UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

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Investigation of:	*	
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FIRE ONBOARD *SPIRIT OF NORFOLK*	*	
NEAR NORFOLK NAVAL STATION,	*	Accident No.: DCA22FM022
VIRGINIA ON JUNE 7, 2022	*	
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Interview of: BRIAN VAUGHN, Special Agent
Bureau of Alcohol, Tobacco, Firearms and Explosives

Virginia Beach, Virginia

Tuesday,
January 31, 2023

APPEARANCES:

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Chief of Analysis and Compliance Division
United States Coast Guard

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ERIC DENLEY, Representative
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I N D E X

I N T E R V I E W

CDR WADDINGTON: Good morning everyone. This hearing is now in session. I ask those in attendance to please silence cellphones at this time and please exit the hearing room to make or receive phone calls. For those interested, my opening statement from the first day of this hearing is posted on the livestream and Coast Guard External Affairs website which provides an expanded explanation of this hearing for the benefit of the public.

My name is CDR Randy Waddington, U.S. Coast Guard, Chief of the Analysis and Compliance Division, located at Coast Guard headquarters in Washington, D.C. I am the lead investigating office for this District Five formal investigation, and the presiding officer over these proceedings.

The Fifth District Commander has convened this investigation under the authority of investigation Title 46 United States Code § 6301, and Title 46 Code of Federal Regulations, Part 4. Our purpose is to investigate the circumstances surrounding the fire and subsequent total constructive loss of the small passenger vessel, *Spirit of Norfolk*, on June 7, 2022, while transiting the Elizabeth River near the Norfolk Navy Base in Norfolk, Virginia. The investigation will determine as closely as possible the circumstances and factors that contributed to the incident so that proper recommendations for the prevention of similar casualties may occur. The Transportation -- the National Transportation

Safety Board is also participating in this hearing. Mr. Michael Karr is the Investigator-In-Charge for the NTSB *Spirit of Norfolk* investigation, and he is here with us today. Mr. Karr will now say a few words on behalf of the NTSB.

MR. KARR: Good morning. I'm Michael Karr, Investigator-In-Charge for the National Transportation Safety Board, for the investigation of this casualty. The NTSB has joined this hearing to avoid duplicating the development of facts. Nevertheless, I do wish to point out that this does not preclude the NTSB from developing additional information separately from this proceeding, if that becomes necessary. At the conclusion of the hearing, the NTSB will analyze the facts of this casualty and determine the probable cause, independent of the Coast Guard. We'll issue a report of the NTSB findings and if appropriate, the NTSB will issue recommendations to correct safety problems discovered during the investigation.

CDR WADDINGTON: Thank you, Mr. Karr. At this time, I call Mr. Brian Vaughn, Bureau of Alcohol, Tobacco, Firearms and Explosives Investigator. LT [redacted] will you administer your oath, and he will ask you some preliminary questions. Thank you.

LCDR [redacted] Mr. Vaughn, please stand and raise your right hand. A false statement given to an agency of the United States is punishable by fine and/or imprisonment under 18 U.S.C. 1001. Knowing this, do you solemnly swear that the testimony you are about to give shall be the truth, the whole truth, and nothing but

the truth, so help you God?

MR. VAUGHN: Yes, sir.

LCDR [redacted] Please be seated.

INTERVIEW OF BRIAN VAUGHN

BY LCDR [redacted]

Q. Please state your full name and spell your last name.

A. It's Brian E. Vaughn, V-a-u-g-h-n.

Q. Please identify counsel or representative, if present, and have them state and spell their last name, as well as your firm or company relationship.

MR. JACOBS: Jonathan --

MR. [redacted] You have to press it.

MR. JACOBS: -- Jonathan Jacobs, J-o-n-a-t-h-a-n J-a-c-o-b-s, Division Counsel, Washington Field Division, Bureau of Alcohol, Tobacco, Firearms and Explosives.

BY LCDR [redacted]

Q. Please tell us your current employment and position.

A. Special Agent and certified fire investigator, based out of Washington, D.C., for ATF.

Q. What are your general responsibilities in that job?

A. In D.C., I'm part of what we call the DC Arson and Explosives Task Force. And we're responsible in the city to respond to all fire fatalities, critical injuries, church fires, most business fires, most large apartment building fires and things of that nature. And we conduct origin and cause investigations of those,

including those -- in my time, I've been in that group now for about eight years. It's -- we've done over 100 fatalities, including about three dozen homicides.

Q. Can you very briefly tell us your relevant work history?

A. Well, I came to work for the ATF in June of 1999. I've done pretty much all sides of the house, firearms, narcotics, alcohol, tobacco. In 2014 I went to the arson side and completed the ATF two-year program to become a certified fire investigator. I do continuing education every year for that program. The program, that two-year program consists of 100 fire scenes authoring (indiscernible) and cause reports, similar to the one we have here, as well as getting a master's certificate in fire science from Oklahoma State University and going through a number of courses that is taught by the fire research lab at the ATF.

Q. Do you hold any professional licenses or certificates related to your position? If you do, please explain.

A. I am an IAAI, International Association of Arson Investigation. I passed that exam, and that's part of the TIF (ph.) qualifications.

Q. Thank you. CDR Roy will now have follow-up questions for you.

A. Yes.

BY CDR ROY:

Q. Good morning, sir. I thank you for being here today to answer questions. During our questioning, if you need a break

just let us know. We can take a break for you. There is an exhibit binder available next to you. And we'll be also be displaying them on monitors around the room. If you could avoid using any acronyms, and if you do, if you could explain after you use one, that would be great. We're going to break your testimony into two main parts. First I'm just going to go a little bit more into some of your qualifications and your experience as an investigator for ATF. And then we're going to go into questions regarding June 7th fire on the *Spirit of Norfolk* and your investigation and subsequent report. Can you just go into a little more detail about your work experience when it is specifically as an arson investigator and doing reports of cause and origin? Like, how many fires have you investigated? How man cause of origin reports have you completed. And again, rough numbers are fine.

A. I'm -- in the past eight years I'd say approximately 600 to 700 fire scenes I've been a part of and authored between 125 and 150 origin and cause reports.

Q. And can you also break down a little more on the training? Lt. [redacted] asked you about your experience as far as training qualifications. Can you explain, like what that involved as far as getting certified, getting your certificate, like how many hours? Go a little bit more in depth on that.

A. So the ATF program, like I said, it was two -- it's two years. In that two-year program you're required to respond to at

least 100 fire scenes and author 80 reports, origin and cause reports as part of that. You also do a research project for Oklahoma State in some fire science related issue, as well as take sic courses through Oklahoma State where you receive a graduate certificate in fire science from that. ATF also puts us through the fire research lab, which is our building up in Maryland. They put us through four or five different origin and cause classes and fire research classes up there, as part of the program.

Q. And you also mentioned it's like continuing education. And can you explain that?

A. One week a year we have to go to our Arson and Bomb Center down in Huntsville, Alabama. And they put us through, you know, updating changes to fire investigations and things of that nature. They'll burn buildings and have us dig them out and see how -- try to trick us, try to see if we're up to date on what we need to know and things of that nature.

Q. So for the Coast Guard, we conduct these hearings using the Coastguard Safety Manual, line five. Is there a document that serves you -- serves as a guide for you when conducting cause of origin investigations? If so, can you explain that?

A. It's this document here. This is the NFPA 921, National Fire Protection Association, 921. It's the guide for fire and explosive investigations. This is our guide that we use on fire investigations.

Q. And did you use that when you were conducting this

investigation on the *Spirit of Norfolk*?

A. Yes.

Q. Are you familiar with the Coast Guard Memorandum of Understanding between the Coast Guard and ATF, and if so can you explain that to us?

A. I have that here. I've read it. It's pretty old, goes back about 20 years. But it's an agreement between the AFT and Coast Guard to assist when there's a major fire, similar to this one, to help with the origin and cause the fire. It kind of lays out how that's going to work.

Q. So just for the benefit of the public. What is the relationship between the Coast Guard and ATF and what is the ATF providing the Coast Guard, based on that memorandum?

A. Expertise on fire investigations.

Q. Right. So we're going to shift to the -- we're going to shift our discussion to talk about the events of June 7, 2022 regarding the *Spirit of Norfolk* fire. You talked to us today about how you received notification about the fire. How you got involved with the investigation. That you arrived. Can you take us to your actions on scene?

A. Well the first time I came down, I believe it was on June 14th. We were planning to do the investigation on that day. And the safety -- there was just real safety concerns about some of the vapors that were still present in the engine room and the bottom of the vessel, and galley area. So we weren't able to do

an investigation on that day. We came back the following week. And that's when we were able to -- using myself and my colleague from the local office down here -- using SCVA equipment, we were able to get down there into the engine room and complete an investigation.

Q. Can you tell for the benefit of the public what a SCVA is?

A. It's a breathing apparatus that provides us with fresh oxygen so we're able to do investigations of this type, in hazardous areas.

Q. Lt. [redacted] could you please pull up Coast Guard Exhibit 82, which is the ATF Report of Investigation? Mr. Vaughn, the following questions are going to relate to your report. I'm going to have you take us through. And again, if you need to refer to your report, please do so. And then after that, I'm going to have some follow-on questions regarding the report as well. Can you explain, take us through how you conducted your investigation, the processes and procedures you used? And during that explanation, talk about what you examined and what machinery you examined and how you came up with your reports and findings.

