q You knew, for instance, that the third mate was on the bridge at that time.

A The chief mate was on the bridge on undocking and then the third mate came up at some time during the transit. Between the dock and the Narrows I believe is where he relieved Mr. Kunkel.

Q Cousins relieved Kunkel.

A Yes.

Q Yes. So you knew Cousins was there from your reading. And you knew he was licensed as a second mate, right?

A Yes.

Q You obviously didn't know Mr. Cousins personally.

A No.

Q You've never sailed with him.

A Never sailed with him, never met him. As far as I

know, I've never seen him.

Q And you certainly never had any -- you were never in a position to personally evaluate his performance or lack of it.

A No.

Q Do you know what Captain Hazelwood knew about Mr. Cousins from your review of materials?

A Not really. I know that he seemed to think that -- I don't believe that --

MR. COLE: Objection, Your Honor.

JUDGE JOHNSTONE: Just a minute.

MR. COLE: It calls for hearsay.

MR. MADSON: Hearsay? Well, that's all he's testifying to.

JUDGE JOHNSTONE: Based on his review of the materials, I'll let him answer that.

BY MR. MADSON: (Resuming)

Q From your review of the materials, did you reach any conclusions, even, you know, other than sheer speculation, about Captain Hazelwood's experience with Mr. Cousins and what he thought of him as a competent mate?

A I don't remember anything saying what Captain Hazelwood thought, no. I remember Mr. Kunkel saying that he'd give him high marks on his cargo, but I don't recall specifically reading anything that Captain Hazelwood had

said about him.

Q Did you review Captain Hazelwood's statement to Mr. Delozier and the --

A Yes, I did. If it was mentioned in there, I don't recall at this point.

Q You don't recall the testimony that he said he'd sailed with him times before and he was a very competent man?

MR. COLE: Objection.

JUDGE JOHNSTONE: Just a minute.

MR. COLE: I object to the form of the question. I mean if he's going to impeach him, if he's using it to refresh his recollection.

MR. MADSON: It's to refresh his recollection, Your Honor.

JUDGE JOHNSTONE: I think it's a proper question. He's referring to a statement that's in evidence, Mr. Cole.

THE WITNESS: At this point, I can't specifically remember. I remember reading that and -- but I don't remember that there was any -- that Captain Hazelwood felt strongly, one way or the other, about Mr. Cousins. It didn't -- if he complimented him, I failed to notice it. If he criticized him, I failed to notice it. So I --

BY MR. MADSON: (Resuming)

Q Well, wouldn't you think, sir, that that might be

rather important in evaluating what actions Captain Hazelwood took or didn't take, his knowledge of Mr. Cousins and what he could do and what he couldn't do?

A I'm sure he did evaluate him and I'm sure that he made a decision and having Mr. Cousins as third mate on up through the Narrows would be -- I didn't find any fault with that. I found fault with Captain Hazelwood leaving, not being up there during the Narrows.

Q The question, though, was he a competent watch officer to be up there on the bridge?

A Oh, sure, I suppose he was, yes.

Q Well, do you suppose he was or do you have an opinion as to whether he was?

A I don't have an opinion because -- on whether Mr. Cousins was competent to be on the bridge during the passage of the Narrows.

Q How about the person at the wheel, do you recall who that was going through the Narrows?

A Mr. --

Q Radtke.

A -- Radtke.

Q Do you know if he was just an AB or actually had a license?

A He had a third mate's license, I believe, but he was sailing as an AB.

Q Is that an indication to you, sir, that he was a very competent -- would be a more competent person than an AB?

A Not necessarily. That's an indication that he had a third mate's license and was sailing as AB.

Q It required him to have more experience, didn't it?

A No, not necessarily. If he -- some of the ABs have ten or 15 years' experience and some of the ABs have as little as one year experience. And you could have a third mate's license and still not have a lot of experience as AB. But I didn't see anything to determine that Mr. Radtke was competent or incompetent at all in what I read.

Q Well, correct me if I'm wrong, Captain Beevers, but isn't there some kind of scheme to this licensing thing by the Coast Guard?

A Oh, yes. He passed the third mate's test, so I assume that he had sailed AB long enough time or else he went to one of the maritime academies and he passed the test. But the test merely tests you in certain things that you need to do. That doesn't mean that you can do them very well or that you can't do them very well. That means that you passed the test, showing that you have an idea how to do them.

MR. MADSON: I guess when somebody passes the

master's exam, it doesn't mean you're a good master or a poor one, you just pass the test, right?

A That's basically, yes.

Q In any event, let's see, on the outgoing passage through the Narrows, then, you have the pilot, Captain Murphy, who's done it many, many times --

A Yes.

Q -- conning the vessel. You have a watch officer who has a second mate's license.

A That's right.

Q You have a helmsman that has a third mate's license, even though he's not sailing --

A Yes.

Q -- as an officer.

A On the ship's structure, you can't use his third mate's license. He's an AB; he signed on as an AB. That's his job.

Q I understand that, but he still is more -- I hate to -- I'm not going to get into a nit-picky argument about whether he's more qualified or not, but he has passed an additional test, right?

A Yes, certainly, and that's -- you know, I'd be glad to see a third mate -- well, I'm not glad to see it because that means the industry's in a bad way. But I certainly wouldn't object to an AB being a third mate. I

would think he would have -- be trying to get ahead and be ambitious and be trying to do a good job and I'd be happy with that. But I can't say, from what I read, that that made him any more competent as an AB.

Q No, but to have the incentive to become an officer from an AB, you generally want to know more about navigation and charts and things like this, right?

A Oh, yes, sure.

Q If you're in a particular area, Prince William Sound, you would naturally -- and, again, I say normally -- want to be familiar with the area, navigational hazards and things like this.

A Yes, I would think that that would certainly be a credit to him and be a plus, just from reading, but I think -- you know, that doesn't mean that he's still a good AB. I had nothing to base a decision on his ability as an AB.

Q I presume you would agree that Captain Hazelwood would be in a better position than you to evaluate his performance.

A Certainly, yes.

Q Now the VTC, the vessel control center, while you're going through the Narrows -- and the number of times you've done that -- you know you're on radar there, aren't you?

A Oh, yes, yes.

Q Have you ever gone off course and had them get on the radio and correct you?

A Not in the Narrows.

Q Where did that happen?

A Okay, I had a conversation with them, coming inbound from Bligh Reef years back, when they first started -- where the Valdez Traffic called and said that I would out of the traffic line, I was in the separation zone.

Q Were you?

A No, they -- at the time they said, you know, "You'd better alter your course to starboard or something." I said, "I'll check my position first," and I checked and I was in the traffic line. By the time I finished checking, they came back and said, "We made an erroneous plot. Disregard that," and that was -- so at that time, they had radar monitoring, at least out to the Bligh Reef area.

Q You said at that time. When was this, sir?

A That was in '78, '79, somewhere in there.

Q What about '86, '87?

A I didn't -- at that time when I was still sailing, I assumed they still had radar following.

Q So you assumed if you got off course, the Coast Guard was going to let you know. In fact, they did that time.

A They did in that case, but I didn't -- I assume they were watching. Whether they -- I never relied on the Coast Guard to tell me where I was at out there, but I assume they were monitoring that, yes.

Q You didn't rely on them as a navigation tool, but certainly you knew they were watching you. If something unusual happened, they certainly made contact.

A That's right, definitely.

Q And certainly there's no question in your mind that you were being monitored going through -- when you're going through Valdez Narrows.

A Yes, yes.

Q There's a speed limit there, I think you said, loaded --

A Six knots, yes.

Q Coming in unloaded, there's no speed limit.

A I think it's 12 knots inbound, but you go through a maneuvering speed and that's in that range, but, outbound, I definitely know it's six knots.

Q So 12 knots is, you say, maneuvering speed and that is apparently safe speed to transit the Narrows.

A In that particular area, in ballast, yes.

Q You can make maneuvers quick enough at 12 knots to avoid any hazards, such as Middle Rock, things like this.

A Yes.

Q Now you said that you would be on the bridge or always are on the bridge going through the Narrows.

A Yes.

Q Let's assume you were in this situation on March 23d and you've got the conn with Captain Murphy, you've got Cousins, second mate, acting as third, you have a helmsman who's a third mate acting as an AB. And is there also a lookout?

A Yes, there would be a lookout on the bow.

Q On the bow.

A Yes.

Q So you have all these people and their job is to safely navigate that vessel through the Narrows, right?

A Yes.

Q Everyone of them's duty is the same, is it not?

A Their duties are not the same, but their goal is the same, to safely navigate the vessel through the Narrows, yes.

Q Oh, I stand corrected.

A Yes.

Q Their duties might be different in that one of them is plotting a fix and one of them is looking out, but the whole aim and purpose is to make sure you don't hit anything.

A That's right.

Q It seems like enough people to do that, doesn't it?

A You're short one.

Q You still want that -- you say they have to have that extra pair of eyes.

A The master. In a situation like that, yes, you need the master on the bridge. That's by every standard that I know of in the maritime industry, yes.

Q What written standard is that?

A That I don't know. I know that that's certainly one of the things in a grounding or in a collision or marine casualty, that's certainly one of the first things that the Coast Guard and all the courts will want to determine is was the master on the bridge and that's one of the things that they take into account in evaluating --

Q Might take it into account.

A Yes.

Q Would you agree, sir, it would also depend on the situation?

A Oh, yes, if you're out in the middle of -- if you're out in the middle of the ocean or off the coast, there's certainly reasons not to be on the bridge. But in a situation where a minute's delay in maneuvering the vessel -- the master should be on the bridge and that's traditionally been his duties.

Q Traditionally been his duty.

A Yes.

Q But in this particular instance, it was a routine transit, right?

A Oh, yes, that's --

Q Nobody made any errors whatsoever.

A No, that's right, it went just fine without him there, but --

Q This transit had absolutely nothing to do with the grounding, did it?

A The transit -- the only thing it had to do with the grounding is they got out, but it had nothing to do with the grounding, no, basically. It was a routine, normal transit that went just fine.

Q They didn't come close to hitting anything.

A No.

Q There was no substantial risk that the vessel was going to be run aground, based on what you saw, evaluated.

A No more risk than you normally have. I mean any time you're moving a vessel that large in a narrow channel, there's a risk. That's why we take so many precautions. But there was nothing undue or nothing unusual about that transit, no.

Q And, of course, there's a certain risk in almost everything we do, is there not?

A Certainly.

Q You flew up there in a plane. There's a risk in that.

A That's right.

Q You assumed the pilot and the copilot know what they're doing and the mechanics didn't make a mistake.

A Yes, as the passenger, you have to.

Q But you had -- I would ask a question -- a routine flight?

A Yes.

Q So while there may be a risk involved in going through Valdez Narrows and that risk you say would be increased if Captain Hazelwood wasn't on the bridge, you can't give us any opinion as to the degree of risk.

A Oh, you mean ten percent, two percent?

Q Yes, five percent, two percent.

A No, that would be --

Q Sheer speculation, right?

A Yes.

Q Now I want to ask you questions about the captain being back on the bridge, when he came back. You evaluated the materials with regard to that, right?

A Yes.

Q Is it correct that the captain, from what you learned, was back on the bridge at 10:52 p.m., at about

Potato Point?

A There seemed -- that's one of the things that -- it really makes no difference what time he came back.

Q The question was is that what --

A I didn't determine if that was the time he'd come back, no. From everything I've read, there seemed to be some confusion, so I didn't make a determination of the exact time he came back to the bridge. I know, for a fact, that he was on the bridge before Captain Murphy left, but what time before that, I don't think that I ever reached a conclusion.

Q Well, you didn't review any of the material of the trial, right --

A No.

Q -- the witnesses who testified --

A No.

Q -- assuming there was testimony?

A I read Mr. Cousins. But I don't know for a -- you know, I didn't make a conclusion on that. It didn't really -- at that point, his time back on the bridge didn't -- wasn't that -- he'd missed coming through the Narrows is what I concluded was bad. The rest of it, he was out there before Captain Murphy left, so I didn't see what difference it made what time he came up exactly.

Q Well, let me ask you if it made any difference in

-- you said that coming back up late, before the pilot gets off, he has to discuss things with the pilot, right?

A Well, as far as -- yes, he'd be up to discuss things with Captain Murphy and I assume that --

Q You assume he did that.

A He must have discussed whatever -- that's part of his duties. If Captain Murphy was there and Captain Hazelwood came up, I'm sure they discussed the changeover of the conn, yes.

Q How long would that normally take, from your experience?

A That would just take a matter of a minute or two. The critical thing about the time is that once the conn has been changed, Captain Murphy then has to go down and disembark, which is a matter of four or five minutes, just a matter of timing, that he should relieve him in time to be down at the boat when the boat is there and the ship's in position to change -- let the pilot off.

Q Well, was there any delay in the pilot leaving, as far as you have determined?

A No, not that I know of, no.

Q Assuming that the testimony at the trial showed the captain to be back on the bridge at 10:52 and the pilot was off at 11:24, that, by my math which is not the greatest, is 32 minutes, is that correct?

A If he was up there, yes.

Q Yes.

A And that's sufficient time. And from what I read, I didn't determine that he was back that early, but that's -- I'm sure, at this time -- nobody's helping people in and out. I'm sure we'll not know.

Q Would it have helped if you had been sitting in the Court and listening to the testimony of various witnesses to get these times down before you reached these opinions and conclusions?

A If I'd have heard the times and realized that they were completely different from what I read, I would assume that maybe there was some confusion either on the first time or on the second time. I wouldn't be able to determine which time was correct.

Q Well, let's suppose that --

A You know, I don't understand the --

Q Well, the question is when would you ever change your mind, sir? When would you ever think that, "Maybe I made a mistake here. Maybe he got off earlier. Maybe there was enough time"?

A I'm not saying it would make it -- it seemed to me, from the information I had at first is that they had to call the captain twice to get him to come up to the bridge.

Q And that's the only information you have?

A And just exactly what the time was when he got up there, I don't know, but if they had to call him a second time to get him up there, then he's kind of crowding the time and just rushing things.

Q And you said "if." That's again assuming something. You're making an assumption that that's correct.

A Okay.

Q Okay. I'm asking you to assume that there was one call and he was up at Potato Point, off Potato Point at 10:52 p.m. Would this change your opinion or conclusion at all, if that is correct?

A If that is correct, yes, that would change my opinion, yes.

Q Then what would your opinion be changed to?

A My opinion on the -- I'd assume that he had been up there in time to relieve Captain Murphy.

Q And you reviewed the letting go of the pilot and what happened there, right?

A Yes.

Q No criticism of that, I take it.

A It seemed to go all right, yes.

Q Now the LPU, load program up, you said that was on, from your review of the materials, at 11:52 p.m.

A I believe that's the time, yes. I mean I believe

so, yes.

Q I'm not trying to pin you down on something and if you disagree with me, please do so.

A Yes.

Q I'm just reviewing my notes, okay? So assuming that was on at 11:52, load program up is when you put this on a computer to make the engine start speeding up, right?

A Yes.

Q How long does it take to get up that speed, sea speed?

A From the information I've received, it seems to me about 40 minutes is what, somewhere in that -- considerable time, yes.

Q So it's a slow, gradual buildup, right?

A Yes.

Q It isn't like just taking the throttle and ramming her up.

A No.

Q Can you take that load program off at any time? You just push a button and stop it?

A Yes, you can, yes.

Q So if you decide you want to go slower or change your speed, you can just push a button and take it off.

A Yes, but you can't -- what you take off is the excess speed that you've built up. I mean your ship is

still moving faster than maneuvering speed, even though you've brought this throttle back, yes.

Q It will slow down. It isn't like you've got brakes on a car.

A Oh, yes, yes. No, eventually, it will slow down, sure.

JUDGE JOHNSTONE: Mr. Madson, I have a matter at 10:00 o'clock I need to take up in my office and I need to prepare for it. So if you don't mind, I'd like to take a break a little earlier than usual.

MR. MADSON: Oh, that's fine, Your Honor, we could take a break now if you want, sure. In fact, I was going to request one myself, thanks.

JUDGE JOHNSTONE: All right, good. Remember my instructions, ladies and gentlemen, not to discuss the matter among yourselves or with any other person. Don't form or express any opinions.

THE CLERK: Please rise. This Court stands recessed.

(Whereupon, the jury leaves the courtroom.)

(Whereupon, at 9:51 a.m., a recess is taken.)

(Whereupon, the jury enters the courtroom.)

THE CLERK: This Court now resumes its session.

BY MR. MADSON: (Resuming)

Q Captain Beevers, I'd like to take a moment or two

and review your testimony and opinions regarding Captain Hazelwood's decision to go around or avoid ice. Do you recall testifying on that subject, sir?

A Yes.

Q If I understand your testimony correctly -- and, please, let me know if I'm wrong -- but you see the chart right next to you there?

A Yes.

Q You describe where the ice was and the route Captain Hazelwood took. Would you agree that he could have gone around or do you believe that the best course of action would be to come closer to the ice, check it out and perhaps slow down and maneuver through it?

A I didn't say that was necessarily the best. I said that would have been the first thing I would have looked at to do. You know, I said there were four things that he could do. One, of course, is stay at the dock. Two is to come up and look and check the ice out. And I have found, at times, that that was the best route to take and I've done that. The third choice, of course, is to go on around the ice, assuming there's enough sea room. The fourth course is to determine that you didn't want to do this, to start around and determine that you didn't have enough sea room, and maneuver back through the ice as best you could at that point.

Q And of course you're looking at it by review of certain materials that were given to you.

A Yes.

Q And you did not have the luxury of being there at the time, looking through the radar and things like this, right?

A That's right, yes.

MR. MADSON: By the way, I'd like to get this marked, if I could.

(Defendant's Exhibit AC was marked for identification.)

MR. MADSON: Your Honor, I would like the Court to examine this statute, which is 46 USC, United States Code, 738C, and ask the Court to take judicial notice.

JUDGE JOHNSTONE: Do you need to review this?

MR. COLE: No, I've read it.

JUDGE JOHNSTONE: Any objections.

MR. COLE: My objection is to relevance.

JUDGE JOHNSTONE: All right, your objection is overruled. The Court will take judicial notice of that Section 46 USC 738C. And, Mr. Madson, this was the statute that was in effect March 23d, 24th, 1989?

MR. MADSON: As near as I can determine. I have not found any evidence that it's been altered or repealed or anything. I've checked the pocket part, Your Honor, the

supplement. There appear to be no changes.

JUDGE JOHNSTONE: All right.

MR. MADSON: Of course, Your Honor, I crossed out what I thought was the irrelevant part. I only ask the Court to take judicial notice of (A), and not (B), just so you understand. I don't think that applies.

JUDGE JOHNSTONE: You requested 738C(A) and I will take judicial notice of that section.

BY MR. MADSON: (Resuming)

Q Captain Beevers, I want to hand you now what's been marked as Defendant's Exhibit AC and ask you if you're familiar with the federal statute.

A Yes, I'm familiar with that.

Q How did you become familiar with that, sir?

A You just showed it to me and I was --

Q Well, before that.

A Before that, this is -- I have never specifically read that, but, yes, I know the law is that you either maneuver to moderate speed or avoid ice, if possible.

Q Okay, the law, then, is that the master of every vessel in the United States, when ice is reported at or near this course --

A Yes.

Q -- shall proceed at a moderate speed or alter his course so as to go well clear of the danger zone, right?

A Yes.

Q Now that statute doesn't say, "When you encounter ice, contact Captain Beevers and check, see what he would do," does it?

MR. COLE: Objection, argumentative.

JUDGE JOHNSTONE: I think that you can get to your point without a nonargumentative question. Sustained.

BY MR. MADSON: (Resuming)

Q The statute gives -- the United States Congress gives the master of the vessel the clear option to do either one, does it not?

A Yes.

Q And in doing that, in going well clear of the danger zone, that master can look at the situation, evaluate it at the time and decide on a course of action which will take him well clear of the danger zone.

A Yes. You have to -- but any time you're navigating a vessel, you not only have the ice danger, you have the danger of shoal water, you have the danger of adjoining land that you have to consider.

Q You've got to decide on your options, right?

A That's one of the options, yes.

Q You decide how close it's safe to go to certain rocks or shoals. On the other hand, you decide how safe it is to go to the ice.

A That's right.

Q And I think your view said -- your criticism of Captain Hazelwood's judgment was that he apparently went too far from the ice when he made his maneuvers.

A My basic criticism is that I thought he made his decision too early, without really evaluating it carefully. And then when he did make his decision, when his decision was made, I still don't necessarily -- I'm not going to say that that was the wrong decision, I wasn't there. But when he -- his error in going around the ice was the fact that he started increasing his speed before he was completely around the ice, put the vessel on automatic steering and left the bridge. I have no -- I mean he may have made -- as far as the ice went that night, that may have been the correct decision. I merely gave four choices that he had and which one I would have looked at first.

Q Okay, that was -- if we can put it in a nutshell, that was simply your personal preference and other masters may do things totally the opposite.

A Oh, yes.

Q And in fact, sir, you, in your evaluation of materials prior to testifying here today, looked and examined the course of the ARCO Juneau, did you not?

A Yes.

MR. COLE: Judge, I object. May we approach the bench?

JUDGE JOHNSTONE: All right.

(The following was said at the bench.)

MR. COLE: My objection is (inaudible). The course recorder of the ARCO Juneau and the Texaco (inaudible).

JUDGE JOHNSTONE: (Inaudible.) The facts are not necessarily in evidence. He's asking his opinion on based on what (inaudible).

(The following was said in open Court.)

BY MR. MADSON: (Resuming)

Q Captain Beevers, where did you examine the charts and other materials relating to the ARCO Juneau?

A In the Anchorage District Attorney's Office.

Q It was material that Mr. Cole had provided you to look at?

A Yes.

Q And when was that?

A Fairly recently here, within the last couple of weeks or last week.

Q When did the ARCO Juneau depart Valdez, do you recall?

A At this point, I don't remember the date, no. They -- let's see. No, I do, too, the Juneau was the last vessel -- excuse me, I had the two mixed up. The Juneau was the vessel, the ARCO Juneau was the vessel before the

Valdez.

Q The one immediately before the Exxon Valdez.

A Four hours. Yes, I had the two mixed up, okay.

Q How about the Brooklyn?

A That was some time previous to that. Whether it was the same day or the day before, I don't remember. It was previous to the ARCO Juneau.

Q Do you know if it was the next vessel? In other words the Brooklyn, the ARCO Juneau and the Exxon Valdez, in that order?

A That could be correct, I can't say. I know the Juneau was before the Valdez. Whether there was a ship between the two, I don't remember at this point, but it was in the same time.

Q Do you recall, sir, what the course of the ARCO Juneau was when it went out? And by "course," I mean in the vicinity of Bligh Reef -- what the vessel did when it encountered ice.

A Yes, they went around the ice.

Q Could you just show the jury basically the course they took?

A They came down and dropped the pilot off. Let me get around. See, this thing glares and it's hard to see. They came down and then crossed over and came down around the ice and clear of Bligh Reef.

Q How close did they get to Bligh Reef?

A According to my calculations, they were close to 8/10ths off it. According to theirs, they were I think about 5/10ths or 6/10ths of a mile off the buoy. And so --

Q According to their --

A According to their plots that they laid down on it. And -- go ahead.

Q Would it refresh your recollection to look at a copy of that particular plot, sir?

A It would. I don't really need to because I know how close they laid out their course. When I laid it out, it was a little further off than that. That was, you know, sketchy information.

Q So if you don't need to look at that --

A No, I know where they went and so go ahead.

Q What speed was the ARCO Juneau at?

A The ARCO Juneau was going full sea speed at that point.

Q What was that, sir?

A 16 knots.

Q 16 knots. And do you recall what its course was coming from the separation zone in the lane where it altered to avoid the ice? What course did --

A At this point, I don't, no. I'd have to look at the course recorder to see.

MR. MADSON: Perhaps I should get this marked, just so the record will be clear.

(Defendant's Exhibit AD was marked for identification.)

BY MR. MADSON: (Resuming)

Q Let me show you the chart, sir, and ask you if you can examine that to refresh your recollection.

A Let's see, there's no -- ah, here it is.

Q I realize that you'd have to estimate the course, but as best you can.

A At this point right here, he's going -- let's see, 180 -- he's probably going 175 maybe, I'd guess.

Q Well, when you say "at this point," would you explain to the jury what that means?

A Yes, I'm looking at two fixes here. One is in the northbound lane at 1903 and another one that's at 1908. And I would say at that point, he's probably steering at close to 175, 1905 that may be. It's hard to read his writing here.

Q Maybe this one would illustrate better.

JUDGE JOHNSTONE: Which exhibit is that, Mr. Madson?

MR. MADSON: This is Defendant's Exhibit Number 122.

THE WITNESS: Okay, he's started up here from

1903, somewhere -- "See Note A" signed here. What do we have here? Okay, right about in here somewhere, he came out of this and came south at 175, down to a point just short of here, and then turned and came down.

BY MR. MADSON: (Resuming)

Q And then turned, turned to the what direction.

A Turned right. To starboard, yes, to the right.

Q And he was traveling at what speed when he was in the area before he made his turn?

A I remember calculated that he averaged around 16 knots there.

Q And the Exxon Valdez in the same area was 12.4?

A 12 knots. Yes, I'm not -- when I reviewed this, I didn't say that I approved of what they did, by the way. That's --

Q Okay, we'll get to that in a minute. But, anyway, 16 knots and he comes within I think you said, according to his calculations, 5/10ths or 6/10ths or a mile off Bligh Reef.

A Yes, something like that.

Q Would you agree, sir, that this appears to be an accurate copy of the chart that you examined in the District Attorney's Office?

A Yes, yes.

MR. MADSON: I would ask that this be admitted,

this exhibit, Your Honor.

JUDGE JOHNSTONE: AD, any objections?

MR. COLE: No, I don't.

JUDGE JOHNSTONE: AD is admitted.

(Defendant's Exhibit AD was received in evidence.)

BY MR. MADSON: (Resuming)

Q And Captain Murphy, I think you volunteered something there when I was asking you to show us the plot of that vessel. You said you didn't approve of what was done, right?

A Yes, that's right.

Q Would you consider the captain's or master's actions reckless for what he did there? I mean gaining 16 knots, full speed, sea speed, makes a turn a half mile from Bligh Reef.

A Yes, I would.

Q Do you know if he was prosecuted or not?

A I don't believe he was and I don't know of any intention to.

Q You said you also examined material relating to the ship, vessel known as the Brooklyn.

A The Brooklyn, yes.

Q Can you remember the course that that vessel took?

A I don't remember the exact course. Generally,

they came down and came the same way, except they stayed a little out in here and turned. I don't believe they ever got over, they didn't get over behind Bligh Reef area. They stayed this side of it as they came down. I'd have to look at it, but they -- the Brooklyn was --

Q Well, maybe we can get --

A Yes, if you can let me see the chart, I can probably work better from that. It's hard to remember exactly when he --

Q Excuse me one second. I have to have this marked, too.

(Defendant's Exhibit AE was marked for identification.)

BY MR. MADSON: (Resuming)

Q I hand you Exhibit AE.

MR. COLE: (Inaudible.)

MR. MADSON: I'm sorry, I forgot.

JUDGE JOHNSTONE: Show it to Mr. Cole first.

BY MR. MADSON: (Resuming)

Q I hand you again, sir, Exhibit AE and ask you if that refreshes your recollection.

A Yes.

Q Could you show the jury approximately the course of the Brooklyn when it left and went around the ice?

A Okay, it came over and it was in the inbound lane

off from -- by the time it got down here off of Busby, and then it slowly went out of the lane in a direction like this and was out of the lane at this point and, at Bligh Reef, it came back across.

Q How close did it get to Bligh Reef?

A I'd have to -- let me see if I could-- no, there's no --

Q No scale on there?

A No. I would say, gosh, I don't remember now, 6/10ths of a mile, something of that sort, if I'm not mistaken, 6 or 7/10ths. But the thing that's better about the Brooklyn is that they took frequent fixes. They were on maneuvering speed and they had the captain on the bridge.

Q Did either of those vessels actually lay down track lines? You said they took fixes, but they didn't prepare a track line, did they?

A I see a track line on this. I don't know if that was laid down or not before or after.

Q What about the ARCO Juneau?

A I don't believe they laid down a track line, no.

Q Then, sir, another matter. Did you examine the licenses of the masters of either of those two vessels?

A I know -- I didn't examine the license. I know that the master on the Brooklyn did not have Prince William

pilotage, that the state pilot brought them down off of Bligh Reef.

Q So the pilot got off at Bligh Reef?

A Somewhere down in that area, yes.

Q How about off of Busby?

A Off from Busby, okay, that --

Q Okay, let's show the jury where those two are. Show the jury, first of all, where Rocky Point is on there.

A Okay, let me get this pointer out. Rocky Point is right here.

Q That's the normal pilot station.

A Yes. And Busby's Island is, right here.

Q And where is Bligh Reef?

A Bligh Reef is right here.

Q So the pilot got off at Busby Island. Then the master did not have federal pilotage endorsement at that point, going around Bligh Reef, right?

A No, he did not have pilotage. He was going -- acting under this letter I believe that the Coast Guard had.

Q Are you sure of that?

A I'm not sure. How can I be sure? I assume that's what he was operating under.

Q Well, that's what I'm asking you, if you're assuming or if you're sure.

A Yes, because that's -- the standard practice is that if they don't pilotage, they operate under the --

Q But you have no way of knowing if he contacted, the master contacted the Coast Guard and said, "I am now operating without pilotage and . . .," check, check, check, right?

A I have no way of knowing that, no. Part of the program when they leave the dock is that they advise the Coast Guard if there's pilotage aboard and, at that point, the Coast Guard would -- if, when they say no, I would assume the Coast Guard would come in and say, "Well, this is how we want you to do it," and that's the way the standard is in the industry at that point.

Q And would it make more sense for the pilot to get off at Rocky Point, the pilot station, rather than to stay on to Busby Island?

A Normally, when they don't have pilotage, they come down -- being I always had pilot, had license, I never had to worry about it. But I assumed, from my reading, that they'd get off somewhere down around Bligh Reef.

Q Well, when you say somewhere around Bligh Reef, would that include, in your opinion, Busby Island?

A When I say Bligh Reef, I would assume around Bligh Reef. If they're getting off at Busby Island, I didn't know that.

Q Well, in this case, you knew that, right?

A Yes.

Q So the pilot stayed on past what you believe to be the normal pilot station at Rocky Point, proceeded farther south to Busby Island and got off there.

A Yes.

Q The master did not have federal license endorsement.

A Right.

Q And then from that point to Bligh Reef buoy, he was operating without a state pilot and without his endorsement, right?

A That's correct.

Q And you don't know whether he contacted the Coast Guard and got this waiver or not.

A The normal practice is that it's done. I don't know that it was done, no.

Q Now getting to the chart there, which I think is Exhibit 122, you identified as the track line or the course of the Exxon Valdez.

A Yes.

Q When you compare that track line or that decision to go around the ice with either the Brooklyn or the ARCO Juneau, is there a substantial difference in avoiding ice by any of the three vessels? I say substantial.

A I would say -- was there a substantial difference between the Brooklyn and the Juneau, no, because the Brooklyn is never steering where they're coming behind the buoy. They're steering this side of the buoy all the time. And the ARCO Juneau and the Exxon Valdez both were steering over into an area that increases the risk and increases the chance of grounding.

Q If I understand you correctly, you're saying that the intent of the master and the -- or the third mate on the Exxon Valdez was to actually enter the red sector to make the turn?

A No, I said they're heading that way.

Q Oh.

A Which means that they it takes more care. Any time you're maneuvering to an area where if you don't do something positive, you're increasing the risk.

Q Well, you're increasing the risk any time you're heading toward any object there, right?

A That's right, yes. But I -- as I said before, I have no -- you know, that was one of his decisions to make, to come this way. The main fault I have in that is that the captain left the bridge before all this was completed.

Q Okay. So you're not really being critical about his decision to go around the ice in the manner that he did.

A If he had sea room, this is certainly a legitimate maneuver to make, yes.

Q If I understand correctly, you said you didn't examine the license of the master of the ARCO Juneau, right?

A How I got my information that he is licensed and how I got my information that the Brooklyn was unlicensed is from conversations with someone in the District Attorney's Office that had contacted me. I'm not just sure --

Q Do you recall who the master of the Exxon -- excuse me, the ARCO Juneau was?

A I didn't look at his name, no.

Q Rick Knowlton doesn't ring any bells?

A Knowlton, yes, okay, now remember. I didn't remember it. You know, I wasn't cerned with his name. In fact, maybe I even have seen his license. I don't remember, at the time, but I --

MR. MADSON: Let me just have this marked.

(Defendant's Exhibit AF was marked for identification.)

BY MR. MADSON: (Resuming)

Q Let me hand you, sir, Defendant's Exhibit AF and ask you if you can examine that and if it refreshes your recollection of having seen it before.

A Well, it's hard -- there again, everything's the same, except the name on this, as most people. But this is -- okay, yes.

Q Yes, what?

A I have seen this before.

Q When did you see it?

A I believe this was part of information on the ARCO Juneau that we got, yes. I just --

Q You say "we got." You got that --

A Through the District Attorney's Office, yes.

Q Now what does that purport to be, sir?

A That's Mr. Knowlton's, Captain Knowlton's license, includes his radar observer and his pilotage.

Q What does the pilotage endorsement say?

MR. COLE: Objection, hearsay.

JUDGE JOHNSTONE: Don't answer the question.

MR. MADSON: Well, Your Honor, this is material he's reviewed that was provided to him by the State. If they have a serious objection as to the authenticity of this, maybe that's it, I don't know. But this witness has been testifying about nothing but hearsay. He has no firsthand knowledge.

JUDGE JOHNSTONE: Objection sustained.

MR. MADSON: On hearsay grounds, Your Honor?

JUDGE JOHNSTONE: Yes, sir.

MR. MADSON: May I approach the bench?

JUDGE JOHNSTONE: No, sir. Just because objections on hearsay haven't been made doesn't mean they couldn't have been made. Now the objection is hearsay. Unless you're going to show me an exception, Mr. Madson, it is hearsay.

MR. MADSON: The exception, Your Honor, is this is an expert witness who is entitled to and does rely upon hearsay and, in fact, all his testimony has been based on hearsay, including this very document.

JUDGE JOHNSTONE: There's no question an expert can base their opinion on hearsay and you're asking an opinion, that's okay. But the admissibility of a document that is hearsay would be prohibited.

BY MR. MADSON: (Resuming)

Q Now, sir, reviewing that, do you have an opinion as to the license that -- the federal license, pilot endorsement that Captain Knowlton had? What's his endorsement say?

A This is --

MR. COLE: Objection, hearsay.

BY MR. MADSON: (Resuming)

Q Well, do you have an opinion -- let me say this.

MR. MADSON: Withdraw that.

BY MR. MADSON: (Resuming)

Q Do you have an opinion, sir, based on this obviously hearsay document, as to whether or not Captain Knowlton had the appropriate federal endorsement for the Prince William Sound area between Busby and Bligh Reef, Busby Island and Bligh Reef?

A He has the appropriate pilotage from Hinchinbrook up to Busby Island.

Q But not to Bligh Reef -- I mean not -- to Busby Island, but not to the -- excuse me, not up to Rocky Point.

A Not up to Rocky Point.

Q And Rocky Point is the state pilot station.

A That's my -- the pilot boat is at Rocky Point and my license reads to Rocky Point and, yes, this doesn't.

Q And Knowlton's only goes to Busby.

A Yes.

Q Do you know whether or not the pilot was on board during the transit between Rocky Point and Busby Island?

A That I don't know.

Q Did you review any materials at all on that?

A I looked -- what I looked at was the -- I think they sent the license. I think they sent the course recorder. And I don't recall, the bell book maybe they sent, I'm not sure.

Q Well, from the materials --

A It's been quite awhile back and I've been

reviewing a lot of things, so it's hard to say exactly what. They had pretty skimpy information to start with on it.

Q From all the materials you reviewed, could you determine where the pilot got off?

MR. COLE: Objection, hearsay.

MR. MADSON: I'm just asking if he could reach a conclusion, not what it is.

JUDGE JOHNSTONE: Counsel approach the bench, please.

(The following was said at the bench.)

JUDGE JOHNSTONE: You're getting into a collateral area (inaudible) Rule 611. Mr. Madson, you're going to have to get back on track. And pretty soon, this is going to be an unnecessary consumption of time (inaudible) with this witness and where the pilot got off. I'm going to let you go a little longer, but I'm going to exercise (inaudible). The objection to hearsay is overruled at this time.

(The following was said in open Court.)

BY MR. MADSON: (Resuming)

Q Captain Beevers, if -- and when I say "if," I'm assuming -- the state pilot got off at Rocky Point and the ship was under the command, direction and control of the captain then who did not have endorsement between Rocky

Point and Busby Island, he would then be in noncompliance, wouldn't he?

A Unless he had reported that to the Coast Guard and they started this nonpilotage program to run it between Rocky Point and Busby Island, yes.

Q And you don't know whether that was done or not.

A No, I have no information on that, one way or the other.

Q Now getting to the course of the Exxon Valdez as it -- you reviewed all the materials, the course change was made as it came out of the arm, proceeding out of the arm, and proceeded on a course that eventually took it down I think a course of 180, right?

A 180, yes.

Q Now you reviewed materials that indicated that Captain Hazelwood had a conversation with Gregory Cousins.

A Yes.

Q And you do not know whether Captain Hazelwood knew of Gregory Cousins' competence or not.

A No, I don't --

MR. COLE: Objection, hearsay, speculation.

JUDGE JOHNSTONE: Objection overruled. You may answer the question.

THE WITNESS: The only thing I know is that they'd been on the ship together a short time and Captain

Hazelwood obviously let him stay on the ship and obviously let him stand a watch, so he must have thought he was reasonably competent, yes.

BY MR. MADSON: (Resuming)

Q And you heard none of the testimony regarding his competence that was testified to in this trial, Gregory Cousins that is.

A I --

Q Any testimony that was in this trial up to today I think you said consisted only of testimony of Mr. --

A Yes, the only testimony that I've read has been Kunkel, Mr. Kunkel and Mr. Cousins.

Q Well, Mr. Cousins' testimony, did you reach a conclusion that Mr. Cousins felt comfortable and competent to carry out the maneuver off of Busby Island?

A Mr. Cousins stated he did, yes.

Q And that was -- a course of 180 is due south, is it not?

A Yes.

Q When someone comes abeam of something, what does abeam mean?

A Okay, abeam is at a 90-degree angle off from your course. So in this instance, it's easy because he was heading due south. When Busby Island Light was abeam, it would be heading due east. That's -- the abeam is 90

degrees from your course.

Q And from the course that you've examined -- and you have no reason to believe that's inaccurate.

A No.

Q You said, I think, it was easy to determine when you're abeam of something.

A That's correct.

Q When you have something like a light at Busby Island, that makes it easy, does it not?

A That's what you use is your prominent points and a light or a lighthouse is an especially good thing to take a bearing off of, yes.

Q How about taking a fix. Does that take any substantial period of time?

A To take a fix on a light is a matter of seconds. You take your -- wait until the light's abeam, take your range off, take your bearing, take your range and that's it.

Q Any competent or reasonably competent third mate should be able to do that, right?

A That's correct.

Q Certainly anybody who's passed the test for a second mate's license would, again, be competent to carry out that maneuver.

A Should be competent beyond that, yes.

Q And did you read Gregory Cousins' testimony regarding his knowledge of both Busby Island Light and Bligh Reef?

A Yes.

Q So he knew where they were.

A Yes.

Q He knew the area he was in.

A Yes.

Q He was familiar with it because he had sailed there a number of times before.

A Yes.

Q So when Captain Hazelwood said, "Look at the radar. Here's the ice. Here's a maneuver we like to make. Go down to Busby Island on this course and then take a fix and then maneuver around the ice" -- that's essentially what he told him, right?

A Yes.

Q In other words, make a right turn, go around the outside edge of the ice, right?

A That's what he told him, yes.

Q Do you think those orders or that command was easily understood?

A I think the language of it is understood, yes. I don't think the -- what it entailed may have not been understood by Mr. Cousins. But I think the language of

what to do and the mechanics of it he well understood.

Q You don't know whether or not Mr. Cousins understood that he was to go abeam of Busby Island --

A Oh, I'm sure he understood that, yes.

Q -- and simply turn to the vessel to the right?

A I'm sure he understood that part, yes.

Q And that is a simple maneuver, is it not?

A Yes, it is.

Q And at that time, you're one mile directly east of -- west of Busby Island?

A According to this fix, yes, yes.

Q It's certainly not heading to Busby Island.

A He's at that point, heading down behind Bligh Reef, yes.

Q And how far from Bligh Reef would you say it is from that point, that is off, abeam of Busby Island, to Bligh Reef?

A Two and a half, three miles, somewhere in there. I'd have to measure it.

Q And do you consider that enough sea room to make a turn with a vessel that's capable of making a turn in 6/10ths of a mile?

A They had enough room at that time to make a turn, yes.

Q Did you evaluate the testimony and the materials

given you and reach any conclusions and determinations as to at what point the turn, if made, would have cleared Bligh Reef?

A I did and I think about a minute and a half is what I determined would be a -- they would miss it. I think that's not allowing a safety. You know, a ten-degree turn, that would miss it fairly easy. Any further than that, if you missed it, it would be so close that you couldn't say definitely. I didn't feel that was a safe turn at that point.

Q All right, let's go back. You said that a minute and a half after midnight?

A Yes, if they made the turn, they could have probably cleared Bligh Reef.

Q It was 12:01.5.

A Or something like that, yes.

Q Roughly that. You didn't pinpoint it.

A Yes. I mean this could be a little each way, that's --

Q How about up to two minutes after, 30 seconds later?

A I think some people figured that. That would be close, yes, you know, but this is --

Q It wouldn't be an intended maneuver to get that close, but you could still make it.

A I'd have to recheck everything to see, but, yes, some people I've talked to have said two minutes. I think my original figuring was a minute and a half, so that's still -- yes, both of those -- let's assume two minutes, you could make it, yes.

Q And if the turn was made or supposedly had been made at 11:56, certainly that gave it a lot of room, did it not?

A It would have given it enough to be an adequate turn, adequate safety, yes.

Q And that would be consistent with Mr. Cousins's instructions, his intent, would it not, that as soon as he got a fix off of Busby Island -- assume that was 11:55 --

A If everything would have went perfect, he got his fix, made his turn, yes, we wouldn't be here today.

Q It took only seconds to make the fix?

A Yes.

Q So a minute, at the longest, after he got his fix and he knew he was right abeam of Busby Island.

A Yes, at a minute you should -- yes, that would be adequate time to take the fix, plot it and come back and make -- in fact, what you'd normally do is you would -- in a situation like that, you would set your range to the distance you're going to be off when you're abeam. You would take your bearing when you're abeam, whatever course

change go in and plot, keeping an eye on it, come back out. So it's even quicker than a minute, probably, would be the normal.

Q And then he would give the helmsman an order to turn the vessel.

A Yes.

Q He could either do that by saying, "Come to Course 245," or something like that?

A He could. He could either order right ten degrees rudder or right to 245 or some such, whatever their practice on that vessel was, yes.

Q And you know from your review of the materials that Mr. Cousins stated that he told the helmsman ten degrees right rudder.

A He stated he did that, yes.

Q I guess the problem is, as you pointed out, we don't know if that order was carried out or not.

A Well, we really -- we don't know if the order was given; we don't know if the order was carried out. We don't know if they could do it because -- you know, there's an uncertainty on that point of just what happened.

Q Do you recall Mr. Cousins' testimony that he called the captain and said, "We're starting maneuvers, I'm making my turn"?

A Yes.

Q Would that give you any more reason to believe that the order had been given if he called the captain and said he did it?

A At that point, I would. Now that was further down the -- a few minutes later here, I believe, in the time order. It was -- anyway, that would let you assume that the order had been given, yes.

Q Do you believe there was one telephone call made between Cousins and Captain Hazelwood or more than one?

A There was -- let's see, the call was made. I think it was later than Mr. Cousins thinks is what I -- if there was more than one -- if there wasn't more than one call, then the call was later than when Mr. Cousins thinks he made it.

Q Mr. Cousins believed he made it about 11:57, isn't that correct?

A I believe somewhere in there is when he stated it.

Q So --

A But when you --

Q Pardon me.

A No, go ahead.

Q Okay. So assuming Mr. Cousins testified and said, "I believe I made this call at 11:57 and I told the captain I've started to make the turn," that would give the captain, would it not, reason to believe that the danger,

whatever danger existed had certainly been lessened because the ship is now beginning to turn away in the direction that he wanted it to go.

A Yes, if you were down below and you got a call from your watch officer saying he had altered course, you would expect that he had, yes.

Q And if you believed your watch officer was reasonably competent to carry out what is acknowledged to be a rather simple turn, that would lessen your anxiety or fear that something might happen, would it not?