A. Okay so, excuse me. On a scene what I generally will do as part of my investigation is I will do a cursory look around the entire vessel or in this case a vessel, and note any damage on the outside before I even consider going into the vessel. After doing that, then I would go from areas of the vessel that are least damaged. In this case, the top level down into the areas of most

damage, which is down in the engine room. And we try to keep that system in place, go from areas of least damage to most damage. In this case, the most damaged area was the engine room and the galley area, in the bottom of the vessel. We also, as part of the investigation will be part of interviews with people that were associated with the boat, in this case the Captain and some of the members working on the vessel. And then we'll -- in this case, in the engine room we went item by item in that room to the most damaged area, which was on the port side engine. And which is we put as the area of origin of this fire.

Q. Lt. [redacted] could you please turn to page 19, section 42. Sir, I'm going to bring your attention to section 42. In this section, you describe, you talk about examining the generators. Can you walk us through in a little more detail and how you ruled out that the generators did not cause this event?

A. The -- working from areas of most damage to least -- least damage to most damage, it was pretty clear to us that the most damaged area was on the port side engine. The generators had some damage at that top, and we believe that that was from fire spread from the area of the engine -- the port side engine over the top of the generators when the cloud (ph.) gasses started swirling, which is what would happen here, would swirl at the top of the -- at the ceiling level of the engine room. We looked at the generators. We considered them and we didn't think that there was a failure there that would have caused it. That also is

consistent with the some of the witness statements that we had from both the Captain and the -- one of the employees that opened the engine door to examine the fire in the early stages.

Q. So you mean, you examined both generators, that correct?

A. Yes.

Q. And they had the same determination as far as damage goes?

A. The one on the port side was more damaged than the one on the starboard side, but that would make sense because it was adjacent to where the fire began.

Q. So for our benefit, can you go at it a little bit more detail? Because I'm -- I just want to make sure we're all clear how you ruled that out as far as damage goes. because you said they were damaged. But can you kind of go into a little more detail about that damage? I'm just, what I'm trying to figure out is how you ruled out the generators if it's in your report, you said they did not cause it. I'm trying -- just trying to make sure the public, for the benefit of the public we understand how that --

A. There's -- there was -- there's going to be damage to it as fire is spreading off of the port side engine, or the area of the port side engine. And there were some movement patterns, fire patterns on the left -- the port side generator as the first spread to other portions of the engine room. But I didn't see any failure from within the generator. What I saw was fire attacking that item from the area of the port side engine.

Q. Okay. Thank you, sir. We're going to go onto, again, Coast Guard Exhibit 92, page 19, section 43. In this section, sir, you said it was about the hydraulic system.

A. Mm-hm.

Q. Said you can tell. Can you tell us how you ruled out the hydraulic system was not cause of the event?

A. I was concerned about the hydraulic system initially. And I think Mr. Karr, who was down there with us for a time, I believe he was concerned about it as well. The -- one of the arms to the hydraulics had broken, broken loose and it would have leaked hydraulic fluid into the engine room, which could potentially be a fire source. After examining the whole room and hearing statements of what happened once the engine room was opened and the water that had built up and the diesel fuel that had built up in that room and rushed out. What I believe happened there is the hydraulic system was weakened by some of the heat from the fire. And then when that water rushed from the engine room after the door was open, that broke that loose. And I think that was just a mechanical failure as part of the event overall and it didn't cause the fire.

Q. In your report, you state that the NTSB was testing that. Did you ever get a report back?

A. I never heard back from them on that, but I was told that was what happened.

Q. Now turn your attention to again, Coast Guard Exhibit 92,

page 20, section 44. In this section you ruled out the starboard engine did not cause this event. Can you go into a little more detail as how you made that conclusion?

A. I -- it was far less damage than the items on the port side of the vessel. It did take some heat damage at near the top of it from fire spread when again, when the vapors were swirling at the ceiling of the engine room. But the -- we were able to rule that out pretty early because it was clear that the fire moved from the port side towards the starboard side rather than the other way around.

Q. Exhibit 82, page 20, section 45, which is the next section down. This is a section in which you stated the port engine was the originating point. Can you again go into a little more detail about how you came to that conclusion?

A. So when we're determining that we have to take into account the fire dynamics, the fire patterns and any witness statements that we have. It was clear from what the wheelhouse had that there was a failure near that -- near or on that engine early on. And our first witness statement was that they see fire on that engine. And that -- and I learned that after I had already examined it. And it certainly looked like the fire patterns start on that engine and move from that direction. So that matched with the witness statements. And also, we know that there were prior issues, two prior issues that had been repaired and there was a third one awaiting to be repaired with that engine. And that's

something we also have to take into account. Now I wasn't specific on what the failure was of that engine, and I'm not certain what that specific failure was. But the fire patters and the fire dynamics I'm seeing down there, along with witness statements, put the fire on that engine and move it to other portions of the engine room from there.

Q. Sir, I'm going to bring your attention to, again, same exhibits, page 21, section 46. In this section you discuss the turbo. Can you explain why you felt it relevant to have a section for the port engine turbo?

A. So the -- in witness statements and with the Captain, it was my understanding that there was an issue with the turbo charger on that engine. And that a part had been ordered for it to be repaired or replaced, and that fix had not happened as of the events of June 7th. So I felt it was important to put in there. Now I didn't say specifically that that's what caused this. But I felt it was important, that piece, to have in the report.

Q. And you mentioned in there about the turbo charger can generate temperatures excess of 1,800 degrees --

A. That's my --

Q. -- and you felt that important?

A. -- I'm sorry?

Q. You felt that was important because?

A. 1,800 degrees is going to ignite any combustible material in the area or could potentially do that.

Q. I'd like to bring your attention now to same exhibits, section 56 and 57, which is on page 22 of the Exhibit 92.
A. Yes.
Q. In this section you mention the fire spread to the adjacent shelving where there were combustible materials. Can you tell us how that may affect the spread of the fire and why you felt it was important to add to you report?
A. So that there's a lot of supplies on those cabinets with shelving that kind of wrapped around the port side of the port side engine on the walls. And there was combustible material on that shelving, like rags and parts and things like that, that could potentially be an early fuel for this fire. And when I say fuel, I'm not talking gasoline. I'm talking anything that potentially could burn. Some of the stuff on that shelving could have been early fuel for this event.
Q. How would that affect the spread of the fire early on in the --
A. Well, it's going to build it up and it's going to continue to build up heat. That extra fuel is going to build up heat while it burns, and that will spread those vapors to other areas of the engine room, which it clearly did. I mean, we had a split in the starboard diesel fuel tank and that poured diesel fuel all over the engine, which added further fuel to this fire.
Q. I'm not too sure. Can you talk about section 57 again, Exhibit -- same Exhibit, 82? I just want you to discuss how you

came to the conclusion, again, in your report it says it was accidental. There is no evidence of criminal activity associated with this fire event.

A. Yes. That's my main concern. I'm a criminal investigator. I investigate every fire from a criminal standpoint. Do I see a crime here? Did I -- did someone intentionally do something? Did someone do something that they shouldn't have been doing in that engine room at the time that this fire originated? And I think the answer to that is clearly no. The fire patterns I see come back to that port side engine, with some failure on near or about that engine causing the event, so we call it accident. And for my purposes, it's a noncriminal event.

Q. I just want to circle back about, you know, cause and origin. Can you kind of walk us through? You mentioned it kind of earlier. I just want it kind of more in a detail about how you narrowed down to the engine room and then again, to the port engine. Can you tell us like the process you use? Is there a scientific process? Is there something that you've learned or?

A. We use a scientific method that's outlined here in our FPA 921 that we talked about earlier. That's how we get to our conclusions, by using that scientific method by coming up with theories or a hypothesis that could have started the fire. That's why we looked at the hydraulics. That's why we considered the generator. And in the end, the best answer we had was that this fire started on that port side engine, through just considering

all the possible options of how this fire started.

Q. So would you say again, tell me if I'm -- this is true, that you rule out places that helps you focus on like, again, origin. So you rule stuff out, which brings you to a conclusion.

A. Yes, sir.

Q. Is -- would that be a true statement?

A. That's correct.

Q. Right. That's all the questions I have.

CDR WADDINGTON: Mr. [redacted] do you have any questions of this witness?

BY MR. [redacted]

Q. Yes, sir. Thank you, Commander. Good morning, sir.

A. Good morning.

Q. So would I be correct in saying that an engine room of a vessel similar to the *Spirit of Norfolk* would be similar to an industrial building that could have all kinds of diesel engines, electrical systems, hydraulic systems, wiring, fuel sources and so forth?

A. Yes.

Q. And you mentioned damage to the generators. In this case and in that context were you referring to external damage caused by the fire?

A. Yes, it was external damage. It -- I didn't see -- when an item like that fails you generally see the damage from the inside working its way out. This seems to -- the damage I observed on

those generators was from fire spread from the area of the port side engine that attacked the side of that generator. Didn't fail from the inside of it.

Q. So in the insipid stage of a fire, in this case on the *Spirit of Norfolk*.

A. Mm-hm.

Q. You have the fire. And I'm asking you this based on fire science. The fire starts on a marine diesel engine. Would there be any -- the *Spirit of Norfolk* had open engine room vents that came out on the port and starboard side, open to the atmosphere. What type or color smoke do you believe that would be initially released into the atmosphere?

A. It's difficult for me to say. Generally it's a whiter smoke that goes to dark. When that diesel fuel was burning I'm sure it was pretty dark later on. But it like, goes from light to dark.

Q. So when the fuel tank seam opened sometime during the fire sequence, would this have accelerated the fire?

A. Yes.

Q. And one of -- one thing that you mentioned, those -- the openings, the vents. That's going to keep this fire burning, right? I mean, fire needs three things. It needs a heat source, it needs a fuel and it needs oxygen. And it's going to entrain that oxygen from the -- through those vents and that's going to continue to build up the heat and cause the fire to burn hotter and longer.

A. Could you estimate how hot the fire was in the engine room based on standards available to you?
Q. I wouldn't want to venture a guess on that. Certainly in excess of 1,000 degrees Fahrenheit, but I don't know an exact. I wouldn't want to give you a more exact number than that.
A. This vessel was not equipped with a fixed fire suppression system. Have you investigated industrial fires in a contained space that have a fixed fire suppression system such as Halon or CO2?
Q. Yes.
A. In those situations where you've examined fires where systems such as that, a f fire suppression system is installed, is the damage less? What I'm trying to get to is, would a system like that have reduced the consequences and the outcomes in the fire?
Q. I would say it probably would have, yes. Certainly slowed the growth in the early stages of it, no doubt about that.
A. And then for the record, did the Coast Guard provide you written statements of the interviews so you could review those written statements?
Q. Written statements, and I also took part in a couple of the interviews as well, over the phone.
A. And for the benefit of the public. Those interviews are contained in Coast Guard Exhibit 071. So what would -- in those statements, what information was reported in those statements and in the interviews that you took place regarding the port engine?

In other words, did you know that there was a recommendation to replace a turbo charger on the port engine, in reviewing those -- either participating in the interviews or reviewing those statements?

Q. Yes, that's where I learned it.

A. Thank you, sir. That's all I have.

CDR WADDINGTON: NTSB, do you have any questions of this witness?

BY MR. FLAHERTY:

Q. Yes, Commander. Thank you. Hi. My name is David Flaherty, with the National Transportation Safety Board. I appreciate you coming in here to share your technical insights to this casualty. Could you describe how extensive the damage was to the engine room as a whole?

A. It was extensive. The port side engine was -- the left (ph.), the port side was heavily damaged. The fuel tank on the starboard engine took to much heat that it split open and poured all that diesel fuel into the engine room, which added fuel to it. And you had a buildup of water and the diesel fuel as the suppression activities were continuing. That water also damaged some of the items in there, so it was pretty extensive damage.

Q. During your investigation were you able to find any V-shaped pattern, which is generally an indication of the potential source of the fire?

A. I don't recall seeing a V-shaped pattern. I saw a lot of

damage on the port side engine, but I don't recall seeing a V-pattern.

Q. Did -- when you describe the damage, where is the damage located that kind of identified that the port area around the port engine was the potential source?

A. Well, everything in that area was badly damaged. The shelving around it was damaged. There was some -- the forming of the top of the top of that port side engine, which I believe is shown in one of the pictures, right above paragraph 46 in the report.

Q. Right.

A. So there was plenty of damage right on the engine and around it.

Q. Did you see any structural damage to the overhead area around the engine?

A. Not that I recall right now.

Q. Okay. Did you -- when you were looking at the engine, the damage to the engine. You mentioned the top of the engine, forward part of it was damaged. Did anything else -- other damage to the engine. Were you able to identify any other damage to the engine during your investigation.

A. I kept it pretty general on what I thought failed. And to me it's the -- what I saw was a fire that started on that engine and moved off that engine in other directions, as far as more damage. I mean, there was a lot of damage to the engine.

Q. Oh yeah. Did the -- since the engine room was flooded at one point, did that -- do you think that may have hindered your investigation with identifying any potential sources to the fire?
A. It could have because as the water level rose and the diesel fuel was on top of it, it's going -- that water is going to protect portions of things that may have -- and may do damage to some of the items that are in that room. So that may have -- that may have been a difficulty in pinpointing exactly where the failure was.
Q. Did you see any other area of the engine room where significant damage also occurred? I know you mentioned the starboard fuel tank split. I assume that occurred because of -- was that because of the heat of the fire or what other -- what do you think could cause that to --
A. That was my assumption that it heated up so much and to split.
Q. But why would that occur, just to --
A. Because you have temperatures and -- excessive temperatures in the rooms that the fire is burning and swirling. And radiant heat and everything that's going around in there is going to put a lot of pressure on the joints of the -- of items like that.
Q. Did you -- was there any equivalent damage to the port side fuel tank?
A. Not nearly as bad as that, no.
Q. All right, but it did sustain some damage.

A. It did have some damage to it, yes.
Q. Okay. Did you find any other failures in the hydraulic system that was located in the engine room?
A. I mentioned just that one that i saw.
Q. Okay.
A. And my best -- my idea was that it heated up during the fire. And when the water released from the engine room, there was a mechanical failure where -- at that break point.
Q. Okay. Then the other part is the storage of combustible material that was located right next to the engine. You mention that the turbo charger can get up to 1,800 degrees Fahrenheit. Do you know from your experience how much -- if that heat was reaching out and touching something combustible, how close would that combustible material have to be in general for it to maybe potentially ignite?
A. It -- within a couple of -- two or three feet. If -- it was certainly within two or three feet of that engine that that shelving was.
Q. Mm-hm.
A. That's, I think that's close enough that it likely -- if you had temperatures of 1,800 degrees that you could have combustion like that.
Q. Well, there were pictures of the engine room taken at some point prior to the fire, and they had plastic totes in that shelving area. Is there a difference with how plastic responds to

heat of that temperature versus cardboard?
A. Well, carboard is going to burn. The plastic is going to melt down.
Q. And if the plastic melts does it eventually ignite or just cools and solidifies again?
A. It could potentially have some ignition. It -- what's in the crates. I mean, I'm not even sure what was in them. I know they were there but I'm not -- if there was combustible material inside of them you certainly would have had combustion inside of it.
Q. And that would have made -- if obviously, having all that combustible material in -- near an engine, when the fire occurred certainly made the fire situation much more challenging?
A. Yes
Q. All right, thank you.
CDR WADDINGTON: Bay Diesel, do you have any questions of this witness?
BY MR. ABELL:
Q. I do, Commander. Good morning, sir. My name is Chris Abell (ph.). I represent Bay Diesel, one of the parties-in-interest in the case. Appreciate you coming here today, sir. ATF describes itself as the nation's primary source for explosives and fire investigation knowledge and assistance. Would you agree with that?
A. Sure, yes. It's on the website. It's on the website, so I guess I have to agree with it.

Q. Okay. Okay. And fair enough to assume that if you guys can't figure out how a fire started, no one can.
A. I'm not saying -- no, I'm not saying that.
Q. Okay. Who's got more resources than the government of the United States and the ATF to figure out cause and origin for a fire?
A. Not -- I don't know of one.
Q. Okay. And in this instance, your assignment was what at the front end? What were you tasked with doing, sir?
A. On any fire scene I go to, my first job is to investigate the origin and cause and to see if there is some sort of criminal act that caused the fire.
Q. Okay. In fact I believe you said early in your testimony that determining whether there was a crime here was your main concern, right?
A. Yes. I'm a -- I work for a law enforcement agency. That's our --
Q. Yeah.
A. -- that's our main concern.
Q. And in this instance you determined no criminal act. This is an accidental fire was your conclusion.
A. I called it accidental, noncriminal.
Q. Right, that's correct. And then we're going to talk a little bit about the origin of the fire because you have concluded that the fire originated in the or near the port main diesel engine,

correct?
A. Correct.
Q. As you sit here today, you don't know what the cause of the fire is, do you?
A. I didn't -- I mentioned a couple things that could have potential to be causes but I did not specify what caused it.
Q. Right. I mean, you can't sit here and say to a, you know, reasonable professional certainty the cause of the fire was this.
A. Not specifically, no.
Q. Okay. Now earlier, when you were talking about your background with ATF. If I've got my sequence right. You transferred to the arson side in 2014 and that started two years of training, right?
A. That's correct.
Q. Okay. So by 2016, you're fully trained and in your traces as far as an investigator in that section, right?
A. In -- I was actually in the ATF CFI classes starting in 2015, so I graduated in 2017.
Q. Okay. And then you talked about the number of fires you investigated. In fact how many you had to investigate as part of the qualification process. How many ship fires have you investigated, sir?
A. I knew that question was coming.
Q. Yeah.
A. I've done two other fires that involved vessels, of boats,

certainly nothing of this size or this complex. I -- we did a marina fire in Washington, D.C. about five or six years ago.
Q. Mm-hm.
A. In which a couple boats were damaged during that. And we did a -- an intentionally set fire on a boat that was in someone's yard. Other than that, I have limited -- admittedly, I have limited experience on vessels this -- of this type.
Q. Okay. And when you say the two prior experiences, those are the two you just mentioned, sir?
A. Yes, sir.
Q. Okay
A. The marina fire and the boat in somebody's yard.
Q. Yes.
A. Okay.
Q. I assume the boat in somebody's yard is small enough, it's a trailerable boat?
A. It was a 30, 35-footer or something like that.
Q. Okay. Probably fiberglass construction?
A. I believe it was. It goes back a while now. I don't remember exactly.
Q. You'd mentioned you were an IAAI certified fire investigator. Are you a member of IAMI?
A. No.
Q. Do you know what IAMI is?
A. No, I don't.