A In normal circumstances, yes.

Q You recall Mr. Cousins's testimony that he looked up later, at some point later, and noticed that the vessel was only at -- the rudder angle, rather, was only at six or seven degrees.

A Yes.

Q He told Mr. Kagan to give it more rudder, right?

A Yes.

Q And eventually there wasn't enough rudder and it went aground.

A Yes.

Q Now do you recall a second call where he -- when I say second call, between Mr. Cousins and Captain Hazelwood -- where he said, "We're in trouble," and then they were aground?

A "We're aground," yes.

Q Now I want to go back to something I overlooked before we get to the grounding here. You also mentioned use of the auto pilot. You thought that that was bad judgment to put the auto pilot on at around 11:52 or something like that, right?

A Yes.

Q How long was that auto pilot on? From all the evidence that you have, that you've examined, how long was it on?

A That is another thing that's -- that auto pilot was put on and I was not able to determine that it was ever taken off until just before the hard right, before the big swing. In the course recorder, there's nothing -- the fact that they couldn't change course, the fact -- it indicates that there's some confusion. And I don't accept the fact that immediately upon Captain Hazelwood's leaving the bridge that he put it on hand steering. I'm not -- I don't see anything to convince us that that happened.

Q What about the testimony of Mr. Kagan and Mr. Cousins that said, "We both went over at the same time," and Mr. Cousins said, "I pushed the button and turned it off"?

A Okay. But if they had actually put ten degrees rudder on or even if they had put six or seven degrees

rudder on, there would be an indication on that course recorder that something happened, and there wasn't. So that's an indication to me that possibly they didn't take it off. I can't say definitely that they left it on, but the fact that there wasn't a movement of the vessel between 56 or 57 and 002 indicates that they weren't getting any rudder.

Q What reason would they have to say, "We . . ."?

A I have no idea. I mean this is a confusing point. Any time you're looking back after months, trying to figure it out, this is one of the things that there's no exact answer to.

Q If it's on auto pilot and you turn the wheel, you know immediately that you're not turning within seconds, right?

A There's no rudder, yes, right.

Q And both individuals who were on the bridge said it was turned off, right?

A Yes.

Q And if no order was given at that time or if it wasn't carried out, there's no way of knowing that, as opposed to whether the auto pilot was on.

A No. But there was definitely some reason that that vessel didn't turn and it was nothing -- you know, in our checking on the vessel, we could find nothing wrong

with the steering gear, so that's --

Q And there's no law or regulation or even Exxon policy that governs the use of the auto pilot at that particular time, is there?

A I don't know of a law regulating it, no.

Q Again, it's a judgment call on the part of the captain.

A That's a matter of safety, yes.

Q Now getting back to -- and I'm sorry if I'm jumping around here -- getting back to the events that occurred on the bridge when Mr. Cousins is there and Mr. Kagan is there. Mr. Kagan relieved Mr. Radtke, right?

A I believe he -- let's see, Claar.

Q Claar, excuse me, you're right. He relieved him at the helm.

A Yes.

Q And Mr. Claar went on as lookout.

A No, Mr. Claar went below at that time and --

Q He went down below, excuse me, and Maureen Jones was the lookout --

A Yes.

Q -- on the bridge wing. And she reported the lights, the Bligh Reef Light to Mr. Cousins.

A Yes.

Q And Mr. Cousins, from his testimony, said he

checked to see if, in fact, they were in the red sector, did he not?

A He did in the courtroom here, yes. It wasn't in his original statements, but he did testify to that in Court.

Q In any event, you don't know what Captain Hazelwood knew or did not know about Mr. Kagan, about his abilities.

A I think that there had been enough with the comments made by other officers and things that he would have certainly had some reason to suspect his abilities, yes.

Q Abilities to steer, right?

A Yes.

Q Now that doesn't necessarily mean that it's the same inability to make a right turn at ten degrees.

A Well, that's part of steering, but he should have had the ability -- or I would assume he would have the ability to do that, yes, but his overall steering would certainly -- Captain Hazelwood had enough information to be suspect of his overall steering ability.

Q Turning a vessel is certainly simpler, by turning just the wheel ten degrees, is simpler than steering (unintelligible).

A Well, it's a part of steering, but it is simple,

yes.

Q And certainly one as in the position of a master, Captain Hazelwood's case, could reasonably rely on the obvious, that Mr. Cousins would look up at the rudder angle to see if, in fact, Mr. Kagan carried out his order.

A That's part of his duties and you would assume that he would do that.

Q Then in order to disregard the risk that the vessel is going to go aground at this point, is it fair to say that Captain Hazelwood would have to assume that both Kagan and Cousins, or one of them, is not going to carry out the order, make the turn? Both of them, actually.

A Yes, one or the other, yes, or both, yes, some combination would have to --

Q Okay, turning to the grounding, itself, then, sir, I believe you said that, in your opinion, it occurred at about -- again, I'm guessing. Was it 12:07, approximately?

A Yes, 007, yes.

Q It could have been -- you could be off?

A Yes, I could definitely be off a little each way, anyone else could be. That's not something that, you know, we can get --

Q Why can't we be exact on that or why can't you be exact?

A Yes, maybe someone else can. I can't be exact on

that because I, at the time that I made that determination, I was making it up from the position of the ship, the estimated speed of the ship, the course recorder and everyone's statements. And I laid out a -- very similar to this, I laid out the whole course and figured the time all up as closely as I could, assuming that their fixes were pretty close to accurate and all, and I determined the 007. Now it could have been 006, 008, but I didn't have the capabilities at that time to determine it any closer.

Q I assume you have to start at either the beginning or the end and work in one direction or the other.

A Yes, I worked it both ways and, you know, to figure it out and that, just made a determination that near the minute 007, the vessel grounded.

Q What leeway would you give it, plus or minus?

A Well, I would say a minute either way would probably be pretty close.

Q 12:08 it could be.

A Yes, it could be 12:08. Maybe it could be two minutes each, but it was -- but I would think within a minute of that.

Q Now, sir, you testified about your previous grounding experience --

A Yes.

Q -- and said that on the occasion where you were

apparently a mate and were hung up -- was this in Venezuela?

A Yes, okay, yes.

Q Were you on the conn at the time?

A No, I was down on deck, supervising the securing of the vessel for sea.

Q And in any event, you said there were soundings that were taken at that time.

A Yes, I was instructed by the master to immediately start taking soundings and report back to him with the information that I gathered.

Q Well, I think you said -- am I wrong? This is not the time of the bow of the ship was into the bank?

A Yes, this was in Lake Maricaibo, when they ran into the edge of the channel, not into the mud, in the edge of the channel.

Q Well, did you have anything ahead of you to indicate that you were in shallow waters, such as a shore or something like that?

A Well, at the time, we had channel -- it was a buoy channel and they had improperly put a couple of buoys and turned us and we were -- it was nighttime, so I don't even know how far out from shore we were at the time. I wasn't involved in maneuvering. But how we -- we knew ran aground up on the bow because we were going ahead. And how we

determined just, you know, how badly we had grounded, how much -- how far into the mud we had actually pushed was determined by taking these soundings to determine where we had enough water, then, for the rest of the vessel to be floating and how much water we had around the stern. We went around the entire ship and sounded at intervals and recorded that.

Q How big a ship was that, sir?

A That was 600 and some foot long, considerably smaller than the Exxon Valdez.

Q Considerably smaller.

A Yes.

Q How many crew did you have available?

A We had, on that particular ship, in the 30s, probably 35 or 6.

Q And the Exxon Valdez had 19.

A That's right, that's --

Q Now was this a dredged channel or just a natural channel?

A No, this was a dredged channel and it had merely -- either the buoys had been relocated, a buoy had been relocated in a wrong spot or been drug over for some reason or another and caused the master trying to follow it out the channel to determine to make a course change to stay between the buoys and he ran aground, so --

Q Now when you say a dredged channel, that means somebody came in there and actually --

A Dug it, yes.

Q -- took out material to make the water deeper.

A Yes.

Q And on the sides, it's shallow.

A Shallow, yes.

Q And it's kind of like a ditch you have to stay in, right?

A Yes. I mean that's kind of a broad thing, but that's good.

Q So when you knew your bow was in shallow water, didn't you have a pretty good idea that there was deeper water behind you?

A Well, it would depend on which way the ship turned. It's just a matter of -- at the time -- it depended on how far you ran out of the channel. These things aren't cut off and straight down or anything. It depends on how far you were out of the channel or out of the -- where you wanted to be before you actually ran aground, how the bottom sloped. There's any number of things to determine and find out here.

Q Well, if you're proceeding in a forward direction and stopped because you ran aground --

A Yes, you would assume you had deeper water behind

you if your vessel hadn't swung, yes, that's --

Q Deeper behind and shallow in front.

A I mean that's an assumption, but it would depend again on how far through the mud you had traveled before you came to a stop or across the bottom.

Q Is this rather muddy water or is it relatively clear?

A Down there?

Q Yes. Oh, I'm sorry, it was dark.

A Basically, Maricaibo is pretty murky looking water, yes.

Q Now a mud bottom versus a rocky bottom, there's a substantial difference, is there not, between the two?

A Oh, yes.

Q First of all, in the way you might decide to get off from your position when you're stuck, right?

A Well, normally, on running a big ship aground in mud, you can assume that you probably aren't going to do too much damage to it. You know, when you run aground on rock with a vessel, a large vessel, you're going to have assume you've done some damage. That's --

Q But by making soundings on a mud bottom, it's rather level, compared to many rocky bottoms, isn't that fair to say?

Q As a usual rule, yes, there's less definition,

yes.

Q In other words, you make soundings -- in your situation, you could get soundings that would show a considerable difference suddenly because it's been dredged, right?

A It would -- it's not like -- no, it's not like a matter of digging a channel and it goes straight down. When you dredge something that's mud out, it slowly -- you've got a dished effect, instead of straight down.

Q Okay.

A And I don't remember the soundings now, but I assume that they -- a dredge will increase as we got back to the stern.

Q At the very least, it would show a gradual increase in water depth in one direction, as opposed to the other.

A Right, yes.

Q Now on a rock bottom, that may or may not be true, right?

A On a rock bottom, you can have deep -- yes, you can have a lot more ups and downs, there's no question about that.

Q And those ups and downs can vary in a short distance, can they not?

A Yes.

(Tape changed to C-3647)

Q You might be hung up on just a pinnacle and it could be deep all the way around, for instance.

A You could be, but that's something you want to determine by your soundings.

Q Well, looking at the situation of the Exxon Valdez at shortly after midnight, I think you said the weather was very dark from what you were able to determine, overcast, no moon, very little light, right?

A Earlier, there had been a little drizzle. I don't remember then, but I assume it was still dark, yes, I'll go along with that.

Q And you have a ship that's almost 1,100 feet long.

A Yes.

Q You've got a crew of only 19.

A That's right.

Q You've got oil coming out from the port -- starboard side, rather.

A Yes.

Q Captain Hazelwood certainly knew that. He was informed of that immediately. You look out, the bridge lights on, the wing lights on, and go out and look and you could smell it, right?

A Yes.

Q Now with regard to soundings this time, when he

got a report from Mr. Kunkel, he knew what cargo holds or tanks had been holed or ruptured, right?

A Yes.

Q He knew those were on the starboard side, right?

A Yes.

Q He knew he wasn't leaking oil on the port side, right --

A Yes.

Q -- because no oil ever leaked on that side. So you know -- all right, would it be fair to assume then, if you had this knowledge -- you've got oil coming up on your right or starboard side and no oil on the left side, that you're in deeper water on the left side than the right?

A What you could assume from that is that you're holed on the starboard side, so you probably hit harder on that side. You couldn't assume that you were floating free on the port side. You could assume maybe you were touching the bottom or laying on the bottom. You could assume that -- you know, there's any number of things. But you would definitely know that you had hit harder on the starboard side, yes.

Q And, yet, there's no damage on the port side.

A Right.

Q No report of damage on that side.

A Yes, so you obviously have not -- you've not hit

as hard or you've not run into a shallow or -- on the port side and possibly you're floating free. That would be an assumption you could make, yes.

Q You could make that assumption.

A Yes.

Q Now if your fathometer -- one fathometer is working and that has a transducer at the stern and that's telling you you've got deep water at your stern, that tells you something else, doesn't it?

A Yes, but your -- that's not going to be out -- you can get a reading right out on the rail, on the stern, and you'd be further out than any fathometer because of the counter and the -- if there was a fathometer on the stern and if it was working, yes.

Q Well, did you determine whether one was on there and one was working or not?

A When I asked on the ship about the fathometers, they said, "Well, of course, it's not working because we grounded, so we didn't try it because the ship's officers told us that it . . . you know, we assumed that they had tried it and knew what they were talking about."

Q Well, did you know or determine whether there were two fathometers?

A That I didn't, no. I just asked them about it and they said, "Well, you know, we grounded and the bottom

is . . .," so to this day, I have no idea if they had two fathometer transducers or not.

Q If you had sat through the testimony in this case or reviewed the testimony of this case, is it fair to say you could have learned something to the contrary? Perhaps there were two fathometers and one was working.

A That could be. I don't know at this point, no.

Q And again, carrying that assumption out, if it was on the stern, it would at least tell you what the depth of water was under that particular point, correct?

A Yes.

Q That would be one more piece of information the captain would have, that's available to him, as to what he could do.

A Yes.

Q And if there was sufficient water there to show that he did not have potential damage to his rudder or to his propeller, he could maneuver the engine.

A Yes, if later on, once he gets to the point of being ready to start, yes.

Q Now you were critical of Captain Hazelwood's decision after the grounding, for instance, of not taking soundings, correct?

A That's one of the faults I found, yes.

Q Have you ever taken soundings -- have you ever

been aground when you were on rock in the middle or the night?

A No.

Q Let's assume, sir, that soundings were going to be taken and you send somebody out on the port -- the starboard side. Oil is coming up rapidly, crude oil. How do you take soundings?

A You wouldn't when it's flooding out like that. Most of the -- so this is -- you would take all the other soundings you could take and if you were going to sound the starboard side, you would have to wait until the oil quit rushing out, which is --

Q Takes some time, right?

A I think that someone's figured out about an hour or less than an hour, 20 or 30 minutes or so, most of the oil was out. But, yes, I wouldn't expect a person to go out there with oil flooding out and bubbling up and be able to take soundings on that side. I would expect them to be able to take soundings around the bow and the port side.

Q You could take some soundings, but not all.

A Yes. So that would merely mean that you're going to delay starting the engine and do whatever you want to do until you had a full picture.

Q Would you agree or disagree with the fact that you can determine, at least get some information on how you're

hung up by using the rudder?

A That would be pretty -- I don't -- I've looked that over and thought about that and I don't know that you could get -- the information that you would get is that you're free on your bow and stern to swing. Now what --

Q Okay.

A But which direction you would want to try to get the ship to swing and head, I don't see where that you would gain anything by that.

Q You would gain something if you were say hung up in the center of the ship and it could pivot, you could move the bow either direction, would you not? That would tell you something, wouldn't it?

A It would tell you you could move, but without knowing exactly where you were at, without knowing what the ground was like around you, you wouldn't know which way you wanted to pivot the ship. A ship aground is not something you want to be maneuvering around in that manner in order to determine anything. The more you're going to move the vessel, the more damage you're going to cause to the vessel. If you're going to move it, you need to know what your goal is and what the risk of doing that is and use the minimum that you have to accomplish this.

Q Okay, fair enough. Now if you are trying to determine just how you are hung up and what your situation

is, you say you couldn't learn anything from the rudder, making rudder maneuvers, right?

A Just by itself, without the -- you would already know your -- if you've taken soundings, you would know whether your rudder is free or not. If you have to -- if you want to turn the rudder to see if the rudder moves, you could do that without any damage if you want, using your engine. If you're using your engine to move ahead, you're risking the possibility of actually moving the ship and doing more damage to everything after the aft. And so you would have to make a little more determination than I think was made at that time, yes.

Q Did the ship -- the ship never moved one inch forward, did it, after the grounding, not even an inch?

A Well, I won't say that. It undoubtedly moved some in every direction because the heading changed and I don't believe that you can make that many heading changes without having some movement. Now I don't think they made any major moving, but it would be amazing to me that after changing the heading and running it full ahead that you didn't move an inch or two inches or six inches or a foot. I mean this is -- we're not talking about any significant moves after he ran aground, but I'm sure that there was --

Q Well, did you review any of Mr. Greiner's, any of his reports or work that he did on this?

A Not really. We talked about it, but I didn't sit down and critique his --

Q Well, did he show you where he thought the vessel was basically hung up?

A Yes, I've seen pictures and seen that.

JUDGE JOHNSTONE: Excuse me just a minute. Let's just wait until people clear out. In fact, why don't we just take a break while this is happening? Don't discuss this matter among yourselves or with any other person and don't form or express any opinions, ladies and gentlemen.

THE CLERK: Please rise. This Court stands recessed.

(Whereupon, the jury leaves the courtroom.)

(Whereupon, at 11:15 a.m., a recess is taken.)

(Whereupon, the jury enters the courtroom.)

JUDGE JOHNSTONE: Counsel approach the bench, please.

(The following was said at the bench.)

JUDGE JOHNSTONE: I don't know if you've had a chance to look outside, but we've got a pretty good dark cloud coming over of ash. I just talked to the weather service and they report heavy ash about 15 miles south. The airport is now closed. I'm thinking, before it gets so bad that people can't drive or there's a problem with the engine or something like that on vehicles, the filters, to

let the jury go today before it gets any worse. Is that going to create a problem?

MR. MADSON: It's a call you've got to make, Judge.

JUDGE JOHNSTONE: I know. I wanted to know if it was going to create a problem. I know it's a call -- I'll balance it against inconvenience here.

MR. COLE: I think it might be a good idea.

JUDGE JOHNSTONE: Okay.

MR. MADSON: (Inaudible.)

JUDGE JOHNSTONE: They may need Friday now, right, so we'll plan on --

MR. : (Inaudible.)

(The following was said in open court.)

JUDGE JOHNSTONE: I was just discussing with Counsel and they have no objections and based on my telephone call to the weather service and finding out that the airport has just been closed -- apparently that's all hearsay. I don't know if it's reliable or not. But looking out the window, it's getting darker and darker. Counsel has agreed with my suggestion that we let you folks go home early. I don't know what the ash problem is going to do to driving conditions. It might make it difficult with bad visibility, so we're going to let you folks go home early today. Plan on being here tomorrow at

8:15 a.m., unless you hear differently from us. If it looks to me like it's going to be terrible tomorrow, we will take steps to notify you. But assume that you'll be here tomorrow, so just take steps to be here tomorrow at 8:15.

In the meantime, keep in my mind my standard instructions about media and, also, not to discuss this case among yourselves or with any other person or form or express any opinions.

I'm letting you go because I'm a little concerned about visibility on the highway and what ash can do to vehicles. I don't want you to get into trouble. So you're excuse now and please be safe. We'll see you tomorrow.

(Whereupon, the jury leaves the courtroom.)

JUDGE JOHNSTONE: We're still on the record, Counsel. We're picking up everything you're saying. Okay, Mr. Cole, did you need to take a matter up?

MR. COLE: Well, I just wanted to let the Court know that we may now be calling two more witnesses, that would be the two tanker captains. They know about them. We've had conversations.

MR. MADSON: Yes, the witnesses aren't a surprise, Your Honor. The only concern I have is we're trying to gear up for Monday and, gosh, I hope we can still make that.

JUDGE JOHNSTONE: Well, we'll shoot for it. We'll have Thursday and Friday and I think these last two witnesses have taken a little bit longer than anybody anticipated, so I don't know if we'll be ready for you Monday or not, but we'll plan on going on Friday now. And I think we still only have half days with the remaining two days this week and our schedule next week will be the same, 8:30 to 1:30, because I have 2:30 and 3:30 hearings. Is there anything else I can do for Counsel?

MR. COLE: No, I don't believe so.

JUDGE JOHNSTONE: Okay, we'll see you tomorrow morning.

THE CLERK: Please rise. This Court stands at recess.

(Whereupon, at 11:33 a.m., proceedings adjourned.)

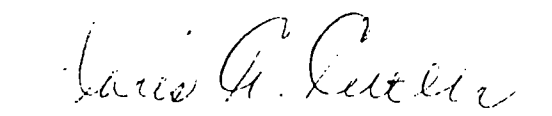
- - -

SUPERIOR COURT)

) Case No. 3ANS89-7217

STATE OF ALASKA) Case No. 3ANS89-7218

I do hereby certify that the foregoing transcript was typed by me and that said transcript is a true record of the recorded proceedings to the best of my ability.



DORIS A. CUTLER

VOLUME 21

STATE OF ALASKA

IN THE SUPERIOR COURT AT ANCHORAGE

In the Matter of:	
STATE OF ALASKA	Case No. 3ANS89-7217
versus	Case No. 3ANS89-7218
JOSEPH J. HAZELWOOD	

Anchorage, Alaska

March 3, 1990

The above-entitled matter came on for trial by jury before the Honorable Karl S. Johnstone, commencing at 8:40 a.m. on March 3, 1990. This transcript was prepared from tapes recorded by the Court.

APPEARANCES:

On behalf of the State:

BRENT COLE, Esq.

MARY ANN HENRY, Esq.

Assistant District Attorneys

On behalf of the Defendant:

DICK L. MADSON, Esq.

MICHAEL CHALOS, Esq.

PRO-TYPISTS, INC.
Professional Transcription Service
(202) 347-5395

C O N T E N T S

WITNESSES:

P R O C E E D I N G S

(Whereupon, the jury enters the courtroom.)

THE CLERK: -- Karl S. Johnstone, presiding, is now in session.

THE COURT: Thank you. You may be seated.

We'll resume with the cross-examination of the witness. You're still under oath, Captain Beevers.

CROSS EXAMINATION -- Resumed

BY MR. MADSON:

Q Good morning, Captain Beevers.

A Good morning.

Q I guess, before the volcano interrupted us, we were at the point where the ship was hard aground, correct?

A The ship was aground, yes.

Q Do we have some questions whether it was hard aground or not?

A Not after reviewing all the information we have at this date, no. I just --

Q We'll get to that in a minute, but -- first of all, sir, I believe you acknowledged that the conditions at the time of the grounding, it was dark.

A Yes.

Q And the ship had come to a stop. The engines were still running -- the engine was still running.

A Yes.

Q Now, at that point, would you agree certain decisions had to be made?

A Yes.

Q Relatively soon?

A Yes.

Q The Captain didn't have the luxury of sitting back and analyzing things for a period of weeks or months, right?

A That's correct.

Q He had to do it now.

One of the things we talked about was soundings. Soundings on a ship of this size is a very time-consuming process, is it not?

A It would be relatively time-consuming, compared to a smaller ship, but it's something that can be done, and with the personnel he had, he could have had soundings taken, yes.

Q What about knowing the ship's load condition? Is that important?

A That's important, and I think he had the Chief Mate checking that.

Q The tide was rising, was it not?

A Yes.

Q Between 12:00 o'clock, 12:07 and high tide, how much difference in tide would there be? How much rise in

tide?

A I'd have to look at a graph to tell you exactly but the --

Q Did you look at one before?

A Yes. I would say the tide was coming up two-and-a-half, three feet, something like that, and I think the time --

Q Between?

A Yes. It was a twelve-foot tide, and I'd have to look at the thing to get it exactly.

Q Maybe we can find that.

A Let me see that, and I could --

Q Yeah.

A (Inaudible).

Q I believe it's a Plaintiff's exhibit, and I just don't have the number offhand.

THE COURT: It's the one with the two curves on it.

MR. MADSON: Yes.

(Pause)

(Inaudible remarks)

THE WITNESS: It should be A.M. of the 24th.

BY MR. MADSON: (Resuming)

Q Well, let me hand you the whole Plaintiff's Exhibit 123 and 124. One appears to be for Thursday and

one for Friday, so maybe between the two of them --

A Okay. According to this, the -- at midnight, the height of the tide was just under ten foot, and at high tide, it was going to be approximately twelve-and-a-half foot, it looked like. So roughly two-and-a-half feet, the tide was coming up.

Q And the draft on this vessel was what?

A Fifty -- 56 foot something, 56 --

Q So would you agree it would be rather difficult to know just what effect the rising tide is going to have on your grounding, your position?

A It would be something to check, yes. Something to keep an eye on and worry about and consider.

Q There's certainly no way of checking that, is there?

A There is no -- at that point, there's no way to know if it is going to have an effect, or if it isn't going to have an effect, no.

Q But there's no way to know for sure whether that tide was going to cause you to lift off the reef or not, because the water level is rising?

A The -- it would be a hard decision to make. The only would be once you got a -- your information back from your computer on the load, and what you had lost in oil, what you'd gained in water. You might determine then that

you had enough weight that it wouldn't bother you, but it would be something you would need to look -- you couldn't make that decision at once from the bridge, no.

Q And, of course, if you were waiting with information from your Chief Mate on a computer analysis, that takes time too, does it not?

A Yes.

Q It isn't something that's done immediately?

A No, it's not instantaneous. It takes a few minutes.

Q And if you were concerned about floating off a reef, wouldn't you agree that it would be better to have your engine running and available?

A With that particular -- with a diesel engine, you can stop it and still have it available. It's just a matter of moving the throttle to start it, in a dead slow, or slow, or full ahead, or whatever you want.

Q You mean --

A It's --

Q If the engines are full stop, how long does it take to get it started, and get it up to some kind of speed?

A To get up to speed, you're talking -- with the propeller, you're talking of just a matter of a few seconds. Just depends on what speed you want to get up to.

Q Let me ask you about this, then. In the sequence of events that occurred between the grounding at 12:07, according to your time, and the time the engines were stopped at 12 --

A 12:20, I believe.

Q You evaluated the information you had from the state of Alaska regarding the captain's decisions and what he did, right?

A Yes.

Q You know that, after the grounding, he told the mate to get a fix immediately?

A Yes.

Q Would you agree that's something --

A And that's a correct thing to do, yes.

Q Because if you needed help, you need to find out where you're at?

A That's right.

Q Do you agree that calling the engine room to check if the engines were okay and everyone was okay down there?

A That's the correct thing, yes.

Q Shutting down the engines in a relatively short period of time. Is that correct?

A That may have not been a relatively short period of time, but that could be explained during the confusion.

I really didn't find that much fault with leaving the engines on that long. I think he could have probably stopped them earlier, but that's not -- you know, that's one of those things that is decided at the time and on the -- under the circumstances. I wouldn't --

Q It's one of those judgment calls that you can decide this first, or that first, right?

A Yeah. Yeah. But the engine would be something that most people would want to stop as quickly as possible.

Q Well, from the grounding to the stop, what were the engine orders on there?

A The -- it was on full ahead when they grounded, somewhere in here, and then they went to half-ahead at 18 minutes. They continued on full ahead from 05 until 18 minutes after. They went to half ahead at 18 after, slow ahead, dead slow, and then stop.

Q The engines were gradually slowed down to stop?

A From 18 minutes until 22 minutes. So they went full ahead from seven minutes until eighteen minutes after.

Q Yeah. And the engine at the time of the grounding was on the load program up, right? The computer program program that --

A Yes.

Q So that wasn't really full ahead, when we say full ahead there? That was something -- full maneuvering

speed, right?

A It was on --

Q A little bit beyond full maneuvering?

A At 24 after, it was still on full. At 005, it was up to 61. So it was a little above normal maneuvering speed.

Q Yeah, but when you say full speed --

A No, it wasn't up to full sea speed.

Q Full sea speed was what? How many knots, in a safe condition?

A In that load, in that condition, I would say around 16 knots. That's -- that would vary with weather and whatever, but somewhere near 15 knots.

Q Then you recall the captain also asking the Chief Engineer to sound the void spaces and check the ER tanks?

A Engine room tanks?

Q Engine room tanks?

A Yes. That was a correct move to make.

Q You also asked if the engines were okay and could be used? That's something --

A That's a correct move to make.

Q What about preparing to lower -- giving an order to lower the lifeboats down to the debark -- embarkation deck, I guess it's called?

A That apparently was done, but I didn't determine

just at what time. It seemed to me that was done a little later in the -- I don't think that was done immediately.

Q But you don't know that for sure?

A Yeah. That was later.

Q Well, what --

A I -- I --

Q Later --

A Uh --

Q Later from when?

A The information I have, it was never decided, but it wasn't anything that was mentioned as being done early on. This was done after they got everything else done and got -- got finished with the engines completely, I believe, or somewhere in there. It was not -- it was not something done in the first ten or fifteen minutes.

Q It wasn't done -- well, would you say within 15 minutes?

A I have no -- I have no opinion as to how soon it was done. I think it was done much later than that, but I don't have a definite time.

Q And you weren't here to hear Chief Mate Kunkel's testimony?

A From what I read of his testimony, I believe that they talked about getting things ready at 12:30. But he didn't -- I mean, that was the discussion was to get some

firefighting equipment out and get the boats ready, but there was no indication that they immediately did this. Because -- and I checked on the statements from the unlicensed crew, and apparently they sat around in their rooms. This would have been a good time to have them out at 12:30 getting this ready, and there's no -- there's no indication that they did.

Q Who sat around in the room?

A That's what Mr. Radtke, I believe, said in his statement; Mr. Claar; and Maureen Jones and Kagan were up on the bridge; and the other two crew members, there was no mention of them that I recall seeing.

Q Once again, when somebody's present at the time, they would be in a better condition to judge the condition of the vessel as to whether or not it was a life or death situation, and we'd better abandon ship, or if things are stable enough, we can sit here and wait for while until we get some determination?

A The thing is, in a situation where you're severely grounded your vessel and you're leaking oil at the rate that they were leaking oil, the -- it is an extreme emergency. It is a situation that you want to be prepared for, and you want to be prepared as soon as possible.

Q So I guess your criticism is, from the information you have, you think the life boats could have

been lowered a little sooner than they were?

A The life boats and the firefighting equipment could have been readied a lot quicker than it was, yes.

Q You say "a lot." What are we talking about?

A It should have been -- that should have been up there right after, or in conjunction with, such things as sounding the engine room spaces, and determining the cargo tanks, due to the -- you have this -- the second mate that apparently, if he was used, it was used by itself. You had all of your sailors and crew. You could have had them doing various things at the same time. You don't have to do it one step at a time. There's people on there, people that have been trained, people that should be able to do those jobs -- and you should use them.

Q And they did those jobs, didn't they?

A Eventually.

Q Well, how about -- I think you said day before yesterday that you would have sounded the general alarm? Right?

A I believe I would have, yes, and used the PA system to announce that "We've grounded the vessel. Don't panic. Report to such and such a place," so that then you could use your people. From there you can have an officer tell -- explain to them about all the safety procedures you want followed at that time, and what you want them to do.

Q And you say you believed that, but you, from that statement, can't say you're absolutely sure it was done?

A Like I said, at that time, if I didn't sound the general alarm, and if I'd have opted to send an officer around to tell the crew, I would have aroused them from their rooms, had them go to a central place where you could use them to work, or give them a job at that time. There was a delay in using the crew to assist in preparing for this possible -- well, this emergency underway, and prepare for further damage, and they weren't used at that time.

Q You say there's a PA system available on the ship. Right?

A Yes.

Q I mean, you can get on there in seconds. You can inform everybody of what to do?

A Not necessarily. If they're asleep, they may not hear it. You sound your general alarm. You muster the people. The general alarm will normally wake everyone up, but the key thing that they didn't do -- whichever way he called them, the key thing they did not do was they did not check to see that, in fact, everyone was -- woke up, and everyone knew of the danger, everyone knew of what should be done.

Q Well, let's see. You will agree the captain was pretty busy on the bridge, was he not?

A Oh, yes. Yes.

Q He gives an order to the third mate, he says, "Go wake everybody up. Tell them we're aground. Standby." Would you --

A You --

Q Would you agree that he is giving a command to someone that he would expect to carry it out?

A He got it that far, and he should have had -- he should have had the third mate check the people, and he should have sent someone -- checked -- he should have asked the third mate to "Give me a report," or -- there's got to be a way, because invariably, when you call a group of people, you do not get them all up, if you send him -- I found that out through experience. You send someone around to wake the crew up for such things as clearing the ship coming back from foreign, and invariably there's one or two missing. So you should have a muster list and check that you've got them all up.

Q Once they're all assembled in the room, it wouldn't take very long to see who is missing, go back and get them, put it --

A Sometimes in case of an explosion or fire, you don't have time to go back and get them.

Q Explosion or fire, you wouldn't have time to do anything, would you?

A You'd have them -- yeah, but you'd have them all up and out at that time. That's a --

Q Unless the explosion or fire happened to kill everybody that was in that particular area.

A Well, that -- that's a possibility too, yes.

Q Well, what we're talking about here is possibilities, isn't it?

A Yes. Right. Yes.

Q He notified the Coast Guard --

A Yeah.

Q Right.

A At a little -- yes. At 26 after, and that would be reasonable with everything else he's doing first. I have no objection with the -- his notification of the Coast Guard at all.

Q Told the second mate to walk the anchors out to the water line? Remember that?

A That come quite a bit later.

Q Still is something in case you're going to have to secure your position, you want your anchors down?

A Yes, but the anchors weren't walked out until considerably later --

Q Well, (inaudible) --

A And that's no problem either, because, as you say, they had other things to do. When they -- when they

decided not to go anywhere, then it was obviously time to walk the anchors out.

Q Would you agree, sir, that at 12:30, the Chief Mate told the captain that he had run an analysis, and at that time the computer analysis said, we are stable in a sense that you couldn't go to sea, couldn't go past Cape Hinchinbrook, but it would be at least safe if you got off the reef?

A He gave him that report, yes.

Q Would this cause, or -- would this, in your opinion, then, give Captain Hazelwood a certain degree of confidence, maybe small, maybe a great deal, but some degree of confidence that, if he did get off the reef, the vessel was not going to capsize or sink at that point?

A Well, when I _____ looked at that, I would have realized that you have several -- ten tanks that's got liquid in or out that's different, and I would be suspect of the computer printout, and I would use that as part of my determination, but I would also consider that the tanks that had lost so much oil would be the overriding factor, and I wouldn't consider it an accurate piece of information as far as being -- as being safe to take the ship off the reef, no.

Q So you'd have to take that analytical piece of information, balance it against your subjective judgment --

A Yes.

Q -- experience, and everything else --

A Yes.

Q -- and make decisions?

A Yes.

Q And of course, Captain Hazelwood was in a position to see what was going on --

A That's right, yes.

Q -- and you were not.

A Yeah.

Q But based on that information, you agree that that's something you would want to know?

A Oh, yes. I would want to know what he had, what the Chief Mate had worked up, and I'd certainly use that in making a judgment call.

Q But then --

A But I wouldn't -- I wouldn't depend on that solely, no.

Q But at least in part, that would cause you to either have a feeling that the risk involved is reduced because you have one more piece of information that says, "Hey. If we get off the reef, we're going to be stable."

A I'll agree that I would have one more piece of information. I won't agree that that would cause me to feel more secure in it, or that -- it would give me what I

would consider a little more insight as to what the -- what all the problems were that I were facing, but that's a --

Q You've got a number of problems, and use all the information available, from whatever source?

A Yes.

Q Drawing on your experience -- things like experience, right?

A Yes. Your experience and your -- your judgment of what the condition is at the time, yes.

Q And, of course, your prior grounding experience was in mud, never on a rock, right?

A Right.

Q So if you'd never had the experience before, that makes it a little more difficult to judge the situation completely accurately?

A Oh, yes, it does. It's --

Q Now, one other thing. It's your opinion, you said, Captain Hazelwood was reckless because he was trying to get off this reef, not knowing whether the ship was going to capsize, or sink, or tear -- cause other damage, right?

A Uh-huh.

Q Why didn't he back up? Go astern? There's no astern orders on there, is there?

A There's no astern orders there, no. What I based

my decision that he was trying to get off the reef on is statements to the Captain of the Port while he was maneuvering ahead, during the time he was maneuvering the vessel full ahead, and the statements he made upon the first investigating officers' coming out.

In both cases, he stated he was trying to get off the reef in various terms, and I have no -- no reason to think that he, at that time, would be lying to the Coast Guard or the Captain of the Port when he's talking to him. I would think that whatever he told him would be what he -- what he was doing, and what he felt at the time.

Q And maybe, by telling that to the Coast Guard, he was trying to alleviate some of their concerns, that the vessel wasn't really in peril, that things were going to be okay, he's going to get back to them -- "I'm going to assess the stability. I'll get back to you." Things like this.

A It seemed to me that all the way through the grounding that Captain Hazelwood tried to minimize the scope of the emergency.

Q Okay. Now, would you agree, sir, that if you run aground, the ship is going forward, just instinctively you'd want to try to -- if you're going to get out and away from that situation, instinctively, you'd want to go astern?

A If I ran a ship aground, instinctively I'd stop the engine, and I'd survey the situation. That's --

Q But my question was not that, but whether you -- you just instinctively wanted to get off the reef --

A If I wanted --

Q Away from it?

A Yeah. I don't think I would instinctively want to -- I mean, you're asking me a question that I don't --

Q You ram into something. You say, "I want to get out of here." What's your first reaction, would you think would be normal? I go forward and I stop. I've got deep water astern.

A I don't think that an experienced captain would do that. I think that everyone has thought about these disasters -- you try to avoid them, naturally, but I don't -- I think that the -- I don't think he would have that instinct, no. I think that if he went astern, it would be after considering all the possibilities.

Q In all that time, Captain Hazelwood, in your opinion, is trying to get off this reef, and never once tries it astern when he can't move it at all going forward? Is that correct?

A You look at the -- you look at where he's at, and the majority of the reef is behind him. The shallower part of the reef, according to the chart that's available to use

is behind him. Ahead of him is deep water. I would think that if he'd made a decision to get off the reef -- which he said he'd made that decision -- I would think he would be trying to do it in what he would have determined to be the -- the best fashion, and apparently he determined going ahead was.

Q But if you make that determination, and you spend that much time -- the time involved -- trying to go ahead, and you're not having any success. You have no reason to believe that ship moved forward at all, do you?

A Not significantly, no. And we discussed that yesterday. No, not --

Q By significant, we can't even talk about a foot, can we? Say for sure it moved a foot?

A We can't say it moved -- I'm sure with that much action and that much turning, it moved somewhat, but we're -- whether it's inches or yards or something, but it wasn't significant. That's --

Q You had a lot of discussions with the District Attorney about this concern, about him not going astern, didn't you?

A We discussed it, yes. The same thing. I don't think that a master would automatically just run up to the bridge and throw his vessel astern instinctively.

Q Well --

A I think that he --

Q -- whether he did it automatically or not, given the time available to him and the ability to assess the situation, the knowledge that he could not go forward, would you, then, in that case say -- not instinctively, but in a thoughtful manner, say, "I can't go forward. I'd better try going backwards"?

A IN that situation, he would have looked and seen that most of the reef was behind him. You don't have as much power when you're backing. Your -- your vessel is not as -- if you do get loose, you're not as maneuverable, and if he were -- I would have thought that if he instinctively wanted to go astern when he -- to get off the reef, he would have --

Q Then -- okay. I didn't mean to interrupt.

A Yeah. Go ahead. That's all right.

Q Okay. Well, then my next question was in your opinion, he was very determined to get off that reef and he was going to go do it in a forward manner, right?

A That seems to be the indication of everything, yes.

Q Then in that situation, would you not -- would you agree that Captain Hazelwood would want to use all the power available to him to get off the reef by going forward?

A Not necessarily, because you're -- in a situation like that, there again, he hasn't really studied it. He just started ahead, and I -- if you're going to use full sea speed (inaudible), load the program up for the -- you're talking about another 40 minutes to get up to sea speed.

And I wouldn't -- if I was aground, and I can't foresee any time that I would have ever wanted to use full ahead on a ship, but if I had, I would have never considered sea speed until I'd tried everything else --

Q Okay.

A -- (inaudible).

Q Trying to go off the reef, going forward, he would have to use a certain amount of thrust to get him off that stuck situation, right?

A Yes.

Q Now, you can certainly get off the load program up and over it by simply pushing a button, yes?

A Yes. It's easy to -- it upsets the engineers, and probably the -- the engine is built to increase slowly and reduce speed slowly, but yes. At any time you can go from full sea speed to maneuvering speed quickly.

Q And the engineers might be a little upset by this time anyway, right?

A They might be, yes.

Q So that little thing isn't probably going to cause any more concern?

A But I -- yeah.

Q Okay. So then you have whatever power that engine can generate at your disposal to use by going forward, right? How much power did Captain Hazelwood utilize on the Exxon Valdez to get off that reef, considering the amount of potential power he had available?

A He -- he had it on full ahead maneuvering.

Q Well, how much horsepower is that?

A That, I don't know. You'll have to get a chart out here and I can tell you, but I'm not -- I'm not -- I never check the horsepower. I never -- I didn't -- didn't enter that -- it didn't enter into my decision on the fact that he was trying to get off the reef.

Q How much total available power did he have?

A I believe 31,000, something like that. Thirty-one six, is that right? I mean, I'm -- I'm --

Q Let's assume that's correct.

A I'm thinking from memory now.

Q Okay.

A It's been awhile since I looked at that.

Q But assuming, sir, you're correct, it's in the neighborhood of 32,000.

A Something like that.

Q Okay. In that situation, my question was, did you calculate, or did you make any determination of what a power he was generating at 55 RPMs, full maneuvering.

A No, I didn't. I didn't make a calculation to that, no.

Q Would you agree, sir, that the -- well, first of all, engine -- there's curves for -- horsepower RPM curves for engines, are there not?

A Uh-huh. Uh-huh.

Q As you increase RPM horsepower -- well, if we go RPM, let's say, on the base line, horsepower vertically -- there's an increase in horsepower as the speed of the engine is increased.

A Yes.

Q Is that a linear type of progression, or is that exponential on that low-speed diesel engine?

A That I don't know.

Q Then you do not know, sir, that Captain Hazelwood, at 55 RPM, was using less than a third of the available horsepower that he had?

A That would -- that would be reasonable, but I don't know for sure what -- what it is. But it would be -- it wouldn't be to the maximum that you would have at full sea speed, no. but --

Q But it still would be in that neighborhood of a

third of his available power, at 55 RPM?

A I wouldn't want to hazard a guess on that. But it would be well -- well below sea speed. But that doesn't alter the fact that, from every statement that he made, and every maneuver he made with the rudder, and the fact that he was not trying to get the engine -- or get the ship off the reef.

Q You don't think that's inconsistent with trying to get off the reef when you're using only a third of the power you have available?

A Not when he's stated several times that he's trying to get off the reef. I would take the -- I have no reason to believe that Captain Hazelwood would lie to the Coast Guard. I've got no reason to believe that he would tell them anything other than what he's trying to do.

Q Sir, yesterday you said you disbelieved certain witnesses, since -- Mr. Cousins and Mr. Kagan with regard to the auto pilot.

A I said I -- I said that I -- from the facts that I could see, that they couldn't have done what they said they'd done. That's a disbelieving them. But I don't see anything in what Captain Hazelwood did that leads me to disbelieve what he told the Coast Guard.

Q That Kagan and Cousins couldn't have done what they said they did by turning the auto pilot off?

A They could not -- during the time they had the vessel on 180, they could not have made a -- put the rudder over before, shortly before they started their turn, because it -- the vessel would have turned.

Q If the auto pilot was on, right.

A No. If the auto pilot was on, it wouldn't turn. It would have to be off. Yes. And there's -- I mean, there's an inconsistency in their statement. With Captain Hazelwood telling the Coast Guard, "I'm trying to get off the reef," and his maneuvering the vessel, I don't see any inconsistency there.

Q Well, let's try it again, sir. You say there's an inconsistency -- or is there an inconsistency between Kagan and Cousin's testimony that they turned the auto pilot off and the vessel didn't turn, because perhaps the order wasn't given, or the turn wasn't made?

A Yes.

Q That's consistent, isn't it?

A Yes. There's something that didn't happen there, obviously, or else they would have made the turn.

Q If that theory is correct, then for your theory about the auto pilot to be correct, you have to say, "Well, then we have to disbelieve Kagan and Cousins. The auto pilot must have been on, and they didn't tell the truth."

A You have to believe that their statements at that

point -- now, the rest of their statements may be true. They may be confused at that point on what they said. But from my findings, they did not get the rudder to go to ten right when they said they did, whatever -- for whatever reason.

Q Well, sir, I don't believe there's any dispute as to the fact the rudder wasn't turned.

A Right, yeah.

Q But then, getting back to this situation, you want to say just the opposite. You want to say, "I believe Captain Hazelwood. That's what he said. And then I will discount everything that he did, or a lot of what he did."

A I'm not discounting -- when I based my decision that I thought he was getting off this -- he's on the edge of the reef, heading in a direction to get off the reef, first off. Behind him is a marking there of approximately five fathoms behind him.