Q. The International Association of Marine Investigators?
A. I'm not part of that, no.
Q. Oh, okay. And in producing the report, and we're going to talk about that in just a moment. You had at least until now, six-and-a-half months since the fire to investigate the circumstances and come to the conclusions that you did. Right, sir?
A. Correct.
Q. Okay. And at any point did you have any kind of limit placed on your ability to collect the evidence that you thought you would need to help you reach the conclusions you did?
A. No.
Q. Okay, so nothing you asked for that you were denied in terms of I need to see this evidence or can I have this resource or whatever. If you needed it, you got it, right?
A. I -- yes, I assume I would have.
Q. Okay. And in terms of the tools that you have to help you do that, you work for the most powerful government in the world. In fact it prints money. Was there anything that you needed to help you do your job that you were denied in coming to the conclusions you did?
A. No.
Q. Okay. Now, at the risk of sounding laughably simple, I just want to make sure that because it's a public hearing, people understand what you're doing. In terms of determining the cause

or origin of a fire and then cause is out, so now we're looking at origin. At some point you got to know how a fireworks and you end up with a fire triangle, right?

A. Right.

Q. Okay, correct me if I'm wrong. But the fire triangle is going to involve oxygen, fuel of some kind, something's got to burn, and there has to be some heat or ignition source, right?

A. Right.

Q. Interrupt that, take any one of those three away, your fire's probably going to go out.

A. Correct.

Q. Okay. Do you know what the initial fuel was when this fire started?

A. I do not.

Q. Okay. Oxygen I'm going to take is a given. This is a naturally aspirated engine room at least in terms of the vents, right?

A. Right.

Q. So there would have been air in there to provide the oxygen needed for a fire -- whatever is burning in that engine room, correct?

A. Correct.

Q. And if you don't know the cause of the fire would it be fair to say that the heat or ignition source to initially start the fire, you don't know specifically what that was, do you?

A. I can't, like I said in the report. I itemized a couple things that could have potentially caught -- ignited it. But no, I cannot tell you specifically what the ignition sequence was.
Q. Okay.
A. I think is what you're getting at.
Q. And once again, just in terms of the physics of the thing. Heat rises. A fire burns up. So typically, once a fire begins, the damage and the spread of the fire is going to be up and out, obviously. But in terms of a vertical direction it goes up, right?
A. Correct.
Q. So if I see an unburned area in a space with a burn above it, it's a safe bet that the fire must have started at least where the burn is and not below.
A. Ask the question one more time. If --
Q. Yeah, it was a poorly phrased question. Let me try again. If you, looking vertically in a space, see a level at which there is little or no burning. Would that suggest to you then that the fire must have begun you know, above the unburned area?
A. It's most likely yes. In this case, we did -- at some point, we had a lot of water that was thrown in through those vents, and that's going to protect a lot of items in that room.
Q. Yeah, so let's talk about that a little bit. So do you know, or at least your investigation. What did it tell you as far as how high the water level got in the engine room at any point

during the fire?
A. I couldn't say specifically.
Q. Okay.
A. It --
Q. Well, let's take the specifics out -- approximately.
A. I would say it was certainly higher than waist level --
Q. Okay.
A. -- at some point.
Q. All right, and then I believe in your --
A. And it wasn't just water. It was diesel fuel on top of that as well.
Q. You're reading my mind.
A. Yeah.
Q. Because I think your report refers to the fact that at some point, at least your assumption is that diesel fuel, whether it's from the ruptured tanks or otherwise, is now on top of that water.
A. Mm-hm.
Q. And very likely burning, right?
A. Correct.
Q. Okay. And the diesel fuel is going to be on top of the water because oil floats on water, right?
A. Right.
Q. Okay. So if I've got a fire with burning diesel fuel on top of it, that's going to burn pretty hot and do a fair amount of damage, at least at whatever level that fire is, right?

A. Correct.
Q. And above because heat rises.
A. Right.
Q. Okay.
A. And not just above the fire. The fire's going to be -- the vapor's going to be swirling at the ceiling level.
Q. Sure.
A. So it's going to be not just above where the fire is.
Q. Yeah.
A. It's going to be all throughout that whole area.
Q. I mean, at some point I've kind of created a furnace now --
A. Correct.
Q. -- between the surface of the water, the overhead. In this case we got a metal box, right, is the engine room.
A. More or less.
Q. Yeah, so I've kind of got an oven with burning diesel fuel in it is what you're imagining having happened, right?
A. Correct.
Q. Okay. And that's going to have a lot of destructive force associated with it, correct?
A. Sure.
Q. All right, which is going to complicate your analysis as far as where the fire began and what pattern it had. Because now I've got this furnace that exists between the top of the water and the overhead of the space, throughout the space, right?

A. It makes it more difficult.
Q. Sure. Do you know how long into the fire event it would have taken for that water to have filled up to at least waist height?
A. I don't know, because it depends on how quick the boats, the fire vessels got there and put the water in it. It would be impossible for me to give you an answer to that.
Q. Sure. I mean, you haven't done any kind of volumetric analysis to figure out how many gallons of water or cubic meters or water or whatever it would take --
A. I did not. No, I did not.
Q. -- to get to that level, right?
A. No.
Q. Okay. So, in answering the questions that were put to you earlier, you've indicated that you ruled out the generators because you said the fire spread from the port engine to them, was your determination, right?
A. Correct.
Q. Okay. How do you know the fire did not spread from the generator to the port main engine?
A. I told Mr. [redacted] When you have a generator, when a failure happens that you should see damage from the -- internally coming out. This one looked like it was attacked by fire from the direction of the port side engine.
Q. Yeah. What internal damage did you see on the port main diesel engine?

A. I didn't dissect the engine, so I didn't get into the internal functions of it.
Q. Right, but you understand. If the reason you assume it flowed from the port main diesel engine to the -- or port generator is because you didn't see any internal damage or evidence of internal failure on the port generator, wouldn't the same be true for the port main diesel engine? If you didn't find any evidence of internal failure or damage to the port main diesel engine, isn't the reciprocal true? Couldn't it have started in the generator and spread to the port --
A. You also had a lot of combustible material around that port side engine, on that shelving.
Q. Well, I'm not disagreeing about that. I'm just talking about --
A. You didn't have much combustible material around those generators.
Q. Yeah, but something had to start the fire, right?
A. And that's why I said, I think it's likely started on or about the port side engine.
Q. Okay, because there was combustible material there.
A. I think that's a factor. I think that was a factor.
Q. But you don't know what would have caused that combustible material to ignite, right?
A. Well, it would be high temperatures coming off of that engine.

Q. Well, when you say it would be high temperatures coming off of that engine. How do you know it came off of that engine?
A. I believe the fire started in that area, okay?
Q. Got it.
A. In that little alcove in that engine room.
Q. Right.
A. What else was producing heat in that area?
Q. I -- you tell me.
A. That port side engine was what was producing heat.
Q. Okay.
A. What the failure was of it, I can't tell you. But that was the only thing in that area producing heat.
Q. And how do you know that?
A. Because we went through there and you have combustible material lined on that shelving around that engine. There was no other mechanical parts of the boat or engine components other than that port side engine. The generator was what, 10, 12, 15 feet away from it. That engine was generating heat and there was combustible material in and around that engine.
Q. When you went into the engine room for the first time. You talk about, you know, you've been there. You didn't go into the engine room on the 14th because of the safety concerns, right?
A. I believe that was the date. Yes, the 14th. We went in on the 22nd.
Q. 22nd, right. So you went in the engine room 15 days after

the fire, after it had been through this incinerator, the furnace event that we're talking about. And based on that, you've made a determination that the only source that you can think of for heat in that corner of the engine room was the main diesel engine, right?

A. That's the only thing I saw like, in that little pod (ph.) alcove where the engine was.

Q. Right. Do you know that we've had testimony, I believe, in this proceeding, that the port main diesel engine, you can literally put your hand on it. It's water cool. It's warm.

A. Mm-hm.

Q. But it wouldn't burn your hand to put your hand on that engine. Did you know that?

A. I think if it was working properly, that's probably true.

CDR Waddington: Yeah, let's be careful about our characterization there, Mr. Abell.

MR. ABELL: That the record will speak for itself. Yes, sir.

BY MR. ABELL:

Q. Let me make sure I got this right. You say if the engine's working properly, what evidence do you have the engine was not working properly, sir?

A. We have eyewitness testimony putting fire on that engine. We have --

Q. Stop right there. I'm going to come back to the others.

A. Okay.

Q. That's the first thing.
A. Okay.
Q. We're going to take these one at a time.
A. I think you're going to go to the confirmation bias. I know where you're going, but that is an important part of this document right here.
Q. Oh yeah?
A. We also have the wheelhouse getting notified that we have an issue, failing on the port side engine.
Q. Uh-huh.
A. The fire patterns are coming off that port side engine. You have combustible material around that port side engine. Like I told you earlier, I did not specify what caused the fire off that port side engine. I don't know the answer to that question. And I guess you guys will figure that out in civil court somewhere. But I don't know the answer to that question. I'm just telling you the fire patterns come back to that port side engine and you have combustible material that likely ignited this event.
Q. Well we're back to your statement about the engine operating properly. And I'm just going to press you on it a little bit on that, that I don't know that there's any evidence that we have. I'm going to talk about each of the three things you just identified. The eyewitness, the wheelhouse and the fire pattern, that the engine was not operating properly. I mean, anything other than what you just told me that was the basis of your

assumption that the engine was not operating properly, sir?
A. I'm telling you this fire started in that area.
Q. I hear that.
A. And I'm telling you, I'm going to ask you why that is and we're going to pick at that a little bit. Let's start with the eyewitness part. You said you talked to the Captain and you talked to the crew member who'd seen the fire, who opened the door, right?
Q. Correct.
A. Okay.
Q. I don't know if I talked to him. I've -- I read his statement.
A. Oh, okay. Do you know whether those were sworn statements?
Q. I do not. I don't know.
A. Yeah. Do you know the crew member under oath in this room, sitting where you're sitting, sir, said on reflection, he couldn't say exactly where the fire was except it was somewhere to the right when he opened the door. He couldn't say if it was five feet, 10 feet, 15 feet after the forward bulkhead. He couldn't tell whether it was on one side of the engine, the other side of the engine, generator. And --

CDR WADDINGTON: Question, please.

BY MR. ABELL:

Q. -- it was somewhere to the right when he opened the door. Were you aware of that, sir?

A. I believe the statement I read that he said it was back near the engine.
Q. Yeah, that's not my question. I'm asking --
A. No, I'm not aware of that.
Q. Okay.
A. I'm not aware of that.
Q. In this hearing, in this room, under oath. The only time he's ever been interviewed under oath.
CDR WADDINGTON: Are you testifying, Mr. Abell?
MR. ABELL: No, sir.
CDR WADDINGTON: Or do you have a question somewhere in the future?
MR. ABELL: I do have a question right now. I'll wait for Mr. Vaughn. Mr. Vaughn --
A. I'm going to stick by my origin. The origin's on that port side engine, I meant. And I'm not sure what we're getting at, but that --
Q. We're getting at that, sir.
A. Okay.
Q. Let me ask this. Have you been following -- I'll wait for you, sir. Sir, have you seen any of the testimony in this hearing up until now?
A. No.
Q. After you issued your report, did you get any kind of feedback from the investigators or anybody else associated with

this investigation on the content of that report, sir?
A. Not about the content of my report. I heard that some investigators that I assume were hired by your company or by you personally, I'm not sure which, had come up with different conclusion --
Q. That's news to me because I don't know what that would be. So tell me where it is that you're getting information about investigators I'm supposed to have hired.
A. No, it -- for -- what I -- what I was told is that there were other -- there were other investigators out there when I was there and that they had concluded that the fire had started in other places other than what my report said.
Q. Who told you that?
A. I believe it was Mr. [redacted] when we had a conversation about -- about this hearing, what time the hearing was at.
Q. So on the report. My question was about the report itself. You didn't get any kind of feedback from anybody in the investigation saying hey, for what it's worth, you might want to look at this or you know, there's a problem with that?
A. No.
Q. So for example, your report says that this vessel could carry a maximum of 400 passengers. You know that's wrong, right?
A. I know what -- I don't know what the number is. I know on this -- this vessel, on this cruise it was about 100 people on it. That -- that's what I know.

Q. Right.
A. But there was --
Q. But your report, the ATF report says, I mean, I could read it to you.
A. Okay.
UNIDENTIFIED SPEAKER: (Indiscernible).
CDR WADDINGTON: Relevance.
BY MR. ABELL:
Q. You can carry a maximum of 400 people. The certificate of inspection issued by the Coast Guard authorizes carry more than 600 people. Where did you get the 400 number from, sir?
A. Does it say more than 400?
Q. It does.
A. Well, that's more --
Q. It says --
A. -- well 600 is more than 400.
Q. No, no. No, sir.
CDR WADDINGTON: All right. Let's stop right here, right now. Let's -- it's (ph.) going to take a quick five minute -- a 10-minute recess.
MR. ABELL: May I ask one question to finish up? Because we're talking about what's in his report. Sir, if you could look at page --
UNIDENTIFIED SPEAKER: (Indiscernible).
CDR WADDINGTON: No.

MR. ABELL: -- two of your report.
CDR WADDINGTON: We're done.
UNIDENTIFIED SPEAKER: Taking a --
MR. ABELL: I'm not allowed (ph.) to look at this on (indiscernible)?
CDR WADDINGTON: On the record, we're taking a recess. You can ask the question after the recess.
MR. ABELL: I will ask after the recess. We'll be -- when we come back, sir, it'll be page two where it says, "With a top capacity of 400 --
CDR WADDINGTON: Stop asking the question, Mr. Abell.
MR. ABELL: We'll talk after the break, sir.
MR. VAUGHN: Okay.
(Off the record)
(On the record)
CDR WADDINGTON: Going on. The time is 9:10, The hearing is now in session. Bay Diesel, you may continue. Thank you.
MR. ABELL: Thank you, Commander.
BY. MR. ABELL:
Q. Sir, earlier we were talking about what eyewitnesses had seen because you, I think, mentioned three things that you're relying on -- eyewitness testimony, the information from the wheelhouse, and a fire pattern in terms of your determining the origin of the fire was somewhere around the port main engine. I'm going to share with you some of the eyewitness testimony that we've had in

this proceeding. And then at the end of it, my point in telling you in advance is I'm going to ask you what this information would tell you as far as the likely origin of the fire. We've had testimony that the first thing that one witness had as an indication there was a problem was a burning wire smell. And he says he's smelled electrical fires before. He knows the smell, a burning wire smell. Then a couple folks have said either white or light gray smoke for a while. Then pretty quickly, you know, matter of less than a minute, seconds it goes to a black smoke. And in there somewhere, the Captain testified that he lost control of the engines. But at one point after he'd lost control of the engines, the gauges came up and indicate that the engines were still running, he just didn't have control of them. Does any of that information cause you to either rethink or confirm what you have in your report as the likely origin of the fire, sir?

A. What I saw, that port side engine is I would stick by that, by that call.

Q. Okay. Do you know what on the port side engine would have caused a white, light or gray smoke to be the first smoke seen?

A. I don't.

Q. What kind of smoke would you expect if you had burning fuel?

A. It should be a darker smoke, like diesel fuel.

Q. Sure, how about hydraulic fluid?

A. I -- I'm not exactly sure.

Q. Okay. Do you know where the engine control modules were for

-- well, we'll just make it the port main diesel engine since that's the one we're talking about.
A. Do I know where the controls were?
Q. Do you know where they were in the engine room, sir?
A. I do not.
Q. Okay. You had indicated earlier in your testimony, sir, that in focusing on the port main diesel engine that there were three issues, and you said that the third issue was waiting to be repaired. Just so we're on the same page, let's walk through. What was the first issue that you understood existed with the port main diesel engine?
A. I know that there was -- I'd have to go back and check the report. But I think there was an issue with it a couple months before that required some work to be done on it. And then a couple ship -- a couple journeys later there was another failure and then they realized that it had to be a complete rebuild.
Q. Mm-hm.
A. They'd have to complete rebuild. They realized that the turbo charge also needed to be replaced.
Q. Do you know what the function of the turbo charger is on this engine, sir?
A. I don't know exactly. I had to look it up, going back to what we talked about earlier, the number of vessel fires I've done. I'd looked it -- looked it up and it -- I think that gives some of the power to the engine.