He's put the engine on full ahead maneuvering, which seems like an intention to go ahead. He's used the rudder a total of, I believe, sixteen times the heading change, so that would indicate at least sixteen rudder commands were given. That would indicate to me that he's trying to get the ship to move free from whatever he's on.

Q Or not an indication to find out if his position is such that he can either turn the vessel one way or the

other?

A Well, without taking soundings around, to get back to the soundings again, if he's the vessel like that and moving the vessel from one -- swinging the vessel, he runs the risk of -- of further holding either his cargo tanks or the engine room from either side as the vessel is rotating on this rock that it's impaled on.

Q On that point, sir, do you have any specialized knowledge about salvage operations, or anything like that? How to get ships off a reef?

A I've never done it. I have no specialized knowledge in that field at all, no.

Q Well, let me ask you. Have you ever run across any type of equations or anything, any studies, as to when it would be physically impossible to remove a ship from a grounded condition because of the coefficient of friction, the force that's on the rock or the mud or whatever?

A No. I have never done that. I don't know of anyone that would be able to determine that in the middle of the night on a -- on a ship stranded on a reef, no.

Q Well, let's do it now in the courtroom.

A Okay.

Q Let's talk about it right now, eleven months later.

A Okay. Okay. I'm not a salvage expert. I'm not

a -- I'm a tanker captain. I never sat down to try to figure -- I didn't assume -- when I was interpreting what Captain Hazelwood did, I didn't assume that he knew that he could, or couldn't, get the vessel off the reef. I assumed, from every indication that I had, that he was making a maneuver to do what he said he was going to do, and that was to get the vessel off the reef.

Q What if he couldn't get the vessel off the reef, did you consider that?

A If --

Q No matter what he did, it simply wouldn't move?

A Well, that's -- in -- that's what happened, and so then eventually they stopped and went to other things.

Q Then you -- you don't have any dispute with any conclusion or finding by anybody else that no matter what he did, the vessel could not have been removed from that reef at that time?

A That's probably -- I don't know for sure, but I would assume that that's probably true. But that's -- that doesn't mean he wasn't trying to get it off, at that -- at that point.

Q Very true, sir.

A Yeah.

Q But doesn't -- if there's a risk involved, as you said earlier, there's a risk the ship did get off, it would

either sink, or the damage would cause more oil to spill, things like this. There would be that risk if you get off the reef, right?

A There's that risk of further damage just trying to get off the reef.

Q But if the ship didn't move -- well, let me ask you --

A If the ship didn't get off the reef there -- it -- obviously, if it stays on the reef, it's not going to sink or capsize, but in his maneuvering at that time, he had no idea whether it would get on and off the reef.

Q Okay. But you have no evidence at all that would indicate that any damage whatsoever, in addition, additional damage was done to that ship, by any maneuver he made after the grounding?

A I have no evidence of any damage which -- any additional damage was done. My statement was that he risked doing further damage by his movements.

Now, to -- I -- apparently most of the damage was done during the original grounding. That didn't mean that he didn't risk doing further damage when he was maneuvering the vessel. It just --

Q You certainly have had a lot of time to talk to Mr. Cole about this risk factor, haven't you? He knew you were going to be asked about this, didn't you? Did he tell

you about that?

A I've talked to Mr. Cole about this. I don't recall any specific questions or statements or anything that -- no.

Q He didn't tell you you were going to be questioned, perhaps, about risk, the risk involved, whether any damage was done?

A When we -- when we first went over this, we were talking about this, and one of the things that he asked me was what the risk would be in trying to get off, maneuver to get off the reef, and I told him this was awhile back, yes.

Q There's a risk involved in trying to get off the reef, right?

A Yes.

Q There's a risk involved if the vessel would move to cause that to happen, correct?

A Yes. Yes.

Q If it did not happen, then there may have been a risk, but the risk would be very substantially reduced, would it not, if it was physically impossible to move the vessel because of the damage?

MR. COLE: Judge, I'm going to object. Mr. Madson is going into an area of the law that this person is not qualified, giving him a question that goes to the

instructions that the court is going to give.

MR. MADSON: Well, Your Honor, if the witness is not qualified, then I'd ask the Court to strike all his testimony, because that's exactly what he's been testifying about.

THE COURT: To the form of the question, sustained.

BY MR. MADSON: (Resuming)

Q Captain Beevers, if I were to tell you -- if I were to go over to that wall, and there's people next door, and I'm going to say, I am intending to push this wall over on those people and kill them, do you feel there's any real risk involved in my doing that, with the available power that I have and the obvious strength of that wall?

A Only -- only a risk that you may be locked up, yes.

(Laughter)

Q I'll be the first one to go.

A You know, that's -- no.

Q Yeah. It's -- it would be impossible.

A But it's -- this is after the fact, as far as the fact he couldn't get off. At the time, Captain Hazelwood did not realize it, that the vessel was that -- that he couldn't get off. I know, you know. I'm sure that that was something that naval architects sat down and figured

out over a period of time at a later date.

Q Let's assume, though, that I really believe I can do that. In my mind, that's my intent, and I believe I can. But I still can't, right?

A Yes.

Q No matter how hard I believe, and how much I'd want to do it, I can't do it.

A I don't believe that's a good analogy to the -- you know, that's a good reference to the ship being on the reef, but that's --

Q I'm talking about the actual potential of something occurring, the degree of risk involved.

A Okay.

Q Talking about that situation. And we don't know, and you don't know, that this ship moved one inch, that it created any additional damage, or even came close to it, after the grounding.

A No, I don't know that there was any additional damage, no.

(Pause)

Q Let me ask you something else, but I think I may have to draw a diagram. When I asked you, Captain Beevers, about floatation of a vessel such as the Exxon Valdez -- and maybe we can (inaudible) --

(Pause)

Now, sir, let's assume that this is a glass, or some kind of a tumbler. Let's assume it's a glass. If you were to invert that and put that into water, it would go down a certain level and -- assuming it would stay stable, and not turn over, it would essentially float, wouldn't it?

A Depending on the weight of the glass, yes, _____. Yes.

Q In other words, the air in here is trapped.

A Yes.

Q And the water is here. So would you agree that that's somewhat analogous to the Exxon Valdez or an oil tanker?

A Close to it, if there's no bottom, yes. That would be a -- the --

Q Yes. Assume, of course, a tanker has a bottom.

A Yes.

Q Now, what if we put, let's say, a vent here. Now, if you could vent the air away, that would allow the water to rise, or the --

A Yes.

Q -- or the tumbler of the ship to sink, right? At the risk of oversimplifying, I would ask you, then, that in the Exxon Valdez, or a tanker like that, it has tanks --

A Uh-huh.

Q -- which are essentially sealed.

A They're closed up, yes. You have a -- these tanks are sealed from the atmosphere by the -- being closed up, and they do have their inert gas system which is sealed off from the atmosphere by water seals, yes.

Q And one way of reducing the -- or increasing the draft and decreasing the buoyancy of the vessel is to open valves and allow water to come in, or oil, or whatever, and allow, then, the vessel to sink, right?

A Yes.

Q Now, do you recall the testimony of Mr. Kunkel, the chief mate?

A Yes.

Q Do you recall him saying, "Well, earlier on, I thought the captain was trying to get off the reef, but then when I realized he was giving me these orders, or making these requests, I knew he wanted me to make sure we could get the buoyancy reduced to settle on the reef."

A He -- from what I remember reading, he asked him to do some calculations on that, yes.

Q And Mr. Kunkel agreed that what he was going, in his opinion, was to be ready in case the tide was coming up, the vessel was going to actually going to go off, he wanted to be ready to flood tanks and settle on the reef?

A This was one of the scenarios that he was working up as an option to do with -- you know, in finding out what

-- what they could do and what couldn't, which was in the scope of what they should have been doing, yes.

Q That's in the scope of what should have been done?

A Is to find out their options, yes.

Q Now, getting back to the -- I'm, hopefully, finally done here -- getting back to the bridge situation, prior to the grounding, okay? Let's say from 11:55, 11:56 to oh, six -- let's say six minutes after, something in that period. Would you agree, sir, that there was _____ a period of time after which, no matter what anybody had tried to do, the vessel was going to run aground as long as it remained on that course, at that speed -- under our situation?

I don't mean to confuse you. What I'm saying that --

A Actually, if had remained on 180, there's a possibility it would have skimmed down behind it, but they'd already started their course change by that time, and by that point it was too late to keep from running on the reef, right.

Q Right. In fact, if the course hadn't changed, there was a good possibility it could have made it to the east of Bligh Reef.

A Yeah. Then something nobody would ever attempt

to do, but -- yes, as --

Q It would have raised a little anxiety, perhaps?

A But at that point, there was -- when they started their swing, there's no question that they were beyond making it.

Q So there was a -- what? Six minutes, would you say --

A That --

Q -- from the time the vessel was supposed to turn, at least Captain Hazelwood thought it was turning --

A Five or six minutes, yes.

Q So he thought -- there was a point in time, for five or six minutes, he thought it was turning, then you reached that point, no matter what he or anybody else did, it would have been too late, and it was unavoidable. Right?

A Yes.

Q Okay. Now, with regard to his actions on the bridge and your opinion concerning him, did you use the same thought process and degree of objectivity on that as you have with the grounding situation? Just as objective in your analysis of that case as you are with the grounding?

A I would think so, yes. I don't quite understand what you're driving at --

Q Well, you had different --

A -- but I looked at everything, and, you know, did the best I could to be fair and impartial in what I decided, and that -- yes, I would say I was objective in that.

Q And you had to use different degrees of expertise, would you say, in either situation, both -- you know, one, a grounding is a little bit different than being on the bridge in a --

A Yeah.

Q Right?

A I know more about maneuvering a vessel than I do about getting one off a reef, if that's what you're --

Q Yeah.

A Yes, because of my -- my experience is as a ship's master, not as a salvage master, yes.

Q And in -- you still, even with what you say is less experience and less knowledge about getting ships off a reef, you still came to some very firm conclusions and opinions, right?

A Yes.

Q And you're just as firm, based on the same degree of how you approach the situation and how you look at it, in the grounding as you were on the bridge situation, right?

A Yes.

Q Then your disagreement, or what you said Captain Hazelwood really did wrong was leaving the bridge, right?

A That's -- that's what caused this. If Captain Hazelwood would have stayed on the bridge, as he should have, due to his pilotage, and due to the fact they were in these close quarters situations, I'm sure that when he ordered the right rudder, that Captain Hazelwood has enough experience to realize the vessel wasn't turning, and he would have realized it much quicker than a relatively inexperienced third mate, and if it wasn't, in fact, turning, I would have certainly assumed that he would have realized that before and made -- made the change properly, yes.

Q You're assuming he would have checked to see if Cousins had checked to see if Kagan had, in fact, turned?

A I would certainly think so, yes. I don't think that Captain Hazelwood would have gotten to be a master on one of Exxon's vessels if he wasn't competent and able to do that, and I'm sure he would have, if he'd have been there.

Q And competent masters rely on competent help, and competent mates?

A In the proper place, yes. This wasn't the proper place to leave someone. This is a place the master should

have been on the bridge.

Q I assume, then, sir, you would say exactly the same thing if Captain Hazelwood had said, "I've got to go in the bathroom for awhile," and be in there -- he's there for six minutes, and he can't see rudder indicators, but he says, "Let me know when you start your turn." And Cousins says, "We're starting now, Captain?"

A The -- the thing is, you just kind of train yourself not to go to the bathroom at those times. That's the --

Q You just jump and down and --

A Whatever it takes.

Q Oh.

A But I -- normally when a vessel that size is turning, even with ten degrees rudder, you can certainly feel a lot of vibration in -- while it's making the turn. And that --

Q When -- have you ever been on the Exxon Valdez in a turn of right -- ten degrees right?

A I've been on large tankers for years, and every one I've been on has always -- with a ten degree turn, you can tell a change in the vibration. Every ship, when it's moving, has a little vibration.

Q Every one you've been on, but you haven't been on the Exxon --

A I haven't been on the Exxon Valdez, but that would --

Q So Captain Hazelwood would have been just as reckless with a bad case of diarrhea and having to go to the bathroom and not being there to see if Cousins watches a rudder indicator or not?

A No one's every indicated in nothing I've ever read that he had diarrhea or that he had an upset stomach or anything of that kind, so --

Q Granted. I'm saying if he -- if that had happened, he's not there to see it.

A I'm sure that, you know, in a major medical problem, that would be taken into consideration when you're evaluating things. At this point, that wasn't part of the --

Q Okay. Let's say it isn't a major medical problem.

A -- information I had.

Q Let's just say he was in the bathroom.

A Like I say, a normal -- normal bathroom functions can be held back for a few minutes, or what have you, and I don't think that -- I don't think that leaving the vessel in a tight situation to --

Q Well, he didn't leave the vessel, did he?

A Or leaving the -- he left the vessel in a bad

situation. He didn't leave the vessel himself. But I don't think that doing that -- I don't think going to the bathroom normally, under normal circumstances, would warrant leaving the vessel's conn to a third mate in that situation, no.

Q Then what about -- there's a chart room right behind the bridge area, is there not? That's normally kept lighter than the bridge, and the bridge is kept dark? Captains normally go back there, too, occasionally, do they not?

A Yes.

Q And if Captain Hazelwood had stepped behind there and said to Cousins in effect, "I'm going to be over here for a few minutes doing something, let me know when you start the turn," and he is informed that, "Yeah, we're starting the turn," but he doesn't come out and check to see if that really was done, would that be the same recklessness?

A If he's in the chart room, he will _____ be able to check the fact that you'll hear the course recorder clicking as the heading is changing. This is something that a man with experience would automatically -- if you're in the -- you'd be in the chart room, you'll hear this, you'll know that making a course change, if you're concerned whether they're going the right way or not, you

can tell by looking at the course recorder.

Q And of course --

A So --

Q -- if that order, or that maneuver had been carried out, it wouldn't -- the turn would have been made in plenty of time, right?

A Yes.

Q So in essence, a master can be on the bridge and yet be in a situation where he is not available, and not in a position to readily see whether an order is carried out or not, because of the bathroom, chart room, something like that?

A The -- normally, going to the bathroom is a minute. It's not a ten or fifteen minute thing. He had five or six minutes from the time the course should have been changed until it was too late. And I -- there was no reason not to be on the bridge and, during that five minutes, if he had to go to the bathroom for a minute and back out, or if he stepped in the chart room and back out, he still had time to check and see if that -- that the course was properly changed.

Q And --

A And from the statement, he can't do that.

Q He's twelve seconds away, but he's vertically away, rather than twelve seconds away horizontally, right?

A Yeah, he's out of -- up on the bridge deck area, you're in the realm of operating the vessel. Down in your stateroom, you're out of that -- that area, yes.

Q But you would be out of the area in the sense that you're in the chart room and you can't see rudder indicators, and things like that?

A The chart room -- the use and entering and leaving the chart room area from the bridge to the chart room is something you do normally and the functions of maneuvering a vessel. That's not -- that's traditionally, and that's -- you walk in there to look at the chart, or put a position down and back out. That's part of the routine.

Q And, sir, lastly, if Mr. Cousins was a competent person, competent to the extent that all he had to do was look at a rudder indicator, and if he gave a command -- assuming he gave the command to Mr. Kagans, and assuming Mr. Kagans -- Kagan -- was competent enough to turn a rudder ten degrees to the right, and Mr. Cousins told Captain Hazelwood whether he was in the chart room, bathroom, or even off the bridge and down in his state room, that, "We're starting our turn." "We're starting our turn." That, you said yesterday;, would be an indication that his degree of consciousness, or awareness of a risk, would be reduced. Would it not?

A I -- if I said that -- I think that if a -- if a third mate told you he was altering course at that time, I would think that you would -- you would accept that, under normal circumstances. However, in their situation, this wasn't your usual position, that you have a third mate conning the vessel where he would be telling you what he's doing. This is a situation where you would be conn -- as the master would be conning the vessel.

Q And you agreed yesterday other ships certainly went through the area around the ice at higher speeds close to Bligh Reef?

A The -- yes.

Q Okay.

And you don't know necessarily who was on the conn at the time?

A Well, from my looking at them, I -- I don't know specifically names, or anything, but they both took frequent fixes, which would indicate that there were two people on the bridge, and they --

Q You don't know that for a fact?

A It's certainly an indication that they did, and that's what we're having to work with. The facts that we have. And I don't approve of what they did, or what the -- what the Brooklyn, I don't have -- they were on maneuvering speed. Their heading was -- or they never -- they never

put themselves heading behind Bligh Reef or anything.

Q But certainly, the --

A That was a normal maneuver.

Q -- the Arco Juneau was reckless?

A The Arco Juneau was excessive in their speed, as far as I'm concerned. They got a little close to Bligh Reef for that speed, and -- but they had fixes regularly. Apparently they had, as best I can determine, they had two people on the bridge, and I have to assume one of those was the master, who had pilotage for that area.

They also were right at -- the Juneau, it was not quite dark yet, which gives him a little better visibility than the Exxon Valdez had. So had --

Q What -- oh, I didn't mean to interrupt.

A Okay. But the degree of recklessness there is -- it's still something I wouldn't do, something I don't -- I don't think was right, but the captain managed to do it and managed to go on about his business, and so therefore, it's not -- he's not here today. That's why.

Q Well, you don't know why he's not here today.

A He didn't run into the reef. That's why he's not here today.

Q Oh, is that why we're here today?

A You know, I mean, that's --

Q Because someone ran into the reef, but the same

person could be reckless and not run into the reef and that's okay?

A It's not okay, no. I don't approve of that, but then that's --

Q Well, do you approve of the state of Alaska judging the actions of tanker captains in Prince William Sound and deciding --

MR. COLE: Objection, Your Honor.

BY MR. MADSON: (Resuming)

Q And deciding who would be or not be --

MR. COLE: I object.

MR. MADSON: I withdraw the question, Your Honor. I agree it's improper.

THE COURT: (Inaudible).

BY MR. MADSON: (Resuming)

Q You've had, of course -- did you talk with Mr. Cole last night, or yesterday afternoon, after you finished in court here today -- yesterday?

A Not much. Just a minute or two.

Q Did he indicate that perhaps you should change your mind a little bit about the degree of recklessness of the Arco Juneau?

A No. He asked -- he asked me why I considered it reckless, and I told him. That's all.

Q How many other charts of other vessels have you

examined before coming here today?

A Just those two.

Q So you don't know how many other ships of whatever company -- Arco, Texaco, Exxon -- have executed similar maneuvers at similar speeds in the vicinity of Bligh Reef?

A No, that I don't know.

Q You don't know how many masters did not pilotage, and didn't have a state pilot on board between Rocky Point and Bligh Reef?

A No, that I don't either.

MR. MADSON: I have no other questions.

REDIRECT EXAMINATION

BY MR. COLE:

Q Captain Beevers, is it your understanding -- what is your understanding of whether the regulations with regards to pilotage vessels has changed?

A The way I understand it, is the only change from when they were originally started up here was the fact that a vessel without pilotage could transit from Hinchinbrook into the Bligh Reef area and back with approval -- on a trip by trip basis, with approval from the Coast Guard. Originally, that was a daylight transit which they now had been changed again, by issue of an order by the Captain of the Port, to the fact that it was a two-mile visibility and

a few other things, and they -- they had him put -- you had to have -- you wanted the details and what they required, or just the fact -- okay.

And that's -- that's the only change I know of, is that.

Q Were there any changes to pilotage vessels themselves?

A No. That's remained the same.

Q And if you had any questions about what your responsibilities were as a master on board a tanker coming into Prince William Sound, who would you ask?

A You'd call the Coast Guard.

Q And how easy is that to do?

A Well, that's exactly what I did when -- after this all happened, when I had heard that they'd made some changes in the pilotage, I called the -- Commander McCall in Valdez.

Q Now, as a captain on the bridge, there -- even in times where you're required, are there times that you need to leave the bridge?

A It can happen, yes.

Q Are there times when you don't leave the bridge?

A There's times when you definitely should not leave the bridge, and that I never did leave the bridge, yes.

Q What type of situations are those?

A Okay. Two things definitely is going through the narrows, and secondly is if you're maneuvering through or around the ice, or if you have a -- if you're maneuvering if there's other vessels in the area, and if you have to leave the traffic lanes or over to get close to any land, it's definitely a time for the master to be onboard.

Q Now, Mr. Madson asked you about delegating, or relieving, the Chief Mate, how a master would take over a Chief Mate's watch. Are there other ways to do that?

A Yeah. You know, I was looking at going over that -- I was looking, and it seemed to me the Chief Mate had time off between 8:00 a.m. and noon in his statement. He'd had time off between 1:00 p.m. and 4:00 p.m. and then true, he was up until 10:00 o'clock. But it seemed to me that at the time that he would have been coming on watch at 4:00 a.m., that he would have had more rest than Captain Hazelwood during the day.

But another way to alleviate that problem is the same as they were doing at midnight, when Cousins stayed up a little longer to allow LeCain to have a little rest. There would have nothing wrong with the two watch mates doing this until the Chief Mate had had a full night's sleep, if that's what he needed. There wouldn't have been a problem with -- if they wanted him to have eight hours

sleep before he went on watch, Cousins could have stood until 1:00 o'clock, LeCain could have added an extra hour on his watch, and then the Chief Mate could have came on.

It didn't have to be that Captain Hazelwood had to relieve him. As far as I could see, Kunkel had enough rest as it was. He could have stood his own watch.

Q As a master of a tanker, are there certain duties that you do not delegate?

A Yes.

Q What are those?

A The -- you don't delegate your --

MR. MADSON: Excuse me, Your Honor. I'm going to object unless it's clear this witness is testifying only from his personal preference. There's no regulation or law that he's referring to.

THE COURT: He may give his opinion. I take it as opinion. Objection overruled.

THE WITNESS: You don't delegate your authority when you're maneuvering at close quarters, docking, undocking a vessel, maneuvering in any area where you're close to a danger to the vessel. That's just something that is not done.

When you're a little further out, if you have to go below for a couple of minutes and you're transitting through the traffic lanes, you know, common sense would

tell you if you have to go below for a minute or two, that's the time to do it, and that, I doubt, would -- it may not comply with the law that you have to be up there all the time, but I think that that's acceptable. If something happens, you can run below and back.

BY MR. COLE: (Resuming)

Q Who handles the majority of commands during docking and undocking procedures?

A The -- you're directly giving the commands to the -- it depends on the situation. On a -- normally, on the bigger ships, and the way I did it on my ship, was the pilot, if we were in the wheelhouse, the pilot would issue the commands to the quartermaster, and the command for the engine speed change.

If we were out on the bridge wing, then he would tell me, and I would use the walkie-talkie to call in so we didn't have to shout and have any misunderstanding with yelling back and forth.

Q How do you find out whether or not a vessel's sailing time has changed when you're in Valdez?

A You can call the terminal, or you can call the -- your agent would be a good -- would know.

Q Captain Beevers, would you -- would leave the bridge of your vessel in the Valdez Arm, relying on the fact that if your vessel got into trouble, the Coast Guard

would contact you and let you know?

A No.

Q Why?

A First off, it's your responsibility to maneuver properly. Secondly, I wouldn't have that much confidence in their radar plotting in at their -- you know, you're getting further off at a distance. The people manning that, I have never met before, would have no idea of that, and I've always considered the -- their radar as strictly an advisory to the vessel. Anything that they would say, I would certainly check it, and do -- do what I felt was right.

Q Why, in your opinion, is it necessary for a master to have, to be aboard, be on the bridge when transitting the narrows?

A Well, you're in restricted waters, a very narrow channel. You're going at a reduced speed. The reason they picked the six knots as reduced speed, that's after tests, they decided that was the optimum speed that you could still steer your vessel and have a minimum damage, if you lost steering, and if you lost your plant, would still basically drift on through the narrows. And why a master is up there is that any, you know -- it's the tightest place in the Sound and it's a place that, if there was a problem, you would want to immediately be able to react,

and you would be able to tell your crew what you wanted them to do and get a response as soon as possible.

Q Mr. Madson asked you some questions yesterday about when Captain Hazelwood came to the bridge. Does the fact that Captain Hazelwood may have come to the bridge earlier change your opinion about whether he used bad judgment in not being on the bridge through the narrows?

A No. At that point, it's -- they were beyond the narrows, at Potato Point, and that doesn't change my opinion that his -- his not being on the bridge at that time was a bad judgment call.

(Pause)

Q In evaluating Mr. Cousins' and Mr. Kagan's statements, are they in conflict with the physical evidence in this case?

A Yes.

Q And did their prior statements, were they in conflict with the statements in this case?

A Yes.

MR. MADSON: What statements are we talking about? Prior to what, when, and -- I'd like a little more foundation, so we could look at that if we had to.

THE COURT: The question has already been answered. You may ask your next question.

BY MR. COLE: (Resuming)

Q Captain Beevers, once again, why would -- if your third mate brought you a computer program which he said he ran to grounding, in the grounding mode, why wouldn't you relay -- rely upon the stability figures from that?

A If the Chief Mate --

Q -- brings the computer printout up to you. Why wouldn't you rely on it?

A Well, because obviously, looking at the program you would see that you had two-thirds of your tanks ruptured, so you would have to assume that there's a tremendous amount of structural damage to the bottom, which may -- would weaken the integrity of the vessel, and that's what the stress figures are all based on, it's what your stability is based on, is an attack ship.

And I would take that as final, you know, as a piece of information to use, but I certainly wouldn't rely on it as the whole -- to make every decision on. That's just another factor, and I would -- I would be very leery of the fact that it showed that it would stable, and the fact that it showed that it could go to sea, or it could float, or anything else. I would just think that the hold tanks are the more important part of that.

Q Would you rely on it to the extent that you would attempt to get your tanker off the reef, a rock reef?

A No.

Q Were Captain Hazelwood's actions that evening consistent with the statements that he gave both the Coast Guard and the trooper that day?

A I believe so, yes.

Q How important is it to give the Coast Guard important information when you call them?

A Well, it's accepted that you're going to give them the information that is required, that they need, and it's -- it's important because there -- at this point, they're handling the response team, they're handling notifying the proper agencies, getting equipment out. So you should keep them -- give them as accurate information as you have.

(Pause)

Q I'm showing you Plaintiff's Exhibit Number 29. Do you recognize that?

(TAPE CHANGED TO C-3648)

A Yes. This is the chart of the Busby Island/Bligh Reef area.

Q And is that an accurate representation?

A Yes.

Q Do you remember seeing this chart?

A Yes. This has got -- this is the copy, I think, that the Coast Guard picked up, is that right?

Q And when you look at that, can you tell where the

plot of this vessel was when it grounded on Bligh Reef?

THE COURT: What number are you referring to?

MR. COLE: Number 29. Exhibit Number 29.

THE WITNESS: Well, they have an arc here, and an arc this way, and it looks like either a bearing line -- it's scribbled, but there's -- looks like two possible positions here. There's two dots. But anyway, one of these two dots is -- perhaps they had a range in bearing, and each one, and that's the range in bearing, that's the range in bearing, so the position would be either one of those two, or in between, or in that area, yes.

BY MR. COLE: (Resuming)

Q And right behind that, what's the depth of the reef right behind?

A That's five fathoms. That's approximately thirty feet.

Q And what else was behind the vessel?

A Reef Island.

Q And what was in front of the vessel that the tanker captain was looking at?

A The traffic lanes?

MR. MADSON: Excuse me. I'm going to object. We don't know that the captain was looking at that. There's no -- no foundation for that whatsoever, and he's leading the witness.

THE COURT: Rephrase your question, Mr. Cole.

BY MR. COLE: (Resuming)

Q What fathom marks were in front of the Exxon Valdez as she lay at rest?

A Okay. As soon as you get off the reef, you've got 22 fathoms, 40 fathoms, 33 fathom. It's -- you're very close to deep water there.

Q Twenty-two fathoms is approximately how deep in feet?

A One hundred and thirty-two.

Q Five fathoms is approximately what?

A Thirty. Thirty.

Q And the draft of this ship was?

A Fifty-six foot, in that area.

Q Captain Beevers, what happens when this vessel rounded, prior to the first time that it shut off? Do you remember reading the Chief Engineer's statement of what he observed when he was in the engineering room?

A Yes. At the time, they were in program up mode, and the engine was overheating.

Q And that was between --

A That was 12:07 and 12:20, yes.

Q And that was when it was on load program up?

A Yes.

Q What happens to the bottom of the vessel when

it's stuck on a reef and you turn it back and forth?

A Well, you're undoubtedly doing more damage to the area that is sitting on the reef.

Q Why do you say that?

A Because of the weight of the vessel, and the fact you're unlocked, and the fact that you're with a -- with turning, you're moving -- at each end of the vessel, you're moving considerable, you know, up to a hundred feed, probably, from one side of the arc to the other. So there's considerable movement, and you would definitely damage the vessel.

Q If a vessel was going to be lifted off a rock by high tides, by high tides, by cresting of high tides, would driving it full ahead, full maneuvering speed, keep you on that rock?

A It would not depend on how -- sitting on a rock, like it turns out the Exxon Valdez was, I doubt it very much. Going at full speed, if the ship indeed did float up would merely cause you to go off the reef, because there was nothing in front of him to lay it -- if you're going to go full ahead and stay on the reef, you have to make sure your bow is pointed in the direction of shallower waters, so that you'll stay where you want to stay.

Q Now, Captain Hazelwood -- or -- when you evaluated the tanker captain of the Arco Juneau, had you

ever been on a ship like that before?

A Yes. I was on a ship that was exactly like that. I was on the Overseas Juneau, and that was originally built for Arco and sold to Maritime Overseas before it was completed being built, and then I was captain on that for four or five years, something like that.

Q And is it a steam turbine, or a diesel?

A That's a steam turbine.

Q What was it about that -- his transit that you found to be unacceptable _____?

A Okay. What I found unacceptable about it is that he was going at sea speed when he's very close to Bligh Reef, and also with ice in the area. And the --

Q Why is that a problem?

A Well, his vessel, as I say, is a steam turbine, and if he's up to sea speed, if you immediately come back to maneuvering speed on a turbine, you end up having to dump so much steam in your condensers, you -- you don't -- what you do is, as your steam is used through your turbine, it's dropped down and condensed back to water, and pumped back in the boiler as water.

And if you get too much steam in there, it can't condense, and you're putting steam right back in your boiler, and this upsets the water and can create a problem with the boiler, or a problem with the turbine, for that

matter, and could be a serious problem for the engine.

So you have to have time to slow a steam turbine down. It's not something that you would just do automatically. A diesel, you can slow down a lot quicker. So --

Q About the plots on the -- on the chart of the Arco Juneau, does that give you an indication of who -- of how many people were on the bridge?

A Yes, it's -- there were significant plots to indicate that there were probably two people on the bridge, all the way through the transit.

Q Now, one thing I would like you to point out to the jury, the Exxon Valdez is right here. Let's say it's about a mile north of Busby Island. How long are we talking about before that vessel gets back over into that safe area?

A Well --

MR. MADSON: I object to the form of the question. It assumes. It's leading, and it's also assuming something that is not in evidence, of what's safe and what isn't safe.

MR. COLE: I'll withdraw it.

BY MR. COLE: (Resuming)

Q How long are we talking about that Captain Hazelwood had to be on the bridge before he got back into

the TSS lane?

A You've got roughly six or seven miles to get -- get passed Bligh Reef and, depending on how fast he could get back over here, and six miles, so it's a little over a half-hour. So if he'd have stayed on the bridge, maneuvered the vessel around and through that, probably within thirty minutes they would have been well clear of the ice, well clear of Bligh Reef and back over in this area someplace where he could set a course to come back into the proper lane.

Q Now, Captain Beevers, I'd like to talk for a minute about your experience in going through ice. When you were travelling in the area of Antarctica, what type of icy conditions did you get in that area?

MR. MADSON: Your Honor, excuse me, but I don't see the relevance of comparing Antarctica with Prince William Sound. Well, that's my objection.

THE COURT: (Inaudible). _____ chance to go over a couple of questions and get on track.

BY MR. COLE: (Resuming)

Q What kind of conditions --

A Okay. On the way southbound, out in the ocean in deep water, the first thing you would come across is large icebergs, and they're, you know, anywhere from the size of a ship on upwards. They're much bigger down there than

they are up here. And you travel through that, on into calmer -- calmer waters.

What keeps the icebergs in that area is the rough water further north. There's a -- in the 50s, it's usually high winds, and the icebergs naturally will drift out as far as they can, and then they just circle the earth. In effect, they're -- once you get inside that, you run into areas of ice that are -- you have areas of open water, of course, too, but you run into areas of sea ice that has been frozen, broken up into huge pancake sheets that may be any, you know, one to two foot thick, maybe thicker, depending on the -- how the winter was.

And this drifts around and, through the month, ends up in huge long tidal rows, wind rows, or something. You'll have an open stretch of water, and you may have a stretch of ice that, as far as you can see, that may be a mile, two miles across -- maybe a half-a-mile across, depending on that particular one, that you either have to maneuver around, if it's possible, and if you look from horizon to horizon, there's nothing but ice, obviously, the thing you do then is you maneuver through this ice. And --

Q And you maneuvered through ice and went around it in Prince William Sound?

A Yes.

Q And always, what was your utmost objective?

A The safety of the vessel and the crew. That's -- you have to -- that's the big concern with operating a ship, is to -- you have to keep your vessel in a safe condition, and keep it afloat.

Q Did you ever have any problem going through ice, weaving your way through?

A In Prince William Sound, no.

Q And what is the advantage of going around the ice?

A Versus through?

MR. MADSON: Your Honor, I'm going to object. It's been asked and answered. I think it's obvious by now that there is no _____ to determine there is no proper way to do it, or not do it. It's immaterial and irrelevant which he would do, and problems he may have, or advantages he thinks that exist.

THE COURT: Objection overruled.

BY MR. COLE: (Resuming)

Q What is the advantage to going around?

A The advantage to going around is you -- one, you don't have to maneuver through the ice. Number two is that you save time in this situation, because you can -- going around the ice, you can go faster than when you're maneuvering through the ice.

Q Captain Beevers, if Captain Hazelwood had wanted

to be sure that Mr. Cousins was giving the orders appropriate to avoid this ice situation, how could he have done it?

A By being on the bridge.

Q And if he wanted to make sure that Mr. Kagan was following those orders as he was given, how could he have done it?

A Again, by being on the bridge.

Q Thank you.

THE COURT: Mr. Madson, why don't we take our break, and --

MR. MADSON: That's fine, Your Honor --

THE COURT: -- come back here.

MR. MADSON: I didn't realize it was 10:00 o'clock. Sure.

THE COURT: All right. Remember my instructions, ladies and gentlemen not to discuss the matter among yourselves or to form or express any opinion (inaudible).

THE CLERK: Please rise. This court stands in recess subject to call.

(A recess was taken from 10:01 a.m. to 10:22 a.m.)

THE CLERK: This court now is in session.

THE COURT: Mr. Madson?

MR. MADSON: Thank you, Your Honor.

REDIRECT EXAMINATION

BY MR. MADSON:

Q Captain Beevers, at the risk of kicking this horse one more time -- if it's not dead, maybe we'll finish him off here, shortly -- before we go too far, let me hand you something here.

I'm handing you what's previously been marked as Exhibit AJ. I believe -- do you care to see this again?

(Pause)

Let me ask you if you can identify this, sir.

A Yes. This is a paper with a list of positions that was taken on board the Exxon Valdez on April 2nd by -- it's four positions here, three of which were taken or observed by me, one of which the ship's officers had taken.

Q And you signed that document, did you not?

A Yes.

Q It appeared to be a true and accurate copy?

A Yes.

Q Okay. This was on April 2nd, was it?

A April 2nd.

Q And it was on the Exxon Valdez after the grounding?

A Yes.

Q What was the purpose of taking these pictures?

A Two things. One is so we'd have an idea of where

the vessel was at, and then to check the equipment that would be used to take fixes to see if it was working properly.

Q You also got gyro headings, did you not?

A I believe so, let me -- yes. Yes.

Q Okay. Those told the -- not only the location of the vessel on the reef -- let me back up.

Mr. Cole showed you earlier a chart, did he not?

A Uh-huh.

Q And you said, "Here's" -- basically, "Here's where the vessel was, on Bligh Reef." And you pointed to a spot on the chart, right?

A I pointed to an area, yes.

Q Okay. And you could do the same thing with the chart over there, right?

A Uh-huh.

Q Okay. What I'm getting at is, that tells you the location on a chart, but it does not tell you the heading of the vessel, from just looking at the chart, right?

A No. How you would tell the heading of the vessel is with other information such as here, where we read the gyro, or in the case of the grounding, you'd use the course recorder.

Q Okay. So from that document there, you were able to determine not only the position, that it was, in fact,

on Bligh Reef --

A Uh-huh.

Q -- but the actual physical position of the vessel with relationship to how it was on Bligh Reef --

A Yeah.

Q -- and which direction it was taking?

A On April 2nd, yes.

Q On April 2nd.

A Yes.

Q Now, do you know whether or not this -- the heading on April 2nd was different, or the same, as the heading that it was on the 24th?

A It seems to me -- I'd have to look, but it seems to me it was 280 something on the 24th when they finished up, according to the course recorder, and it's 294 here.

Q Okay. So there may be a difference of 10 degrees or so?

A They had done -- yes. There's ten degrees, roughly, different. They had done some lightering and stuff, too, in there, so that -- that just doesn't mean that's where it actually ended up at the end of the --

Q Yeah. What I'm getting at, sir, if you know, roughly, it's within, say -- as far as you know -- ten degrees of its original position?

A Yes, within a point on the compass, yes.

Q Okay. But the point is, the heading on the reef, the position as the vessel lies on the reef, would tell you, would it not, exactly -- if you were going to compare that with soundings, or, you know, as far as the depth of water is concerned, the exact position, is it necessary to determine what water you have behind you, or ahead of you, on the port side or starboard, right?

A Uh-huh.

Q Now, you also indicated -- Mr. Cole asked you about well, if he had questions about pilotage, you know, you go to the Coast Guard. They're the ultimate authority on this, as I --

A On the day-to-day basis, yes, yes, they are.

Q So you went to Captain McCall, and asked him, you know, what he meant by this, right? What he meant by his orders?

A Right.

Q When did you do that?

A This was sometime after the grounding, probably on or around or -- it wouldn't be on, but near this --

Q After the grounding.

A Yeah. Near that -- April 2nd.

Q You don't know whether or not the Coast Guard had any interest in what might happen, any litigation involving them, or the fact that they may be potential Defendants in

a case, or anything like that, right? Captain McCall didn't -- you know, have any reservations about that?

A I was surprised he didn't. He told me exactly what he had, there, yes. I --

Q What do you mean, you were surprised? You expected him to --

A I wouldn't have been surprised if he'd had said, you know, no comment or something, if -- because he didn't have any idea who I was when I was calling up. I just called up and asked him about it.

Q Certainly, he was telling you, whoever you were -- I mean, whoever he thought you were -- hey, this was perfectly obvious. This was what I meant, you know? Perfectly clear, you know?

A Yeah.

Q Taking all that responsibility away from the Coast Guard -- if there was any, right?

Now, you also talked about the possibility of other people taking the Chief Mate's watch, and whether he could have stood that watch, rather than Captain Hazelwood doing it for him, right?

A Uh-huh.

Q Again, this is a nice thing to look at in hindsight, right?

A Uh-huh.

Q And would you also agree it's the captain's prerogative to decide who might be tired, and who's the best person to take over for another one?

A That's correct. He could make that decision anytime he wants to. I just was pointing out that it seemed that Mr. Kunkel had probably had -- at that time, had as much rest as anyone else. So --

Q Well, maybe you might ask Mr. Kunkel that. He might have been able to say, "Hey, I was really tired. I appreciated having a few more hours of sack time." Right?

A Could -- I'm sure he would appreciate having the time off, yes.

Q Now, certainly, sir, while the master or captain of the vessel is very important, if he should drop over with a heart attack, or get severely ill, the ship doesn't come to a complete halt and everybody just run around, saying, "What do we do now?" That doesn't happen, does it?

A Well, it shouldn't happen. There's a progression of order there, yes.

Q Now, for instance, in the Exxon Valdez, Kunkel, Mr. Kunkel, had a master's license?

A Uh-huh.

Q He would be authorized to operate this vehicle? Authorized -- when I say that, maybe not by Exxon hiring practices, but by Coast Guard standards, he was authorized

to operate that vessel and command it.

A Oh, yes. He had the license. He could have been -- they could just as well have named him captain of that vessel, if they'd had chosen to. That's right.

Q Now, you also talked about when captains should be on the bridge and when they shouldn't, and again you said, close quarters. If you were a mile from Busby Island and two miles from Bligh Reef, you consider that close quarters?

A For a ship that size, yes.

Q And you disagree with Captain Murphy when he says those waters aren't dangerous?

A The --

MR. COLE: Objection, Your Honor. I don't think that's what he said. If he's saying this situation is not dangerous? If he's saying general travel in the area of Busby Island --

THE COURT: Are you asking him if he does disagree?

MR. MADSON: Yeah.

THE COURT: Okay.

BY MR. MADSON: (Resuming)

Q Just if he just agrees that if Captain Murphy, in fact, had indicated in that area it was not dangerous in his opinion, would you agree or disagree?

A On that, with the conditions the way they were then, yes, I'd disagree with him.

Q You also said that the Coast Guard -- you wouldn't rely on them to tell you you were off course, but you would at least expect them to advise you that you may be off course, wouldn't you not?

A Yes. Before -- up until this, yes. I would have expected them to advise you you were off course.

Q After the grounding now you wouldn't have that expectation?

A Yeah. I realize now they're not doing it. To that point, I thought they were checking it, yes.

Q No reason to think Captain Hazelwood didn't have the same knowledge that you did, and the same --

MR. COLE: Objection.

BY MR. MADSON: (Resuming)

Q -- believe that you did, is there?

MR. COLE: Objection. Speculation.

THE COURT: He'd have no way to answer that question. (Inaudible) answer it. Sustained.

BY MR. MADSON: (Resuming)

Q Now, with regard to the statements of Cousins and Kagan turning off the auto pilot, you looked at a number of their statements, did you not?

A Yes.

Q They were entirely consistent at all times, weren't they, that the auto pilot was turned off?

A I'd have to review them each individually now, but I believe that somewhere along the line they both had said, yes, they're off. But there's -- I've never got a clear picture of just exactly when, what and how. I said that the other day, I believe, that somewhere along the line they both said that the auto pilot was off, yes.

Q In addition to their statements, they both testified under oath at the NTSB hearings here in Anchorage, did they not?

A Yes.

Q Did you review that testimony?

A Yes.

Q And they both said clearly at that time, it was turned off?

I'm afraid you'll have to answer out loud.

A Yes. Yes.

Q You testified again on direct examination about possible damage to a ship if it was turning, say, a hundred feet laterally -- you know, after it's grounded.

A Yes.

Q Okay. Did you talk to Captain Greiner about his theory of the grounding?

A We discussed it, but nothing specific that I

recall.

Q Well, did he mention to you anything about maybe 94 feet of possible movement, of the bow?

A We both figured out various -- depending on the point -- at the time that I was discussing it with him, I wasn't sure of where the point was, but we took various measurements and figured out, and I got one scenario in which -- I don't have the figures with me here -- of 123 foot, one of just over a hundred, and I think he had something less than that. But --

Q And there's a lot of scenarios?

A Oh, sure.

Q Yeah.

A You know, it's all speculation at that point. You know it's swinging. You know it's moving. We were just trying to determine how far it actually was swinging.

Q And that would be almost like on a pinnacle, would it not? It's pivoting, like this?

A Uh-huh.

Q If there's a distance of, let's say, a hundred feet, hundred and fifty feet, that the vessel is actually riding on, in -- you know, 150 feet is a relatively long distance, is it not?

A Well, yes. It's --

Q And if the ship is having to move on that 150

feet, that is, swing, when it -- that distance, wouldn't you expect to see some lateral damage, obvious on the hull of that vessel?

A You would expect to see that. I didn't --

Q I may have used the wrong word.

A Yeah.

Q That's the transverse, okay?

A Yes, I know what you mean.

Yes, you would, and I would -- that's one of the things that I believe they went into. I happen to not go to San Diego when they looked at it, so --

Q So you didn't go down there to see if any such damage was observed?

A No.

Q And you know, from talking with Captain Greiner, he -- did he tell you that they saw no damage to indicate the ship had turned in a sideways fashion at all? Did not determine that?

A Apparently, there wasn't anything that they could see. I think what they determined is that it had either been crushed in so badly, or broken away, or cut off before they got to see the ship, that they really couldn't determine if there had been or there hadn't been.

Q Okay. So then what you did, and Captain Greiner did, was take the worst case scenario, right?

A I just took an idea that they were approximately 330 or 350 feet off, and assumed that it pivoted on that point. I didn't take into consideration that it -- still, if you're pivoting, I would assume that there's a point -- somewhere, there's a center of that circle, whether you've got 150-foot base that it's pivoting around, or whether you've got a pinpoint. There's still a point, and that's all -- all I was trying to do was determine actually how much swing that they were getting.