Q. Do you know how a turbo charger works?
A. Not exactly.
Q. Do you know how many turbo chargers are on each engine on this ship (ph.)?
A. I don't.
Q. Your report refers to a turbo charger generating 1,800 degrees. And that's Fahrenheit, right?
A. Fahrenheit.
Q. Yeah. Where did that number come from?
A. I -- we researched it back at the office.
Q. Okay.
A. That if it's failing it can generate that kind of heat.
Q. If it's failing it could generate that kind of heat.
A. Mm-hm.
Q. Do you know what its normal running temperature is?
A. I know it's hot, but I think there's the insulation around it protects other parts of the engine and parts of the vessel.
Q. Sure. Do you know whether the insulation around the turbo chargers -- and I'll tell you, there's more than one, there's two of them on this engine.
A. Okay.
Q. Were the insulation blankets around either the turbo chargers' (ph.) engine were damaged significantly in the fire?
A. I don't know.
Q. Do you know whether the turbo chargers, after the fire, were

examined and found to be essentially undamaged?
A. I don't know.
Q. If the turbo charger was the cause of the problems, sir, such that you get your 1,800 degrees. Would -- wouldn't you expect to see some evidence of damage to the turbo charger?
A. I would think we would.
Q. Yeah. Do you know what temperature aluminum melts at, sir?
A. About 1,200 degrees.
Q. Yeah. Do you know there are aluminum components on this engine?
A. Yes.
Q. Okay. You talked about this, the third issue, the turbo charger waiting to be repaired. Was (indiscernible) --
A. I think they ordered the part and it was -- it couldn't be repaired in the coming days is what I'd been told initially.
Q. Well, let's focus on the repair part. They had ordered the part. I'm not going to argue with you about that, sir. But a repair would suggest some sort of failure that had to be repaired, something broken. Was there anything broken or that had failed on the turbo charger that was to be replaced?
A. Well I assume if it was working perfectly well, it wouldn't be replaced.
Q. I'm not asking about assumptions, sir. Do you know of anything about the turbo charger that was to be replaced that had --

A. It --
Q. -- let me finish my question, sir -- that had failed or had it not functioning properly?
A. I believe the Captain mentioned there had been some leakage from it in one of the interviews, and that was the reason why that it was going to be replaced.
Q. So were you aware, sir, that the testimony in this proceeding is that there was a leakage of something. There was something that dripped from the turbo charger during the sea trial after the rebuild. It was cleaned up and then for the next 18 trips, averaging about 54 hours of engine time, never had another drip, never had another problem, not even sure it was oil that dripped out of the turbo charger that got wiped up on that occasion. If you knew that, would that change any of the information you have in your report, sir?
A. No, I would still list it as something that was being -- going to be replaced. I mean it -- I didn't specifically say the turbo charger caused this failure, caused the fire. I think I was as fair as I could be on that.
Q. Sure. Have you ever replaced a part on your car?
A. Yes.
Q. It was getting old but hadn't failed yet.
A. Sure.
Q. Sure. And it doesn't mean that it's failed or needs repairing. It's just gotten old. It's time to replace it, right?

A. I've also been driving my car and had parts fail before.
Q. Sure. But what failure occurred with regard to any part of this engine, including the turbo charger, sir?
A. I think you need to read the report. I said on, about, near the port side engine. I didn't specify the turbo charger. I didn't specify any part on that engine. I just said the fire started on or about that area.
Q. Well let's look at the report, and let's start with paragraph 43 on page 19, sir, where you talk about the hydraulics on the port side of the engine room.
A. Mm-hm.
Q. Now, you'd indicated earlier in your testimony that you had sent the -- some components of the hydraulics system out for testing to the NTSB.
A. Not me. The NTSB took it. I didn't take it, yeah.
Q. Oh, okay. Let me back it up. Had you ever asked the NTSB for what the results were of its testing or analysis of any of the hydraulic system components from the *Spirit of Norfolk*?
A. I did not.
Q. Do you think that would have mattered to you in coming up with your report?
A. What I concluded on the hydraulics is that the hydraulics were subjected to an awful lot of heat from the radiant heat that was circling around in there. When fire suppression went in there to try to knock it down they popped open that engine door. The

water rushed out. It probably had loosed joints from all that heat, the joints were damaged from the heat and the water just popped it loose. I don't think that caused the fire. I admit, I had concerns about it initially and I looked at it. I didn't think -- I believe Mr. Karr had concerns about it initially and we looked at it for quite some time, but I was able to rule that out as a cause.

Q. We'll take a look at the -- I think what you're talking about, the pipe that came --

A. The pipes that popped. This (ph.) --

Q. -- separated, yeah.

A. Right.

Q. I'm talking about the pipes that blew apart. There are hydraulic lines in the overhead that have two separations. One of them blown open like a flower.

A. There was a lot of damage in that area, there's no doubt.

Q. Yeah. So --

CDR WADDINGTON: Mr. Abell, could you like not testify? Can you just stick to the questions please?

MR. ABELL: Sure.

CDR WADDINGTON: You can certainly create foundation. I respect that. But testifying about what's in the record or not, which may or may not be an accurate representation. Thank you.

MR. ABELL: I'd only ask that the same rule be applied to everybody asking questions, Your Honor -- or Commander.

BY MR. ABELL:

Q. So, Mr. Vaughn, let's talk about the hydraulic system in the overhead. First off, any idea how old that system was?

A. I don't know.

Q. Yeah. Would you be surprised to know it was original equipment on that ship?

A. No.

Q. Do you know how old the ship was?

A. In early 90s?

Q. Yeah.

A. Early 90s, I believe.

Q. That's right.

A. Yeah.

Q. So, roughly 30 years old.

A. Yep.

Q. Yeah. And do you know whether the hydraulic fluid in that pipe is pressurized?

A. I assume it is.

Q. And do you know what pressure it runs at?

A. No, I don't.

Q. Do you know whether that pipe failed because of a corrosion or weakness on the inside of it?

A. I don't know.

Q. And again, you never read the NTSB analysis or testing?

A. I've not read that, no.

Q. Okay. And tell me how you were able to rule out the two places in the engine spaces where the hydraulic line had burst, as either a cause or providing fuel to the fire?
A. Oh I mean, it could have provided fuel to the fire. I'm not saying it didn't do that.
Q. Okay.
A. But the fire patterns, when we go work from area of least damage to most damage, brought me to that port side engine.
Q. Sure. The part of the pipe that blew open, like I said, like a flower. I mean, it's just splayed open completely. Do you know where that was in relation to the port engine?
A. The hydraulics were up closer to the port side fuel tank, like kind of adjacent to that.
Q. Right. Do you know the distance between the part where the failure was, the broken pipe, and the nearest part of the engine?
A. Offhand I'd say it's probably 15 to 20 feet, something along that range?
Q. Would you be surprised to know it's 39 inches?
A. Yeah. I thought you were talking about the actual -- the part that was broken there. That was probably bout 15 to 20 feet, that I saw, the one that I documented in my report. That was probably about 15 to 20, 20 feet.
Q. I am talking about that part.
A. That was 36 inches away?
Q. 39 inches I believe would be the measurement to the nearest

component of the engine from that pipe.
A. That's surprised me that it's that close.
Q. Yeah. And have you done any kind of testing or analysis to determine whether the hydraulic line that was parted, the lower line that -- pictures of it -- that came apart. And in fact I think Exhibit 39 has a picture of it. Do you have a binder there in front of you, sir?
A. Yes. 39?
Q. Yes, sir.
A. I don't have 39 on this one (ph.).
MR. JACOBSON: There's a 39 on this one. Right here.
MR. ABELL: Have you got 39 in front of you, sir?
MR. VAUGHN: Yes.
MR. ABELL: Okay. If you look at page for of --
CDR WADDINGTON: Tag one, for the record?
MR. ABELL: Yes, 39, tag one.
BY MR. ABELL:
Q. Look at page four or five, sir, you'll see a couple of pictures.
A. Okay.
Q. And the upper two on that page, on the right-hand side you'll see kind of an oval around what looks like a pipe or a hose. And it says, "Source, Castle Rock, taken before the fire." You see that, right sir?
A. Yep. (Indiscernible).

Q. And then the left-hand side you see what appears to be the same thing with some wire ties on it and a red circle around it. As you understand it, that -- that's the same area, that same pipe or hose after the fire, right?
A. It looks like it.
Q. Right, and just so we're on the same page. When you talk about a pipe that's separated that you contend might have happened when the water rushed out of the engine room, is that the one you're talking about, sir?
A. I don't. I don't believe that's the one I was talking about in the report.
Q. Oh, okay. Well how would you account for this separation then in terms of cause of the fire?
A. I don't know. I'd have to go back and look at that.
Q. I mean, if you had that come apart at some point and it had pressurized hydraulic fluid in it, would that be a potential cause of the fire?
A. I'm going to go back to what my report says. My report shows that this fire started near the port side engine. I understand there were other failures in there. What caused those failures, I'm not 100 percent certain of. The fire, as I wrote my report, my origin cause of that -- my origin of the fire is back on or about that port side engine. I mean, you can point out everything in the boat to me if you want, but it's not going to change what my origin cause says.

Q. Sure. Do you need me to repeat my question, sir? My question was if in fact that had separated, could that have been a cause of the fire?

CDR WADDINGTON: Asked and answered.

MR. VAUGHN: No. It --

MR. ABELL: No, it wasn't.

MR. VAUGHN: -- I don't think it's the cause of the fire. It -- could it have been more fuel for the fire? Possibly, but I don't think that caused it.

BY MR. ABELL:

Q. If you would look in the same exhibit at page 2, sir. Page two has a picture. It says, "Source, Bay Diesel." You see a line above where you see some boxes along the shelves there. And then in the right-hand side a -- it says, "Source, USCG." And then a closeup on the left lower says, "Source, NTSB." Do you understand that to be the hydraulic line that had the -- what I'm calling the flower burst in terms of the pipe bursting, sir?