Q And, of course, there's no way of determining now, or even earlier, what, if any, damage was caused in excess of what was already caused by the initial grounding itself?

A That's correct. I -- I couldn't determine any -- you know, I wouldn't be able to do now, and I wouldn't have been able to, probably, in San Diego at the -- if other people couldn't.

Q Yeah.

You talked a little bit, again, about steam turbines and diesel engines. From your knowledge of a slow speed diesel engine, such as that on the Exxon Valdez, isn't it true, sir, that when you turn the diesel engine in reverse -- in other words, you put it in reverse -- you have all the power available in reverse as you have in forward?

A You have all the power on the engine, yes. Where you have trouble with power is the fact that the propeller, and the prop washing against the vessel.

Q Okay. You have horsepower. But you don't necessarily have the same amount of thrust?

A Right.

Q Is that what you're saying?

A Yeah.

Q But the engine itself will turn just as much?

A Oh, yeah. Yes. Yeah.

Q And the propeller will go around, just in reverse, just as much. Same RPM, everything like that?

A Yeah, yeah. It's just you don't have -- if I've given you the impression that it didn't have the same RPMs astern as ahead, that's wrong. It does.

Q The only difference is because you have the bulk of the vessel behind you, instead of pushing it, you're kind of pulling it?

A Yeah.

Q Right?

A Yeah, that --

Q Now, last -- getting to the end here, hopefully -- the Arco Juneau -- you went into that a little bit, and the Brocklin, those were the last two trips out of Valdez prior to the Exxon Valdez, correct?

A To my knowledge, yes.

Q And you examined no other ones?

A No.

Q So if you were to assume, sir, that those two trips, by the Brocklin and the Arco Juneau, and the Exxon Valdez, all went around the ice -- maybe not exactly the same course, but at different speeds, but went 'round the ice, would you tend to believe that that might be the normal procedure for what is done in Prince William Sound?

A I would say that that may have been what they chose at that time. It may be normal, yes.

Q When I say for Prince William Sound, I am, again, assuming that there's ice conditions.

A Yeah.

Q That would cause one to make those maneuvers.

A Right. That may be normal. I -- you know, I can't speak for everybody transitting it through there. It would appear that they -- all three determined to go around at that time for some reason, yes.

Q But that was three in succession, wasn't it?

A Yes.

Q And so they chose to go around and not what you necessarily might do, by slowing down _____.

A Yes. That's a decision for the master to make, on site at that time. Yes.

Q And lastly, sir, you are retired, correct?

A Yes.

Q You don't have to be concerned about perhaps sitting -- having other people sit in judgment of your actions in the future as a --

A As a sea captain.

Q -- in command of a vessel, right?

A No. No.

Q And of course, your -- if I were to stand here for the next two days, you aren't going to substantially change your opinions, are you?

MR. COLE: Objection.

THE COURT: I don't think that's going to help anybody, that answer to that question.

BY MR. MADSON: (Resuming)

Q Let's say, sir, that you have pretty firm opinions, right, in this case?

A On what I've read and seen, yes, I do have a firm opinion.

Q And you don't feel, in all fairness, that your fee in this case influenced any of those opinions at all, not in the slightest?

A No.

MR. MADSON: I don't have any further questions.

THE COURT: Anything further, Mr. Cole?

MR. COLE: Just two or three areas.

THE COURT: All right.

REDIRECT EXAMINATION

BY MR. COLE:

Q Captain, what would tell you that the vessel, the Exxon Valdez, was moving -- the heading of the vessel was moving on March 24, 1989, between, say, 12:35 and 1:40?

A The most obvious thing that would tell you that it's moving is the course recorder, because you're changing heading as it's -- as the weather is being -- had been put over one way or the other.

Q As a retired master, you don't have to go back to the shipping industry and face the pressures of the shipping industry for testifying in this case, do you?

A No.

MR. COLE: Thank you. Nothing further.

THE COURT: All right.

May this witness be excused from further performance?

MR. COLE: Yes.

THE COURT: Mr. Madson?

MR. MADSON: He may be excused, yes, sir.

THE COURT: All right. You're excused.

(The witness was excused.)

THE COURT: You may call your next witness.

MR. COLE: Yes. At this time, we would call Mr. Bill Milwee.

(Pause)

Whereupon,

WILLIAM MILWEE

called as a witness by counsel for the State of Alaska, and having been duly sworn by the Clerk, was examined and testified as follows:

THE CLERK: Sir, would you please state your full name, and spell your last name?

THE WITNESS: My name is William I. Milwee, Jr. M-i-l-w-e-e.

THE CLERK: And your current mailing address?

THE WITNESS: 4019 Southwest 55th Drive, Portland, Oregon 97221.

THE CLERK: And your current occupation?

THE WITNESS: I'm a consultant in marine salvage diving, towing and related disciplines.

THE CLERK: Thank you.

DIRECT EXAMINATION

BY MR. COLE:

Q Mr. Milwee, why have you been asked to testify in this matter?

A I was asked to look at the Exxon Valdez and the incident in which it grounded on Bligh Reef, and to

evaluate the action that was taken following the grounding.

Q Before we talk about this, would you tell the jury what your education background is?

A I have a BS from the U.S. Naval Academy in 1959. I have a Master's in naval architecture from Webb Institute, and a Bachelor's in marine engineering.

Q And where did you get your Bachelor's in marine engineering?

A At Webb Institute, also.

Q What is Webb Institute?

A It's a school of naval architecture in New York.

Q And after -- would you explain what your naval career --

A Yeah. First four years after I graduated from the Naval Academy, I was a line officer. I served in destroyers as a deck officer, and was Chief Engineer. I was the -- during that time, I qualified for command of destroyers.

Following that, I went to graduate school at Webb for three years. Immediately after graduate school, I went to the naval school of diving and salvage, where I was trained in, obviously, diving and salvage. We'd go short tour at Long Beach Naval Shipyard in the ship repair business.

During that time, I was borrowed for a salvage

job in Vietnam. Following that, I went to a unit that was doing salvage in Vietnam and other places in the Pacific.

Following that tour, I spent five tours in the Supervisor of Salvage Office in the Navy in Washington. And following that, for four years, I was Salvage Officer for the Pacific Fleet. And following two years back at Long Beach Naval Shipyard, I retired in 1979.

Q When you say that you were Fleet Salvage Officer for the U.S. Pacific Fleet, what does that mean?

A It means that I was responsible for the fleet readiness as far as salvage operations, insuring that we were equipped and prepared, and I personally went to the scene and took charge of salvage operations.

Q Now, since -- once you retired, would you tell the jury about your career after retirement from the Navy?

A When I retired, I went to work as a marine manager for an offshore drilling company in the southeast. We were operating twelve rigs in the Gulf of Mexico. I was responsible for all the marine aspects of that, including moving the rigs.

Ten days after I got there, we lost a drill tender, and they realized they had just hired somebody who knew something about salvage, so I took charge of that operation.

Q What's a drill tender?

A Oh, it's a type of drilling rig in which a floating platform is used for the support of the drilling platform. And this thing was moored along side of the platform.

And then I joined a consulting group as president. We were doing salvage and -- same types of things I'm doing now. I was with them for about two years, and then I became senior vice president and general manager of Divine Salvage down in Portland. When I left them, I set up my own operation, and have been doing this since 1953.

Q What type of salvaging operations have you been involved in? Can you give the jury an idea?

A Oh, just about everything possible. I've done sinkings, strandings, vessels ranging from small craft, barges, tugs, cargo ships. Maybe half a dozen tankers. Ships up to 250,000 tons dead weight, both a tanker of that size and a bulk carrier of that size.

I've been oh, just about everything you can be on one of those operations from salvage engineer from salvage master.

Q What is a salvage master or salvage engineer?

A The salvage master is essentially the person that's in charge of the salvage operation. The salvage engineer does the engineering and calculations associated

with the operation.

Q Have you been involved in groundings in rock?

A Yes, in the last -- oh, ten, twelve years, I've been involved in at least thirty casualties that I can recall. And roughly half of those have been either on rock or coral, which have very similar characteristics.

Q Have you -- can you give the jury an idea of where in the world you worked?

A I've worked on all seven continents, actually. I've done a lot of work in the Pacific, in the South Pacific. I've looked at a lot of casualties up here in Alaska, for one reason or another. I've worked on both coasts of the United States, in the Persian Gulf and South America, and was even on the casualty in Antarctica last year.

Q Have you worked in military areas?

A Oh, yes. I got my -- my basic training in Vietnam in doing salvage in the rivers along the coast of Vietnam, where we had all sorts of conditions, ranging from rock to mud, groundings, sinkings, comeback casualties, fires.

Q Would you like a glass of water?

A Please.

(Pause)

Q Now, would you give the jury an idea of how many

-- let's talk just about tanker casualties that you've been to and worked with.

A I've done five or six tanker casualties. The only one -- and I've done those around the United States and abroad, the Persian Gulf, Gulf of Mexico, Hawaii. One in Alaska, and it was a tanker striking a rock, was at Glacier Bay, out in Cook Inlet in 1987, which hit a rock and then floated off on the tides you have in Cook Inlet before I got there, but we did emergency discharge of the ship, and --

Q Now, have you done any writing in the area of casualties, salvage?

A Yes, I've done quite a bit of writing in the area. I've written roughly ten articles that have been published in the United States and Great Britain on -- in the professional press -- on casualties and salvage. I've done about roughly the same number in other areas. One of these articles was an article on essentially what to do after the ship is aground and before the salvos arrive.

I've also, for the last two years, been the technical director of a project to rewrite the U.S. Navy Salvage Manual, which is a six-volume set of how to books on salvage. It's about half done. We've done the volume on strandings and the one on sinkings.

Q Have you done any other work for the U.S. Navy,

as far as publications?

A Yes. I'm involved in the publication of a Salvage Engineer's Handbook. I've worked on the U.S. Navy, and contributed to the U.S. Navy diving -- sorry, damage control manual. The Salvager's Handbook. And I have written some directives for them on how salvage operations should be handled and managed.

Q How about any group memberships?

A I'm a member of the Society of Naval Architects and Marine Engineers; the American Society of Naval Engineers; the Nautical Institute, which is a British organization; the Society of Underwater Technology, which is also a British Organization; and the Marine Technology Society, of which I'm the chairman of a group of professional committees.

Q Have you been asked to testify in the past?

A Yes, I have. I've testified in -- oh, Alaska, Washington, Texas, California, Louisiana.

Q Can you give the jury an idea of what type of cases those have been?

A About half of them have been salvage and salvage-related cases, one involving an incident in Dutch Harbor, in which a processor broke loose from her moorings, and was rendered salvage assistance by two fishing boats.

Another where a ship grounded in Kiskah (PH) and

was rendered some salvage assistance, again by fishing boats.

Oh, two drill rigs that were casualties. The remainder were diving cases.

Q Now, when were you asked to provide your services in this matter?

A In August of this year -- August of 1989, last year.

Q And did you enter into a contract with the state of Alaska for your services?

A Yes, I did.

Q Would you explain that to the jury, what that contract entailed?

A Well, it was a contract to do as I said earlier, to look at the documentation and material relative to this, and to use my expertise in evaluating the casualty that occurred, and the action that was taken after the casualty.

Q And what was your rate per hour?

A My rate per hour is $90.00 and in circumstances involving actual testimony or being on burning ships or casualty, it has a 25 percent premium on that.

Q What information did you evaluate? Did you receive any information in this matter?

A I received a stack of paper that was somewhat over two feet high in this matter.

Q And did you review that?

A Yes, I did.

Q Would you tell the jury in particular, were there any areas that you, in the paperwork, that you paid particular attention to?

A If I may refer to my notes so I don't miss anything. I looked at all the NTSB testimony and the exhibits that went along with that. The interviews by the Alaska State Troopers. The Grand Jury testimony. The characteristics of the ship, the bell log, the maneuvering characteristics, chart -- course recorder.

I looked at the salvage documents, loading and damage data, and transcripts of taped conversations between the Exxon Valdez and the Coast Guard Vessel Traffic System. And I also used a -- I did -- I did _____ the analysis of the tape, course recorder tape, from these people at King's Point. And I used a lot of reference material from my own library.

Q Did you have any conversations with a gentleman by the name of Mr. Leitz?

A Yes, I did. I had a telephone conversation with Mick Leitz, in which we discussed the salvage operation.

Q Who is he?

A He's a salvage master that lives in Portland and was the salvage master during the Exxon Valdez refloating.

Q And do you know him personally?

A Yes, I do.

Q And what did you discuss with him?

A Again, I'll refer to my notes to be --

(Pause)

We discussed the conditions that he found on board, and what he did on board the vessel, and the salvage -- generally, what was done during the salvage operation on the vessel.

Q Now, did you end up going and visiting the Exxon Valdez?

A Yes, I did. I visited the ship on 7 September.

Q And why did you go there?

A I was asked to go there by your office to look at the -- look at the damage, and to familiarize myself with it, and see if I could add to the evaluation of the damage.

Q And after reviewing that damage, and using your own experience, do you have any opinions about how that damage occurred?

A Yes, I do.

Q Could you explain that for the jury?

A The damage was typical of the damage one sees on ships that lie aground on rock in that there was plating. It was upset -- and by upset, I mean dented and torn, badly scraped from the stem of the ship, the _____ most

part, to just _____ to the pump room bulkhead, well -- well after the ship.

Q Let me -- if you would, I'll hold up the model here. Maybe you can indicate to the jury --

(Pause)

A The damage started in this area of the ship on the starboard side, went mostly along the bottom and aligned at curves just about 5 degrees from straight back and extended back to -- oh, right about in here. That was the last -- last markings.

It varied throughout in intensity. Some of it was quite bad; there were holes. Two cases of a rock still in holes. In the mid-ship's area here, I just sent it right around bulkhead 23. The ship's structure just simply no longer existed. The ship's plating was no longer there, and there were large holes.

The longitudinal members, structural members, were twisted, oh, as much as 90 degrees.

Q Now, before you -- what is a longitudinal?

A It's a structural member that runs the length of the ship, and it's one of the primary structural members in the ship.

Q Where would it be running on the bottom of the vessel?

A Oh, they run very relatively close spacing, all

along the bottom of the vessel, inside the plating.

The damage in that area, because of the way the hull was set up, indicated that the hull was crushed, and that the ship had sat down very hard on that area, and it's --

Q And that was in the area of where?

A That was in the midship's area around the bulkhead 23, maybe a hundred feet on either side of it, maybe -- eighty to a hundred feet on either side of it, I'd say.

Q Can you give the jury an idea -- do you have an opinion as to how the vessel was -- how that came to be caused?

A Yes. I think the vessel came over a rocky area, passed completely over it, continued for a short distance, and then came to rest, grounded on an area along the starboard side, and extending over just to about amidships.

Q Did you -- why do you say that it passed completely over the first rock?

A Because the damage extended well past the area where it was hard grounded, and in fact, ended in the -- near the stern of the ship, near the pump room.

Q And can -- do you have an estimate as to how long that process would have taken?

A It's impossible to say exactly how long that

process would take, because one of the things that happens as a ship grounds is the speed decays, the speed slows down. And that process is impossible to predict, because there are other things happening at the same time that affect it.

But to move that far, it would take just about two minutes for the ship to move that far under the average speed it would have had to be moving at.

Q Now, do you see any evidence of -- well, before we get to that, I'd like to talk about something else. What does it mean to ground a vessel?

A Can I draw a picture on that?

Q Yes.

A Okay.

(Pause)

When the ship is afloat and in the water, it's completely supported by the force of buoyancy, and the force of buoyancy, which is -- comes from the surrounding water, is exactly equal to the weight of the vessel.

When a ship grounds, if it grounds high and dry, as sometimes happens so that it's completely out of the water, the -- and it's sitting completely up on the land -- the land supports the vessel, and it completely supports the weight of the vessel.

When a ship grounds as is the more normal case so

that it is partially supported by the water and partially supported by the land --

(Pause)

-- that being the land that the vessel is resting on, it's partially supported by the buoyancy -- it's own buoyancy and by the -- and by the ground. But the combination of the two, the buoyancy and what we call the ground reaction is exactly equal -- again, exactly equal -- to the weight of the vessel.

Now, the weight of the vessel -- the vessel in this condition still has a water line, because it's still in the water. But this water line is below the water line that the ship would normally float at, which would be up here somewhere. The area between those two water lines -- or the volume between those two water lines, actually -- represents the lost buoyancy of the vessel, and is exactly equal to the ground reaction of the vessel.

Q Now, what, again, is the ground reaction?

A The ground reaction is the amount of the weight of the vessel that is supported by the ground, and it's the amount of buoyancy that the vessel has lost in grounding.

Q When a -- what causes a vessel to stop?

MR. CHALOS: Objection, Your Honor. You can turn the engine off. Any number of things can cause a vessel to stop.

THE COURT: That may be true, but we'll let the witness answer that question. Objection overruled.

THE WITNESS: Well, I'm going to answer that question where a vessel is grounding. When a vessel grounds, several things happen to it. It's bodily lifted, and it stops. The stopping is generally caused by the friction of the vessel on the bottom.

BY MR. COLE: (Resuming)

Q And what has to be overcome before the vessel comes to a stop after a grounding, after an initial contact with the bottom?

A Well, the momentum of the vessel has to go from whatever it is, which depends on the size of the vessel and the speed at which it's travelling to zero.

Q Can you give the jury an idea of how the type of bottom that a ship grounds on affects the damage that is done?

A It's -- the damage that's done is a direct result of the hardness of the bottom, and what the bottom is composed of. If a ship grounds in soft mud, it will generally just mush into it, and since the mud is much softer than the seal of the vessel, there's usually very little damage to the vessel.

If it grounds on sand, depending on the consistency of the sand, there's very little damage to the

vessel. There's sometimes, if it's very hard sand, there will be some upsetting or indenting of a plate, seldom enough to tear it, unless the -- unless there are rock or coral formations in the sand.

On coral, it depends on the age of the coral. young, soft, living coral is not as hard as old, hard coral. Old hard coral is very much like rock. Rock is really the worst thing to ground on from the standpoint of the damage to the vessel, because it's more likely to severely indent or tear the bottom.

I don't believe I've ever seen the bottom of a vessel torn unless it grounded on either rock or coral.

Q What about after the grounding? What's the possibility of immediately refloating a vessel, depending upon what a vessel grounds on?

A Well, that depends on a number of conditions: how hard the vessel is aground, what the vessel is aground on, and how it's aground, how it lies. It would be very difficult to quantify. There's a possibility of refloating without -- it's impossible to quantity it without knowing more about the condition of the grounding.

Oftimes a ship in -- oh, down in the Mississippi, or in an area like that, where there's a soft bottom, is able to just nose into a mud bank and back right off again.

Q Do the actions that you take as a salvage master,

or skipper, depending on the type of bottom that a vessel has grounded?

A It depends on -- yes. It varies with the type of bottom and the type of ship.

Q Now, I would like to talk a bit about what the procedures should be of a master after a ship has been grounded. What should a captain do?

MR. CHALOS: Your Honor, I object. No foundation. Aground in what type of bottom? How grounded? Is it grounded by the bow, on th stern? There are so many factors that have to be laid out before --

THE COURT: Mr. Cole?

MR. COLE: Judge, he's just being asked his general recommendations. I think there are certain things that you should always do, and I'm just exploring that area.

MR. CHALOS: And I would further add, Your Honor, that Mr. Milwee, I believe, is an expert on salvage operations, but I don't think he's been qualified as an expert captain. I don't think that foundation has been laid, either.

THE COURT: Lay a little bit better foundation for this type of answer on what a captain should do.

BY MR. COLE: (Resuming)

Q Well, as a salvage master, are you -- are there

certain things that need to be done in order to allow you to do your job as a salvage master?

A Yes. One of the first things you must do in any grounding is to determine the condition of the grounding, and determination of condition of the grounding should be made before any salvage attempt is made.

Q And how does one do that?

A Well, the first thing to do is take soundings all around the vessel, to determine how the vessel lies on the ground, how much of it is actually resting on the ground, and how hard she is resting on the ground. From these soundings, it's a very simple calculation to determine the ground reaction and the amount of weight of the vessel that is supported by the ground.

Q Is it important to know the -- for instance, the damage done to the vessel?

A Oh, yes. It's very important to know the damage done by the vessel.

Q Why?

A Because to refloat a vessel with extensive damage is extremely dangerous. It may result in a loss of the vessel.

Q What does -- what do you use to ascertain the damage?

A When it's possible, an inspection of the damaged

area should be made. If it's not possible, because of cargo or material in the ship, soundings should be taken -- that's essentially measurements of the depth of water inside the various hulls to determine if there -- if there is leakage coming in through the outside, and how bad it is.

In the case of a tanker, one of the best indications of damage is, is there a loss of cargo.

Q What needs to be done as far as the crew?

MR. CHALOS: Objection, Your Honor. There's no foundation that this gentleman has expertise as to what a captain would do on the ship with his crew. Unless he's asking what should be done with the crew after he comes on board when the vessel is being salvaged.

THE COURT: Mr. Cole?

MR. COLE: Your Honor, I think he can testified as the salvage master as to what he regards as the important things he should take into consideration.

THE COURT: I don't think he's been qualified in that area, Mr. Cole.

MR. COLE: Well --

THE COURT: The objection is sustained.

BY MR. COLE: (Resuming)

Q Well, when you come aboard, let's say that you got there a very short time after a grounding, and you were

-- what would be your first priority?

A I've been in exactly that -- that circumstance, where I have come aboard groundings immediately, and there's been no one else around other than the crew. My first priority is to insure that the ship is secure, and that the crew is secure. And by secure, I mean to determine the extent of the grounding and I use that crew -- working through the master -- of course, to assist me in determining the extent of the grounding, and also make sure that if the situation worsens for some reason, that we've got a way out of there, that the proper safety measures have been taken.

Q When you say secure the crew, then, what do you mean?

A Essentially, ensure that measures have been taken from their safety, that boats are rigged, everybody's got the proper survival gear, and it is -- they're ready to use it, and that fire protection methods, measures, have been taken. And usually that measures -- measures have been taken to prevent any further deterioration of the ship, if the ship is in an extremely hazardous condition.

Q What about communicating with authorities. Is that something that you would do?

A It should have been done by the master immediately upon grounding, but I would certainly

communicate with whoever I'm representing on the case.

Q When you come on a vessel immediately after a grounding, what type of options are open to you?

MR. CHALOS: Objection, Your Honor. I think the testimony is that that happened once. We don't know how quickly he came on after the grounding, but I think Mr. Cole is asking generally what's available when he comes on board in a grounding. I think the testimony is one specific incident, and whatever options were available then, certainly he can testify to. But not generally.

THE COURT: This witness can give his opinion in general. Objection overruled.

THE WITNESS: Would you repeat the question, please?

BY MR. COLE: (Resuming)

Q When you come aboard tanker vessels -- and let's say, for instance, you were on it immediately after the grounding -- what options do you have available, as far as action that can be taken?

A Again, the first -- the first necessary action is to determine the condition of the grounding by taking soundings, perhaps getting the sounding float out, getting -- wants to get a boom out, also around the vessel and contain the -- any cargo that may have spilled. And in doing that, you use whatever resources are available.

If the crew is the only resource available, you use them. If you have a salvage crew, or crew that you bring in from ashore, you use them, too.

Q Now, do you -- from your experience has it been that you say, for instance, check the hulls, broken hulls, the engine room, the pump room, to make sure that they're --

A That's right. That's right. You check all the spaces on the ship, not just the spaces where you know that there's damage indicated.

Q After evaluating the evidence that you have in front of you, what are your options then, at that time?

A When I come aboard the vessel, and I'll start to -- make an evaluation, my first -- my choices are, after I determine how I lie on the ground and what my conditions are, I just start to develop a salvage plan, and to determine if I'm going to refloat the vessel.

Probably the first thing to get out of the way is to determine if it's practical, or possible, or reasonable to make an initial refloating attempt using the ship's engines and whatever tugs I may have available. Or if I should just put that option aside and wait for it to rock and lighten the vessel, or bring out heavier gear to drag the vessel out, back afloat.

Q What type of risks are associated with

immediately trying to refloat the vessel?

A If the vessel is badly damaged, there is risk that the vessel may sink, that you may put the crew in the water, that you may have additional pollution, or that you may strike something that you don't know about when you -- as you refloat. It's absolutely vital to determine, determine the conditions before you do anything, and to have knowledge of what you're about to do before you do it.

Q What would be the risk of not attempting to refloat a vessel after a grounding?

MR. CHALOS: Your Honor, I object. _____ foundation has been laid. Again, what circumstances are we talking about?

THE COURT: Objection overruled. This witness may give a dissertation in general on this subject. He's been qualified.

THE WITNESS: It depends on the condition of the grounding of the vessel. If the vessel is grounded -- oh, on a sandy beach, sandy, moderately sloping beach in a surf, it's an extremely dangerous situation to the vessel, and one in which a refloating attempt is often justified immediately, without some of the knowledge that you would have otherwise --

BY MR. COLE: (Resuming)

Q What makes that situation dangerous?

A If the ship is -- lies in directly facing the surf, it's a very good chance that she is going to rotate so that she's broadside to the beach., and on a sandy beach, the surf coming in will generate very high currents around the ends of the vessel that will scour the sand out from the vessel, and around the ends of the vessel, so that she's supported only in the middle. And a vessel will break very quickly like this.

The Arco Alaskan, out on St. Paul Island in '87 is an example of exactly this type of -- this type of casualty. She grounded on a Friday and broke on Sunday night, and she was broadside to the beach.

A ship like that may -- or on that type of beach, in the surf, may pound very hard, and do herself additional damage, hull herself even more. A ship aground on rock is better left alone, until other -- other measures can be taken, because she'll ride heavy on that rock and stay there, but if you try to move her in an initial refloating attempt, there's a possibility of doing additional damage to the ship. Coral, the same as rock.

Q Now, when you reviewed the evidence in this matter, do you have an opinion of what Captain Hazelwood was attempting to do with the throttle and the rudder after the Exxon Valdez was grounded on March 24, 1989?

A Yes. I believe he was attempting to refloat the

vessel.

Q Why do you say that?

A Because he used a full bell and considerable rudder. He essentially was doing -- seemed --

Q What did you say? A full bell?

A A full ahead. A full ahead on the engines at his maneuvering speed. He was using a lot of force to -- to disturb the vessel, which is exactly what you do when you try to refloat a vessel, is you try to disturb its position, so that it will move. He did this on the rising tide, which is exactly the way that you would do to refloat a vessel.

Q Why do you -- why do you say that?

A Because, as the tide rises, this water line comes up closer to the original floating water line of the ship, and the ground reaction is reduced. The ship rests more easily on the bottom. And Captain Hazelwood said that he was attempting to refloat the ship.

Q Did you rely on statements that you heard from Captain Hazelwood?

A Yes, I did.

Q Why would his actions -- do you have an opinion on whether or not his actions were inconsistent with attempting to keep the vessel on the reef?

A Yes, I do. I do not think they were consistent

with attempting to keep the vessel on the reef because it was too much force he used, and -- but most telling to me is that he stopped doing this at 17 minutes before the water was at the highest, when the ship was resting most likely on the ground.

If it had been necessary to do that, and to use that much force to keep the ship on the reef, he would have had to continue that during the high water, and well after the high water, until the ship was resting as it was an hour or two hours before.

Q Maybe you can explain that concept by referring to Plaintiff's Exhibits Number 123 and 124.

(Pause)

A This is a representation of the tide, and -- as it rises, as it rose and fell on the night of -- I think I've got the right one here -- (inaudible) -- this would be it. March 23rd.

Q Is this the evening of March 23rd, of the --

A Well, this is early in the morning of March 24th. It was -- high water was at 1:57, just before 2:00 o'clock here. And it -- it was in the period from the time of the -- some time after the stranding until 1:40 that the maximum force was used to, as I believe, to free the vessel.

Coming up on about 17 minutes before high water,

the water is continuing to rise, and the tide may stand at its high water for a period of time, and at -- during that time, the vessel is resting very lightly on the ground -- well, as lightly as it's going to rest.

If it's necessary to use a lot of force to keep the vessel on the ground, that's when you have to do it. Again, the vessel -- the tide began to drop after the high water, and the same conditions that existed in that time before high water exists after high water. As the tide begins to drop, the vessel rests more heavily on the ground, but it goes through that period where it's as light as it's going to be at the time, and where, if you have to use a lot of force to keep it there, you have to do it the whole time, not just part of it. And certainly, you don't stop just before it's lightest.

Q You've indicated the use of excessive disturbing forces. How is the use of the rudder inconsistent with attempting to stay on the reef in this matter?

A Well, the rudder swings the ship, and it disturbs the condition under which the ship lies. If you're attempting to stay on a reef, if you don't disturb it, you make the ship heavy, and you don't move it. You just don't do anything that's going to disturb the conditions under that ship.

Q Can you describe for the jury what action is

being done from 1:00 -- from 12:45 to 1:40? There's a pointer there, if you want to point to that.

(Pause)

A This --

Q You may have to stand just a little bit to the side.

A Yeah. This area in here indicates changes in heading of the ship in both directions. Obviously, in -- as it comes back and forth, and it indicates to me that the rudder is being used in conjunction with the engines to swing the ship back and forth, and to disturb it as it lies on the bottom.

Q Now, is that consistent with going ahead, or trying to get something off the reef, or trying to stay on?

A It's consistent with trying to get it off. It's -- the -- if the ship were -- if there were conditions existing that made it necessary to keep the ship on the reef, it would generally just drop off in one direction, and there would be a response to it, to hold the ship as steady as possible, not -- not to wiggle it.

Q If you had rock and you had the tanker, and you were worried about your tanker coming off that rock, how would you turn your rudder, and how would you use your throttle to stay on that reef?

MR. CHALOS: Objection, Your Honor. Does that

purported to be the grounded position of this vessel, or is Mr. Cole just asking about that example --

THE COURT: It's a general question, using that example.

MR. CHALOS: Then I object to the foundation, Your Honor -- and relevance, really.

THE COURT: Can you understand what that picture is?

THE WITNESS: Yes, sir.

THE COURT: All right. If you can answer the question, go ahead. Objection overruled.

THE WITNESS: The rock is holding -- holding the ship at some point, and the ship may be able to rotate. Now, would you repeat the question, because I got -- I'm lost on this.

BY MR. COLE: (Resuming)

Q If you felt that there was a chance, or you had a problem that would -- that was going to cause your ship to come off that rock, how would you take that action to prevent it?

A You would see what that problem was doing to you. If you had a current that was -- that was acting to rotate you away from that, you would -- you would use just as little engine and rudder as necessary to hold the ship in position.

Q So it's literally a turning into?

A Well, in this case, you would turn the head to starboard, just _____ the stern to port, and keep it -- keep it hard up on the rock.

(Pause)

Q How would you use your anchor, if you were concerned about keeping a vessel on the reef?

MR. CHALOS: Objection, Your Honor. No foundation.

THE COURT: With the same qualifications as before _____.

THE WITNESS: You would put your anchor in the water with a -- the scope would change, depending on the depth that your bow and the type of bottom.

BY MR. COLE: (Resuming)

Q What about using the rudder commands to change -- to cause your ship to move back and forth to determine what kind of bottom you have underneath you? Is that a good way to use your rudder?

A It certainly is not, because your -- and particularly if you're on rock, because you're not going to do anything but just wiggle that thing and grind it back and forth on the bottom.

Q If you are sitting on a rock, and you're going back and forth, what is happening to the bottom of the

vessel?

A Right. You're grinding the two surfaces together, just like -- well, if you take an orange and squeeze it, or you take -- take your foot and just rub it back and forth on the deck. You're grinding the ship on that rock. And you're going to stand a very good chance of doing additional damage to it.

Q And what about if you are unaware of other areas that have rock while you're going back and forth like that?

A You're likely to bump into one. You certainly shouldn't do it. You shouldn't attempt to move that ship in any way until you have a knowledge of the water that lies immediately around the ship, the way the ship lies on the ground, and the water that lies in the direction in which you intend to move it.

Q After a grounding, what is the general rule that you should abide by before taking any action?

A Find out what you got.

Q And now, Mr. Milwee, you've given us your opinion on what you believe Captain Hazelwood was attempting to do after the Exxon Valdez was grounded. I'm reading you the definition of recklessly in the state of Alaska.

"A person acts recklessly with respect to a result or to a circumstance described by a provision of law that finding an offense when that person is aware of, and

consciously disregards a substantial and unjustifiable risk that the result will occur, or that the circumstance exists. The risk must be of such a nature and degree that disregard of it constitutes a gross deviation from the standard of conduct that a reasonable person would observe in the situation."

Do you have an opinion on whether or not Captain Hazelwood acted recklessly in attempting to remove that vessel from the reef on March 23, 1989?

MR. CHALOS: I object, Your Honor. This gentleman has not been qualified as a tanker master, or having knowledge of what a tanker master should or should not do. On that basis, he can't give an opinion as to whether Captain Hazelwood acted reckless. All he can give an opinion on is what he saw from a salvage standpoint.

MR. COLE: Your Honor, he is a salvage captain. He evaluates tanker captain's actions, and that's what he makes decisions on is salvage plans. He should be able to give his opinion on that action.

MR. CHALOS: I don't think there's been any testimony, Your Honor, that this gentleman evaluates tanker captain's actions.

THE COURT: Objection overruled. The witness may give his opinion.

(TAPE CHANGED TO C-3649)

THE WITNESS: Yes, I have such an opinion.

BY MR. COLE: (Resuming)

Q Will you tell the jury what that opinion is?

A I think it was reckless, because Captain Hazelwood did not have enough knowledge of the situation to make the decision to make a refloating, immediate refloating attempt. He knew that he had a badly damaged ship. He had enough information to know that he should stay there, but he didn't have enough information to know that he should -- he should refloat.

Q When you say he had enough information to say that he should stay there, what do you mean?

A He probably -- drop of the level in the cargo tanks that was reported to him by his Chief Mate. He had -- he knew that he had severe hull damage. He knew from his knowledge of the bottom, knowledge that anyone going into a certain area had, that he was aground on rock.

That was information that he did not know how he was aground, he didn't know where he was aground. He just simply did not have enough information to make that immediate refloating attempt.

MR. CHALOS: Your Honor, I move to strike. This gentleman can't tell us what Captain Hazelwood knew as to how he was aground, or where he was aground. I don't think there's been any testimony to that effect.

THE COURT: Objection overruled.

BY MR. COLE: (Resuming)

Q And when you say he didn't have enough information to take action to refloat the vessel, what do you mean?

A He had not taking soundings around the vessel. He had not made any attempt to determine how the vessel lay upon the ground. It's just basic information that's needed for attempting to try to refloat a vessel.

Q If you refloat a vessel, how certain should you be, before you attempt to do it, that your vessel will float?

A Dead certain.

Q What do you risk by not being certain?

A Loss of the vessel, loss of your crew, additional pollution.

MR. COLE: I have nothing further.

THE COURT: We'll take our break.

Don't discuss the matter among yourselves or with anybody else and do not form or express any opinions.

THE CLERK: Please rise. This court stands in recess subject to call.

(Whereupon, the jury left the hearing room.)

A recess was taken from 11:36 a.m. to 11:47 a.m.)

THE COURT: You may be seated.

I understand there's a discovery request?

MR. CHALOS: Yes, Your Honor. We received, as part of the discovery, a letter from Mr. Milwee to Sam Adams, dated February 12, 1990. May I approach the bench, Your Honor, and give a copy to Your Honor?

THE COURT: Yes, sir.

(Pause)

MR. CHALOS: As you'll notice, Your Honor, Mr. Milwee renders a pretty extensive opinion in that particular letter, but it makes reference to a letter, or a memorandum, that he received from Mr. Adams on February 2, 1990.

We've asked for production of that particular letter so we can determine what it is that he was asked to do, and what information he was given on which he based his conclusions. The State --

THE COURT: You want the memorandum.

MR. CHALOS: Yes, basically.

THE COURT: Let's hear why not.

MS. HENRY: Your Honor, the memorandum contains attorney work product and contains our view and our theories of the risk that Captain Hazelwood did in his conduct of this case. In addition to that, the memorandum contains a list of the information that we provided to Mr. Milwee, which the defense already knows. We already

provided that independently of this memorandum. And it also contains a list of the requests that we were making of Mr. Milwee to set forth in a report that he was to produce that our request of what he was to do has also been made known to the defense.

So the only other thing in my view in this memorandum, other than those two areas, is work product. If I can approach the bench, I'll provide it to the Court.

THE COURT: Please.

(Pause)

Give me just a minute to read it, please.

(Pause)

So the portion here that sets forth the view of Mr. Adams, Mr. Cole, retired tanker Captain Bob Beevers, Mary Ann Henry, and State Trooper Sergeant Jim Stogsdill, it's that portion of the letter that you object to as work product, setting forth what your opinions are to this _____?

MS. HENRY: Yes, Your Honor.

THE COURT: As far as the rest of the letter, you have no problems, correct?

MS. HENRY: Yes, Your -- I have no problems as to the rest of the letter. That's work product. It was just my view that we already provided most of that information in separate documents. So.

THE COURT: What is objectionable about setting forth your views to this memorandum to the witness? That doesn't seem to be any kind of surprise. I'm sure that it's consistent with the opening statement that's been made by Mr. Cole, and the tenor of the testimony so far.

What's so surprising about this, or something that you want to keep confidential that hasn't already been disclosed in opening statements and through examination of witnesses?

MS. HENRY: Your Honor, I don't believe our entire theory of the case and discussions that we had over the last eleven months about our theory of the case, which did evolve and change, is something that the defense has a right to know.

THE COURT: I disagree. I'll order production of the letter to Bill Milwee from Sam Adams, dated February 2, 1990, subject: expert analysis, and you already have the February 12, 1990 letters. You can have that back.

Is this a copy of it, Ms. Henry?

MS. HENRY: That's a copy that can be provided.

THE COURT: Okay. Then this is okay if we give this one then? You don't need a --

MS. HENRY: Yes, that's fine.

THE COURT: Okay. That doesn't mean that what's contained in here is necessarily admissible before a jury.

This is just a discovery.

We'll take a recess and come back in about five, six minutes.

THE CLERK: Please rise. This court stands in recess subject to call.

(A recess was taken from 11:45 a.m. to 12:02 p.m.)

(Whereupon, the jury enters the courtroom.)

THE COURT: Mr. Chalos?

CROSS EXAMINATION

BY MR. CHALOS:

Q Good morning, Mr. Milwee.

A Hello.

Q You're here under contract to the state, are you not?

A That's correct.

Q How much -- how much is your contract for?

A The maximum value of my contract is $25,000.00.

Q Have you billed the State?

A I have.

Q How much have you billed them so far?

A I'm not -- I'm not dead sure. It's under $5,000.00.

Q Do you expect to bill them more?

A Yes, I do.

Q Do you expect to bill them up to $25,000.00?

A I doubt it.

Q What do you think you're going to bill them before this is over?

A I don't know exactly. I've been in Anchorage for ten, eleven days now, so it will be probably another nine, ten thousand dollars, at least.

Q Plus your expenses?

A Plus expenses.

Q Now, you're not a ship's master, are you?

A No, I am not.

Q You hold no licenses issued by the Coast Guard?

A No, I don't.

Q You don't have any engineering licenses issued by the Coast Guard?

A No, I don't.

Q You've never commanded a merchant ship, I take it?

A No, I have not.

Q Now, have you ever been on a ship that's gone along and all of a sudden it grounds?

A No, I have not.

Q You said that --

A That's not totally true. I have intentionally grounded a ship, but that was part of a salvage operation.

Q Why did you intentionally ground a ship?

A Because it was the safest thing to do with the ship at the time. We wanted to grind it -- grind it; ground it so that we could secure the ship and salvage it.

Q In other words, in that case, you wanted to make the ship more secure?

A That's correct.

Q And you ran it forward, I take it?

A That's correct.

Q Onto something?

A Onto a sand bar.

Q Now, you said you had been on one ship where you came on shortly after the grounding, is that correct?

A No, that's not correct. I have been on ships where I came aboard shortly after the grounding. I have been on several in that situation.

Q How quickly after the grounding was the quickest you've ever been on?

A Probably six or seven hours.

Q By then, all of the initial decisions by the master had been done, had they not?

A Usually.

Q And no doubt by then the vessel was secure in whatever fashion was secure at that time?

A Usually they required additional action to make

them totally secure.

Q Now, with respect to the Exxon Valdez, you didn't see the ship out at Bligh Reef. I take it?

A No, I didn't.

Q And you didn't see it at Naked Island?

A No, I didn't.

Q Just a little bit about your experience. You said you've been involved with tanker groundings before. How many of those tanker groundings involved a rock bottom?

A As I stated, the only one that I have been involved in that hit a rock was at Glacier Bay out at Cook Inlet.

Q All right. And by the time you got there, the vessel had already been refloated?

A The vessel was refloating.

Q How did they refloat the vessel in that case? Did they back up?

A No, it was tide rise.

Q The tide took it up, and refloated it?

A That's correct.

Q She was holed, wasn't she?

A Yes, she was.

Q And she didn't sink?

A She was holed in two tanks. She was not --

Q But she didn't sink?

A She didn't sink. There was no way she was going to sink with the amount of damage that was done.

Q Okay. Now, your work as a salvage master is based on accidents, isn't it?

A Marine casualties, yes.

Q An accident happens, a ship runs aground, you're called out?

A That's right. When there's a casualty, I respond to it.

Q Would you agree that groundings happen frequently?

A It would depend on your definition of frequently, and the degree of the grounding. There are major groundings, and there are very minor groundings.

Q They're part of the maritime life, are they not?

A That's correct.

Q Now, in that -- and that can happen no matter how prudent the master is, right?

(Pause)

A It's like any other kind of accident. There's usually a cause for it -- or there's always a cause for it. And it's very rare that a -- that there is not a grounding to -- or there is not a deviation from the norm when there's a casualty.

Q But that's true, isn't it, of every accident.

There's some deviation from the norm that puts you into an accident situation?

A Oh, I'm not really qualified to talk about every accident.

Q Well, if you're acting normally, you would expect not to have an accident, wouldn't you? I mean, using the word "normally" as you use it?

A Oh, I suppose so. It's a matter of semantics, though.

Q You spoke about some of the writings that you've done over the years. You wrote an article that appeared in the U.S. Naval Institute proceedings for March of 1974?

A Yes, I did.

Q I'd like to talk generally about salvage operations, and specifically about your article. Let me approach you, if I may.

On the document that is Exhibit AH for identification, do you recognize that as a copy of your article?

A Yes, I do.

Q And you wrote that article, did you not?

A Yes, I did.

Q And have you read it recently?

A Oh, yes, I have.

Q Do you agree with the precepts that you set forth

in here?

A Just about completely.

Q Okay. Well, in the first paragraph you write --

MR. COLE: Objection. What it the purpose of reading this? Is it to refresh his recollection, to impeach --

MR. CHALOS: Your Honor, I want to know if he agrees with a specific opinion that he expressed in this letter -- or in this article. The title is, "The Ship Aground; the Do's and Don't."

MR. COLE: He can't just read it into the thing. That's improper.

THE COURT: That's hearsay, and the objection will be sustained, unless you can come up with something that -- some exception here. I'm finding a relevance problem here, too, if he just reads something into the record without us knowing what it is about.

BY MR. CHALOS: (Resuming)

Q Mr. Milwee, do you agree that, when a grounding occurs, any grounding, that there's a lot of confusion?

A Usually.

Q And that would be more so in a situation where you have a tanker the size of the Exxon Valdez, at night, at Bligh Reef. Would you expect a lot of confusion at that point?

A I would expect no more confusion there than in the case of any other grounding.

Q But you would expect to see some confusion, at least in the first five, ten minutes?

A Yes.

Q Now, do you agree with the proposition that when a vessel grounds, there's an instinctive reaction to get off?

A Yes.

Q And would you also agree with the proposition that the instinctive reaction is to back up?

A No. It depends on how the ship grounds.

Q Well let's say it grounds going forward, and comes to a stop.

A Well, ships ground going forward in any number of ways. They may pass -- they may ground going directly into a shore. They may ground on a reef or a sand bar. Depends on how the ship grounds and no, I would not agree the instinctive reaction is to back up.

Q Well, let me ask you this, then. Would you agree that the wrong thing to do in a grounding, initially, is to back up?

A Again, it depends on the condition of the grounding and how the ship grounded, and what the master knows about the grounding.

Q Well, in this article, you say, "Perhaps the most common made by the commanding officer of a stranded ship is to attempt extraction by lightering ship and backing ful on high tide."

Now, what do you mean by "lightering"?

A Lightening, not lightering.

Q I'm sorry.

A Making your ship lighter.

Q How do you do that?

A Remove weight from the ship.

Q Such as --

A Cargo.

Q Cargo, ballast.

A Ballast. Any kind of weight.

Q How about in the case of a tanker? How about closing down your IG system? And I'm talking now about a tanker that's been holed.

A That would be an excellent move.

Q To make it lighter?

A No, it would be an excellent move to prevent the loss of cargo.

Q And how about making the ship more buoyant?

A It would depend on the amount of oil in the tanks and the amount of damage that was done _____.

Q But that's another method, if you wanted to make

a ship lighter?

A Not necessarily in itself.

Q Okay. We're going to talk about that in awhile, but -- Now, you had a chance to study the evidence in this case, right?

A That's correct.

Q And would you agree that, at no time after the grounding, did Captain Hazelwood put his engines astern?

A That's correct.

Q So he didn't commit the error that you say is most common in this situation, that is, trying to back up?

A That's correct.

Q Now, would you agree that one of the tasks that a master has is to try and put his vessel, in any stranding, in as secure a position as possible?

A That's correct.

Q And is it your feeling that, when a vessel grounds, under no circumstances should the captain back his vessel up?

A No, absolutely not.

Q Well, in your article, on page 120, did you say this? "In general, the following form the basis for action in most strandings. Unless the weather is dead calm and no possibility exists that the ship can be driven further ashore" --

A Wait a minute. I'm not finding you.

Q Let me come over and help.

(Pause)

A Okay.

Q Okay, are you with me? Starting with "In general"? Shall I start again?

"In general, the following form the basis for action in most strandings. Unless the weather is dead calm and no possibility exists that the ship can be driven further ashore, broach or pound, no attempt should be made to back off. All efforts should be devoted to making the ship secure."

Do you remember writing that?

A If I were writing that today, I might not be so definite about it.

Q Oh, so you disagree with what you wrote back in '74?

A I don't necessarily disagree with it. I would give that some thought, and be -- see if perhaps I've learned something in the intervening sixteen years.

Q Well, let me ask you this. Is it your opinion that the sounder practice, rather than backing the ship up, and trying to get it off the reef in that fashion, would be to weigh the ship down?

A Sound practice is to determine the condition of

the grounding, before you do anything. That's the most critical thing.

Q Well, we're going to talk about that as well, I promise. But at that --

MR. COLE: I object to Mr. Chalos's commentary in the questioning.

MR. CHALOS: I'll try and restrict it as best as I can.

BY MR. CHALOS: (Resuming)

Q Mr. Milwee, did you say in this article, "By far, the sounder practice is to weigh the ship down by filling all tanks from the sea."

A That's a good practice in general. I was not specifically referring in this ship to tankers, certainly.

(Pause)

Q Now, in this article, you also mentioned the term "tons aground."

A Yes.

Q Can you explain for the jury what that means?

A That's the ground reaction that I was speaking of when I drew the pictures up here on the thing. It's another term for ground reaction.

Q Let me see if we can simplify it, because I have a tough time understanding ground reaction. Do you mean by tons aground, or ground reaction, that that is the weight

of the vessel resting on a particular bottom?

A It's the weight of the vessel. It's supported by the bottom, yes. Or the portion of the weight of the vessel that is supported by the bottom.

Q Okay. Did you make any determinations in this case as to how many tons this ship was aground?

A I did, and of course, the ground reaction, the tons aground, varies with the tide.

Q All right. We'll get into _____ detail.

Now, I'd like to refer your attention to some excerpts of a book by a fellow named Graham Danton, called "The Theory and Practice of Seamanship," and ask -- which we marked as Exhibit AI for identification -- and ask you, does this book come out of your library?

A Yes, it does.

Q The excerpts? You refer to it from time to time?

A Yes, I do.

Q You use it as part of your reference work?

A Yes, I do.

Q Have you referred to this book in respect to your testimony here?

A Certainly have. I believe I gave you this.

Q You did.

A Uh-huh.

Q Now, in this particular book, starting with

Chapter 8, and titled "Stranding and Beaching," Mr. Danton gives us thirteen things to be done, after a grounding, does he not?

A Yes, he does.

Q And nine of them are immediate action upon stranding, and four of them are subsequent action. Do you see that?

A Yes.

Q Now. Do you agree with the proposition that the first thing that one does after the vessel runs aground is to stop the engine and put it astern if the tide is falling?

A No, I don't. Not necessarily.

Q So Mr. Danton doesn't know what he's talking about?

A I didn't say that. Mr. Danton has a different opinion than I do about that.

Q Okay. Do you agree with the second opinion that he expresses, which is: "The master much be close to the bridge and the engine room informed."

A Yes.

Q Now, you've read evidence in this case, did you not?

A Yes.

Q You've read the testimony of Mr. Cousins?

A Yes, I did.

Q How about Mr. Kunkel?

A Yes.

Q How about Mr. Kagan?

A Yes.

Q Basically, all the crew members?

A Yes, I think so. All the crew members.

Q Okay. Do you remember testimony to the effect that one of the first things that was done by the captain was to call the engine room to ascertain their condition?

A It was one of the things that was done by the captain, yes.

Q And do you also remember that the engineers were told to sound the void spaces, and to sound the engine room tanks?

A I don't remember the engineers were told that. I remember the engineers did it.

Q Did you read Mr. Bulocki's testimony?

A Yes, I did.

Q Do you remember him saying that?

A I remember him saying that the tanks were sounded, yes.

Q Okay. Do you consider those prudent actions?

A They were correct actions.

Q How about the taking of a fix to ascertain the

position?

A That's a correct action.

Q Good action?

A Good action.

Q Okay. The third thing that Mr. Danton suggests is, "Close watertight doors and make the signal for emergency stations." Do you agree with that?

A That's correct.

Q Okay. The fourth thing is to swing out the boats. He means the lifeboats, doesn't he?

A Yes, he does.

Q Do you remember the testimony in this case that Captain Hazelwood wanted the lifeboats brought down to the embarkation deck?

A Yes, I do.

Q Good action?

A Good action.

Q Now, number five says, "Observe rule 30 of the rules for preventing collisions and show the appropriate lights and shapes." Do you agree with that?

A Yes.

Q Have you heard from anyone, or has anyone told you, that, after the grounding, they lit up their two red lights?

A I don't know whether that was done or not. I

was --

Q Okay. Sixth action, ascertain position of the ship. That was done.

The seventh action, he gives a distress message to be sent to other ships in the area. Do you agree with that?

A Oh, yes.

Q In this case, the Coast Guard was called?

A Oh, yes.

Q Okay. The eighth action that he suggests is, "The master must decide whether to call for tugs to stand by?" Do you agree with that?

A Yes.

Q Do you remember the testimony of Mr. Myers having a conversation with the captain about getting salvage tugs out there?

A Yes, I do.

Q Correct action?

A In this case, it's almost a trivial action because of the nature of the tugs in the Valdez area.

Q Well, that's not Captain Hazelwood's fault.

A That's true.

Q Now, number nine, he says, "If the vessel is damaged, oil pollution may be occurring. This should be reported to the coast radio stations." That was done in

this case, right?

A That's correct.

Q Okay. Now, he says -- now, would you -- he doesn't specifically say it, but would you agree another important action to do here is to ascertain where your damage is, and how you've been damaged, and how much oil you've lost?

A Absolutely.

Q Do you remember Mr. Kunkel's testimony?

A Yes.

Q The captain told him to go below, ascertain where we're losing oil, how much oil we're losing, the rate that we're losing it, and report back to me on stability --

A I think he said, "Go below and see what you've got and check your options."

Q In effect, the same thing, right?

A Same thing.

Q Correct action?

A Correct action.

Q Now, in this, Mr. Danton goes on and says, subsequent action. He says, "The owners' charterer should be informed."

A Well, let's look at what Mr. Danton really says. He says, what should be classed as immediate and subsequent action is very much a matter of personal opinion and

choice.

Q Okay. That's --

A That's (inaudible).

Q That's the master's discretion, at that point?

A Well, I think it's what the master should do immediately, yes.

Q It's his choice, based on what he sees at that time, based on what information he has at that time?

A Uh-huh.

Q Okay.

Now, he puts number twelve as the item -- what he calls the item -- "The ship should now be examined for damage, never forgetting that the force of impact may have called hatches to spring away." Doesn't apply here, but certainly the checking for damages is an important part of it, right?

A Yes.

Q And the last thing that he has on here is, "soundings should be carried out over side and a general survey of the area, weather permitting, will enable the master to assess the best direction to which to try going off." Do you agree with that?

A I agree with that. I think it's location in here is perhaps unfortunate, because I think it's a very, very important thing to do.

Q Okay.

A Because without it, you can't -- you can't make any rational decision about action to be taken.

Q Okay. In the list of thirteen things to be done, some immediate, some subsequent, Mr. Danton lists the soundings as the thirteenth item out of thirteen.

A That's Mr. Danton's opinion.

Q But you don't agree with that?

A I do not agree with it.

Q Okay.

Now, let's talk a little bit about soundings. Would you tell the jury how soundings are made?

A Well, they're -- generally, in soundings on a casualty, you take a weighted line and drop it over the side to measure the depth of the water. You do this at very frequent intervals around the ship in order to get a picture of the profile of how the ship rests upon the ground.

In the case of rough weather, or something that interferes with being able to take soundings in a normal manner, you take the soundings by measuring from -- not from the surface of the water to the bottom, but from the deck edge to the bottom, and then marking it on a profile of the ship. So you're essentially marking this distance, rather than measuring from the water's surface to the

bottom.

Q Mr. Milwee, when you talk about a weighted line, can you tell the jury what you're saying?

A It's a piece of relatively light line with a weight on the bottom of it. So it will go in the water and sink. And it's essentially a plumb line, so it will sink and hang straight down into the bottom.

Q And how does one measure the depth of water when you're sounding, on that particular line?

A Well, if you're taking soundings from the surface, you're measuring -- you measure the depth of weighted line.

Q All right.

You know in this case, from reading what you read so far, that there was a lot of oil in the water, right?

A That's correct.

Q Okay. So we go over to the side with this sounding that you say, we drop it over the side the first time. The line gets coated with oil, doesn't it?

A That's correct.

Q Okay. So the second time we take it and drop it into the water, you can't tell what the depth is at that point?

A And that's exactly why you don't do it that way. That's why you measure from the deck edge, and then

measure --

Q The deck edge to what? To the water line?

A From the deck edge to the bottom, and measure to to you --

Q The bottom of what?

A The bottom of the sea.

Q Uh-huh.

A And then you measure that depth, and plot in on a profile of the ship.

Q Now, would you agree that, with oil spewing out all over the ship, you're not going to get an accurate reading?

A No, you're not going to get a totally accurate reading at any one spot. That's why you take a lot of them.

Q Uh-huh. And would you also agree that one of the ways you determine your draft when you're taking soundings, or determine how you're aground, is to know what your draft is, right? Are you with me on that?

A No. I'm not. You've _____ --

Q Well.

A Back over that one again.

Q You start out with the proposition that you know you're drawing 57 feet, your draft is 57 feet.

A You start out you knew you were drawing 57 feet

when you were afloat.

Q Okay. But now you're holed. Now you're losing oil, you're gaining water. You don't know what your draft is, do you?

A That's correct.

Q Okay. So what good are soundings, if you don't know what your draft is?

A Because you can then determine a profile of the bottom.

Q But if you don't know how deep you're in the water, you can't tell --

A That's exactly what you're trying to determine. That's exactly what you are determining.

Q Let's look at it a different way. If you're on a rocky, pinnacle bottom, right? Which Prince William Sound is? You can take a draft right here, and it could read one thing. You go over here two feet away, and it reads completely different --

A That's right.

Q Maybe it could be twenty feet difference.

A That's right. And then I know I've got a problem.

Q You go back here and it reads something else, right?

A And I know I got a problem.

Q Well, you know you're on a pinnacle bottom.

A I know I'm on a -- on a tough bottom, and it's -- I have some idea about how hard (inaudible).

Q Well, Captain Hazelwood -- Captain Hazelwood knew, didn't he, that he was on a rock pinnacle bottom?

MR. COLE: Objection. Lack of knowledge.

MR. CHALOS: I'll rephrase the question, Your Honor.

BY MR. CHALOS: (Resuming)

Q Based on what Captain Hazelwood was told at the time, and based on the testimony you read, it's fair to say, isn't it, that Captain Hazelwood knew he was aground?

A Oh, yes.

Q And he knew that he was aground in Prince William Sound?

A Yes.

Q And he knew he was aground on a rocky bottom?

A Yes.

Q Okay.

Let's talk about what Captain Hazelwood did know. He knew he wasn't holed on the port side, didn't he? He was told that by --

A He didn't have any loss of cargo on the port side. He had reason to believe he wasn't holed.

Q And he knew that, on the basis of -- of what was

given to him, that he had enough water, at least, right below his propeller and his rudder?

A Say that again, please?

Q He knew that he had sufficient water around his propeller and rudder at that point? Do you remember that testimony?

A I don't believe he knew that. I don't believe he could have known that.

Q All right. He knew -- he knew that he was holed on the starboard side, did he not?

MR. COLE: I'm going to object. We're projecting what he knew, and that's impossible for this person to say.

MR. CHALOS: Well, let me rephrase it.

THE COURT: That's in evidence, Mr. Cole, that Mr. Kunkel told him what was happening with those tanks, and I think that was an inference, is that he knew there was some damage on the right side. So the objection is overruled.

BY MR. CHALOS: (Resuming)

Q He knew that he was holed in the center tanks, and he knew that he was holed on the starboard side?

A That's correct, and that's all he knew.

Q Right. What more would soundings have told him? He knew all that information already?

A He didn't know where he was aground. He didn't

know how hard he was aground.

Q Well --

A He didn't know how he was sitting on the bottom.

Q Again, if he was sitting on a pinnacle rock, and that rock was projecting into the ship, the fact that he may have taken a sounding over the side over here where the rock wasn't wouldn't have told him how far in the rock was, would it?

A Nothing would have told him how far in the rock was, but he didn't make any attempt to determine that, and it's very basic information.

Q You know, I agree with you, if we're talking about a mud bottom, or we're talking about a shoal bottom. But you say the same principle would apply when you have a pinnacle rock bottom?

A It would apply on any type of bottom. It's basic information. You've got to try to determine it.

Q In spite of all the problems that we've just discussed, the oil, and the fact that he didn't know his draft, and he knew certain other information? That's your opinion?

A He knew very little information. He did not try to determine this information, and I think he should have.

Q By the soundings?

A That's correct.

Q Okay.

Sir, just before we leave this subject, the soundings wouldn't have told him how the rocks were impaled in this ship, would they?

A No, they can't.

Q And the soundings wouldn't necessarily, on the pinnacle bottom, tell him how many tons he had aground?

A Give him a pretty good indication.

Q Assuming that the bottom is uniform at that point?

A No, not necessarily.

Q Would the soundings tell him how much oil he's losing?

A No.

Q Would the soundings tell him anything other than what you say may be the general area, assuming that he could get through the oil?

A It would tell him how much -- roughly how much of the ship was resting on the bottom, and by a very simple calculation, it would give him an approximation of the -- how hard the ship was aground.

Q Okay.

Now, just a few more questions about your background. You said you've testified a number of times?

A Yes, I have.

Q How many times have you testified?

A Half a dozen, somewhere -- maybe ten.

Q Have you testified in any situation involving a tanker aground?

A No.

Q Did I understand you correctly, that you looked at the King's Point simulation of this vessel's course?

A Yes, I did.

Q Why did you look at that?

A General background.

Q Did you rely on it in any way, to come to your conclusions?

A No.

Q Now, you mentioned also that you -- you spoke with Mr. Leitz about the grounding.

A Yes, I did.

Q And, without getting into the substance, he basically told you what he did?

A How the salvage operation went, yes.

Q Do you have any problems with what he did to get this vessel off the strand?

A Not at all. Not at all.

Q Do you have an understanding as to how this vessel was lightered and taken off the strand?

A Her cargo was removed, and she was -- the

pressure was put on the tanks to -- where necessary until she was lightened. It's pretty much the standard way to remove tankers. You lighten them and move them. You don't try to drag them on the bottom, and you particularly don't try to drag them on rock bottoms.

Q Okay.

In this particular case, she was refloated on high tide?

A That's correct. It happened to be high tide, yes. It was -- one would normally choose to do it on high tide, because it simplifies some of the other problems.

Q Okay. Now, you saw this ship down in San Diego, did you not?

A Yes, I did.

Q And you saw the damage that she had at that time?

A Yes, I did.

Q All right.

You couldn't tell, could you, by looking at it in San Diego what damage was caused by the grounding, what damage may have been caused by subsequent tidal action, what damage may have been caused by the refloating attempts of the salvors, or what plates may have been cut away?

A Well, no, that's not totally correct.

Q Well --

A The damage caused by the grounding was obvious.

Damage --

Q What damage was that?

A It was the scraping and the upset plate, the torn plate throughout the length of the ship. Damage by the tidal action was also very obvious, because it was -- it was vertically oriented damage in the structure of the ship. Crushing of the hull plate, buckling of structural members, well up into the ship. Damage to the reef. In the salvage attempt, there should have been one, the way the ship was refloating. She brought -- just brought straight up.

That's why you do that, with tankers. That's why you lightened and refloat them that way, rather than trying to drag them. So any damage that was done in an initial refloating attempt couldn't be apparent because the plating that -- where that damage would have occurred, essentially, the shell plating, the hull plating in the grounded area was gone.

Q Could you tell in San Diego, by looking at the bottom of the ship whether there had been any damage done transversely, as a result of using the rudder?

A I didn't see any, but most of that damage I would have expected to appear in the area that was gone.

Q Would you agree that whatever damage this ship suffered occurred in the striking of the reef, other than

the damage that occurred because of the tidal action?

A All that I saw occurred from both the striking of the reef and the tidal action.

Q Now, I'd like to talk a little bit about your opinion that there were two hits. It hit initially, and then it hit again and stopped.

Have you done any plotting to figure out where this ship was at any particular time?

A No, except for the soundings that were taken during the salvage survey, there are no fine grained soundings in that area, that I know of.

Q The sounding -- the soundings that you're talking about now were done during the salvage survey. Have you looked at those?

A I've looked at them. I haven't studied them in great detail but --

Q Do you have a copy in your book?

A Let's see whether I do or not.

(Pause)

I don't think I do.

Q Well, from memory -- from memory, do you remember that in those soundings there was plenty of water aft of the ship, according to the soundings?

A Immediately after the ship? I believe that was. I didn't -- I didn't spend a great deal of, you know, time

on those soundings, because I wasn't greatly interested in the salvage operation, other than just as a matter of general professional interest and --

Q But you do recall plenty of water being after the ship?

A Immediately after the ship.

Q Okay. Now, you say that you didn't plot the ship's course, or speed, on any chart to determine where she might have at the particular time just before the grounding?

A I plotted it, but I just did it as a model of -- as a rough plot, as a matter of general background.

Q And I take it you spoke to Mr. Greiner about his theory of two hits, and the hits lasting about two minutes between them?

A Well, I don't think we talked about it lasting two minutes between them. We talked about it taking a total of about two minutes for the vessel to come to rest.

Q That would depend, I suppose, on what the depth of water was in that particular area as to whether it would take two minutes, or one minute, or --

A Oh, it would depend on the distance, the -- how hard the vessel hit the reef. I would -- how much of the energy of the vessel went into speed decay, how much went into physical lifting of the vessel, how much of it went

into breaking of the rock, but just from the distance that the vessel travelled, it looked like it was about two minutes.

Q But you didn't plot it to make sure that your theory is correct?

A No way to. No way to. The information just wasn't available.

Q All right.

And you've heard the crew's testimony, or you've read the testimony, about the type of action they felt, the type of noises they felt?

A I heard it was bumping and grinding across the bottom, yeah.

Q About 15, 20 seconds, you remember they said that?

A Well, no, I heard a few seconds, but I don't think anybody was that specific.

Q If the crew -- several members of the crew said that we felt vibrations, we felt the vessel rocking, and that lasted about 15 seconds, and we came to a stop, that would be inconsistent with your two-minute theory?

A It would be inconsistent with the vessel travelling the distance it would have had to travel to get damage the length that it did.

Q Well, that's because you assume that the vessel

first hit at the bow and then travelled the whole length.

A Vessels going forward normally first hit at the bow, when they have damage at the bow, yes.

Q You didn't assume any other potential scenario?

A No, and the damage I saw was consistent with what I -- with damage at the bow, first.

Q Did you speak to Mr. Boris about this theory of two hits?

A I don't recall specifically discussing it with him. I might have.

Q Have you seen a letter written by Mr. Boris, dated September 11, 1989, which we marked for identification as AA?

THE COURT: (Inaudible).

MR. CHALOS: I'm going to show him what was marked for identification. I think he knows the letter I'm referring to.

(Pause)

BY MR. CHALOS: (Resuming)

Q Have you seen this letter before?

A No, I haven't.

Q This is the first time you've seen this?

A Yes.

THE COURT: Which Exhibit are you referring to?

MR. CHALOS: AA, Your Honor.

THE COURT: Okay.

BY MR. CHALOS: (Resuming)

Q The first time?

A First time.

Q Have you discussed Mr. Boris the proposition that you, the experts in this case, had to show conclusively that there were two hits on this vessel in order to offer that as a logical explanation as to why Captain Hazelwood did not go astern in this case? Do you remember discussing that?

A I definitely have not discussed that with Mr. Boris.

Q How about with Mr. Greiner?

A No. I haven't discussed that with anyone.

Q Then this is the first time you're hearing that proposition?

A That's correct.

Q Okay.

MR. CHALOS: May I approach the witness, Your Honor?

THE COURT: (Inaudible).

BY MR. CHALOS: (Resuming)

Q Let's talk about tons aground. Have you looked at any schematics of the vessel aground? Specifically, I'll show you what I've marked AG, which is a blow up of

something that you had in your file.

A Yes. I've seen several of those, those schematics.

Q Okay. Do you recall seeing this one here?

A I've seen several that were either that one or close cousins to it, but that's typical of the ones that I've seen.

Q You made certain calculations about how many tons this vessel was aground?

A Yes, I did.

Q Did you base those calculations in part on this schematic?

A Not that particular one.

Q One close to it?

A One close to it.

Q Okay. Let me, if I may -- how --

MR. COLE: Judge, is this being offered for admittance? If it is, I object. I object to him using it.

MR. CHALOS: Your Honor, I just want to ask him how he determined the tons aground on the basis of this schematic, either this one, or one close to it. I've had this one blown up from documents that came out of the --

THE COURT: Did you use this document in making that determination?

THE WITNESS: No, sir, not this particular one.

I used one very similar to it.

THE COURT: You're not offering it as an exhibit, just --

MR. CHALOS: No, just as an illustration right now.

THE COURT: All right. I'll let you go ahead (inaudible).

BY MR. CHALOS: (Resuming)

Q Could you tell the jury how you made the determination of how many tons were aground?

A I -- in the one that I had that were drafts marked on the -- on the particular drawing, they were drafts for the starboard bow, port bow, starboard quarter and port quarter. I used a method of averaging those drafts in which you take means of several times in order to determine a mean draft, or a resultant mean draft.

And from that I multiplied it by quantity known as the tons per inch immersion, which is the amount of weight that must be removed from a ship to raise it one inch, or add it to a ship to increase the draft one inch, and I determined a -- the amount that the ship had raised during the grounding.

That gave me the ground reaction under a particular condition of the tide and the drawing that I had had the -- had the time on it, as this one does, and then I

-- I took that and ran a series of calculations for all -- all states of the tide that existed during the period of the grounding.

Q Let's just stop there one second. At what stage of the tide did you start your calculations?

A Oh, I think it was -- that's the date and time. It was -- soundings were taken between 3:30 in the afternoon at 5:00 o'clock on that date. I took -- I said, well, let's take the mean of that. Let's take the average time and call it soundings at 1615, and high water that day was about 4:09. I said, well, let's just assume it's the top of the tide, and we calculated the ground reaction for that, and then it's just a matter of going up and down a straight line.

Q Okay. So it's fair to say that you started with the tons aground with the tide _____ as its highest?

A It wasn't at the highest that it reached during that period, and it certainly --

Q Well, at high tide.

A -- wasn't at the high _____, but it was high for that particular day. The tide doesn't reach the same height every day.

Q Okay. Now, is it fair to say that this vessel was always aground, no matter what stage the tide was at, whether it was high tide or low tide? She was always

resting on the bottom?

A Yes, _____, it was.

Q Would you agree that this vessel was very hard aground, on the basis of what you've read?

A It was -- it was from hard aground to very hard aground.

Q Was she impaled?

A I don't know that. I suspect that there was rock, if not actually impaling the vessel, there was rock well up into the -- some of the indentations in the upset.

Q Mr. Greiner testified that for this vessel to hit the forwardmost -- or the aftermost point on which it was aground, it would have to move forward, about 350, 400 feet. Would you agree with that assessment?

A It would have to move forward from its initial impact here of three or four hundred feet. Now, this is three or four hundred feet after the stem.

Q Right, and to get to the engine room spaces, it would have to move another three, four hundred feet?

A That's more than that, I think.

Q More?

A I think the the ship's well over that --

Q What do you think?

A Well, the ship's 945 feet long. This is about 480 -- it's about four hundred, five -- almost five hundred

feet.

Q Okay. So in order for the engine room spaces to come up here and hit this portion of the rock, the vessel would have to move forward about 400, 500 feet?

A That's correct.

Q Okay. Now, let me take this now.

You made some calculations as to the number of tons aground at any particular point. How many tons aground did you figure approximately two hours before high water?

A Two hours before high water, it would depend on the height --

Q The reason I'm using two hours --

A Yeah.

Q -- for high water, it would have been about the time that this vessel grounded on that night.

A I --

Q 24th.

A I calculated a figure when she grounded of something around 13,000 tons.

Q 13,000 tons. May I write this down?

(Pause)

Okay. That means that 13,000 tons of this vessel was resting on the bottom.

A That's correct.

Q Okay. And that number, as the tide changed, would get bigger, wouldn't it? As the tide dropped --

A As the tide dropped, it would get bigger. As the tide rose, it would get smaller.

Q Okay.

Now, this 13,000 is based strictly on this TPI formula that you used?

A That's correct.

Q Now, you didn't take into account the fact that there was oil mixing with water, and more -- as the oil was coming out, more water got in?

A No, I didn't.

Q Okay. And that would increase the _____?

A That would increase it.

Q That would increase it.

A Would you agree with it.

Q Would you agree with me that, at the time this vessel was aground, an approximate number of tons aground was about 20,000 tons, given the amount of oil that was going out, and the water coming in?

A I wouldn't agree with you without making those calculations, no.

Q Okay. Do you find the number 20,000 to be whacky, for instance?

A I wouldn't use the term whacky. I just wouldn't

want to put a number on it without doing my own calculations.

Q Okay.

A It would be greater than 13,000.

Q It would be greater. Okay.

Now, in order -- could you explain to the jury what the term coefficient of friction means?

A I think so.

Q (Inaudible).

A No, I'm going to come around there and draw pictures with you.

Q Okay.

(Pause)

A If weight, no matter what it would be, is resting on the surface, and all that weight is acting down and supported by the surface, you can move that weight by pushing on it. We all know that. You have to push on it with a certain amount of force in order to move it along the surface, and the resistance to that, and the amount of force that you use, depends upon the surfaces, surface at its own, and how much friction there is between the surface and the object, and the friction that has to be overcome before that thing's going to move.

So there's a formula that engineers use that says the force is equal to the coefficient of friction times the

weight, so the coefficient of friction is a number that relates the weight to the amount of force that it takes to move that weight.

Q Another way of saying force in respect to a ship would be the thrust generated by its engine, would it not?

A If that's --

Q In other words, that's the way a ship moves, is by the thrust generated by its engine?

A Not always in salvage operations, no. But that's one thing that moves a ship, yes.

Q Okay. Now, the coefficient of friction varies depending on what type of bottom you're on?

A Yes, it does.

Q For sand it's something, for coral it's something else, and for rocks it's yet a different number.

A Yes, it is.

Q What's the coefficient of friction for rock -- rock bottoms?

A It varies. It's quite high for rock, and it varies from about .8 to 1.5.

Q And I think in one of your papers, you -- you put -- you always use 1.5 --

A Well --

Q -- in determining the force necessarily to move the vessel?

A My practice is to be very conservative in this, because I don't want to get caught short with insufficient force to move it.

Q Okay.

A It's not necessarily an accurate determination of the force that's going to be used. It's -- it's a planning figure for operational planning, yes.

Q All right.

A Okay.

Q This is 13,000 tons. Now, this coefficient of friction of 1.5 assumes a fairly smooth rock bottom and a vessel that's not hung up in any way?

A No, it assumes a rock bottom.

Q And a vessel not hung up in any way?

A Not impaled in any way.

Q Okay.

A If it impales, you're not going to move it.

Q All right. Well, that's my next question. If you have an impalement, the coefficient of friction just goes right off the graph, doesn't it?

A Well, it becomes irrelevant.

Q And _____?

A It becomes irrelevant, because you're -- you're working against the rock. If the rock is up in the ship, you've got to move the rock, not -- not simply slide over

it.

Q Okay. That would be the same, also, if you had plate hanging down, hung up on the rock? It would --

A Ah, it would, to a lesser extent, yeah.

Q Okay. Let's assume, for the moment, that this ship, Exxon Valdez, was not impaled, and let's use your number, which you say is 13,000, but it could have been more at the time of the grounding, and use the coefficient of friction of 1.5.

So what you had -- the force that you needed to move this vessel would have been -- would you agree -- 19,650 -- 19,650 tons?

A That's about right.

Q Okay. So even -- even under the minimum circumstances you described -- and, by the way, this number got up, I think you calculated, as high as 50,000?

A But it also got down as low as 4,000.

Q Okay.

A Or less than 4,000, around 3,600.

Q That was at the highest high tide?

A That was at the high tide that existed shortly after the grounding.

Q Again, not using -- not taking into account the fact that oil was mixing with water, and that would tend to raise it?

A No.

Q Okay. That's correct, then? Okay.

So let's, just for calculations sake, say that it would take 19,650 tons to move this vessel an eighth of a inch. Right? Do you agree?

A Any distance at all, yes.

Q Okay.

A I guess an eighth of an inch is --

Q Have you done any calculations as to what kind of thrust this engine would generate?

A Yeah, I did a quick and dirty on it that gave me --

Q What do you mean by quick and dirty?

A -- gave me a very high figure. An approximation.

Q Okay.

A A very _____ approximation, and it gave me -- intentionally gave me a very high figure.

Q What was the figure you came up with?

A Oh, I came up with about 365 tons, which I think is probably about twice, or better, what the engine would actually do.

Q So you think the engine would do about 200 tons?

A Oh, at the outside.

Q Okay. So the best this ship could do -- the best this ship could do, using maximum power, 31,000 horsepower,

is 200 tons, right?

A That's about right.

Q And it had to overcome 19,650 tons of friction?

A There is absolutely no question that this ship could not have moved using its engines alone.

Q No matter what Captain Hazelwood did?

A No matter what Captain Hazelwood did, but Captain Hazelwood didn't take any -- make any attempt to determine that.

Q That's not the question. The question is Captain Hazelwood could have thrown this thing into full, full ahead, which he did, use the full 31,000 horsepower that he had, and the best he was going to generate was 200 tons of thrust. Right?

A That's correct.

Q And even under your scenario, which you're saying could have been higher at that time, he would have to overcome 19,650 tons of friction?

A He would have to overcome a figure somewhere -- he would have to overcome a figure that was greater than the amount of thrust that he was able to generate. That was -- those figures are still a little indeterminate, because the ship was rising, the tide was rising, the thrust was going down. That's the highest possible coefficient of friction for rock.

Q You're talking about an impossibility, aren't you? It was impossible to move this ship with the power that it had, and in the condition she was hung up?

A That's correct.

Q And that would be -- strike that.

(Pause)

Sir, you say Captain Hazelwood couldn't have known how he was aground because you say he didn't take soundings, but we've covered that ground already. Captain Hazelwood, on the basis of testimony you read, knew that he had been holed in ten tanks. He knew that his ship was hung up somewhere. He could tell that, just by using the rudder.

A That's right. According to his statement to Commander McCall, he thought he was hung up astern somewhere.

Q Okay. But he knew -- he thought, at that time, that he was hung up somewhere. Am I correct?

A That's correct.

Q Okay. And it's safe to assume that, if he were making calculations, he'd know that at least one, possibly two tanks, were sitting on the bottom at that point?

A That's correct.

Q Okay. And if he did a real quick calculation that said, "I've got number three tank, number four tank,

aground. I know that my tons aground are going to exceed, by far, any potential thrust this engine has --

A You've lost me completely.

Q Captain Hazelwood would have known that he was aground somewhere, right?

A Yes.

Q And he would have known that there was a certain tonnage aground, whether he knew it was 13,000, or 19,000 or 50,000 --

A Or 50.

Q Fifty.

A He didn't -- he had no idea how hard aground he was.

Q When you say fifty, you're assuming one pinnacle of the ship resting on one pinnacle, right?

A Not necessarily, no.

Q Well, how would he know that it would --

A He could be very lightly aground. He could be just resting very lightly on the bottom.

Q Okay. Let's take your scenario. If that's true, if that's what he's trying to determine, wouldn't one of the things that he would do would be to use this rudder to see how the ship swung?

A On rock? Absolutely not.

Q That's your --

A Attempting to move a ship, aground, on rock, without knowing anything about the grounding condition, is not the thing to do.

Q That's your opinion?

A Particularly a tanker that you can do additional damage to.

Q What -- if he knows that he's got ten tanks holed, and he's concerned about -- about coming off this little pinnacle that he might be on, what does he do in that situation? Does he keep his engines running?

A It would depend on what indication he had of a reason to be concerned about coming off of this, as you phrase it, little pinnacle, but he wasn't on a little pinnacle, and he did nothing to determine what he was on.

Q Mr. Milwee, you'll agree, won't you, that we're talking about a major casualty situation, right?

A Absolutely.

Q And you'll agree that ship's crews are not trained, or geared up, or experienced in major casualty situations? Do you agree with that?

A I would agree that most ship's crews are not experienced in major casualty situations.

Q All right. And will you agree that, in a situation like that, the captain has to make some quick decisions?

A That's correct.

Q And the decisions that he has to make are under the pressure of the moment, the panic of the moment, of the situation as it exists at that moment? Do you agree?

A I certainly wouldn't phrase it like that. I certainly wouldn't say the panic of the moment. I would say they have to be made under a great deal of stress.

Q Okay. Stress is a better word.

Did you read the testimony of Mr. Kunkel when he came up to the bridge at 12:30 and he spoke with Captain Hazelwood?

A Yes, I did.

Q And you remember how Mr. Kunkel described Captain Hazelwood at that moment?

A I believe he said he was calm and collected and --

Q And in command, right?

A Your words -- or Mr. Kunkel's, perhaps.

Q Mr. Kunkel's words.

Now, you have a situation where Captain Hazelwood, under the stress of the moment, in the heat of the moment, had to make certain decisions, and one of the decisions he obviously had to make was to figure out how this ship was hung up at that particular time. Right?

Now, you criticize him, eleven months later, for

using his rudder, but isn't that one of the ways, a quick way, to try and figure out if you're hung up astern, forward, in the middle; if you're hung up on pinnacle?

A With the massive damage that that ship had at that time, using the rudder was not the way to figure out anything.

Q Sir, with the massive damage that this ship had at that time, what other damage could have been done by turning the ship a little bit to find out whether you're aground or not?

A You don't know what kind of damage could have been done, and it's a risk that's not worth taking. You know you've got massive damage. The best thing to do is hold her right where she is, not go wiggling around on a rock.

Q You're a salvage master, right?

A That's right.

Q It's your job to know these things, and to do those things, and to speak about those things as an expert here?

A That's correct.

Q A captain is not salvage master?

A That's correct.

Q A captain has to do what he has to do at that particular time to try and minimize the situation, right?

A That's correct.

Q Okay. You've had eleven months to think about, "Boy, if I was Captain Hazelwood on that night, and I came up to the bridge, and I saw oil all around, the first thing I would have done, is I would have run down and throw my line over the side to see how -- get some soundings right?"

A I've had more than eleven months to think about what should be done in the case of a stranding. I've had about six weeks, I think, to look at any information in this case.

Q Let's talk about the information that you've looked at in this case. Now, before we do that, you don't know what training or experience Captain Hazelwood had in groundings on rock bottoms with this type of vessel?

A Say that again, please?

Q I say, you don't have any idea of whether Captain Hazelwood had any training at all as to handling a situation of this type?

A No, I don't.

Q There's no school, is there, that takes masters, such as Captain Hazelwood, and says to them, "Look, we're going to give you fourteen scenarios and if scenario number twelve comes up, that is night, Prince William Sound, hard aground on Bligh Reef, you'd do one, two, three, four, five, six, eight, twelve, thirteen things?" No school like

that, is there?

A There are no schools like that. There are certainly publications for tanker masters about what to do in groundings.

Q Well, talking about that, I read you two publications, one was yours, and one was Mr. Danton's, right?

A That's two of four publications that I know of in the English language.

Q All right. And, let me give you a third one. It's called "Shipboard Damage Control," by Mr. Bessell, Orel and Livingstone. Do you know this book?

A I've seen it. It's not one I have in my library.

Q Okay. They say, on page 65 --

MR. COLE: Judge, could I see this before he reads it into the record?

(Pause)

THE COURT: Do you one of you folks need to take a break?

MS. : Yes.

THE COURT: We're going to be finished in about ten minutes. Can you wait ten minutes?

MS. : (Inaudible).

THE COURT: We can take one now, if you need to, and we'll come back in about five or ten minutes, and we'll

be back in about five or ten minutes when we come back. We're going to recess at 1:30.

MS. : Okay.

THE COURT: Can you wait for ten minutes?

MS. : Yes.

BY MR. CHALOS: (Resuming)

Q Showing you page 65, Messrs. Bessel, Orel, and Livingston say, "It is evident that prompt action must be taken by" --

MR. COLE: Judge, I mean, what are we doing here? Are we going to --

MR. CHALOS: I'm going to read --

THE COURT: Well, Mr. Cole, you could get an objection in --

MR. COLE: I object to his reading this into the record without a proper foundation.

THE COURT: I hear hearsay was hidden somewhere behind that, but you can make my job a little easier if you'll just make it clear to me what your objection is, Mr. Cole.

This hasn't been given the learned treatise foundation by this witness, if you're trying to read it into the record for that purpose.

MR. CHALOS: Judge, I'm only going to read this sentence and ask him, if, in his opinion, that's correct or

not.

THE COURT: Well, that's what learned treatises are for, and you have to lay a foundation for them, Mr. Chalos, and he hasn't given you the foundation, so the objection is sustained.

BY MR. CHALOS: (Resuming)

Q Mr. Milwee, you say you know of this book?

A I know of that book.

Q And you've read it?

A No, I haven't read it. I've looked -- thumbed through it, looked at excerpts from it, and I haven't read the book.

Q Is -- do you know whether or not this book is used in any naval architecture schools, such as Webb?

A I don't know now, no.

Q Have you seen this in the library of Webb Institute, or --

A I think that book was published long after I was last in a library at Webb Institute.

Q Where did you see this book?

A Oh, Heavens, I don't know. Probably in the year -- at a naval institute bookstore, in the publisher's bookstore, in some marine shop somewhere.

Q Have you had occasion to visit other salvage master's offices?

A Yes, I have.

Q Have you seen this book in their libraries?

A I don't specifically recall seeing it in their libraries.

Q Let me -- if an opinion is expressed in this book that the commanding officer should --

MR. COLE: Objection, Judge.

THE COURT: Mr. Chalos, you're trying to do indirectly what you can't do directly. This -- this witness has not testified that this is a reliable source which he relies upon, and you've got no foundation for it.

BY MR. CHALOS: (Resuming)

Q Mr. Milwee, do you consider this a learned treatise for salvage?

A Well, I don't use it. I have never used it, and I have deliberately not bought it on a couple of occasions, because --

Q Do you know Mr. Bessell?

A No, I don't. I don't know -- I don't know any of the authors of that book.

Q You don't. Is there a particular reason why you wouldn't want to use this book?

A No, I just -- I just haven't chosen to use it.

Q Well, let's get back to the two treatises that we did read, yours and Mr. Danton's that you do rely on.

There seems to be a discrepancy between what you would do and what Mr. Danton suggests, right? Mr. Danton says you should back up; you say, no, never back up.

A No, I don't say nobody -- I didn't say never back up. I says I just don't agree with him that that's always the first thing you should do.

Q Okay. You said there were publications available to ship's masters, so if a ship's master was reading your paper and Mr. Danton's paper, what does he do? You're saying one thing; he's saying another?

A Well, I think he would evaluate what they said, and weight it accordingly. I think he might also, if he were very interested in the subject, might go out and find the other documents that apply, and I think if he were a tanker master, he would go out and find the one that was specifically directed at tanker masters.

Q Is there such a publication?

A Yes, sir, there is.

Q You didn't bring it here today?

A Yes, I did.

Q You have it with you?

A I have it with me.

Q Well, you didn't make that available to us.

A I certainly did.

Q You did? What's the name of it?

A It's "Peril at Sea and Salvage, a Guide for Masters. It's published by the Oil Company International Marine Forum and the International Chamber of Shipping.

Q Okay. What is the name of it?

A "Peril at Sea and Salvage, a Guide for Masters." It should be in that stack.

(Pause)

Q Well, maybe you could point you to it, because I read all the publications --

A I didn't give you the whole thing, if I did. There are just excerpts of it there.

Q Could you point out to me where that is?

(Pause)

A Well, this is a portion of it. This is the proceedings from _____ where it was introduced. (Inaudible).

Q But you didn't give us any of the material. All you gave us was the forward on that?

A I haven't finished going through the material. Here it is. Here it is. Looks like the whole thing, to me.

Q Let me --

A No, it's not the whole thing. It's just the table of contents and some pertinent portions.

Q Okay.

(Pause)

Now, you -- I take it you've read this article? The one that you just referred me to?

A Yes, I have.

Q And would you agree that the premise of the article is that every situation differs? Every grounding situation differs?

A Anyone who has ever been anywhere around a casualty situation knows that every grounding situation differs, and that's why it's very important to get all the information you can.

Q Right. And the situation as it exists is best known by the people who are there? They're the ones who are in the best position to evaluate what the situation is? Do you agree?

A If they take the action to determine what the situation is.

Q Okay.

And in that article, there's a suggestion, is there not, that, depending on the master's discretion, he can try and refloat the vessel, if he desires?

A After full information of the damage has been obtained, and only after the full of damage is in would it be possible to make a good --

Q Just so we understand each other, the thing that

you say that Captain Hazelwood did not do to complete this knowledge of everything that's going on, was take soundings, right?

A That's the primary thing that he didn't do. He did not -- he did not obtain to gain information that was available to him, and he could hasve gained.

Q And again, assuming that the soundings would have told him anything, given the condition around the ship at the time, the oil, and so on and so forth.

(TAPE CHANGED TO C-3650)

But he did do everything else that was required in order to ascertain his position, did he not?

A No, he didn't. He didn't -- one you skipped very quickly over --

Q Which one is that?

A Mr. Danton's book. Sounding the emergency stations and getting the crew up and counting them, available for use, and --

Q Okay. What you're saying is, he should have rang the general alarm, right?

A That's correct.

Q Do you remember Mr. Kunkel's testimony?

A Mr. Kunkel came up and said, "Captain" -- he said he was in -- at a high anxiety, maybe even in a panic situation. He said, "Captain, let's ring the general

alarm. Let's go over here and pull this lever and bring -- get everybody up." And the captain said, "Calm down. I don't want to get anybody excited or panicked here. I've sent the third mate down to wake everybody up." Do you consider that to be imprudent?

A I consider it not to be prudent to sound the general alarm immediately on the PA system and address the situation and to get the people up, with their survival suits, and in a central location.

Q You do recall Mr. Cousins saying that he was sent around to get everybody up?

A That's correct.

Q And that was a conscious decision that the captain made at that particular time?

A Yes.

Q And you're criticizing him for not -- him now, eleven months later?

A I would criticize him eleven months later, or eleven minutes later, or eleven seconds later.

Q But you've never been aground. You haven't been the master of a ship aground?

A No, but I've been in some pretty difficult situations with salvage crews.

Q And, in those situations, did you run over and pull the general alarm?

A I sure made sure I knew where my people were and that they were prepared for the emergency, and I have gotten crews up and assembled and working in the middle of the night when there was an emergency.

Q Do you think Captain Hazelwood had the luxury of making sure every right command that he issued was carried out at that particular time?

A I think that was his job.

Q And you think he had the luxury of time, in order to bring Mr. Cousins back and say, "Mr. Cousins, I told you to go down and get everybody up. Did you make sure you had everybody up?"

A I think that was his job.

Q Do you have any evidence that he didn't do that?