A. Yes.

Q. Okay. And is it your testimony that that could not have been a cause of the fire was that line bursting?

A. I've already answered. My testimony is that the fire started on or about or near --

Q. Yes, sir. But my question is --

A. -- the port side engine.

Q. -- my -- that's not my question. My question is, could that

have been a cause of the fire, that bursting?
Q. It didn't.
CDR WADDINGTON: Asked and answered.
MR. VAUGHN: I just told you that -- I said this fire started on or about or near the port side engine. So this did not cause the fire.
Q. So it couldn't have --
A. Now, could it have added fuel to it? Possibly, but I don't think this caused it.
Q. Any evidence you see, any question I ask your answer is always going to be the same? It was the port side engine and nothing will change that, sir?
A. I'm telling you -- look. This is a criminal investigation from our side. It was noncriminal in that the fire patterns -- I don't have an axe to grind. If I thought it was this I would tell you that. The fire patterns come off of that port side engine. If I felt it was the generator or felt the -- it was the hydraulics, I would say it. I don't care. It's not part of my investigation. I'm a criminal investigator.
Q. Then tell me why that could not have been a cause of the fire, sir.
A. Because the fire patterns come back towards the port side engine. And we have witness statements put it there and we have other evidence from the wheelhouse putting it back there. The fire patterns lead to the port side engine.

Q. We've talked about --
A. You're not going to change my opinion on that.
Q. -- we've talked about the witness statements. Tell me what you say evidence from the wheelhouse? Who (ph.) puts it there?
A. They were telling us, or the interview with the Captain said that the first thing that was failing was the port side engine. There was issues with the port side engine that the wheelhouse was alerted to. That's what sent the deckhand into the engine room. And now you're telling me he (ph.) said something different. But that, you know, we're talking six, eight months later here.
Q. Under oath.
A. At the time -- well, he's speaking with investigators at the time. I assume his recollection would have been better a few hours or a few days after it rather than eight months later. He sees fire on the port side engine. That's what my report says and that's my opinion on this one. I'm not going to change it based on your photographs there.
Q. Okay. Let's look at page 22 of your report, sir, paragraph 46.
A. Page 22, you said?
Q. Yes, sir. You got that in front of you, sir?
A. Yes, I got it.
Q. Okay. It says, "This engine had recently undergone a rebuild, and witnesses spoke of continued issues with the engine after the rebuild." Other than the one leak that we've talked

about, which was wiped up and then 18 voyages afterwards without ever reappearing. What are the continued engine -- issues with the engine that you're referring to that you say witnesses were --

A. I think the two that I was referring to is that leak you were describing and the fact they had ordered a part to replace the turbo charger. Those are the two issues that I was referring to there.

Q. You say, "A leak in the area of the turbo charger on the port side engine and observed by the engine mechanic. This required the turbo charger to be replaced." Is it your understanding the turbo charger was being replaced because of a leak that had been discovered?

A. That was my impression that the reason they ordered that part -- the reason they ordered the part is they had a leak from it. I mean, if they --

Q. What's that based on?

A. Well, based on one of the interviews I read.

Q. No, sir. Who?

A. It --

Q. There's 2,000 pages of interview transcript. I've read them all. Where in there does it say that the turbo charger was being replaced because of a leak in it? Who said that?

A. They discovered -- they discovered this leak and then they decided to replace the turbo charger. Whether they just -- whether there was some other reason they'd replace the turbo

charger, maybe that's the case. But they discovered this leak and then they ordered the part, the turbo charger part. That's how I read the interview.

Q. Could it have been the other way around? They ordered the part and then after the part was on order they discovered a leak, cleaned it up once and it never reappeared? Is that possible?

A. What -- from what --

CDR WADDINGTON: Asked and answered. Let's --

MR. VAUGHN: -- from what I recall --

CDR WADDINGTON: -- let's move on.

MR. VAUGHN: -- I'm sorry.

CDR WADDINGTON: Yeah. I will let you, obviously, answer that question. But seems like we're retreading a little bit of territory here. So go ahead and answer the question.

MR. VAUGHN: From what I recall is they discovered this leak and they realized oh, we need to do more work on this engine. Let's get a -- let's replace the turbo charger. And that's how I read it from I believe it was the Captain's interview.

Q. If you were wrong on that, would that cause you to rethink?

A. No, because it -- I didn't specify that that caused this fire. I said the fire started on, near or about the port side engine. I didn't say it was the (ph.) turbo charger failure.

Q. If you look at page 23 of your report, sir.

A. Oh, this way (ph.).

UNIDENTIFIED SPEAKER: Mm-hm.

MR. ABELL: Subparagraph C for paragraph 55.

BY MR. ABELL:

Q. Now, three sentences in it says, "When the event" -- I'm sorry. Let's go two sentences in. "Despite that rebuild" -- talking about the rebuild of the port main -- "there were still leaks coming from the turbo charger on this engine." Other than what you've already testified about, is there anything that you can tell me as to where that comes from, the idea that there were leaks --

A. That's --

Q. -- coming from the turbo charger?

CDR WADDINGTON: Asked and answered. Asked and answered. I -- we're retreading here.

MR. VAUGHN: Based on the -- the witness statements.

CDR WADDINGTON: Please -- yeah. I think you've made your point.

BY MR. ABELL:

Q. Could this fire have started because of an electrical problem of some kind?

A. I'm sticking with what my report says, that it started on or about the port side engine.

Q. Not my question, sir. Could it have started --

A. I don't -- I don't believe it did.

Q. Why not?

A. Because I think you're referencing the generator? Coming off

the generator?
Q. No, sir. I'm just asking could it be electrical? Any electrical component in that space. Could it have started from that?
A. I think it's unlikely.
Q. Why?
A. Because I think you have heat coming off the -- I think the most likely cause was some sort of failure or heat coming off that engine and causing combustion on some of the items on or near the engine. I don't -- I didn't see a failure from the electrical.
Q. Right, my question wasn't your looks -- like electrical (ph.).
A. And my answer is I don't believe that was the cause.
Q. And my question is why is it not possible that it could have been?
CDR WADDINGTON: Asked and answered.
MR. ABELL: And respectfully, Commander, not answered. A different question was answered.
MR. VAUGHN: I don't. I don't believe it was electrical fire.
BY MR. ABELL:
Q. Because what?
A. Because I believe it was failure from the port side engine. There was some sort of port side engine failure on, near or above that engine.

B. Why did the starboard side fuel tanks split open but the port side didn't if the fire started on the port side?
A. Why did it split open?
Q. Yeah.
A. Because you have lots of heat that is building up at the ceiling and it's going to deform the metal components of that tank and eventually they -- the seams just gave away.
Q. Why not the port side?
A. Just wasn't -- maybe it wasn't -- it was -- maybe it was protected from some of the -- from some of the walls? I -- I think that the starboard side engine or the -- I'm sorry, the diesel fuel tank was subjected to more of the heat. Maybe if it'd given more time it would have.
Q. But help me with this. The engine room is built symmetrically. I mean, the engines, port and starboard, are in the same place relative to the center line, right?
A. Yes.
Q. Okay, generators. Same place --
A. Yes.
Q. -- relative to the center line. Fuel tanks, port and starboard, same place relative to the center line, right?
A. Yes.
Q. If the fire started on the port side, wouldn't it have burned longer and hotter on the port side than any other side in that engine room?

A. Not necessarily.
Q. So you don't believe that it's more likely, if the fire started on the port side of the engine room, that the port fuel tank would have failed?
A. No, I don't because it didn't happen that way, did it? The starboard engine -- the starboard tank failed.
Q. Yes, but how do you connect the fact that the fire started on the port side but the starboard side failed?
A. Because you have so much -- it was subjected to more heat or maybe it had a weakness in it prior to the fire. I don't know. But it was subjected to a lot of heat. The heat's twirl -- swirling at the ceiling. You're going to have heat, radiant heat going in all directions, convective heat. And it's going -- it weakened that tank before it weakened the port side tank. Fire does weird things.
Q. In looking at the damage to the port main diesel engine. Was the damage greatest at the forward end or the after end of the engine, sir?
A. I think it was pretty significantly damaged all around. And I didn't specify where it potentially started. I said it started on or about that engine. I didn't -- and like I said, I -- there was damage all over the -- that engine.
Q. Yes, sir. My question isn't where it is in your report, because it doesn't say. I'm asking you. You were in the engine room, you saw it, you did the investigation. Your notes, your

photos, the inputs that you had. Was the forward end of the engine or the after end of the engine the more damaged of the two?
A. I don't -- I don't recall.
Q. So --
A. I remember there being a lot of damage all over it.
Q. Thank you, sir. I have no questions. Please answer any questions Mr. Denley has if CDR Waddington has him as the next person asking questions, sir.
CDR WADDINGTON: Good? City Cruises, did you have any questions of this witness?
MR. DENLEY: I do, Commander.
BY MR. DENLEY:
Q. Good morning, Mr. Vaughn.
A. Good morning.
Q. My name is Eric Denley. I'm with City Cruises.
A. How's it going (ph.)?
Q. And I appreciate you being here and answering some questions for us. I will try to ask different questions than Mr. Abell asked. But there are just a couple things I probably will want to go back over. You know, you're -- you are very clear in your conclusion that really the only conclusion you make is that you believe the origin was in, on or about the port side engine of. When you say that are you referring to the engine itself or are you referring to kind of that area within the broader engine room?
A. That area.