A We have evidence that he didn't get people up and assembled and --

Q No. You have evidence that Mr. Cousins may not have gotten them up. You don't have evidence that Captain Hazelwood didn't get them up.

A He had -- we have evidence that Captain Hazelwood did not sound the general alarm and give what I consider proper instructions in an emergency situation.

Q But you do have evidence that Captain Hazelwood was aware of ringing the general alarm and made a conscious decision at that time not to panic the crew, but to get

them up individually?

A I can't imagine a crew that's sounding the general alarm is going to panic. If they are they're not much of a crew.

Q Well, in one of the treatises that I read that you referred me to, they -- do you recall reading something about not panicking the crew, not telling the crew members to get into the boats, because there's a tendency for them to lower the boats and get into the water before they have to? Do you remember reading that?

A Not telling them to get in -- I wouldn't tell them to get into the boats, no. But I don't think that sounding the general alarm is a cause for panic.

Q Well, Mr. Milwee, did a single crew member on this ship get hurt?

A No.

MR. COLE: Objection. Relevance.

BY MR. CHALOS: (Resuming)

Q Did anybody who's testimony you read here say, "I was frightened for my life, and Captain Hazelwood wasn't doing what he was supposed to be doing?"

A No.

Q Do you remember reading any such testimony?

A No. I read some testimony that said, "I was frightened for my life."

Q That was Mr. Kunkel, wasn't it?

A That was Mr. Kunkel.

Q Right. He came up and he said, "Captain, let's ring the general alarm. Let's put on our survival suits. Let's do this. Let's do that." And do you remember what Mr. Kunkel said?

A Mr. Kunkel said later that it was a measure of his inexperience. I think it was a measure of his good judgment.

Q Do you remember what Mr. Kunkel said after he spke with the captain?

A Which time?

Q He said, "After talking to the captain and taking his instructions, my anxiety dissipated, I was completely at ease, and I went about my business. I went and did what the captain told me." Do you remember that?

A I don't remember it being quite that extreme, all this completely at ease business. If he was completely at ease on a -- stranded on a grounded tanker that was leaking cargo, he was not rational.

Q Well, at ease enough to go about doing his job. Do you remember him saying that?

A Uh-huh.

THE COURT: Mr. Chalos, we're not going to finish this witness --

MR. CHALOS: No _____.

THE COURT: At least one of the jurors want to take a break, and I want to take one now, too.

So let's recess for the day, ladies and gentlemen, and I'll see you back tomorrow morning, 8:15. Remember my former instructions, continuing _____ media information as well as my reminder not to discuss this case _____ with anybody, and not form or express any opinions. See you back at 8:15 in the morning (inaudible).

We'll stay here for a minute. Step down.

(Pause)

THE COURT: How many more witnesses after this one?

MR. COLE: Three.

THE COURT: I thought you'd added a couple or three --

MR. COLE: No.

THE COURT: You've subtracted a couple now? Okay. So the current number is three?

MR. COLE: I think we have a good chance of -- well, I was not going to say it, but I was hoping to say tomorrow.

MR. MADSON: It's never going to happen tomorrow, Your Honor. Never.

We're right now figuring that -- well, we were figuring before that we'd probably finish on Tuesday. We're ready for Wednesday. Now that we're geared up for Wednesday, I don't know if we can move it up or not. We can try.

THE COURT: I'd get geared up for Monday, just in case. If we get finished tomorrow and we have any time tomorrow, we can take up other matters, and we can take up some matters Wednesday morning, if we have to, but --

MR. MADSON: Well, Your Honor, just for my understanding, they have three more experts to go. Is that correct?

THE COURT: Are these experts that you're calling?

MR. COLE: Well, one of them is a trooper. Two of them.

THE COURT: Stogsdill and _____ and somebody else?

MR. COLE: Boris -- actually, it's Prowdy.

THE COURT: Prowdy, I'm sorry.

MR. : Prowdy and _____, right? And then Stogsdill?

THE COURT: Well, I'll do this much. How about if we do this. Let's finish tomorrow. We can use Monday to take care of some motions. You can gear up. We won't

call the jury in. If it doesn't finish tomorrow, then we'll have to have the jury come in on Monday. I'll consider releasing them early, and then we can take up other matters on Monday after the State completes. Is that fair enough?

MR. MADSON: We'll make every effort to be ready for Tuesday then, sir.

THE CLERK: Please rise. This court stands in recess subject to call.

(Whereupon, at 1:26 p.m., the hearing recessed.)

SUPERIOR COURT)
) Case No. 3ANS89-7217
STATE OF ALASKA) Case No. 3ANS89-7218

I do hereby certify that the foregoing transcript was typed by me and that said transcript is a true record of the recorded proceedings to the best of my ability.

Alexandra Tomalonis
ALEXANDRA TOMALONIS

VOLUME 22

STATE OF ALASKA

IN THE SUPERIOR COURT AT ANCHORAGE

In the Matter of:	:	
STATE OF ALASKA	:	Case No. 3ANS89-7217
versus	:	Case No. 3ANS89-7218
JOSEPH J. HAZELWOOD	:	

Anchorage, Alaska

March 5, 1990

The above-entitled matter came on for trial by jury before the Honorable Karl S. Johnstone, commencing at 8:56 o'clock a.m., on March 5, 1990. This transcript was prepared from tapes recorded by the Court.

APPEARANCES:

On behalf of the State:

BRENT COLE, Assistant District Attorney
MARY ANN HENRY, Assistant District Attorney

On behalf of the Defendant:

RICHARD MADSON, Esq.
MICHAEL CHALOS, Esq.

- - -

PRO-TYPISTS, INC.
Professional Transcription Service
(202) 347-5395

C O N T E N T S

- - -

E X H I B I T S

	FOR IDENTIFICATION	IN EVIDENCE
STATE'S		
159		84
DEFENDANT'S		
AK	4	6
AL	4	
AM	4	
AN	107	

- - -

P R O C E E D I N G S

(Start Tape C-3650)

(Defendant's Exhibits Numbers AK, AL, and AM were marked for identification.)

THE COURT: You may be seated.

Are you folks ready for the jury now?

MR. COLE: Yes.

MR. CHALOS: Yes.

THE COURT: Mr. Cole, I can't control volcanos, I can't control influenza, but there is no excuse for you to forget things. So please don't let that happen again. It's -- you've tied up a half an hour of valuable time. Let's get the jury.

(Whereupon, the jury entered the Courtroom.)

THE COURT: Good morning, ladies and gentlemen. I'm sorry we're getting a late start. We'll try not to let that occur again.

We'll resume with the testimony. And sir, you are still under oath.

Whereupon,

WILLIAM MILWEE

having been called as a witness by counsel for the State of Alaska, and having been previously duly sworn by the Clerk, was further examined and testified as follows:

CROSS EXAMINATION (Resumed)

BY MR. CHALOS:

Q Good morning, Mr. Milwee.

A Good morning, Mr. Chalos.

Q You recall when we left off on Thursday, we spoke a little bit about soundings that were taken around the vessel sometime either the next day or the day after that. Do you remember that?

A Yes.

Q And I asked you about the depth of water behind the vessel and you said immediately behind the vessel there was sufficient water. Do you recall that?

A Yes.

Q All right.

Let me show you what has been marked into evidence as Exhibit -- or introduced into evidence as Exhibit 95, and I will show you what I have marked for identification as exhibit AK, which is Exhibit 95 in its normal size. Exhibit 95 appears to have been shrunk a little bit.

Now, taking a look at what I have marked as Exhibit AK and Exhibit 95, can you tell how far back these soundings were taken that indicate there was at least anywhere between 70 foot of water and 120 foot of water?

A Appears to be about 150 feet -- wait a minute, that's 40.

Q Upside down.

A Well, used to looking at the bow at the right. That's the only thing. There's a line indicates this first line of soundings is about 180 feet out and this one is about 150 feet out.

Q And it doesn't appear to have any further soundings to the back of that?

A None further than that.

Q Okay.

But at least from what you can see here to 180 feet out, he's got anywhere between 70 foot of water and 112?

A That's correct.

Q Okay.

MR. CHALOS: Your Honor, at this time I would like to offer Exhibit AK, which is 95 in a bigger form, into evidence. 95 has been shrunk down, it's difficult to read.

MR. COLE: No objection.

THE COURT: Admitted.

(Defendant's Exhibit Number AK was admitted in evidence.)

BY MR. CHALOS: (Resuming)

Q Now, Mr. Milwee, have you looked at any charts to find out -- any detailed charts of soundings to find out where this vessel was at the time of the grounding and how

much water she had behind her?

A No -- no fine grains charts, no.

Q Now, you said on Thursday that one of the things that you believe Captain Hazelwood did wrong was not to take soundings after the grounding.

A That's correct.

Q Where do you get that information from, sir?

A I'm sorry, I don't understand what you've asked me.

Q Well, you've read the testimony in this case, have you not?

A That's correct.

Q You've read Mr. Cousins, you've read Mr. Kunkel, I take it you've read some of the other crew members?

A That's correct.

Q Do you recall seeing anywhere any crew member said that no soundings were taken after the grounding?

A I don't recall anywhere where soundings were taken. And there's no record of soundings --

Q So you're speculating that no soundings were taken?

A -- soundings being taken.

Q You're speculating?

A Yes.

Q Now, you also said on Thursday that you believe

that the captain was trying to get this vessel off the reef by going ahead, is that right?

A Yes, I did.

Q In your career as a salvage master and your Navy career where you were involved with groundings, have you ever gotten a vessel off a reef by going ahead?

A Yes, I have.

Q Straight ahead?

A No, the particular vessel, we took it off forward, but we took it off --

Q On a high tide?

A Of course on a high tide.

Q After you took some cargo off?

A After we took a lot of cargo off.

Q And after you pumped water out of the vessel?

A No, we didn't have -- we didn't -- that wasn't necessary.

Q But in any event, you lightened the vessel before you went forward?

A Yes.

Q And in your career as a salvage master, did you ever get a vessel off the ground by going astern?

A Oh, yes.

Q And that's the prescribed method for getting it off?

A Not that there is no prescribed method for getting a ship off. It's dependent on the particular conditions of the stranding.

Q In your career have you ever kept a vessel on the strand, on the ground, by going ahead until more favorable conditions came about?

A I have not personally, no.

Q But you've seen it done?

A Yes.

Q Now you said also on Thursday in response to Mr. Cole, that the captain used, in your opinion, too much force after the grounding, which you faulted him for. Do you recall?

A I don't think I phrased it quite like that. I said he -- it was indicative that he was trying to get the vessel off because he did use a lot of force.

Q All right, let's talk about a lot of force. Have you done any analysis of the power curves of this engine?

A No, I haven't. I have just done some very rough calculations on that.

Q Do you know what full power -- what kind of horsepower this engine had at full power?

A Yes, 31,600.

Q Do you know what kind of horsepower this engine had at 55 rpms?

A No, not specifically.

Q Well, if I told you that it had 8800 horsepower at 55 rpm, does -- does that in any way comport with your knowledge of slow speed diesel engines?

A That seems reasonable. But I haven't seen the curves for this particular engine.

Q Well, if -- I want you to assume for the moment that 8800 horsepower, 9000 horsepower at the most, was all that Captain Hazelwood used. If your scenario and your hypothesis is correct, wouldn't you think that at some point he pressed a button and let this engine go full ahead if he was trying to get it off that way?

A Not necessarily.

Q You don't think he would do that?

A Not necessarily.

Q Now you know that the captain, according to what you testified, ran his engine ahead for about an hour at various speeds, the highest being full maneuvering speed, or 55 rpms. Do you recall that?

A That's correct.

Q You would -- wouldn't you agree that in doing so for an hour, he realized that he wasn't moving at all forward?

A Would you ask that again, please?

Q Yes.

You know that the captain used his engine for about an hour in the forward direction.

A Yes.

Q And you also know that the vessel didn't move at all on the basis of what we know today.

A That's correct.

Q The captain -- we can assume, can we not, that the captain also knew that at that time? He could see that his vessel wasn't moving?

A Yes. And it's not at all unusual not to move for a period of time like that.

Q Okay.

If in fact the captain was trying to get the engine off, isn't it logical -- I mean the vessel off, isn't it logical that at some point he is either going to use full power or he is going to try and back up? Wouldn't you agree?

A No, I wouldn't, not necessarily at all.

Q Because it doesn't fit your theory?

A No, it doesn't -- it's just not necessarily what would happen.

Q Sir, in those situations where you are trying to get a vessel off the strand, when you went forward and nothing happened, did you back up?

A Not necessarily. It depends on the conditions of

the stranding.

Q But you have done that, haven't you? You went a little forward, didn't go anywhere, you back up a little bit, trying to get it off?

A No.

Q Never in your career?

A No.

Q Even though you have written about that?

A That's true. It's --

Q Okay.

Now, you said that if the captain was in fact trying to get the vessel off -- trying to keep the vessel on the reef, in your opinion he should have kept the engines running up until high tide and a little bit beyond it?

A Absolutely.

Q Did you do any calculations to find out what the difference of tide was between the moment he shut down his engine at 1:40, and 2:00 o'clock, when high tide came in?

A Yes, I did.

Q What was the difference?

A It was trivial.

Q It was an inch, wasn't it?

A I would have to look it up, I don't -- but it was a very small distance.

Q So the fact that he shut his engine down at 1:40

when the tide had maybe another inch to go, wouldn't have made any difference at all, would it?

A Well, if it was necessary for him to keep the engines running to keep on the beach during the rise of the tide for the previous hour, it would also be necessary for him to run the engines to keep on the beach during the fall of the tide and during the stand of the tide at high water.

Q Mr. Milwee, you said you read mr. Kunkel's testimony?

A Yes, I did.

Q Do you recall Mr. Kunkel saying that about 1:15, 1:20, 1:30, the vessel took a list to starboard, and then settled down on the reef?

A I remember him saying it settled. I don't remember what time it was.

Q Well, it was about 1:30. Do you remember that testimony?

A I remember him saying it settled.

Q Okay.

And do you remember him saying to the captain, we're not going any place, and the captain saying, that's right, we're not going any place?

MR. COLE: Objection, your Honor.

BY MR. CHALOS: (Resuming)

Q Do you remember that testimony?

MR. COLE: I object to the form of the question. I don't believe that that is what the testimony was.

THE COURT: Objection --

MR. CHALOS: I'll withdraw the question, your Honor.

BY MR. CHALOS: (Resuming)

Q Do you remember Mr. Kunkel saying that the captain ordered him at that point to be ready to ballast down, sometime between 1:00 and 1:30?

A I remember him saying that he was told to look at his options and look at the ability to ballast down.

Q That's right, that's correct; that's the testimony.

Now is that consistent with somebody trying to get off the reef, if he is looking at an option to ballast down at that point?

A It's consistent with somebody looking at all their options.

Q So you'll agree that the captain at that point was looking at all his options?

A Well, he was looking at his options, yes.

Q Now, you were asked to write a report by the State of Alaska?

A Yes, I was.

Q Specifically by the DA's office?

A Yes, I was.

Q And you did write such a report on February 12th?

A Yes, I did.

Q Let me show you what I have marked as Defendant's Exhibit AB -- AM, rather, for identification. Is that the report you wrote for the State?

A Yes, it is.

Q And this report was written in response to a request that had been made to you in early February by the DA's office?

A That's correct.

Q Was the first written opinion that you gave them?

A Yes, it is.

Q Had you given them any opinion prior to this?

A I don't recall specifically. We probably had talked on the phone about it.

Q Well, let me show you what I have marked for identification as Defendant's Exhibit AL, which is a letter dated February 2nd, 1990, from Mr. Adams, who you know as an Assistant District Attorney --

A Yes.

Q -- to Bill Milwee.

Do you remember receiving that letter?

A Yes, I do.

Q And was it in response to that letter that you

wrote your report of February 12th?

A Yes, it was.

Q Now, you see in the second paragraph of this letter of February 2nd --

A Yes, I see the second paragraph, yes.

Q Are you with me?

Did you render an opinion that in certain circumstances it is appropriate to immediately remove a stranded vessel?

A Yes.

Q And did you also render an opinion that conversely, in some circumstances it is imperative that the vessel remain firmly aground?

A Yes.

Q And did you also render an opinion that it may be necessary to run the vessel at slow ahead to ensure that it doesn't go anywhere?

A Yes.

Q Now, sir, 8800 horsepower, when you have 31,000 available, is akin to a slow ahead, isn't it?

A Not when you ring up full ahead, no. Slow ahead is slow ahead.

Q Well, 55 rpms in terms of the power curve on the slow speed diesel engine is equivalent to a slow ahead or just a little bit higher, isn't it?

A No, I'm not going to agree with that.

Q In any event, you -- in any event, you rendered an opinion here that under some circumstances it may be necessary to run the vessel slow ahead to keep it on the reef, didn't you?

A That's correct.

Q Okay.

Now, in your opinion of February 12th, you said -- you rendered this opinion, didn't you. Stranded vessels usually refloat along the reciprocal of the course on which they grounded. They refloat much less frequently by passing over a reef or a shoal in deep water -- or into deep water. Is that correct?

A That's true.

Q Now what do you mean by stranded vessels usually refloat --

MR. COLE: Judge, I object and ask for under Rule 106 that the whole thing be read. I think Mr. Chalos is taking this out of context and I would ask that he have to read the next sentence.

MR. CHALOS: Well, I'll be happy to, your Honor.

BY MR. CHALOS: (Resuming)

Q Why don't you read your paragraph 4; you wrote it.

A I'll read the entire paragraph.

Q Go ahead.

A Stranded vessels usually refloat along the reciprocal of the course on which they grounded. They refloat much less frequently by passing over a reef or shoal into deep water. Until the conditions of the stranding are known, any refloating attempt is foolhardy. Before defining the way that a ship lies upon the ground and the amount of lost buoyancy, a refloating attempt with engines and tidal rise is a blind attempt.

Q Now, before we get into the whole paragraph, what do you mean by stranded vessels usually refloat along the reciprocal of the course on which they grounded?

A Well, it's much more frequent that a stranded ship will strand headed into shallow water, and the logical way to remove her is to take her out the way that she went in, just --

Q By backing up?

A Back her off in the direction in which she -- in the opposite direction in which she was going when she grounded.

Q In this case, Captain Hazelwood never used the engine astern, right?

A Wasn't appropriate in this case.

Q Now, with respect to the rest of your opinion there in paragraph four, you wrote that because the State told you to write that, isn't that true?

A No, sir, I did not.

Q You did not? Let's read something here. Look at page two of exhibit AL, look at the third paragraph, starting after extensive review. Would you please read that into the record.

A After extensive review --

MR. COLE: I object; it's hearsay.

MR. CHALOS: Your Honor, this is for impeachment purposes.

THE COURT: Objection overruled.

BY MR. CHALOS: (Resuming)

Q Go ahead.

A After extensive review of the relevant evidence, it is our view, Sam Adams, Brent Cole, retired tanker Captain Bob Beevers, Mary Ann Henry and State Trooper Jim Stogsdill, that from the time Hazelwood returned to the bridge after the grounding, at approximately 12:10 p.m. until the --

Q a.m.

A -- a.m., until the engines were shut down at 11:41 --

Q 1:41.

A -- 1:41, Hazelwood's actions were designed solely to remove the vessel from the reef.

Q Now this is the District Attorney, the Assistant

District Attorney telling you.

A This was telling me what their opinions are.

Q Uh-huh.

Now, when was the last time Mr. Adams, Mr. Cole, Miss Henry and Sergeant Stogsdill commanded a vessel that went aground?

MR. COLE: Objection; relevance.

THE COURT: Sustained.

BY MR. CHALOS: (Resuming)

Q Did you ask -- did you ask Mr. Cole and Miss Henry, Sergeant Stodgegill or Mr. Adams on what they based their opinion?

MR. COLE: Your Honor, it's Sergeant Stogsdill.

MR. CHALOS: I beg your pardon; sorry.

BY MR. CHALOS: (Resuming)

Q Did you ask them on what they based their opinion on?

A I did not and I did not give any value to this statement. I formed my opinion independently of that.

Q Now would you read the rest of the paragraph.

A Our conclusion is based on the absolute lack of any evidence that Hazelwood was trying to do anything else but remove the vessel from the rocks, from Hazelwood's statement to the Coast Guard to that effect, from Greg Cousins' statement that Hazelwood gave a series of rudder

commands designed to remove the vessel from the location of the vessel on the western edge of the reef, from Hazelwood's statement to the Captain of the Port at approximately 1:00 p.m. about his attempts to free the vessel, and from FBI statements and trooper interviews of Maureen Jones, Chief Mate Kunkel and Helmsman Kagan.

Q Now, until you got this letter, exhibit AL, you hadn't rendered any opinion, had you?

A No, I had not.

Q And you say this didn't influence you in the least?

A Not in the slightest.

Q Yet when we look at your letter of February 12th, you write the exact same opinion that they suggested to you.

A I formed that opinion completely independently.

Q After you got the letter of February 2nd?

A Well, I got the letter after -- I believe before I got the letter.

Q But you didn't write to them anything about that? The first time you wrote was on February 12th after you received the letter of February 2nd, is that right?

A That's correct.

Q They also suggested to you, and you made that a part of your letter of February 12th, that you express an opinion that the vessel would have capsized if she came off

the reef, isn't that true? Look at the last paragraph of page two. Would you read the first sentence, please?

A In your report, please address the following areas.

Q Go ahead.

A Would a reasonable captain in the same situation recognize that actions such as Hazelwood's risk causing the vessel to come free from the reef and possibly capsizing or sinking.

Q And you wrote in paragraph 5 (b) of your letter of February 12th, refloating the ship before defining the condition of the vessel could result in capsizing, sinking, or catastrophic structural failure of the hull girder. Am I correct?

A That's correct.

Q Okay.

And then you spoke about the vessel grinding into the rock. You remember that?

A That's correct.

Q Remember you had the model and you were showing the jury that the vessel would grind into the rock.

A Uh-huh.

Q They told you to say that too, didn't they?

A They didn't tell me to say anything, sir.

Q Well, continue on then please, in that paragraph,

starting with the word, related.

A Related to the immediately preceding question is the related question of whether a reasonable captain would recognize that grinding a vessel into a rocky reef could increase the possibility that the vessel would break up, either at the time the rudder commands were being given or upon a falling tide..

Q Then you wrote in paragraph 5 (c) of your letter of February 12, working the ship on a hard bottom is likely to cause additional damage and increase the possibility of catastrophic structural failure.

A That's correct.

Q And it's true also, isn't it Mr. Milwee, that they told you what evidence to read and what evidence to ignore, didn't they?

A They suggested. They did not tell me and I didn't necessarily take their suggestions.

Q You think it is proper in your business as an expert to have the party you're working for tell you what evidence to read and what evidence not to read?

A It may or may not be proper, but it is certainly proper for me to ignore their suggestions.

Q Well, they told you, looking at the first paragraph of page three, also, you should not put much weight into Second Mate LeCain's NTSB testimony, that the

crew was standing by for quick action. Remember that?

A I see that.

Q Did you ask them, why should I pay attention to what LeCain said? He was there.

A No, I ignored it.

Q But you did give an opinion that the crew wasn't prepared to deal with this casualty, didn't you?

A Yes, sir.

Q And that is contrary to what Mr. LeCain said at the NTSB.

A That's not contrary to what other people said, though.

Q And your opinion is consistent with the State telling you to ignore his testimony.

A That's true, but I didn't give any credence to what the State suggested.

Q And yet your report of February 12th, 1990, goes right down the line as to what the State told you to say. And you say --

A They did not tell me to say anything, and I did not blindly do what the State suggested. I arrived at the opinions independently, sir.

Q The exact same opinions that the State suggested to you you came to independently?

A I think if you bring out the whole thing you will

notice there are a couple of things that I did not address in my report.

Q Such as?

A The next to last paragraph on the third page, lastly, would a reasonable captain drink even one alcoholic beverage just one hour before assuming command in violation of Coast Guard regulations.

Q And you said in paragraph 6 (e) of your letter of February 12th, I would expect the master of a tank ship that is aground and spilling oil to, (e) do nothing to impair his ability to perform at his highest level of competence. They didn't suggest that to you either, did they?

MR. CHALOS: I have no further questions, your Honor.

REDIRECT EXAMINATION

BY MR. COLE:

Q Mr. Milwee, when did you get hired on this matter?

A In August of 1989.

Q And when did you receive the packet of information concerning this matter?

A January 1990.

Q Why was that? why did you not receive it until January 1990?

A I was given to understand that you wanted to make sure that the evidence was not tainted in any way.

Q And that was a decision that was made by the State of Alaska?

A That's correct.

Q And were you given any instructions about how to proceed, as far as whether you could review other newspaper articles, or watch TV or anything else about how this -- the facts of this case, when you were hired?

A None whatsoever.

Q What do you mean by that?

A I mean I was not restricted in any way with the information that I could review or look at or have access to.

Q Now, in the memorandum that was sent to you from Mr. Adams, were you given suggestions as far as conclusions to reach, or were you asked to reach opinions on issues?

A I was asked to reach opinions on issues. They were put in the form of questions that I should answer.

Q Were there any opinions other than the ones set forth in the one in paragraph number -- page number 2, paragraph number 3?

A None that I recognized as such.

Q Well, let's talk about the opinions that are in that. Did you see any evidence whatsoever in anything that you read, heard or saw, that would indicate that Captain Hazelwood was trying to put this vessel on the reef?

A I didn't --

MR. CHALOS: Objection, your Honor. Objection, your Honor; he's leading the witness.

THE COURT: Objection overruled.

THE WITNESS: I did not.

BY MR. COLE: (Resuming)

Q In fact, what did Captain Hazelwood say to the Coast Guard?

A Captain Hazelwood told the Coast Guard he was --

MR. CHALOS: Objection, your Honor.

THE WITNESS: -- attempting to get the vessel --

MR. CHALOS: Objection.

THE COURT: Just a minute, just a minute.

THE WITNESS: -- off the reef.

THE COURT: What's your objection?

MR. CHALOS: He's leading the witness.

THE COURT: No, he's not. Objection overruled.

BY MR. COLE: (Resuming)

Q What did Captain Hazelwood tell the Coast Guard at 1:10 a.m.?

A That he was attempting to refloat the vessel.

Q How many times did he say that?

A Oh, several.

Q And did you read the Trooper interview that Captain Hazelwood had with Trooper Fox?

A Yes, I did.

Q What did he tell Trooper Fox he was trying to do?

MR. CHALOS: Your Honor, that's hearsay. That's no foundation that he's asking did he base his opinion on what he read or what he heard. He's asking him to submit it as the truth of the matter.

THE COURT: Objection overruled. This is in support of his opinion.

And stand behind the podium instead of wandering around, Mr. Cole.

BY MR. COLE: (Resuming)

Q What did he tell the Trooper?

A He told the Trooper he was trying to refloat the vessel, and I believe he used the word, extricate.

Q What does extricate mean to you?

A Remove the vessel, clearly.

Q Did you read anything, in anything Captain Hazelwood said, that would indicate he felt there was a possibility of that vessel coming off the reef, and that he took actions to stop that?

MR. CHALOS: I object to the form, your Honor.

THE COURT: Mr. Cole?

MR. COLE: I'll rephrase it.

BY MR. COLE: (Resuming)

Q Anything that you saw that you looked at that

would indicate that Captain Hazelwood was afraid of this vessel coming off the reef?

A There was nothing in anything that I saw that indicated there was any chance of the vessel coming off the reef through the forces of nature or anything of that -- accidentally or anything of that nature.

Q Mr. Chalos asked you about the fact that this vessel didn't go astern. Does the fact that this vessel did not go astern change your opinion on what Captain Hazelwood was trying to do?

A Not at all.

Q Why is that?

A Because the action was consistent, totally consistent with attempting to refloat the vessel.

Q Why is that?

A Because he was using the rudder, he was using the engines. It was like he was aground on mud and trying to slither off. That's just the action -- that's just what you would do to refloat a vessel ahead like that. And it was an action that was consistent with a ship grounded on a reef where there was clear water out ahead of him.

Q In your article, you talk about reasons why you back off a reef when you get stuck, and you think when Mr. Chalos asked you, you indicated that that would be the kind of situation where you would run into a shallow area from a

deeper area, is that correct?

A That's correct.

Q What about the hypothetical of, you've just run over a rock and you have shallow water behind you and you've got deep water in front of you. What would you expect a master's actions to be then?

A That is the type of action where you take the vessel off in a forward direction. It's those -- the rare actions that I referred to in my report.

Q And Mr. Chalos indicated that -- asked you about whether or not this vessel was not put on sea speed. Does that indicate to you that he was not trying to get it -- use full power. Does the fact that this vessel was not put on load program up and put up to, say, 78 or 80 rpm, change your opinion about what Captain Hazelwood was trying to do?

A No, not at all.

Q Why is that?

A Because they -- the engine's running under conditions for which it's not defined, and it is very likely it is going to overheat.

Q And did you see any evidence that the engine overheated at any point?

A I'm not certain that I remember specific evidence to that effect now.

Q Now, Mr. Milwee, I'd like you to take a look at

the times up there between 12:38 and 1:41.

Now, do you see the time around 1:20? If 10:00 a.m. is 1:00 o'clock?

A Yeah, okay; yeah. Yes.

Q Now, is there anywhere in there that you see action consistent with someone trying to keep a vessel on the reef?

A No.

MR. CHALOS: Objection, your Honor. No foundation.

THE COURT: He can give his opinion. Objection overruled.

BY MR. COLE: (Resuming)

Q I'm sorry, I didn't hear you, Mr. Milwee.

A No, I see the heading being changed frequently, to -- oh, 13, 14 degrees.

Q And would you describe, this point at 1:20 right here, this heading changes, which way is the vessel turning now?

A Well, the vessel is turning -- let's see, he's down in this quadrant. He's turning to -- to port.

Q Turning to port. That's to the left, right?

A That's correct.

Q And he was grounded on his starboard side, is that correct?

A That's correct.

Q So he was turning away from the reef?

A That's correct.

Q And would you describe the number of turns that he made after that?

A Oh, he -- he zigs back slightly to the right, turns to the left again, to the right again, a couple of degrees to the left and then back to the right and stops his engine, stops maneuvering.

Q Anything in that section of that course recorder that would indicate to you that Captain Hazelwood was trying to keep this vessel on the reef?

A No, there's not.

Q And if he was trying to keep it on the reef and he was trying to use the minimum force necessary, what would that course recorded look like?

A It would be considerable less swing than it shows there.

Q Would there be turns right and left?

A There would probably be an indication that he started -- his heading started to drift off in a response to it, but it wouldn't be a change as drastic as is shown there in the recorder. Certainly shouldn't be.

Q If you were going to slide off a reef and you were hard on your starboard side, where would you be afraid of

sliding off towards? Your port side or your starboard side?

A Obviously to port. You know your port side is probably not aground. If you know your starboard side is aground and you know you port side isn't, you're going to slide off to port.

Q And if you wanted to keep yourself from sliding off when your port side was not aground and your starboard side was, would you turn to the port?

A No, you --

Q Or would you turn to the starboard?

A You would probably carry a little constant right rudder.

Q To turn into --

A To turn into the grounded area. If you were grounded forward of your pivot point.

(Pause.)

Q Now, I'd like to talk for a second about the IG system on this vessel. Would you explain to the jury why it would not have been a good idea to seal the IG system? Before we start, what does the IG system do, what's its purpose?

MR. CHALOS: Your Honor, I think this goes beyond cross. I don't think I brought up the IG system at all with this witness.

MR. COLE: Your Honor, he talked about sealing.

THE COURT: I think you did. I think there was an inquiry about that.

MR. CHALOS: Well, I'll check my notes -- it's been so long. But I don't remember bringing it up with this witness.

THE COURT: Well, I'll let Mr. Cole inquire, and you'll have a chance after his inquiry. I think you did bring it up, Mr. Chalos.

BY MR. COLE: (Resuming)

Q What does the IG system do on this vessel?

A The purpose of the IG, or inert gas system, is to put an inert gas, a low oxygen content gas, into the tanks, the cargo tanks, to reduce the danger of fire and explosion. To reduce the amount of oxygen in the tanks so that the mixture of cargo fumes and atmosphere in the tanks is below the limits at which it will burn or possibly explode. It has been a great boon to tanker operations. It has reduced tanker explosions tremendously over the last ten, fifteen years.

Q And Mr. Chalos talked to you about closing off the IG system in order to make this vessel, I guess, not lose any more buoyancy. Do you remember him talking about that?

A That's correct.

Q What are the problems associated with taking an action like that?

A Well, one problem is timeliness, that it's -- the loss of cargo is very rapid from damage in the bottom. But more significant loss is that if you do that, you disable the IG system, you are unable to put any more inert gas in a tank, and this is at a time when the cargo level in the tank has been dropping rapidly and the vacuum breaker system on the tank which prevents a vacuum from forming has begun to function and air is pouring into the tank. So you've got an atmosphere in the tank that is 8 percent oxygen, you begin to mix air with it at 21 percent oxygen, and the percentage goes up and there becomes a danger of fire and explosion that didn't exist with the IG system functioning and the tank sealed.

Q On -- when -- when we talked last week about soundings, how difficult is it to take these soundings -- would it have been to take these soundings on the Exxon Valdez that night?

A It's -- it's difficult to quantify that. It wouldn't have been simply a matter of walking around and making the measurements, but it would have been certainly within the possibility for an AB and a mate to take these soundings and to take them effectively.

Q And where would you have taken these soundings? Where physically on the boat? On the ship?

A Oh, all around. Completely around the vessel. At

short intervals. Short intervals being, oh, probably 25 feet the first shot and then refine that later and when you -- if there was an area that you found was aground, you would certainly take those at more frequent intervals.

Q Well, I guess the last consideration -- the last thing -- there's two other things. Why -- why does a tanker captain have to take any throttle or rudder action at all after a grounding? What is the necessity or is there any?

MR. CHALOS: Your Honor, I object, unless some foundation is laid. What situation are we talking about? This one? Grounding in mud, grounding on coral? Ahead, astern? There's just not enough foundation.

THE COURT: Mr. Cole, you asked about three questions there, too, and the form of each of them was objectionable, so if you can rephrase it.

BY MR. COLE: (Resuming)

Q Well, let's just talk generally. Why is it that a tanker needs to come off a reef? Or why is it that immediate action has to be taken, or is there a reason?

A Depends on the condition of the grounding. In most cases, in many cases, absolutely no action is required. In all cases, no action should be taken until the condition of the grounding is reasonably well defined. It is particularly un desirable to take any action when the ship is aground on rock.

Q And if you were told that you had damage in center cargo tanks 1 through 5, port -- or starboard cargo tanks 1, 3 and 5, and that you were taking on water in your ballast tanks on the starboard side, 2 and 4, and that within a half an hour you had lost as hundred to a hundred and fifteen thousand -- or you could not account for a hundred to a hundred and fifteen thousand barrels, what would that tell you about your ship?

A It tells you --

MR. CHALOS: Objection, your Honor. This man hasn't been qualified as a master of a ship. He said he doesn't have any experience as a master. He expertise is in salvage, not as a captain of a vessel.

MR. COLE: He's on damaged tankers all over the world, your Honor. I think he should be able to evaluate what impact that effect has on his assessment of the stability of that vessel.

THE COURT: The objection goes to the weight, Mr. Chalos, not the admissibility. Overruled.

THE WITNESS: Would you repeat the question, please.

BY MR. COLE: (Resuming)

Q If you were told that your center cargo tanks 1 through 5 were damaged, that your starboard cargo tanks 1, 3 and 5 were damaged, that your ballast tanks 2 and 4 on your

starboard side were taking in fluid, and that you could not account for between a hundred and a hundred and fifteen thousand barrels of crude oil, and all this information was relayed to you within the first twenty to thirty minutes after the grounding, what would that tell you about your tanker?

A I would know that I had a very badly damaged tanker. I would be particularly concerned about the flooding into the ballast tanks and the loss of buoyancy that would come about from that flooding. I would realize that I should stay right where I was and not attempt to move that ship, because there was a danger, because I am losing buoyancy, and because I have a very badly damaged ship that if it did come afloat, it would sink, and I would be much better off securing that ship in that position where it obviously can't sink very far.

Q And in that situation, what would have hurt -- what would have been lost by simply doing that? By simply securing the vessel and waiting?

A Nothing.

Q And by attempting to remove the vessel, what was risked?

A The possibility that it might -- if it did come off, the vessel would be in a very -- a very dangerous situation. I have -- in a similar -- in a situation where a

tanker suffered damage to one of the tanks that was -- one of its buoyancy tanks, we put that thing aground immediately. We did just the opposite. We put -- we deliberately put it aground to prevent the ship from sinking in deep water.

Q And did you see any indication from anything that Captain Hazelwood was attempting to secure that vessel between 12:38 and 1:41?

A No, other than looking at his options and having the mate look at his options, there was no positive action to secure the vessel.

Q And all of the things that you saw were consistent with him attempting to get off?

A That's correct.

MR. COLE: I have nothing further.

RECROSS EXAMINATION

BY MR. CHALOS:

Q Mr. Milwee, when you are hired as a salvage expert and you come on board the ship, you are always working under the supervision of somebody, aren't you?

A I think we always all work under the supervision of somebody.

Q Except the captain of a ship who has just run aground? Isn't that right? He has got to make the decisions himself.

A That doesn't mean he is not working under somebody's supervision.

Q Well, when you come on board, you advise, right? You advise the captain, you advise the company representative, you advise whoever has hired you?

A I am sometimes in positions where I am completely running the operation.

Q Now, when you say you would have done this and you would have done that, and some of the actions were inconsistent with what you would have done, you have never been in that situation, isn't that right?

A In what situation?

Q Of a ship just run aground, spewing oil, you've got to make a decision in the middle of the night. You've got the crew members to worry about. You've got your ship to worry about. You've got the Coast Guard to worry about. You've got stability, you've got --

A I've been in very similar situations many times where I had to make the decisions.

Q By the time that you got there, the ship had already run aground and it was fairly stable at that point, is that right?

A After the initial grounding, yes.

Q Now, you keep talking about the fact, if the vessel would have come off. Well, we know that this vessel

wasn't going to come off. It was impossible for it to come off, don't we?

A We know that now, eleven months later.

Q Uh-huh.

The fact of the matter was that whether we know it now or they knew it then, that vessel wasn't going anywhere.

A But Captain Hazelwood took no steps to determine that.

Q So when you say he was reckless, what you are saying is he was reckless in not knowing his vessel couldn't move? Is that what you're talking about?

A No, that's -- let me think about the way you phrased that a little bit. He was reckless in taking actions without determining the conditions that were extant at the time.

Q But all those risks that you talk about, the capsizing, the breaking up, the -- the -- what do you call -- the sinking, all right, those were all situations that weren't going to happen no matter what action he took. It was impossible for him at that time to move the vessel, either by using the or by using the rudder, isn't that right?

A That's correct.

Q Now, Mr. Cole asked you about the evidence that you reviewed at the end of January, early February. You

recall that?

A Yes.

Q Whatever evidence you reviewed, whatever testimony you reviewed, whatever reports you reviewed, were reports, testimony, evidence, that was given to you by the State, isn't that right?

A Yes, that's correct. Except for items from my library.

Q Okay. So the State controlled what you saw and what you based your opinion on, isn't that true?

A The State didn't restrict me in the seeking of other evidence and other information whatsoever.

Q Did you, on your own, do any independent analysis, any independent study, gather any independent information with respect to the grounding, other than what the State gave you?

A Well, other than the specific information about this grounding, and besides getting out the charts and talking to the salvage master, no.

Q Do you remember Mr. Kunkel's testimony where he said he came up about 12:30 and told the captain that the vessel was stable at that point?

A Well, I don't remember it exactly like that. I remember --

Q Well, did you consider --

A -- him coming up and -- with a report of another analysis he had done using the loadmaster computer.

Q That was later on. He said that was between 1:00 and 1:20.

A Well, there were two -- there were two reports.

Q Right.

A One which indicated there was a stability problem and the stress was all right, and the other indicated that there was a stress problem and the stability was all right.

Q That's right. And the first one was that the stability was all right but the stresses were below the acceptable level if they were going to go beyond Cape Hinchinbrook, do you remember that?

A That's correct.

Q And the second report was that the stability was marginal. Do you remember that?

A That's correct.

Q Did you consider that in your opinion, those two reports?

A I certainly did.

Q Did you also consider the fact that when the captain spoke to the Coast Guard he told them on several occasions, we're ascertaining right now, we're ascertaining out situation right now. Did you read that in those reports?

MR. COLE: Objection, your Honor. I don't believe that that's what that says.

MR. CHALOS: It certainly does say that.

MR. COLE: No, it doesn't.

THE COURT: On several occasions he says that, Mr. Chalos? I don't have this in front of me.

MR. CHALOS: Well, let me rephrase it, your Honor.

THE COURT: Rephrase your question.

BY MR. CHALOS: (Resuming)

Q On at least one occasion the captain told the Coast Guard, when he was communicating with them, that we're ascertaining our situation right now.

A That's correct.

Q What does ascertaining mean to you?

A That means he was determining the situation.

Q Now, you spoke about situations where you have gotten vessels off the reef by going forward, do you remember that?

A Yes.

Q And in those situations you said you always lightened the vessel by taking a lot of cargo off, right?

A That's because that fit the circumstances of the particular grounding, yes.

Q Right. And if you didn't lighten the vessel, no matter how much you -- in that situation that you are

talking about, no matter how much you drove it forward, she wasn't going to go anyplace? Isn't that right?

A Well, I wasn't using the engines. Engines are not my tool of choice for refloating vessels.

Q Well, that is because you take out the cargo and you let it float up and you wait for high tide and you pull her off.

A Well, that's one way you do it. There are other ways, also, of laying anchors and purchases and hauling with high powered vessels and the like.

Q Tell the jury what you mean by anchors and purchases in those situations.

A One of the basic tools of the salver is a high holding power anchor laid in the direction that the ship is to be refloated, and taken to a multiple part -- purchase, a series of pullies and blocks which multiplies the force that is applied to it. And then either hauled with a winch or a hydraulic puller, to give a force and direction that'll pull the ship off.

Q And in that situation you are generating a lot of force, a lot of pull, aren't you?

A Well, you are generating -- a lot of pull, yes.

Q Now, one of the considerations of trying to go forward when you haven't taken any cargo off, aside from the fact that you are working the vessel on rock, is that

whatever you are grounded on is going to hit your propeller and your rudder, isn't it?

A Very likely.

Q Now, you've heard testimony here about Captain Hazelwood being an experienced master, didn't you?

A That's correct.

Q Now, does it make sense to you that an experienced master like Captain Hazelwood would run his engine and his propeller and rudder over a reef, does that make any sense to you?

A It's not the best action, but it's consistent with what was take -- what was done here.

Q Well, you said that the captain knew that his ballast tanks were damaged, didn't you?

A Yes, I did.

Q And you said that by seeing that, that you have water -- he knew that he had water in his ballast tanks, didn't he?

A Yes.

Q And the effect of water in the ballast tanks is to make the vessel heavier, to bring her down, isn't it?

A Yes,

Q Now an experienced captain like Captain Hazelwood would know that, wouldn't he?

A Yes, he would.

Q Now you spoke sort of in an off handed manner about the loss of product being rapid from the damage to the bottom -- to the hull plating in the bottom, you recall that?

A That's correct.

Q It's true, is it not, that it's not the size of the hole on the bottom that controls how much oil flows out, but the smallest opening at the top that permits the air in that controls the flow of oil, isn't it?

A That's correct.

Q So you could have a hundred foot hole in the bottom, but if you have a four inch valve on top, it is the four inch valve that is controlling the flow, not the hundred foot opening.

A That's correct.

Q You spoke about the danger of fire and explosion by using the IG system or not using it. You are talking about the explosive range that one goes -- that the system goes through at some point?

A Yes.

Q Tell the jury what the explosive range is, please?

A It is a mixture of oxygen and fuel vapor that's where an explosion is possible.

Q Did you do any calculations to find out what the explosive range in this situation was?

A No, I didn't. I didn't have the volume of the tanks or the other information that would have required to do that.

Q So when you say it would have been dangerous to use the IG system, or not use it, you don't know whether they were in the explosive range, whether they had gone beyond it already, when that happened, or what danger may have existed at that point?

A No, I don't. I know that the inert gas would have been diluted. I know that the oxygen percentage would have been increasing and I know that the industry standard recommends keeping the inert gas system in operation.

Q You know, do you not, that one goes in this type of situation where the inert gas system is open and you are losing cargo rapidly at that point, you know that the system goes through the explosive range very quickly, don't you?

A I would have to see figures on that before I would necessarily believe that.

Q In any event, you didn't do the calculations?

A I did not do the calculations.

Q And then it is also true, is it not, that once you go through the explosive range, the danger of explosion or fire is dissipated?

A No, I think you have got a continuing danger that you could run in and out of that explosive range.

Q But it has nothing to do with using or not using the IG system at that point?

A It would have a lot to do with not using it.

MR. CHALOS: I have no further questions at this time, your Honor.

THE COURT: Make it brief, Mr. Cole, we have had this witness on a long time and we have covered the same ground several times. So stay on new material only.

REDIRECT EXAMINATION

BY MR. COLE:

Q When Mr. Chalos asked you about whether or not an experienced captain like Captain Hazelwood would do such things, you assumed that he was not intoxicated at the time, didn't you?

A Of course.

MR. CHALOS: Objection, your Honor. No evidence of that.

THE COURT: Would counsel approach the Bench please.

(An off the record Bench conference was had.)

BY MR. COLE: (Resuming)

Q When Mr. Chalos asked you about what Captain Hazelwood or what a reasonable captain would do in this circumstance, you assumed he meant a reasonable captain that was not impaired?

A That's correct.

MR. COLE: Nothing further.

RECROSS EXAMINATION

BY MR. CHALOS:

Q Sir, you have no reason to believe that at the time of the grounding that Captain Hazelwood was impaired, do you?

A I have read testimony that Captain Hazelwood was drinking earlier in the day and I have read testimony that he was not showing any signs of impairment.

Q That's you answer?

A That's correct.

MR. CHALOS: Okay. I have no further questions.

THE COURT: All right, sir, you are excused.

(The witness was excused.)

THE COURT: Are you ready with your next witness, Mr. Cole?

MR. COLE: Yes.

THE COURT: You may call your next witness.

MR. COLE: The State would call Professor William Vorus.

THE COURT: I see you passing briefs around here. Do you have a copy for me?

MR. MADSON: I do, you Honor. I didn't want to interrupt the Court.

THE COURT: That's okay. This is as good a time as any. And file the originals downstairs if you would, and just give me the copies.

Thanks, I'll just take them, thank you.

Whereupon,

WILLIAM VORUS

called as a witness by counsel for the State of Alaska, and having been duly sworn by the Clerk, was examined and testified as follows:

THE CLERK: Sir, would you please state your full name and then spell your last name?

THE WITNESS: William S. Vorus, V-O-R-U-S.

THE CLERK: And your current mailing address?

THE WITNESS: 13560 North Lake Road, Gregory, Michigan.

THE CLERK: And your current occupation?

THE WITNESS: I am a professor at the University of Michigan.

THE CLERK: Thank you.

THE COURT: We'll take a break about 10:15, Mr. Cole.

MR. COLE: Sure.

DIRECT EXAMINATION

BY MR. COLE:

Q Professor Vorus, why have you been called to

testify in this matter?

A To render opinions in the general area of naval architecture and specifically with regard to our findings having to do with the freeing of the vessel from the reef.

Q Where do you teach currently?

A Department of naval Architecture and Marine Engineering at the University of Michigan.

Q Would you tell the jury what your educational background is?

A I have a BS in mechanical engineering from Clemson University, 1963. A masters from the University of Michigan in naval architecture in 1971 -- or '69. A Ph.D. naval architecture in 1971.

Q Would you explain a little bit of your employment background in the shipbuilding industry?

A I was at Newport News shipbuilding for ten years. Actually three of those years were on educational leave. I went with the shipyard in 1963 after graduation from Clemson. Was there for five years. Away at school for three. And went back there for three years.

Q What were you doing then?

A Various positions in the engineering departments. The last one was the manager in charge of ship machinery in engineering.

Q Would you describe what you mean by manager of

ship machinery in engineering? What were your responsibilities there?

A Well, our job was to verify designs produced by design departments in the area of main propulsion machinery, deck machinery, steering gear, anchors, primarily . Structural interface with the hull associated with those components. The job was actually somewhat broader than that in that this group was analytically well equipped. We handled all types of special problems for the yard. Vibrations problems, noise problems, special structural problems that arose.

Q And did it also include looking at damaged vessels occasionally?

A I can remember occasions where we worked with our ship repair department to do damage assessment in terms of strength degradation.

Q Now, after working for Newport News, what did you do?

A I went back -- returned to the University of Michigan as a professor in '73.

Q And what were you teaching then?

A My first assignment was a junior level course in structures, ship strength.

Q And would you explain to the jury what is a naval architect?

A Naval architecture is -- could be viewed probably as a sub-field of mechanical engineering having to do with vehicle design. W are to marine vehicles what the aerospace engineer is to space vehicles.

Q What's a marine engineer?

A Well, the naval architect is more the hull envelope and outside, the interface with the water. Strength issues having to do with the hull. A marine engineer, they could be viewed as two types. One would be the operating marine engineer aboard the ship, and there was also a design marine engineer who was associated primarily with main propulsion machinery.

Q Now, you have been teaching at the University of Michigan for how long?

A Sixteen years.

Q And what kind of classes do you teach now?

A At this moment I am teaching a junior level course in ship dynamics, marine dynamics, and a graduate course in marine structures.

Q And have you taught about structures, designs in the past?

A My first course at Michigan was a course in design of ship hulls. I have continued to teach that throughout the year.

Q Do you work with graduate students in this area

also?

A Well, I have been the graduate program chairman. I am not currently, but I was for a number of years. I currently supervise seven Ph.D. students.

Q And that would be with various projects with regards to marine, naval architecture?

A I think two of the seven are structures, two in hydrodynamics, there's one in propellers.

Q I'd like to ask you a little bit about Vorus and Associates. What is that?

A Well, it is a company that I formed in 1980. It is a corporation, small -- very small corporation, but I felt a need to stay a little closer to the front lines of activity in the field, and that company allows me to do that.

Q What kind of work have you done with that company?

A We -- we say we're specialists, but in a broader sense. We specialize in non-routine problems in the marine field. They could be structures, they could be hydrodynamically oriented problems. The types of things that require a little extra effort in terms of careful diagnosis, analysis, and resolution. The types of problems that the normal design office is not equipped to deal with.

Q Can you give the jury an idea of the types of problems that you have been asked to handle with Vorus and

Associates?

A Well, we are currently, for example, designing our lines of high tech cavitating propellers for recreational craft. The other extreme, recently I was engaged by a container ship operator who had a problem on a class of twelve ships with main deck damage up in the forebody in heavy storm seas. Others had recommended that the forebodies of those ships be rebuilt. We looked at it very carefully, determined that it could be very simply solved by the addition of some simple panel stiffeners which was done and done successfully.

Q Have you published any -- authored any publications in the field of structural design?

A About a third of our publications are in structures in general.

Q And the work that you do with Vorus and Associates, who helps you with that?

A My associates are generally the staff and students of the Department of Naval Architecture and Marine Engineering. They are -- I use them on an as needed basis when they are available.

Q And how much of your work with Vorus and Associates deals with structures?

A I would say about half.

Q Have you been asked to testify in cases before?

A Yes.

Q Approximately how many times have you had to testify in civil or arbitration cases?

A Well, not so many. I pick and choose these jobs rather carefully. But I have been involved, I believe, in five arbitrations in the marine field, and two civil cases.

Q When were you asked to provide services -- the services that you have rendered in this case, by the State of Alaska?

A August, September, 1989.

Q And did you enter into a contract with the State of Alaska?

A Yes.

Q And what was the amount of that contract?

A It was originally $25,000.

Q And what was that for?

A It was to help the State with the case, to provide some analysis and conclusions with regard to certain aspects.

Q And have you reached any conclusions in this matter?

A Yes.

Q What conclusions have you reached about the stability of the Exxon Valdez on March 24th, 1989, in the early morning?

A In the grounded condition?

Q If it had gotten off the reef?

A If it had been extracted from the reef soon after the accident or during that period, our analysis shows that the vessel would have capsized and sunk.

MR. CHALOS: Your Honor, I move to strike any testimony on what would have happened if the vessel came off the reef, since we already have testimony that that was impossible. So anything that Professor Vorus would say would be hypothetical, it would be speculative , and really of no probative value, because the vessel couldn't come off.

THE COURT: Let's take a recess now for the jury and we'll take this up outside their presence.

Remember not to discuss the matter among yourselves or with any other person. Don't speculate on what we do in your absence, please, and do not form or express any opinions concerning the case. I'll call you back when we can.

(Whereupon, the jury exited the Courtroom.)

(Start tape C-3652)

THE COURT: Mr. Chalos, we've had several witnesses testify as to what might have happened, the risks that were involved. I am sure you are aware of the nature of the answer that was about to come, and you waited to object until after the answer came in. So I deem that you

have waived the objection that you are making now. But as to future objections, I think we need to deal with this situation now.

I have your brief. I don't think Mr. Cole has had an opportunity to look at your brief. You have had an opportunity to look at his brief. This is somewhat in response to the Court's inquiry last Friday, and apparently both counsel had understood this was going to be an issue because briefs had been prepared by State already.

The issue boils down I think, Mr. Cole, to whether or not factual impossibility of the vessel capsizing or any more damage occurring to it or any further pollution occurring as a result of Captain Hazelwood's actions, which we'll assume for the purpose of this argument, were to extract the vessel from the reef, can constitute the creation of a risk as the term is used in the statute defining the offense. I think you need to have time to look at this brief that has been filed by the defendant. We'll come back in in a few minutes and well resolve this. There's been substantial evidence already submitted, and we'll have to deal with it at some time, and we can start dealing with it now if necessary, and we'll definitely be dealing with this question during jury instructions.

We'll come back in about fifteen minutes. If you need more time, let me know.

We stand in recess.

THE CLERK: Please rise. This Court stands in recess subject to call.

(A recess was taken from 10:13 o'clock a.m., until 10:39 o'clock a.m.)

THE COURT: You may be seated.

All right, ready to argue this point?

MR. COLE: Yes.

THE COURT: Okay. I think you know what the objection is. We've got the brief on it. We've got your brief on it, too.

Let me start with a couple of questions for you. Maybe we can narrow this down. How can Captain Hazelwood be reckless when the definition of reckless requires to be aware of and disregard a substantial risk if there is no risk? And for example, the crime cited by the defendant where a defendant was charged with arson and reckless endangerment. That case sounds like it might be on point. In that case the defendant contracted with or made some deal with an undercover agent to burn some place down, and they charged him with an attempt at arson and then they said they couldn't be charged with reckless endangerment because it was factually impossible. The undercover agent wasn't going to burn the structure down, so it was factually impossible for the reckless to have occurred. So maybe you could use

that as an analogy to this case.

MR. COLE: Sure.

Judge, I think we need to go back to what the charging documents are in this matter.

THE COURT: Well, let's just deal with the charging document at this time of criminal mischief in the fourth.

MR. COLE: Right. And the charging document at this time reads Captain -- Joseph Hazelwood, having no right to do so or any reasonable ground to believe he had such a right, recklessly created a risk of damage to the property of others in an amount exceeding $100,000 by widely dangerous means, to wit, by the totality of his actions on March 23rd and 24th. He recklessly risked damaging the structural integrity of the oil tanker Exxon Valdez, causing the spillage of crude oil.

THE COURT: Now, as I understand it, based on our earlier orders that have come out and the bill of particulars ordered by the State to be produced, the damage that the State is showing that exceeded $100,000, the risk of damage, was to the shore line, the marine mammals, the birds and the fish, correct?

MR. COLE: That's correct.

THE COURT: Okay.

MR. COLE: But we have to show that he risked --

that by his actions that evening, the 23rd, that he risked -- that he was aware of and consciously disregarded this risk of causing damage to the structural integrity of the Exxon Valdez. And our theory is when a tanker captain runs into a reef, he risks causing structural damage to the oil tanker and causing an oil spill, which causes this damage. Now, we have to prove that.

One of the ways that we have chosen to prove that is to put on a person who is going to explain what happened to this particular vessel on this particular occasion, and if it -- what would have happened if it had gotten off the reef instantaneously or five minutes later or an hour later. One of the elements is that we have to prove is that he was aware of and disregarded this risk of damaging the structural integrity by running into Bligh Reef.

Now, the way we have chosen to do that is put on someone who can tell the jury, who's done an analysis of the damage sustained by this, and can point out to the jury why these risks are there.

THE COURT: I understand all that. You're not addressing the issue here, Mr. Cole. The issue is the witnesses testimony that had it got off the reef, had Captain Hazelwood been successful in getting this vessel off the reef with his efforts, it would have capsized, when in fact, he could never have got it off the reef. And I think

that is undisputed, isn't it? Do we have any dispute about whether or not he could have got it off the reef?

MR. COLE: I don't think there is going to be any dispute on that. He could not, with the engine horsepower.

THE COURT: What element of the offense of criminal mischief in the fourth degree, does the testimony by this witness that it would have capsized had he got it off the reef, what element does that go to prove?

MR. COLE: It goes to prove that he risked damaging the structural integrity of the oil tanker causing an oil spill. I mean, you capsize -- you've got to explain to them why his actions risk an oil spill, causing the release of the $100,000 damage. And our theory is it risks it because when you run into rocks you cause significant damage which can cause the release of oil.

THE COURT: We understand that. That is part of the elements, when he went aground the oil came out, and the testimony so far is that no other damage occurred after he went aground and it came to a rest. And there is no evidence that any more pollution took place. There was a risk had he got it out that more pollution would have taken place, there is a risk that it would have capsized and people's lives may have been lost. But once it came to a stop, the evidence seems to me to be pretty clear that it wasn't going anywhere and there was no further risk. Even

though Captain Hazelwood may not have known that, in fact there was no further risk. Now, I think that's a fair -- if I am wrong, correct me. Is that a fair summary of the evidence so far?

MR. COLE: I have no problem with that.

THE COURT: Okay.

MR. COLE: But Judge, see, what we are going under and what I am trying to get at is originally we brought this case as two acts, what he did before and what he did after, and you consolidated it, at their request. So I have to prove in my case that he risked the structural integrity by running over a reef. And that is what Professor Vorus does. he gives that to the jury. We're not focusing on, as Mr. Chalos would like to say, what he risked if -- by taking the actions that he did. Because you told me, and you consolidated this whole thing -- what we are talking about is what he risked by running his vessel over a reef, which Professor Vorus can testify about.

THE COURT: Well, let's get back to my original question. The elements of the crime of criminal mischief is that the defendant, having no right to do so or any reasonable ground to believe he had such a right, recklessly create a risk of damage to the property of others in amount exceeding $100,000 by widely dangerous means. Those are the elements. After that, the to wit and the document that the

State chose to file, isn't an element of the offense. The elements are what I just read. So which of the essential elements of the crime charged I just read to you, does this witnesses testimony, that had it gone off the reef it would have capsized, prove?

MR. COLE: Created a risk of damage. When he was approaching the reef and he is ten feet away or he is a hundred yards away, we have to prove that there is a risk, that he creates a risk of the damage. And one of them is through Professor Vorus, saying when this vessel hits rocks, this is what happens to the undercarriage.

THE COURT: Maybe we're not communicating. My question is, what does the evidence of what he did after it went aground and came to a stop and the damage was done, the pollution took place, the damage was done -- what further evidence that had it got off the reef -- which was factually impossible -- it would have capsized, prove? What element does that prove? The fact that -- the chance of getting off the reef, that was impossible, what does that go to prove? After the grounding?

THE COURT: If you want to focus on that, Judge, I think it is a mistake of fact. Mr. Madson has not addressed that at all in his brief. All he says is impossibility. Contrary, really, the law review article that we pointed out and the cases in line, say that this is a mistake of fact,

not impossibility. A mistake of fact in the State of Alaska is not a defense in this particular case.

If you want me to focus on that, what does the actions of coming off the reef, our response is, this is not impossibility, it's a mistake of fact. And AS 1181.620 sets out the defenses for when a person commits the -- you know, when mistake of fact. The mistake of fact here is that Captain Hazelwood thought he could get this thing off the reef, when in fact he couldn't. And that is not a defense in this case.

So we believe that if you look at it as well, how does this -- the actions of taking the vessel off the reef or attempting to take it off the reef relate to the State's case in chief, if that is the question you're asking me, my response is that it's a mistake of fact.

THE COURT: Maybe i misread the briefing and maybe I was unaware of the point, but it seems to me that is what the briefing addressed, the events by Captain Hazelwood, him attempting to get it off.

MR. COLE: Right.

THE COURT: And the risk here that you're trying to introduce is that had he got off the reef, there would have been additional damages. There would have been more pollution and there would have been risk of life?

MR. COLE: That's correct.

THE COURT: Okay. Now, that's what I thought Mr. Madson's brief addressed. Am I incorrect, Mr. Madson, about that?

MR. MADSON: I think you're correct, your Honor. That's what it addressed.

THE COURT: So my question becomes again, if it was factually impossible to do any more damage or create any more pollution, what essential element of the charge does the opinion that it would have capsized had it got off by Captain Hazelwood's efforts, go to prove?

MR. COLE: Well, Judge, if you tell me that you are ruling that it is a factual impossibility, then you are right. It doesn't.

THE COURT: But wait a second now. I just asked you if it was a fair summation of the testimony that in fact it could not have been removed by Captain Hazelwood, in fact no more damage occurred, and in fact there was no chance of additional pollution. if that was a fair summary of the State's evidence so far, and I thought you said that is correct. Am I wrong about that?

MR. COLE: Well, there was more damage done by what he did. I mean, you just don't put a ves -- a tanker on a rock and grind it back and forth for an hour and a half and not be additional damage, and that is what everybody has testified to, that there was additional damage that was

done.

THE COURT: What witnesses have testified that there is additional damage done --

MR. COLE: Captain Beevers and Captain -- Mr. Milwee both testified that additional damage was done by going back and forth on that reef.

THE COURT: Has there been any evidence of additional pollution as a result of that?

MR. COLE: Well, I don't think they'll -- our expert will say that there -- that the additional pollution is caused not by the damage inside, but my understanding, it is based on the apertures on top of the deck.

THE COURT: Is there any -- any evidence whatsoever that Captain Hazelwood's efforts, and for purposes of this argument we're assuming his efforts were to remove it from the grounding, that that -- those efforts created additional pollution?

MR. COLE: Yes, I believe some --

THE COURT: What is the evidence?

MR. COLE: The evidence is going to be -- or that has been is that he created additional damage by damaging the longitudinal beams on the keel of this vessel.

THE COURT: What is the evidence that he created additional pollution. Just bring it to my attention.

MR. COLE: The additional pollution is caused by

the risk that he creates by disrupting the longitudinal beams going forward and aft. And that is -- and the problem that arises there is at 8:30 in the morning, we've got a low tide coming and that at that time there is the greatest chance of this vessel breaking in half. And that is what he risked. I mean that -- Professor Vorus is going to say that, too. The most critical time of this vessel was at 8:30 in the morning at the low tide.

THE COURT: He risked it had he succeeded in getting it off the rock, is that what you're saying?

MR. COLE: No, just by going back and forth, he risked damaging the bottom of this vessel, which -- it goes to the stress and stability of the vessel. But the greatest stress that this vessel was going to see was at 8:30 that morning.

THE COURT: Okay.

Now Mr. Cole, the elements say that he has to recklessly create a risk of damage to the property of others. Now what is the property of the others that he risked damage to in this case?

MR. COLE: It's further oil pollution if this vessel breaks up in the morning.

THE COURT: And your witness is going to testify that by his actions in trying to get this vessel off, that there was a substantial risk that he could have broken the

vessel up even though it couldn't have moved?

MR. COLE: No, he's not going to say that.

THE COURT: Okay.

You've answered some of my questions. I'll let you go ahead with your argument, Mr. Cole.

MR. COLE: Well, in addition to that, Judge --

THE COURT: Now we're just dealing with the criminal mischief. We're going to get into other charges against Hazelwood in a minute. But right now we're just dealing with criminal mischief.

MR. COLE: Okay.

As I said before, I think that when you look at count 1 of the information amending indictment, Professor Vorus should be allowed to testify as to what the risks are of a vessel going over a reef. And he has a scenario in this case where the Exxon Valdez sustained the same damage, but came off immediately or within five minutes after the grounding. And I believe that that is one of the elements that we have to prove, that the risk is that when a tanker captain runs over a reef, this is the type of damage that can be sustained and this is the type of risk that is involved with operating a tanker.

Second, as I stated earlier before, we believe that in addition to the impossibility, there is also a mistake a fact here. Captain Hazelwood certainly believed

that he could take that vessel off the reef, and it wasn't for a lack of trying, either.

Finally -- well, there's two other things. The defendants have waived this by failing to object earlier than this. Professor Vorus gave his opinion. The time to stop -- to object was prior to that. He should be allowed to explain his answer.

And finally, what Hazelwood did afterward and what he risked, Captain Hazelwood did afterward and what he risked, goes to the element of bad judgment, your Honor. That is one of the things that we have to prove in this case, that he was acting in an impaired state. That he was acting not in the conformity of a person because of the impairment of alcohol. And one of the ways we can prove that is to show what -- what he risked by doing this.

And that's our argument.

THE COURT: All right, thank you.

MR. MADSON: Your Honor, at the risk of oversimplifying this, I think the Court has really zeroed right in and targeted the issue squarely on the head. But there's a couple of comments I would like to just make with regard to what we're talking about, and hopefully it'll put it in perspective.

If I or anybody else here -- let's assume there are ten weapons on Mr. Cole's table over here. One of them

is loaded. I have reason to believe one of them is loaded. If I pick up any one of the ten and point it at somebody and pull the trigger, there is a substantial risk. I risk that result. It was substantial one considering even though maybe one out of ten or one out of a hundred, because of the result that would follow.

But let's take another example. Let's suppose none of the weapons are loaded, but I don't know that. I have reason to believe that there may be one there. The fact that I grab an unloaded weapon, point it at somebody -- no matter what my intent is -- does not create this risk of whether it be damage to property, injury, or death, because it is a nonexistent risk. And that's exactly what we have here.

The evidence showed, and I think the State's main expert on this, Mr. Milwee, clearly showed -- and he said it last Friday and he said it here again today, it was impossible to move this vessel off the reef no matter what he did, because he had insufficient power to do it. No matter what he intended, and how many times apparently in discussions with the State, Mr. Milwee had a misconception of what his role was and his opinion, because he kept saying, but Captain Hazelwood didn't know that. And of course, we agree with that. It isn't -- it has nothing to do with what he knew or did not know.

Now, if he were charged with intentionally trying to get the vessel off the reef, we wouldn't be here arguing that. Intent crimes are completely different. When you intend to do something that is factually impossible to do it, that doesn't relieve you of criminal responsibility or liability. What it does is simply say well, because of the result, the crime couldn't occur, therefore you have attempted to commit the crime even though it would be impossible to do it. And that is what the statute Mr. Cole refers to really addresses.

The statute on impossibility or mistake of fact or mistake of law, really addresses the defendant's mental state. It does not address the other part of the recklessness statute, which is the substantial risk factor. In other words, like I think that just common sense says that no matter what you do, every time you drive a car, no matter what, it can be argued that you create a certain risk. Recklessness doesn't come into play until that risk raises to that level where it becomes a substantial and unjustifiable one.

Now if we look at this case in the context of if it was originally three counts as the State originally had it, I don't think there would be any question but at this stage or certainly by the end of the State's evidence, that count would have to be dismissed because there was simply no

evidence of a substantial risk, which is an element the State must prove.

Now they are coming in here and saying, well, it's other things. It goes to the whole total -- the whole package. Well, we can remove it from the package and that's what I asked the Court to do in the brief, is simply say it cannot be considered in the total circumstances of Captain Hazelwood's judgment in the context of recklessness. Now there may be others, but I am just saying with regard to that, it simply muddies the waters, the allows the jury -- if it were to go to the jury and they came back with a decision after the testimony they have heard and nothing else, it would be, I think, serious error, because we wouldn't know if they jury based their decision on actions taken after the grounding or not. And if they did, they would be totally wrong. So we have to put it in the context of one count now, but we can still remove that. And whatever happened prior to the grounding, the State is still free to argue. We are not going that far. We are just obviously saying from the State's own evidence here, it was impossible to create the risk after the grounding.

Other than that I don't know what more we can add, your Honor. I think the highest Court in the State of New York is certainly not a little magistrates court somewhere, it's taking exactly the same statute we have, word for word,

and basically saying in essence, you can't have a substantial risk if it was impossible.

Thank you.

MR. COLE: Judge, I just want to add one last thing. There was another risk of what Captain Hazelwood did, and that has been shown in this thing.

THE COURT: The risk of damage to the property of others?

MR. COLE: Damage to the vessel, yes.

THE COURT: You were given specific instructions to give us a bill of particulars to set forth what damage it was that you were claiming was damage to the others, and specifically you said it wasn't to the vessel, as I understand it. Am I correct about that?

MR. COLE: I am saying that. But I am saying that there is a risk, and that risk is -- let me just show it to you, and this has been testified to.

(Pause.)

This vessel is sitting on this rock right here. Captain Hazelwood does not know anything, all the way around this vessel. And he goes backward and forward. That whole time the experts, Mr. Milwee sat here and told you that he risked puncturing another hole in that vessel. He risked the engine being damaged. He risked -- I understand the bill of particulars. But he also risked running into a rock

here, running into one here, here, here, and here. And he didn't take soundings. And I think that supports more oil loss.

THE COURT: All right.

At this stage of the proceedings, since there has been so much evidence produced already showing what might have happened had Captain Hazelwood been successful, it would seem to me it would be inappropriate to instruct the jury at this point. I haven't made up my mind completely. However, I do see the relevance of this evidence to prove the element of under the influence, for driving a watercraft while under the influence. The argument could be, and I am not saying that this is what the facts are, but it is relevant to show under the influence. Mr. Cole might legitimately argue that not taking soundings, trying to move the vessel off the rock, is evidence that Captain Hazelwood was impaired and that he should have known or was under a duty to know that by doing this he did take a chance, had he been successful, in capsizing the vessel. And that goes to his judgment at the time.

So I think that goes to prove an element of the misdemeanor, operating a watercraft under the influence. It may not go to prove that Captain Hazelwood recklessly created a risk of damage to the property of others. I don't know the answer to that yet. However, I can cure any kind

of ambiguity that may be given to the jury with a jury instruction at the completion of the case.

I am going to let the answers come in as proposed. If you have other objection to testimony as it comes in, please make it timely so we can make a timely ruling on it. But this time I am going to overrule the Defendant's objection and I'm going to deny your motion to strike. And any other objection that comes in for that very question or one very similar to it would probably be overruled as well.

Although Mr. Cole, please be on notice that there is a likelihood that you will not get an instruction that suggests that what could have happened goes to prove an element of the criminal mischief. My inclination now, but I am going to give it more thought and I hope that maybe you can give me a little better briefing on this than you have already, is that factual impossibility, physical impossibility of creating any additional damage is not evidence of any of the essential elements of the crime of criminal mischief in the fourth degree. And I would be using the New York cases, and my law clerk is doing some work on Alaska cases, but I have been unable to find any Alaska cases on point so far.

Let's call the jury back in.

MR. MADSON: Your Honor, I might mention, I have tried to find Alaska cases, too, and that's the only cases

we could find on this subject.

THE COURT: How long do you expect the rest of your direct will take?

MR. COLE: Probably an hour.

THE COURT: All right.

(Whereupon, the jury entered the Courtroom.)

THE COURT: Thank you for your patience, ladies and gentlemen.

BY MR. COLE: (Resuming)

Q Professor Vorus, in coming to the conclusions that you did, what evidence did you rely on?

A Piece by piece?

Q Yeah. Just generally.

A NTSB testimony. Salvage plan. Various ship design documents, the longitudinal strength report. Trim and stability booklet. The ship general arrangement, the body plan. The Cale and Brett documents giving the loading at departure. The output of the loadmaster computer program run at the departure condition. There may have been a few others. That's essentially it.

Q Did you have any conversations with Mr. Kunkel?

A Yes.

Q And how about with Mr. Leitz?

A Yes. I also saw the vessel in drydock in San Diego.

Q Well, let's talk about that. When did you visit the Exxon Valdez in San Diego?

A In September, 1989.

Q And who were you with then?

A You, Mr. Adams, Mr. Milwee, Mr. Greiner.

Q And had you received any of the evidence at that time? The documents from the State?

A Yes, I had -- perhaps a very limited amount.

Q Now, would you describe for the jury the damage that you observed? And let me -- let me set that here and you use that pointer.

A What about my drawing?

Q Oh, did you bring that over?

A Yeah. These were in order. This one.

Q Okay.

Now, Plaintiff's Exhibit Number 159, is that a diagram that you made?

A Yes. This is a schematic or drawing of -- this is the main -- shows a plan view of the main deck of the vessel with the compartmentation indicated. It's basically the same drawing you see on the easel but without the frame notation. These two are just simple views viewing the ship from the bow, from the front. And what I prepared this for was to sketch on here the damage that I observed in the dry dock in San Diego and the scenario that I expect as to how

that was created.

Q Can you show the damage then on the top of the diagram there?

A Well, I would like to draw one other sketch to accompany this. The Exxon salvage report has attached with it soundings of the area that were taken on March 24th. In addition, we have a number of course re-creations that show the ship on a 180 heading towards Bligh Reef. Let's see, let me -- it was on a 180 heading. The Exxon salvage report -- this sketch is lifted out of that documentation. It shows a reef line that comes roughly across the path of the ship. This represents a line of shallow water representing a ridge in this rock field associated with the territory right off the northern end of Bligh Island.

The ship executed a turn and at a heading of about a hundred -- or 250 degrees is where the course recorder shows a deviation in path. I suspect that that is where it first encountered this reef ridge line. Its momentum carried it across that line. And viewing the damage in San Diego what I saw was the ship encountered that water -- and that -- the depth there -- the vessel is running at a draft at this point of about 56 1/2 feet, and if you project that -- now this was from a view of the damage and some knowledge of what the water depth was and lay of the reef ridge, it looks like projecting the profile of the reef on this view,

what you saw was some contact at the corner, water open below much of the starboard side, and then a rock coming up under close to the center line on the starboard side.

The damage that that did was, I believe some -- it looks like some scraping. It's hard to tell here because the later encounter with shallower water produced more extensive damage. But back in this region there was some scraping associated with that and mild holing here of the number 4 ballast tank.

All right, in addition to that you could follow the damage line of this rock -- this looked like it was down a depth of say 54 feet, about a two foot interference between the bottom of the ship and the top of the rock. So say this is 54 -- and these are rough -- these are very -- rough numbers. What that did was cut a tunnel. You could see the upset. You could view the ship from the bow, look down the tunnel. The ship was into a starboard turn. It was turning to the starboard, and that rock seemed to cut a tunnel -- just upset the plates -- over most of the length of the ship. You could follow it down the length. And it made a trajectory on the bottom that started at the forepeak tank and went down the entire length of the vessel with a trajectory to starboard. It took out number 1 center tank, it took out number 2 center tank. And I say took it out, it was like taking a pair of scissors and just snipping the

bottom plating. This upset region, the plate was upset and it was open. It was opened at the top. This was a width of about eight -- six to eight feet. But it was holed through the tanks. This trajectory followed a course generally towards the starboard side as the ship went into the turn. It took out 2C, it took out 3C, it took out 4C, it took out both 5C and 5S, and it took out the double bottom -- the ten foot, eleven foot double bottom under the starboard slop tank.

So that -- I think that first encounter which is very likely the crew didn't even hear or didn't even feel, it just thundered right over it, took out one, two, three, four, five, six, seven, eight, including the forepeak nine, of the twelve tanks.

All right, then it progressed into the turn and came on around to a heading of something like 305. This was 180. 305. It later settled back to about 280. This was the most intense region of that reef, from the simple soundings and sketches that Exxon produced. At that point the interference was large enough, again projecting on this view, an interference that looks more like that, where now we're set up here on the starboard side, perhaps to -- you know, 50 to 52 feet, somewhere in that range, a much -- a much more intense interference.

And that interference was such to dissipate the

momentum of the vessel and stop it. And in doing so it took out much of the turn here, into the bottom. It did extensive damage to the forepeak and to 1 starboard, to 2 starboard -- 1 starboard, 2 starboard. This is a ballast tank number 2. It got 3 starboard. And came to rest somewhere in this region on that shallow part of the reef.

Here we come across for the first one, for the second one when the ship stopped, in an attitude something like that. Stopped at about 305 and then swung back to something about 280.

Q Now would you use the diagram that you have just drawn to explain a little bit about the longitudinals, beams that run along the bottom of the vessel?

A All right. We really need to get into strength to deal with that precisely.

Q Well, just explain the layout before you get into that. What is the layout on the bottom?

A As you can see the layout better from the drawing on the other easel. The pink lines here, these are the bulkheads, the major transverse lines that I have on that sketch. The intermediate transverse lines are frames. They are big frames about as high as that -- higher than -- as high as this ceiling, but are open, generally open. And these occur roughly at the spacing indicated here.

And then the next level of structure, closely

spaced longitudinals with flanges on top that are probably about this high, that run longitudinally and pass through all the frames and all the bulkheads.

Q Now, when you were in San Diego, did you notice any damage that would be consistent with tide ballooning? Going up and down on the tide?

A Yes. The -- the vessel came to rest locally -- this ridge seemed to be rather steep, so it came to rest right in the region here of bulkhead 23. And then with the outgoing tide, the ends of the ship then tend to droop over. It's like you have got a bar with a fulcrum in the center and the tendency is for the ends, because of the weight, to droop over, and it creates a very stressful situation. Fortunately this ship, rather than knuckling, breaking at that point, it crushed -- the local structure crushed so that this region -- the region here where it settled on the grounding was -- you could walk down the length of the bottom in a drydock, the dry dock -- the docking blocks were set at four feet, and usually it is very hard to even get underneath. In this case you could stroll down between longitudinals on either side of your head all the way through this region. And then in reaching the region of settlement, this became like a cathedral almost. It was upset, set up about eight feet. The longitudinals were spread and they were heavily bowed. And that represented

the settling of the ship on the reef with the first low tide.

Q Did you see any indication of damaging where twisting, of twisting of the heading of the vessel?

MR. CHALOS: Objection, your Honor. Your Honor, I object. He's leading the witness.

MR. COLE: It's a foundational question, your Honor.

THE COURT: Maybe you can be a little more specific. The form of the question is ambiguous. When you say twisting, what are you referring to?

BY MR. COLE: (Resuming)

Q Did you see any evidence to the damage -- evidence of damage due to the vessel changing course through twisting motions?

A If again we draw that similar picture, this time looking upward from the bottom, the vessel was badly crushed and distorted in this region where it had settled on the starboard side, about 365 feet back. There were to me there were signs of rotation due to some cause, in that you could generally walk out in any direction from roughly the center of this cathedral and see marks that were perpendicular to radial lines out of that area. Just walk out a radial line, and much of the plating was missing. But where plating was intact, you could see -- I could see scratch marks that were

roughly perpendicular to my direction, indicating a rotation roughly about some center in this area.

Q Now, can you determine the cause of that twisting just from the marks itself?

A No.

I should add that there was also -- the longitudinals are by design absolutely straight. Nothing is absolutely straight, but that is where they provide their maximum strength as members of the hull structure. When these members become bowed in any direction, they lose their stiffness and essentially discontinue to provide strength to the hull. There was an indication of longitudinal splaying. It was certainly vertical. It was unquestionably vertical where the ship had settled on the reef. But there was also splaying laterally, which could have come from the ship rotating -- a rotation about some fulcrum at this point would move the ship -- the ship's center line transversely. And then in the presence of rock, a rough bottom contour is catching in these longitudinals and bending them sideways.

Q And you saw evidence of longitudinals that had been bent in this way?

A Yeah, I think the pictures that have been introduced as evidence confirm that that exists.

Q When was -- well, we can get to that in just a second.

You talked about the conclusion that you reached in this matter. Are there any factors that the jury or theories that the jury needs to understand before you explain why the Exxon Valdez would not have floated had it come off that reef?

A Well, buoyancy is the key. If you can understand buoyancy, I think most of this become rather simple. An understanding of simple buoyancy leads to understanding what we did here in terms of strength, stability and even the spill itself, the flow of fluids into and out of the tanks.

Q Have you made some exhibits to demonstrate this?

A Yes.

MR. COLE: I am going to move the admission of what has been marked as Plaintiff's Exhibit Number 159.

MR. CHALOS: No objection.

THE COURT: It is admitted.

(Plaintiff's Exhibit Number 159 was admitted in evidence.)

(Pause.)

BY MR. COLE: (Resuming)

Q Well, let's talk about stability. What do we mean by stability in a vessel?

A You mean buoyancy?

Q Buoyancy?

A Well, I would like to illustrate this with a very

simply example. I don't -- this may be unnecessary, and I don't want to insult you with this, but I think if you'll bear with me for just a moment, now this is a key to understanding the things that I am going to show you a little later.

MR. CHALOS: Your Honor, I don't mean to interrupt, but I think the witness has to be responsive to the question rather than give us a lesson as he would his students in class. I think there has to be questions and answers rather than a lecture.

THE COURT: I think our rules, Mr. Chalos, allow an expert to give somewhat of a dissertation on a subject, particularly preliminary to an opinion. I am going to let him do it. Objection overruled.

THE WITNESS: I want to start with the idea that you have two balls, one is a tennis ball made out of fabric, and the other, say, is a cannon ball, muzzle loading cannon ball. They are both the same size, roughly three inches in diameter. And let's say that we have water and you take the two balls, the same size, and hold the beneath the surface. Now obviously if you let go, one floats and one sinks. But just say for now that you are holding them below the surface. You know that the tennis ball is going to rise, the cannon ball is going to fall, and I mean, that is the proof. But there is another way to prove that. And that is

by the concept of displaced volume. Say these are both -- are both the same size, three inches, and they both have the same volume. And the volume of the three inch ball is essentially about one cup, it's about eight ounces.

All right, so the volume -- and when we say displaced volume, it's the water which occupies the same space as this material. So it is the volume of a three inch sphere. All right, the volume here in both cases is about eight ounces, volume ounces. And the weight of eight ounces of water is about a half a pound. So the weight of that volume is about one half pound.

Now the fact is if this weight is greater than the weight of the ball -- it's greater than the weight of the ball, then the object floats, rises to the surface. If this weight is less than the weight of the object, the object sinks. Now I think it is obvious that a fabric tennis ball full of air weighs less than a half pound. So the tennis ball rises and the cannon ball sinks once you release the two.

The half a pound is the buoyancy. That is the buoyancy of the submerged ball. It is the weight of the volume displaced by the objects.

All right now let's forget the cannon ball -- we are interested in bodies that float -- and go to the surface with the tennis ball. The tennis ball goes to the surface

and it floats there. It has a new displaced volume in this configuration. The displaced volume now, the volume of water displaced by this object is the volume of this little cup. It is now just a cup of water. And the weight of that cup of water which is the volume of the ball below the surface -- that's its displaced volume -- the weight of that cup of water is its buoyancy. And it is exactly equal to the weight of the ball. The weight of the ball, if the ball is heavier it displaces more water. The weight of that water is heavier, equal to the heavier weight of the ball. If the ball is lighter, it displaces less volume. A lighter weight equal to the lighter weight of the ball.

BY MR. COLE: (Resuming)

Q So if you -- your little half circle there, if that was filled up with water, the half circle there --

A Yes.

Q -- that would then be equal to -- the weight of that half a cup of water would be equal to the weight of your tennis ball?

A That's right.

Q What about -- go ahead.

I was going to ask you, what about the center of gravity in that?

A Okay, that's the next thing. You've got to go from buoyancy now to talk about where the buoyancy acts.

It'll be centered. We need the concept of the center of gravity which I think most people are familiar with. Low center of gravity, high center of gravity, it's the center of your weight.

So center of gravity for the tennis ball, since this is absolutely symmetric, would be in the center of the ball. All right, so draw the center of gravity. This represents G, and I'll refer to this as G. All right, acting through G is the weight of the ball. That's W. Now, center of buoyancy. Center of buoyancy is nothing more than the center of gravity of the displaced volume. All right, this is the displace volume. That displaced volume has a center which is somewhere on the axis because it is symmetrical, but somewhere below the surface. Just a geometric center of that -- of that space. That is known as B.

Q What's B mean?

A B represents center of buoyancy. It is center of buoyancy and center of gravity. Center of buoyancy being the center of gravity of the displaced volume.

All right now, the weight, you see, also then -- since buoyancy, the magnitude of buoyancy is equal to the weight, then you have got the weight of the object acting down through the center of gravity and you also have the weight of the object acting up through the center of

buoyancy because the buoyancy is equal to the weight.

All right, that represents a condition where the ball is stable. And it is the condition for -- we'll define stability, but the center of buoyancy must lie directly above the center of gravity for any object in order for the object to be stationary. If the center of gravity is not directly above the center of buoyancy on the same line, this will rotate.

Q When you say rotate, it'll start to twist, is that right?

A It'll turn. If you had a configuration, for example, where the center of gravity was over here and the center of buoyancy was here, you've got the weight acting through both, but this is coming down and that's going up, so it tends to twist it. And it will seek an equilibrium state. A state where these two always line up, one on top of the other.

Q What is it that acts to -- what forces are there that push this ball up again? What has happened?

A Well, it is the pressure of the water which holds it up. But that is represented in this buoyant volume.

Q Now, what happens now when they become disaligned?

A All right, for this case, for a sphere, you can put it in any position you want -- I can take the ball and, say, rotate it -- rotate it and as I -- it'll rotate, but as

it rotates, the center of gravity -- it's rotating about the center of gravity. About the center of the ball which is the center of gravity, that stays in the same place, but as it rotates the center of buoyancy rotates with it, so the center of buoyancy always stays under the center of gravity. And I can put the ball, turn it in any position that I want, and it'll stay there. Now, that's not generally true. This is a very special case because of the symmetry of the ball. And that is generally not the case with the ship.

Q Why is a ship different?

A The ship is different in two respects. One, the center of gravity is not at the axis of rotation. This shows a ship which has been inclined. Now remember, the center of buoyancy, B -- both of these arrows represent the magnitude of the weight of the ship -- but the center of buoyancy is the center of this displaced volume, and you can see that that center is shifted to one side.

All right, the center of gravity is along the axis. Now the ship has been rotated over, but you can see that in this configuration with the center of gravity below the axis of rotation -- the axis of rotation is where the vertical line through the center of buoyancy intersects the axis of the ship. If the center of gravity is below that axis of rotation, the ship will rotate back to upright, as you would expect it to.

Q You say rotate back. In other words, it'll right itself?

A The action of these two forces is to rotate it back towards upright. And that's what you would expect it to do. You know, you rock your boat, and when it stops rocking, it's sitting upright again.

All right, but that doesn't have to be the case, as indicated here on the lower picture. Imagine moving the center of gravity. The center of gravity now will be symmetric. It will be on the axis of the ship, because we are assuming that the weight is the same on both sides at this point. That's not necessarily true, if one side floods, for example. But for the symmetric case, as the center of gravity, as you stack more weight on the deck, for example, the center of gravity moves up this line. If it ever crosses the vertical line through the center of buoyancy -- in other words, if it gets above the axis of rotation of the ship, then these two forces act to rotate it in the direction of the angle.

Q So instead of righting itself back up, it continues to roll?

A It capsizes, and turns over. That's stability. Let me give you another example of that, I think one that maybe you can relate to.

A log roller or a lumberjack. Think of a ball --

this ball that we drew is now a log. The log is cylindrical. So instead of looking at a sphere, you are looking in the end of a cylinder. A ship is more of less cylindrical. All right, if the log roller is not aboard, then this looks very much like the sphere. It floats at some depth, the center of gravity is in the middle, is in the center, and the center of gravity -- or the center of buoyancy is some place below and you have got the action buoyancy and weight lined up together on the same vertical line, and stable.

But now let the log roller climb aboard. And the center of gravity goes way up. If you put the log roller on, the center of gravity of the system now goes up say to somewhere here. And if his balance is not precise and he leans one way, then that log tends to rotate. It tends to rotate so that now the log roller, center of buoyancy still in the same place, but the center of gravity is now off to one side and the weight is down. And I think you can clearly see that now because the weight and the buoyancy are not in the same vertical line, that the long is going to tend to roll over, capsize. The center of gravity is above the axis of rotation.

So in order to correct that, the log roller has to start running. He has to do something to get his center of gravity back above the center of buoyancy to stabilize the

system. So he starts running to try to get his center of gravity back up, up over the center of buoyancy so that the log will stop rolling. In this case he has gone too far and it will be rolling back the other way. But if he can't run fast enough or respond quickly enough to this, he gets thrown in the water.

Q Now, in the examples that you have given, does it make a difference when you have a liquid cargo, like in the tanker here?

A Yes. That is a case of center of gravity movement.

Let me say first of all, the idea of low center of gravity. Everybody skiing, for example, you get your stoop down, get your center of gravity low. High centers of gravity are bad.

Let me -- one other demonstration here. This thing caught my eye, and it looks like a good candidate for capsizing. The axis of rotation is fixed here at this fulcrum.

THE COURT: Is there anything in that?

THE WITNESS: The center of gravity, you can look at it and it would appear to be below the axis of rotation. And this is table, it can be rocked back and forth and aside from friction that exists in the mechanism here, it tends to right itself. All right, but turn it upside down, so that -

- center of gravity demonstrations often don't work --the center of gravity is above the axis of rotation, and let it go. Give it a start. Well, that's friction that is keeping it upright. It tends to turn over and turn back into the stable position, which if this was the attitude that you were trying to maintain, this device would be unstable in that condition and would capsize.

BY MR. COLE: (Resuming)

Q Now we were talking about what happens when a vessel, a ship, has a liquid cargo. Does that further complicate stability questions?

A We talked so far about the center of gravity rising above the axis of rotation. I think it's really best to think of the two vertical lines and where they lie relative to one another. You've got a vertical line through the center of buoyancy and a vertical line through the center of gravity and for the vessel to be stable, those lines have to be the same. They have to be coincident. Or in the stable configuration.

Now this is stable because the line -- vertical line through the center of buoyancy lies outside of that through the center of gravity, which tends to make it rotate back into the condition where the two lines are the same.

All right, the condition here, the vertical line through the center of gravity lies outside of the line

through the center of buoyancy, and that tends to make it rotate so the lines are dispersed further and further apart. And it turns up -- has to turn upside down in order to get the lines to align.

All right, now you can see that anything that moves the center of gravity further away from the center -- further outside the center of buoyancy in this case tends towards greater end stability. Anything that moves the center of buoyancy towards the center of gravity means greater stability.

Now, you can see a tanker has an advantage, with this very boxy sections in regard to the movement of the center of buoyancy. In other words, if this was circular, you don't get much movement of the center of buoyancy, but with these very sharp corners, the center of this displaced volume tends to move to the outside, which is good. It is like a sumo wrestler spreading his legs apart.

On the other hand, liquid cargos -- for example if this is carrying liquid, when the vessel rolls to one side, the liquid will pile up on that side, which tends to move the center of gravity in the wrong way, outside of the center of buoyancy. So free surfaces, liquid cargos, present a problem with tankers. And of course you can see that if you carry more weight, if the vessel is holed, and you are taking on water on one side, then that further

shifts the center of gravity outside of the center of buoyancy, not only perhaps raising the CG, leading to a more unstable situation that can lead to capsizing.

Q So we talked a little bit about stability. What is the next concept that we need to understand?

A All right. It is really the same -- it's the same mechanics, except we have got to talk about the -- we talked about buoyancy where buoyancy and gravity act, and now you need to recognize that they are really distributed. They don't really act at points. That they are distributed over some dimension.

What I am doing now is looking at the ship rather than from the end, from the side. And what this represents -- this is just a simple schematic -- these curves represent the distributions of weight and buoyancy. I mean, the fact that the ship has length, the weight is not at a point, distributed over the entire length from stern to bow.

Q You mean it is heavier in some spots than it is in others?

A This vertical distance represents the weight at any point. And you can see the ship trims down to essentially no weight at the ends. And then as it broadens, carrying more weight in this case in the center, the weight goes up -- there may be an engine room here which takes some weight out. But the area under the curve, the sum of all

these weights, represent W, what we have been calling W. And in fact, the area under that curve is the weight, the total weight, if you take that area.

All right now, the other curve that is superimposed here is the buoyancy distribution. The buoyancy similarly is distributed over the length. It will be smaller where the displaced volume is smaller, which will be at the ends, and it will be largest where the vessel displaces more volume, near the center.

All right. And likewise the total area under the buoyancy curve is the total buoyancy. And the total weight and the total buoyancy have to be the same. So the areas under these two curves have to be the same.

Q Well, what happens then when they are not in certain areas of the vessel?

A Then we have stress.

If they were exactly the same, point for point, there would be no stress of the type that we are primarily concerned about. The stress occurs because these two curves are not the same, point for point. The fact you can see here that in the middle for this particular case, it says that buoyancy, it says that buoyancy is larger than weight in the middle. Which tends to lift the vessel up locally in the middle. However, the weight is greater than the buoyancy on the ends, so it tends to sag off on the ends,

which tends to bend it. I mean, the weights in the middle, it's, you know, pushing down on the ends. It is tending to bend this as a beam.

That is called a hogging. That's a hogging model where it hogs up in the middle.

You can have a tanker can do that. It is typically more the other situation where it sags in the middle. Where it is more weight over buoyancy in the middle and buoyancy over weight on the ends. It can be either. But it is the difference in weight and buoyancy distributions that produce the stress of primary concern. The stress that essentially knuckles or breaks the ship.

Q How do waves affect this?

A It is just again a simple extension of the same argument. You can view the wave as just a change in the buoyancy. That this represents a wave, and it is freezing the picture in time. At some other time the wave will be somewhere else. But here there has been a wave placed here, so that we have taken buoyancy out of the middle with the wave. So here we tend to get buoyancy overweight on the ends and it sags down in the middle trying to fill the space created by the trough of the wave.

A half -- a quarter of a wave length later -- a half a wave length later, this trough is now reversed. It is in the middle tending to make it hog. Lifted in the

middle and it falls off on the ends, supporting what we have here just in still water without waves. So that the ship, as it -- as it traverses waves, is continuously going like that.

Q These are these tankers. Even though they are made out of steel, they are bending up and down?

A Well, any ship. But particularly these tankers. It was thought that these ships could never be built in these sizes because the big waves in storm seas are about a thousand feet long, which is typically the lengths of these ships. And this represents a wave which has the length of the ship. If the waves are longer than that or much shorter, they don't stress it as severely.

The way this was accomplished was to move the superstructure back to the stern and get a long, continuous, parallel midsection with all this longitudinal material. Ships had to be reconfigured, these ships, in order to handle stresses associated with this, with practical construction methods.

Q What is the ultimate consequence if a ship gets overstressed in a hogging or sagging motion -- moment?

A Well, it can fracture. It's buckling of either the deck or the bottom probably occurs first, depending on whether it's hogging or sagging. And then knuckling. Just takes a problem at set and possibly fracture beyond that.

Q You indicated that the longitudinals were designed to help. How do the longitudinal beams running down the length of the vessel help prevent this?

A Say that we have the hogging situation -- I think that was the one that was the most critical with regard to this case -- where the bending of a vessel is up in the middle, down on the ends. What that tends to do is stretch the deck -- you are stretching -- this is being stretched out. In other words, because this is bending on an arc, this has to become longer and it's being stretched. By the same token, the bottom is being compressed. All right, so that there is compression. So these longitudinals that we talk about, if this is a web and this is a web, these are the transverse members that we showed on this sketch -- these, the transverse webs that run between the bulkheads, and this is a longitudinal. This might be twenty feet, these are, you know, ten, twelve feet high. This member is from here is being pushed -- it's being pushed, and all of them are being pushed together by the action of this hogging. If this member is -- if it's absolutely straight, it's stiff in compression. But if it has some initial bow to it -- if it is already bowed, then to press on it in a bowed or distorted condition, it has no stiffness. It doesn't really contribute to resisting the stress associated with this hog. In other words, if this is bowed up

initially when you bring the compression on, it bows up some more, just has very little rigidity. So these members become ineffective in resisting stress once they're subjected to these out of plane deformations.

Q And is that what happens when a vessel hits rocks and tears out the bottom of its --

A Some of it is bound to occur.

Q Now we talked about two things. What is the final concept that the jury needs to understand to understand how this vessel reacts if afloat?

A All right. It's to take the same concept of buoyancy and stability and apply it to the tanks themselves. The tanks with holes in the bottoms.

I'd like to consider this just as a tank. It's not necessarily at this point a tank in a ship, but it's just a tank that -- whoops, that's the wrong one.

(Pause.)

It's an open tank with no top. And you take this tank, it has a depth, D, and this is what we have been called draft. It's the distance from the waterline to the bottom of the vessel. But this is a tank, and you put water in it, up to the level of the surface, exactly equal to the level of the surface, so that the displaced volume -- the displaced volume now is the volume of this vessel below the waterline. That is exactly equal to the weight of the water

in the tank, by definition.

Now take the bottom away, and what happens?

Q What you say take the bottom away, you mean --

A Just remove the bottom. These dotted lines mean that the bottom has been taken out. Nothing happens. Because the water inside, this just becomes an open cylinder or rectangle and the water is stable. The water stays at that level if I take the bottom away.

All right, now go to the next picture and let's say that I want to put a weight of oil in the tank equal to that original weight of water.

(Start tape C-3653)

Now, oil weighs less -- oil weighs less than water. So it will take a bigger volume of oil to get the same weight. In other words, my displacement is the same. So in the concept of displacement it takes a bigger volume of oil to equal the same weight. So I take the water out and put the oil in and it rises up above the level of the surface outside, because it is a bigger volume for the same weight.

Now take the bottom away, and what happens? Nothing. See, the concept -- people are under the misconception that an oil spill is like the bottom falling out of a bucket. That the bottoms gets a hole in it and the oil gushes out. That doesn't happen -- doesn't empty. It

will go down to the level for which the water displaced is equal to the weight of the oil in the tank. And it stays there. Now, there may be some seepage and some washing back and forth in this case, but basically the level is established.

Q Well, what happens then if you have more oil, the weight of the oil in your tank is greater than the weight of the water displaced?

A All right, take O here, this O, oil, this is O. Take O, O level is this equilibrium level. The amount of oil for which I can take the bottom away and nothing happens. So put more oil in that and take the bottom away and the oil runs out, will go out the bottom until it reaches the level O, for which the system is in equilibrium, and then it stops.

Q Well, what happens then if oil is below?

A All right. If you put less in than O, which is equilibrium, take the bottom away, water comes in the tank. Water will come in under the oil and float the oil up to a level so that the total weight of the water plus the oil is again equal to the weight of the displaced volume of water. So in this case the oil won't go quite back up to level O.

Q Now, does it make a difference that there -- in your hypothetical, that there -- in your hypothetical, it's an open atmosphere. What would happen if you had it closed?

Oh, you've got another couple there. What are these?

A It demonstrates the same thing. Again, level O is the level for which there is no bottom. Oil is above the level of the water and in equilibrium. Now, imagine the tide falling. If the tide falls a certain amount, the level of the water level outside drops and oil runs out. But oil runs out only until it reaches a new level above the new waterline, and then it stops. On the other hand, the ship is sinking, so that the waterline is rising relative to the tank. The waterline has come up. This is the equilibrium level with no bottom. If the waterline rises, which can either be a rising tide or a sinking ship, then again water would come back underneath the oil and float the system up until we reached a new equilibrium level of oil above the original one. And above the new waterline.

Q Now what happens when we put a top on it?

A All right, now if you go to the equilibrium case, and the bottom is -- overfill. O is equilibrium, so that if I take the bottom out, it stays put, nothing happens. Put the bottom back on, put some more oil in -- we'll put a top on. And assume that the top is airtight. Then take the bottom away. Now before when we took the bottom away with no top, the oil ran out. But the top is airtight. What happens? Nothing. There may be a little bit of movement

because of the compressibility of air. But generally in order for oil to flow out of the bottom, it has to be replaced by an equal volume of air in the top. And if the air can't get into the top, there is no way oil can run out of the bottom. The system is locked, it's got a vent lock. It tends to draw a vacuum. The weight of this oil is hanging on the air and it is creating a vacuum in the air. It is what we started calling the soda straw system for oil spill controls. Just vent lock the tops of the tanks and oil can't go out the bottom. You know a soda straw, you fill a soda straw with liquid and put your thumb over the top and it doesn't go anywhere. Well, that's what this is.

On the other hand, if you cut a small hole in the top and overfill it with oil above O, cut -- take the bottom away, now you let air come in to the top of the tank so that oil can go out the bottom, but slowly. At this point we haven't considered how fast any of these thing occur. But it takes time for this to happen, and the smaller this hole the longer it takes for the oil to leak out and reach the level O. It will ultimately get there. The smaller the hole the longer the time will be required for the level to drop, the oil to leak out the bottom, and to achieve the level of equilibrium stage.

Last point. Go to the same case, but now instead of removing the bottom entirely, only take part of the

bottom out, but such that the area removed from the bottom is still much greater than the area of the little hole in the top. If that's the case, these two situations are essentially the same. But the rate -- in terms of rate. They are certainly the same, they are both going to reach the same level. But the rate at which it reaches the equilibrium is controlled by the small hole.

In this particular case, as we'll see -- this is what I wanted to do to go on to explain the analysis we've got of the Valdez -- that that's the case. That we've got holes both in the tops and in the bottoms of the tanks. But the holes in the tops are much smaller than the holes in the bottoms and in fact the spill is controlled from above and not from below.

Q So what you're saying is that it is not the size of the damage that is done to the bottom that controls the oil loss, or water gained, but rather the size of the openings up above?

A It's the vents in the top. It is important the tanks have to be holed, but the sizes of the holes in the bottom almost no matter how big they -- in this particular case they are a lot bigger than the vents in the tops.

Q Did -- did you develop a computer program to demonstrate this?

A Yes.

Q And how did you do that?

A Well, we used something called the Darcey Equation. It's like pressure -- a pipe. You've got pressures at two ends of a pipe. And if they are different, there's a flow occurs through the pipe. Well, this whole thing could be viewed simplistically as a big pipe, all the way from the ends of these vents, the inert gas system and the vents and the ballast tanks from where they're exposed to atmosphere to the bottom of the tanks where they are exposed to the water pressure due to surface elevation -- that could be looked at as one big pipe, and you just calculate -- can predict the flow rates through that system.

Q Do you have a way of predicting the loss to the oil that would have occurred on this vessel when it was on the reef?

A That was the first part of the program was a flow model to fix the attitude of the ship and fix the contents in terms of oil and water at some initial state, and then start time and then predict the flow rates out of and into the oil tanks and the flow of water into the ballast tanks with time.

Q And have you done a graph to show that?

MR. CHALOS: Your Honor, may we take a break at some point? We're coming up to about a quarter after 12:00.

THE COURT: I think that's a good idea. We'll

take our break, too, ladies and gentlemen. Don't discuss the matter among yourselves or form or express any opinions. We'll take about ten or fifteen minutes.

THE CLERK: Please rise. This Court stands in recess subject to call.

(A recess was taken from 12:11 o'clock p.m. until 12:36 o'clock p.m.)

(Defendant's Exhibit Number AN was marked for identification.)

THE CLERK: This Court now resumes its session.

THE COURT: You may resume now, Mr. Cole.

BY MR. COLE: (Resuming)

Q Professor Vorus, when we took our break we were talking about the computer program that you used to predict the oil loss. The exhibit that is right there, Plaintiff's Exhibit Number 166, is that graph that you designed to help explain the oil loss, the rate of loss?

A It's a graph of the output of the computer program that was written to predict the oil loss, water gain, versus time. This was a program that was developed -- you have to specify the attitude of the vessel. Here that was specified as the departure condition. The departure draft --

Q Which was about 56.?

A 56.3 feet. Essentially zero list or heel which is the rotation. And I think a slight trim by the stern.

And this is a plot versus time. This lower scale here is the time in minutes after grounding. T equal 0 is the time that the tanks are opened up. The ship is now fixed on the reef and one of these curves is the rate of oil loss predicted by that program and barrels per hour -- now you need to multiply, if you want to use -- this is the loss rate barrels per hour, you have to multiply this number by one million. So it starts off at the initial time losing oil at a rate -- this is the total tanks -- losing oil at a rate of about one and a half million barrels per hour, a barrel being 42 gallons.

The second curve is the cumulative oil loss. This is the oil loss versus time after the holes are opened with the vessel in position, as if it were on the reef, as existed approximately at the time. The numbers here is predicting about one and a half -- here for the cumulative oil loss, this scale has to be multiplied by 100,000.

So it indicates two things. One that the spill is over, at least initially, in about eighteen -- twenty minutes. That those tanks are -- all are about seventy-five to eighty feet of oil. It was 85 percent loaded. And their equilibrium position, the point 0 that I talked about, is about ten percent above the draft of the vessel, so 62 feet. So the tanks come down from seventy-five to eighty -- to eight feet depending on the tank, down to around 62 feet,

and then they stop. And that takes about less than twenty minutes according to this calculation. The prediction is at that time that we have lost about one hundred and sixty thousand barrels.

Now Mr. Kunkel's testimony cited number like a hundred and forty thousand, losing ten to fifteen feet of oil. This maybe is a little higher, but certainly in the same range. At this time we have lost about twelve percent of the cargo, and no doubt the rest of it -- twenty five percent totally, the other half, most of that occurred when the tide went out. The tide went out, you drop another twelve feet. The tide goes down, the oil runs out, and that constitutes the bulk of the spill. After the first low tide no doubt there was seepage back and forth, but not major change in oil.

Q So any bubbling that people would have seen as they came up, would have been kind -- at like say 3:30, 4:00 o'clock, 5:00 o'clock in the morning, that would have been as a consequence of the low tide and the water level going down, and at the same time the oil level correspondingly going down and the vessel losing more oil.

A And falling with the tide.

Q Well, what happens next then? You've lost oil. What else is happening at the same time?

A All right, this is a graph out to thirty minutes.

This one is to eighteen minutes. This is the same -- essentially the same graph in that this is the cumulative oil loss as on the preceding graph, and now instead of barrels we are in tons. This is thousands of tons of oil lost versus time out to thirty minutes. You can again see that the oil loss is stabilized at about sixteen, seventeen minutes.

The other curve is the rate of water gained. We've got the forepeak tank, which was initially empty. The two ballast tanks on the starboard side were initially empty. So this represent essentially water -- the net water coming in to those tanks versus time. Again out to thirty minutes. The oil is stabilized but the water -- the water is continuing to increase. And the reason the rates are different -- the reason the rates are different is because of the size of the small hole in the tops of the tanks.

Q Well, now, what you have been referring to is Plaintiff's Exhibit Number 165, is that correct?

A Yes.

Q Now, do you have a diagram there that will help explain the difference between the oil loss and the oil gain -- the water gain?

A All right. This is Exhibit 168. What you are looking at here is again this same plan view of the main deck that we have had up here on several occasions for

different reasons. BT represents ballast tank vent system. Now the ballast tanks on this ship are the forepeak tank -- it's a tank right in the front, just forward of the forward bulkhead. Then number 2 starboard is a ballast tank that was initially empty. And number 4 starboard is a ballast tank that was initially empty.

All right now, all three of these tanks were holed during the accident. You will notice the vents here. The forepeak tank has two ten inch vents and one two and a half. And that is a good bit of area. As a result of that the forepeak tank stays up pretty well with the waterline. There is some lag. In other words, there is some time required for the changes to occur as controlled by these vents. But the forepeak tank is relatively open. In other words, the openings in the top are relatively large. So things occur more quickly there.

Q Wait a minute. When you say things occur, does that mean water is coming in?

A The water fill occurs more rapidly in the forepeak tank than it does in these two ballast tanks because the vents in the top are larger. They can pass more air more rapidly.

Q Which way is the air going, in or out?

A The air is coming out of the vents as water comes in the bottom. This is really the reverse situation from

the one I demonstrated. Oil will go out -- this is the system down here that controls the oil loss. Oil goes out, air has to come in through this system. Here as water comes in, air has to come out. It is pushed out through these vents.

Q So would it be fair to say that the water gained in the forepeak is relatively quick?

A The forepeak gains water fast. Relatively fast compared to tanks 2 and 4. These have only one six inch and one four inch vent in each tank. It is the same with both of them.

All right, in these -- the four and the six vents in these tanks are much more constricted in fact than the vents associated with the cargo tanks.

Q Now before you get into that, you are assuming now that each one of these tanks is like a separate little container, is that correct?

A Yes.

Q Like you were talking about how the water and the oil comes in in your previous examples, instead of having one tank, we're talking about about fifteen or sixteen tanks?

A That's right. They are all gaining water or losing oil at the same time. Depending on the constriction in the top which allows the flow to occur, and then the

curves I have just shown with the cumulative amounts of oil and water, lost or gained with time.

Q Now would you explain to the jury why it is that oil is lost faster now? What type of vents do we have on the cargo holding tanks?

A All right. This is the inert gas system that you have heard about that keeps the inert atmosphere on the tanks to avoid explosion. There is a 24 inch diameter main that comes out of the engine room. This is flue gas, the exhaust gas out of the boiler that is washed and is pushed through this 24 inch diameter pipe. On that 24 inch diameter line are pressure vacuum relief valves that they lift if the pressure exceeds about 3 psi to relieve the gas and they open the vacuum if the gauge pressure, the pressure below atmosphere is about 1 pound per square inch.

All right, in addition there is what is called the liquid breaker which is basically a U pipe with liquid in it that allows for a high volume of flow or air or gas. This is for protection of the system and protection of the tanks, in that the liquid can either be blow out or sucked out, and when it is, by vacuum or by overpressure, at essentially those same settings, when that occurs the system is open to the atmosphere. The mechanical pressure vacuum relief valves will reseat. The pressure drops within those limits of minus 1 to plus 2 3/4, they will reseat. But the liquid

breaker won't. It has to be recharged with a water-glycol solution in order to -- to secure the system.

All right, then off the 24 inch main, we have these branch pipes that are twelve inch lines going to each of the cargo tanks. At each of the tank access openings there's an additional pressure vacuum relief valve, mechanically actuated, on a four inch line.

All right, the valves in this system -- there are valves here at just upstream in the branches at the cargo access hatches. But the venting for this system is the mechanical pressure vacuum relief valves -- this is the cargo tanks -- to let air in on four inch lines at the tank accesses -- that's the first level. Then we've got the pressure vacuum relief valves on the 24 inch main as well as the liquid breaker. And under the vacuums created by that bottom opening, all of these valves will open very quickly after the spill, or after the opening occurs.

Q And when the opening occurred and the oil started to leave the vessel, how fast was this air coming in these tanks?

A Well, up here because of the high constriction in the vents on the ballast tanks, its a choke flow. I mean, its sonic velocity in the throats around the balls. It's -- no matter what the pressure difference is across these vents is initially, it's a sonic flow -- speed of sound of the air

through those vents.

Q And would it be making noise?

A I am sure it would be making -- screaming.

Q And what -- what then -- based on this you were able to reach the diagram that you just -- the flow rates of water in and out, is that correct?

A That's right. These really control the rate at which oil goes out, these two systems. It really doesn't matter what's happened to the bottom. The holes there are so much larger than the equivalence of four and six inch pipes and the constrictions of this system, that these two control -- absolutely control the rate at which water comes in and oil goes out, almost independently of the size of the holes in the bottom.

Q And your program was designed to take that into consideration, is that correct?

A That's right. These systems were both modeled in that program.

Q Now, did you -- the second part -- you had a second part of your computer program.

A All right. This --

Q Go ahead.

A This program was then coupled -- what you see to this point is the ships attitude is fixed. The tanks are opened and the flows are allowed to occur and we predict

what happens in time. We then took that program and coupled it to a ship hydrostatics program, and that program, for a given loading of the tanks, will predict its attitude. This program predicts the loading in the tanks at any time. The other program predicts the change in attitude of the ship with the change in loading.

All right, so this previous program changes the loading. That goes into the hydrostatics program which changes the attitude of the ship. The attitude of the ship then comes back to this program and that predicts new flow rates and changes in loading. That goes back to the hydrostatics program to predict the new attitude of the ship, and those two are flip flop, sequentially step forward in time together, to predict what would have happened had the ship then come free of the reef after some starting time.

Q Now, let's take an example. Did you run one when the vessel had come off ten minutes after it initially hit the reef?

Okay, before I ask you that, it could have been -- it just refloated off by its own, is that correct?

A We ran -- once we got these programs written and working, we ran a number of different scenarios as to when it comes off is important because that becomes the initial condition for which the ship attitude starts changing which

in turn changes the rates at which water comes on and oil goes off. But we did one for which the ship was holed but never stopped. And then we did it for different starting times on the reef. In other words, used the preceding curves and went to a particular time on those -- this is ten minutes -- and that became the initial condition then at which the ship is refloated at that time and then the flow and the vessel attitude change is allowed to progress in time out to either a new equilibrium condition --

Q An equilibrium condition meaning what?

A Equilibrium condition meaning that the ship remains floating and upright. Or the consequence, the alternative is capsizing or sinking or both.

Q And if the vessel refloats after ten minutes after the grounding, what would have happened?

MR. CHALOS: Objection, your Honor. Speculation. Not probative. Irrelevant.

THE COURT: Well, consistent with my earlier ruling, we will overrule the objection, and we'll be able to take this matter up at a later time.

You may answer the question.

THE WITNESS: Well, this assumes that the vessel came off the reef. It was allowed to lose oil and gain water for ten minutes according to the preceding curves, and at ten minutes it was kicked off or set adrift and coupled

to the other program allowing for attitude changes. This is the oil loss continuing out to seventy five minutes. Now at this point, as it comes off -- and I think it may be appropriate at this point to put up the other --

Q Now you are referring now to Plaintiff's Exhibit 169.

A What this is, this is a profile view of the ship, showing the transverse bulkheads which separate the tanks. This is the bow, forepeak tank. This is along the center line. This view is right down the center of the ship, so all you are seeing, you're seeing the forepeak tank and then all the center oil tanks. The oil is red, the water is blue. All right, then the figures down below are sections. This section goes with this tank. In other words, looking in from the end so that this level is the level right in the middle and then this is a port tank which is full, and then this is a starboard tank corresponding to number 5.

All right, this section likewise is 4, this is a section through 3, the section through 2, the section through 1, and the section through the forepeak.

All right, with red being oil at this particular time and blue being water. Now this time is ten minutes. In other words, it has been sitting on the reef for ten minutes and this is the configuration that it has reached. You will note that there is water indicated under number

four center tank. Now that is because that tank was loaded to about sixty feet initially at departure at the terminal. The equilibrium, the point 0 for the tank is about sixty two feet. So this predicts that when that tank was opened, rather than oil going out, water came in in a small amount.

Now I should say that the precise position of the ship on the reef is somewhat indeterminate. I assumed that it was fixed on the reef at the departure draft. It could have been raised slightly on the starboard side. I don't think it makes significant difference to the outcome of this exercise.

All right, so this is after ten minutes showing the levels of oil in the tanks. It has been freed and the first movement is a slight heel -- it changes draft, it comes up, it rises up slightly because it has lost weight net, and it heels, rotates slightly to port. You can see it has rotated in this direction, opposite to the direction of the ground as it came off.

Q Why did it heel to port?

A Because it had lost more weight on the starboard side than it had gained.

Q It had lost -- the weight of the oil that it had lost had not been replaced by --

A That exceeded the water that had been lost.

Q Okay.

A All right.

That's this point. And you can see that as it went over to port, it dropped a little more oil. The oil rate went back up and then stabilized again at less than thirty minutes. At that point, it has lost seventeen percent of the cargo. Now the total spill we know is twenty five. About twelve percent was lost during the going out tide as it stayed on the reef. This says that had it come free, we would have come free, the oil would have restabilized at seventeen percent cargo loss.

Now some people have -- I have heard rumor that some have claimed that the best thing that could have been done here was to free the ship, float the ship and to minimize the spill, because then it doesn't have to face that going out tide on a reef. And that's true, seventeen percent versus twenty five percent. Had it stayed afloat.

But the prediction here is that after seventy five minutes, it capsizes, turns over, and the displacement at that time is up around 260,000 tons.

Q Now, do you have the next time period?

A The remainder of these charts are the attitude of the ship every fifteen minutes from the ten minute start out to capsizing.

Q What's the next one?

And that has been identified as 170.

A This is at fifteen minutes. You can see at fifteen -- now the times here are different. This is fifteen minutes from ten. So this is at twenty five. This picture corresponds to twenty five minutes. The oil has restabilized, there is no more oil spilling. About all that has happened to the attitude of the ship during this time is a rotation to starboard. There is very little change in draft, there is very little trim change.

But in that first fifteen minutes after freedom, our program predicts that we get a roll back over to starboard. Went to port first and then back to starboard. It is at 3 1/2 degrees.

Q Why is it going to starboard?

A It goes to starboard now because the oil has stopped and we are now picking up water in the ballast tanks.

Q On the starboard side?

A We have ceased losing oil on the starboard side, we are taking on water in the starboard side ballast tanks and she begins to go over towards the starboard side. You can see the forepeak tank is staying pretty much with the attitude of the vessel. It is full. The ballast tanks are lagging way behind because of the constrictions in the vents on the deck. In other words, they would tend to come up to the water line, because that's water. But because of the

lag in the system associated with the constriction of the vents, the ballast tanks stay somewhat behind the motion.

Q Now, thirty minutes after, do you have one for that?

A At thirty minutes, the heel angle is up to eleven degrees. It's now going down by the stern. It's trimming -- or down by the bow. The bow is dropping down. It's at almost one degree. The draft has increased to sixty feet. It has taken a very noticeable heel angle to starboard. Water is now coming back under all the oil tanks. You see, as the vessel drops both to starboard and down by the bow, that creates a higher draft. You know, the ship is sinking. So that makes oil come back -- or water come back under the oil and add more weight. And more weight makes it sink further. And the deeper draft makes more water come aboard. And it is happening throughout now, the ruptured tanks. But the effect is to make the bow go down and the ship list to starboard.

Q How does that effect the ship's stability as you get the greater weight on the starboard side?

A Well, you remember the lesson, the center of gravity now is moving further and further outside of the vertical line through the center of buoyancy, which is tending towards a capsizing situation, an instability.

Q That was Exhibit Number 171?

A That's thirty minutes, which is actually forty minutes on this graph.

Q And then at, is it forty five?

A This is at fifty minutes.

Q Fifty minutes. And this is Plaintiff's Exhibit Number 172.

A The foredeck is now awash.

Q When you say awash, what do you mean?

A Well, there is water over the deck edge. The trim is one and a half degrees bow down, the heel is now almost twenty degrees. You couldn't walk on the decks in this condition. You can see the ballast tanks on the starboard side are filling up as well as are the oil tanks with the combination of oil and water. These will ultimately fill completely up with the tank volume being oil on top floating on water on the bottom. The draft is up to sixty six -- almost sixty six and a half feet.

And then the ultimate even here which occurs at sixty five minutes relative to start, seventy five relative to grounding, shows that the -- you know, you've got water half way across the deck. If the watertight doors in the engine room are not shut, the engine room is taking on water. She at this position has become unstable. Heavy water on board. And the process from this point would be a slow roll onto her back, then flooding in the engine room

area and no doubt sinking if the water was deep enough.

Q And this is Plaintiff's Exhibit Number 173, is that correct?

A Yes.

Q Now did you run any of the scenarios like you just did if this vessel had never been grounded and it just suffered the damage and stayed afloat?

A Yes.

Q Would you explain to the jury what happened then?

A We started running at different times. And the plan was to go on out and start it at successively greater and greater times, but it became obvious very quickly that the longer it stayed on the reef the more quickly it sank after it came off. And that is because as more space, the longer it stays on the reef, the more oil is lost, the more space you had for water, and water is what sinks the ship, not the oil -- that capsizes the ship, not the oil.

So we're looking at a conservative situation here by starting, freeing the vessel quickly from the reef.

Q What about when you assume it came off without being grounded at all, what would have happened?

A The time the sinking was about ten minutes longer than after ten minutes.

Q And did you run any scenarios at all that this vessel would have reached equilibrium?

A There's been some testimony about slider valves, I believe, that they're the valves on the inert gas system which are at the hatch openings. If you'll remember --

(Pause.)

The valves here on the branch lines on the inert gas system are butterfly valves which could be shut. Now, if those valves are shut, then the pressure relief, the vacuum relief provided by the PV and liquid breakers on the main is eliminated, so that the only vacuum relief then if these valves are shut are through the pressure vacuum breakers on the four inch lines right at the cargo access hatches.

All right, so that -- if those valves are shut, that provides a greater constriction to air flow into the tanks on the cargo tanks and slows down the rate of oil loss. All right, so then when it comes off the reef then there is not as much space aboard for water because the oil loss has been slowed down.

And we did -- we ran it starting at 0, assuming the tanks were holed and it passed over the reef and free floated, and in fact with the slider valves shut in that case, it does not capsize by this prediction. It comes back to equilibrium. It's at a high heel angle and at a high trim, but it continues floating.

That is also the case at five minutes. At ten

minutes however, which was the case run here with the sliders shut, enough oil has still be lost then so that capsizing is predicted and then for any later time, it would predict capsizing, whether the valves were shut or not.

Q When you were asked to do this, you were assumed -- you were asked to assume the damage that was done to this particular vessel, the Exxon Valdez, as you saw it, is that right?

A Yes.

Q And the scenario then with -- just to go over one more thing -- if the vessel had not grounded whatsoever, and the slider valves had not been closed, what was your prediction as to when the vessel would have capsized?

A Well, I don't have the numbers right in front of me, but I think it was -- this was seventy five minutes after -- or after ten minutes on the reef. I think it was -- it added about another ten minutes to that time, as I recall.

Q And every time -- any time after that it just speeded it up?

A That's right.

Q And when was the most critical time period for this vessel in terms of the danger that was posed to it by the tides?

A Well, I think it had to be on the going out tide.

The vessel was pivoted, the fulcrum there at -- between cargo tanks 2 and 3, and as the tide went out that became a hard support near the center of the vessel. A hogging -- a hogging configuration with the ends of the ship hanging over tending to bend the vessel about that point. So as the tide drops, more and more of the support of the vessel is from the rock and less and less from buoyancy of the ship, producing a situation where it is just propped up in the middle. And I think if you do that stress calculation, I think that you'll find that unless the structure relieves that point support, that the vessel is overstressed.

The thing I think that saved it was that the structure did crush -- it crushed and relieved the magnitude of that concentrated load at the rock, and let more of the load be taken by buoyancy distributed over its length.

Q Now, there was no damage done to the port side in the initial grounding, is that correct?

A That's -- that's correct.

Q If the port side had been one of the -- let's say cargo tank number 5 were holed for some reason, what would happen then?

MR. CHALOS: Objection, your Honor. This is sheer speculation again.

THE COURT: Objection overruled.

THE WITNESS: I'm not --

BY MR. COLE: (Resuming)

Q Would the amount of -- let's say that, and for instance --

MR. CHALOS: Your Honor, there is a question pending, and the witness said, I'm not -- And Mr. Cole interrupted.

THE COURT: Let him answer the question, Mr. Cole. You'll have to be satisfied with the question and answer. Can you answer the question?

THE WITNESS: Cargo tank number 5 would have lost oil at a rate similar to what we have shown here for the other tanks, and ultimately water would have begun to come back in to the ruptured port side tank.

BY MR. COLE: (Resuming)

Q Would it have been under the same theory that it depends on the assumption that the hole is greater -- that's caused by the rock would be greater than the aperture above the tank?

MR. CHALOS: Objection, your Honor. Now we're really speculating.

THE COURT: Mr. Cole, you're going pretty far off track. I am going to sustain the objection. You'll have to get back on track.

MR. COLE: I have nothing further.

CROSS EXAMINATION

BY MR. CHALOS:

Q Good afternoon, Mr. Vorus. Professor Vorus, I'm sorry.

You say your initial contract was for $25,000?

A Yes. That's my company now, that's not me. I had to hire three people to do this job. But yes, it was for $25,000.

Q Are you -- is there a contract now that is greater than $25,000?

A There's been an amendment to the contract to allow for the extra time that I have spent here in Alaska.

Q How much is your contract presently?

A $40,000.

Q How much have you billed the State so far?

A About $12,000.

Q And how much do you anticipate billing them before its over?

A Well, $40,000 is conservative. That's certainly adequate.

Q It could be greater?

A No. It would be no greater than that.

Q How much is this $40,000, if that's what you bill, how much does that represent of Vorus and Associates annual income?

A Not a large amount. I have a contract with a

propeller manufacturer that pays Vorus and Associates $4,000 a month. I have a contract with BP Oil on one of their Alaska trade tankers which is $40,000. It's not the only thing we're doing.

Q I understand that, but based on the numbers you just gave us, it is about a third of your annual salary.

A Well, I don't have a -- no. I mean, that is the backlog at the moment. I mean there is work -- there's work coming and going all the time.

Q Now I take it that you don't hold any Coast Guard issued licenses.

A No.

Q You are not a master?

A No.

Q Chief mate?

A No.

Q Chief engineer?

A I own a 52 foot yacht that --

Q Have you ever been aground?

A No.

Q Now you have never sailed as a crew member on a merchant ship, have you?

A No, but I have spent many hours on merchant ships.

Q In your work at Newport News?

A Yes, and since.

Q Now you have never sailed as a crew member on a tanker, I take it?

A No.

Q Let's talk a little bit about your background and your experience. You spent some time down in Newport News, I think you said 12 years?

A 10 total, 7 in residence, 3 on educational leave.

Q And you have written a number of papers over the years?

A Yes.

Q Is it fair to say that your expertise lies in main propulsion rather than construction of vessels?

A You mean construction of main propulsion plants rather than construction of vessels?

Q Yes.

A You'll have to clarify that.

Q Well, as I read your resume, it seemed to me -- and you can let me know if I'm wrong -- that your experience lies in the construction of main propulsion equipment and the effects on vessels of main propulsion equipment?

A That was my job at Newport News by definition. I was a manager of machinery engineering. We got involved in many aspects of vessel design that involved interfaces with the machinery and many that didn't.

Q But your area was the main propulsion. The

interfacing you're talking about is putting a propeller or a shaft or an engine into a vessel that has been constructed?

A By definition of the job, it was machinery.

Q Could you tell the jury what we mean by machinery and main propulsion equipment?

A Well, the main propulsion machinery is, at Newport News naval produced diesel ships, so at the time it was everything from boilers, turbines, condenser, main shafting, propellers, it included auxiliaries, diesel, diesel generators, steam driven generators, it included steering gear, rudders, deck machinery, which would be windlasses. On military ships it was weapons elevators -- simply the machinery aboard the ship.

Q And you would consider that to be your primary area of expertise?

A No, I don't. That was the job that I had at Newport News between the years of 1963 and 1973.

Q As I read your resume, since 1973, you have been at the University of Michigan.

A Yes.

Q So your practical experience, your field experience, if you will, ended at that point?

A It did not. I have had a great deal of field experience since being at Michigan.

Q In what way?

A Activities such as this involved with not so much trials, but with shipping companies, with ship yards, problem identification, diagnosis, rectification, that's what Vorus and Associates does. Vorus and Associates is not a research company. I do my research for the University of Michigan. Vorus and Associates is an engineering company and the engineering it does is by and large on ships, ship problems.

Q Do you go out there yourself or do you send your associates?

A Oh, I go.

Q Yourself?

A Yes.

Q Now I take it that you yourself have never been aground. I mean, you said you haven't been aground on your boat, but I take it you have never been aground on another ship?

A Oh, I have been aground on my boat.

Q You have?

A Yes.

Q Oh, I thought you said you hadn't.

A I'm sorry, I misunderstood your question.

Q How often would you say you have run aground in your little boat?

A Well, it's a 52 foot boat -- it's not a -- I don't

want to be defensive. But I have run aground several times.

Q This is a sailboat?

A Yes.

Q Have a motor on it?

A Yes.

Q How did you get it off?

A Well, there's only one way to get a sailboat over an obstacle.

Q Well, how's that?

A Well, that's to back up.

Q Now, when you ran aground with your little sailboat, I take it you didn't have your computer with you?

A No.

Q You didn't sit there and say my center of buoyancy, my center of gravity, my KHE, my this-that, this X, Y, and Z. I'd better figure out how I am going to get out here.

A Well, I am sure that those concepts have to go through one's head if you are familiar with them.

Q But you didn't do the calculations in your head, I take it?

A No.

Q You have never been aground on a tanker have you?

A No.

Q And I take it you have never had the experience of

both seeing a crew that has just run aground try and figure out what the best course of action is?

A No.

Q Now you mentioned that you have testified before in some arbitrations and some Court cases?

A Yes.

Q None of those cases involved groundings, did they?

A No.

Q And none of them involved the type of structural problems that we are talking about here?

A Well, yes, at some level. I mean structure is structure, and it behaves the same in different circumstances. I mean, the considerations are the same.

Q Well, what I am really talking about is the cases that you were involved with did not involve a ship capsizing or possibly capsizing and sinking?

A No, none of the arbitrations that I was involved with had to do with capsizing and sinking.

Q Now I take it that your main expertise or the expertise that you had on propulsion dealt with steam engines?

A Yes.

Q Have you had any experience with slow speed diesel engines?

A Some since then.

Q Since you left Newport News?

A Yes.

Q Are you familiar with the power curves of a slow speed diesel engine?

A Yes.

Q Did you -- do you know what the maximum horsepower of this vessel was?

A It was about 30,000. I think I have heard the number 31,600.

Q Do you know what the horsepower was at 55 rpms?

A Well, it's a constant torque machine. The power should vary roughly with the cube of the rpm.

Q Have you done any calculations to figure out what the horsepower was at 55 rpm?

A No.

Q You didn't feel it necessary for your purposes?

A I wasn't asked to do that.

Q Did you discuss it with any of the other experts in this case? Discuss the available horsepower at 55 rpm?

A Initially as the contract was defined, I was to look into some of those issues. But in view of the time frame we had to pick the things -- I picked the things that I thought were most important, most relevant.

Q Did someone tell you not to bother with figuring out what the power curves for this vessel were?

A No. That was part of the original scope of work. But there simply wasn't time to do it.

Q Is it very, very difficult to figure out the power curves of this vessel?

A No, all you have got to have is the propeller open water curve and the power curve for the engine is extremely simple. It's a straight line.

Q That's easy enough to get if you wanted to find out what kind of power this vessel would generate at 55 rpms?

A Well, you would have to have the propeller open water curve, including the effect of the Mitsui duct, because you certainly -- if -- you're not going to develop full 86 rpm at bollard, but let's assume that you could develop 55.

Q Well, the point I am trying to make here is that if you wanted that information, it was easy enough to get?

A I suppose. I suppose it was.

Q Now, talking about what the State asked you to do, you mentioned that the State provided you with certain information.

A Yes.

Q And on the basis of the information they provided you, you came to certain conclusions, you did some studies and certain conclusions?

A Which is the typical way I operate with all of my clients. I have to have the input information to do anything. My client this time was the State of Alaska.

Q Did you do any independent analysis yourself? In other words, did you try and gather information from other sources besides the State of Alaska?

A Well, I have my own sources.

Q Such as?

A Well, my experience, my knowledge, that's been gained through 27 years of experience. My library. I did seek some information on IG system operation, which I provided independently of the State.

Q But other than what you just mentioned, everything else came to you from the State?

A The State and my own observations of the ship.

Q So if the State didn't want you to know something, they could have withheld it from you for all you know?

A I am confident that they didn't. I had the complete information that I needed in order to do what was defined.

Q Now, did anyone write to you from the State, from the DA's office, telling you what kind of conclusion they wanted you to reach in this case?

A No, they did not.

Q Did they write you a letter telling you what they

wanted you to do?

A No. The only definition on paper is what is written in the contract that I have with the State.

Q The one that was originally for $25,000?

A It's the same contract. The wording is the same. There has been an extension which ups the maximum.

THE COURT: It's 1:30, Mr. Chalos. Do you think this would be a good time for us to --

MR. CHALOS: I can finish him up tomorrow, your Honor, in about a half hour, forty five minutes at the most.

THE COURT: Ladies and gentlemen, we'll recess for the day now. We'll see you back at 8:15 a.m., tomorrow morning. I think we'll get a prompt start at 8:30 tomorrow morning. I am going to do my best, at least.

Don't discuss the case among yourselves or with anybody else. Don't form or express any opinions and avoid the media sources with regard to this case. See you back tomorrow.

(Whereupon, the jury exited the Courtroom.)

THE COURT: You may step down.

(The witness stands aside.)

THE COURT: Mr. Cole, when this witness is finished, how many witnesses do you have left in the State's case?

MR. COLE: Two.

THE COURT: And do you anticipate what, about a day for both of them?

MR. COLE: No.

THE COURT: You anticipated an hour for this witness. And I am going to multiply it by a factor of two or three, whatever you say.

MR. COLE: I think that one witness -- I think we'll be done tomorrow.

THE COURT: Okay. I dug up the Court's order and the State's response to the Court's suisponte order, if you folks don't have a copy of that. Mr. Cole, you indicated the phrase, property of another as used for the purpose of the indictment includes the fisheries, wildlife, vegetation, shoreline and other aspects of Prince William Sound. It does not include the Exxon Valdez itself. So I have been going on the assumption that we were dealing with that as the damage to another.

Is there anything else we can do today before we recess?

Let's have counsel in Court tomorrow at 8:15 and we'll get a prompt start at 8:30.

THE CLERK: Please rise. This Court stands in recess subject to call.

(Whereupon, at 1:31 o'clock p.m., the Court was in recess>)

- - -

SUPERIOR COURT)
)
STATE OF ALASKA)

Case No. 3ANS89-7217
Case No. 3ANS89-7218

I do hereby certify that the foregoing transcript was typed by me and that said transcript is a true record of the recorded proceedings to the best of my ability.

ALFRED H. WARD

- - -