Q. Okay. So when you then say that the fire spread from the engine to the adjacent shelving, that might not be correct.
A. That area was where the first started. Could it have been something -- the first thing to ignite on that shelving? I -- it could have been. I can't say 100 percent certain on that.
Q. So it could have been something other than the engine that ignited (indiscernible)?
A. In, on or about the engine. That's --
Q. I just want to be -- and I appreciate you clarifying that because I think that is -- that's an important part of your conclusion, whether the fire, you know, originated with the engine and then spread to something else, or whether something in that area could have -- some other component or some other system in that area could have then spread to the shelving that was adjacent to that --
A. Mm-hm.
Q. -- that engine. And so I guess similarly, I'm going to refer you to 55 Charlie, paragraph 55 Charlie of your report. And that's one of your hypotheses. And we've talked about the turbo chargers quite a bit, so I don't want to kind of rehash it necessarily. But the third line down, "There were still leaks coming from the turbo charger on this engine." If that was not what the record reflected, would that change your opinion about that hypothesis?
A. About the port side engine? That area causing the fire? Is

that what?
Q. No. About you made a hypothesis that the turbo charger, I mean.
A. I listed it.
Q. You list -- it was the only component on the engine that you listed.
A. Right, well.
Q. So I, you know, that's kind of the reason why we're asking so many questions about it. Because you've just said that it didn't necessarily come from the engine. You were referring to that sort of area within the engine room.
A. Mm-hm.
Q. But yet you point to that particular turbo charger. And so I guess if that -- if that fact were different that, you know, it wasn't actually leaking after it was repaired, would that have changed maybe that hypothesis?
A. I would still list it in there because it was due to be replaced. I mean, I think that was pretty clear that was -- the part had been ordered and was going to be replaced. So I would have still listed it there.
Q. But you could have listed other components in that same area, like you said, on, at, near, around.
A. Right.
Q. I forget exactly the terminology.
A. Yeah.

Q. But kind of that general area. I mean is -- how come you didn't take a picture of the turbo charger?
A. We may have it and I may not have put it in there. I --
Q. So --
A. -- I'd have to go back and look at all the pictures.
Q. -- so the area that you have identified as kind of the origin area of the fire. I mean, best -- best that I can tell, the only picture that you've included is on page 21, which is damage to the top --
A. Yeah, we get the damage there.
Q. -- damage to the top of the port side engine. So this is your conclusion that somewhere in this area. And how come you included that particular image in your report and not other images?
A. Because it looked like to me like there was some -- and it started to (ph.) deform (ph.) and it, you know, near the top of the engine there. So it was subjected to a lot of heat. That's why I put that in there.
Q. But you don't really know --
A. But maybe I should have put a picture of the turbo charger into the report. That's a good point.
Q. So were you aware of whether the turbo charger was damaged or not?
A. I was -- I put that in there based on what we were told by the Captain. I had told --

Q. Not really what you saw when you -- when you inspected the engines.
A. I was told that that part was due to be replaced, that that was the last component that needed to be replaced, that it had been an issue. Now you're telling me that there's -- changed their view on that or that.
Q. Well --
A. Or maybe the leak wasn't there.
Q. -- but I'm just saying, because it is a hypothesis, I mean.
A. That's why it was listed.
Q. Yeah.
A. Because it was told -- I was told that was the component that still needed to be replaced on the engine.
Q. But that's not -- so that's not necessarily based on your physical observation, fire investigation.
A. Well we had a lot of -- well, like I said.
Q. And it's not --
A. The fire started in that area and I felt I -- since that part was due to be replaced it needed to be mentioned in the report.
Q. I'll ask the question again. That's not necessarily based on -- those are based on statements --
A. Right, correct.
Q. -- not necessarily what you observed and what you saw when you did the physical examination of the engine --
A. Correct.

Q. -- fire.
A. Correct.
Q. Similarly, that's not necessarily based on the burn patterns that you physically saw when you did your -- when you did your investigation. Isn't that correct?
A. Correct.
Q. So are you aware? You testified earlier that you were not aware that there were two turbo chargers on the port main diesel engine. Do you know which -- there are two. Do you know which it would --
A. I do not.
Q. -- okay.
A. Uh-huh.
Q. So you don't know whether it was the --
A. I may have been told at some point. I don't recall offhand.
Q. But it wasn't really relevant to your report?
A. No.
Q. Okay. So whether the port side turbo charger was supposed to be replaced or the starboard side turbo charger, which these inboard and outboard. Whether it was the inboard side or the outboard side, that wasn't really relevant to you?
A. It probably should have been. I probably should have clarified that.
Q. I'd like to ask the recorder. Let me ask some preliminary questions. The -- I recall your testimony from when -- from this,

from today that -- and it's consistent with the prior testimony, that the fire began somewhere, and then a lot of firefighting water was added to the space. And you indicated that that increased to about, you know, waist level or --

A. Maybe even higher.

Q. -- maybe even higher. And so as you're looking for -- as you're looking for an origin, and you're looking at burn patterns for an origin. In general, are you looking for the low -- the lowest level? And you look for low and intense --

A. Mm-hm.

Q. -- as a potential origin location. Is that correct, in terms of how you kind of do your analysis?

A. Generally, mm-hm.

Q. And so if you're looking for an origin place, you're going to look for low and you're going to look for intense. But as was testified, at some point in time there was likely oil on top of water and so the period of anything above that is going to be subjected to intense heat. Is that correct?

A. Certainly was.

Q. And so it's kind of difficult to determine that. I'm sorry. Just give me moment here. Let me unlock my screen. So, going back to the turbo charger. You commented that -- you commented that it --

CDR WADDINGTON: Mr. Denley, I don't want to interrupt you --

MR. DENLEY: Go ahead.

CDR WADDINGTON: -- but we've had a lot of questions about the turbo charger.

MR. DENLEY: Right.

CDR WADDINGTON: Is this a novel question or?

MR. DENLEY: I just -- okay. I will. I'll be specific.

CDR WADDINGTON: Thank you.

BY. MR. DENLEY:

Q. Did you inspect any of the lagging around either the inboard or outboard turbo charger?

CDR WADDINGTON: Asked and answered already during Mr. Abell's --

MR. DENLEY: I don't -- well.

CDR WADDINGTON: -- yeah. Mr. Abell asked that same question. But you can go ahead and ask it if I'm incorrect.

MR. VAUGHN: I mean, we examined the engine. Whether we looked specifically at all, you know, that component. Do you know what?

MR. DENLEY: Do you know what lagging is?

MR. VAUGHN: I don't believe so.

BY MR. DENLEY:

Q. Do you know what lagging is around a -- around a piece of equipment?

A. Not exactly, no. No.

Q. Oh, okay. And so you can't recall whether you inspected any of the lagging around either the inboard or outboard turbo

charger.
A. I did not.
Q. And --
A. And I just want to say it again. I did not say the turbo charger started the fire.
Q. Yeah, I understand (ph.).
A. I said the fire started in and on and around the engine.
Q. I know, but --
A. This is a noncriminal event.
Q. -- got it. I got it and I appreciate it, and I appreciate your broad conclusion. But you did list it. I mean, of all the components on the engine, it was the one thing you listed as a hypothesis.
A. Because that was the one thing due to be replaced.
Q. I get it. I get it. And I'm just --
A. Yeah.
Q. -- I need to protect the record in terms of --
A. Okay.
Q. -- in need to protect the record in terms of what is and isn't reflected in the actual condition of the engine, okay? And that's the only reason why I'm asking you these questions. I appreciate your broad conclusion about -- about this particular incident. So just to be clear. You did not inspect the lagging.
A. No.
Q. You did not inspect underneath the lagging.

A. Not that I recall.
Q. If there were leaks. If they were -- if a component on the engine leaked, any component. Let's not even say the turbo charger. If any component on the engine leaked and leaked oil, where would you expect that oil to go?
A. In an incident like this, I don't think I would expect to see that leak. I mean, we had thousands and thousands of gallons of water in there. I believe there was 5,000 gallons of diesel fuel in there, and it's all floating in there. And diesel fuel is going to cover that up when -- when everything rushes out. It's going to be impossible to see exactly what the leak would be.
Q. But you commented about the port generator, that you were able to exclude it as a source or a potential cause because the appearance was that the fire sort of attacked it.
A. Attacked it, rather than filling -- yeah.
Q. It was -- yeah. Did you see anything on the engine that indicated that the -- that the actual burn patterns or anything on the port engine were the cause?
A. Just the damage I've explained earlier.
Q. Okay. And so you're suggesting that because -- that because the engine is a heat source, it's kind of the only thing in the area. Is that to summarize?
A. That was a major thought, yes.
Q. Okay. Would that change your -- if you knew, for example, that a watch stander was, you know, 10 minutes before the fire had

walked right past it, inspected it and said that it was working properly, would that change your, you know, opinion?

A. No, the fire patterns put it back there for me, in that area.

Q. I get it, but that's different from the engine itself being a cause versus it being (indiscernible).

A. I didn't say the engine was the cause, I said on there and about was the engine.

Q. Okay, I get it. I -- you're being very consistent.

A. I'm supposed to be, aren't I?

Q. So if you could, if the recorder could draw up, bring up Exhibit Charlie 4, City Cruises, Charlie 4. And it's going to be at the very end of your -- the last binder. So it's the small binder and it's at the very end. There's City Cruises exhibits and there's like one through 13. And so, if you could find -- it's a little green -- it's in the bottom right-hand corner of the photograph.

A. C-13?

Q. Yes, C. So, I'll just represent for the record. Do you -- did you want to find it or?

A. Well, is it C-13, one through --

Q. No, no. Four.

A. -- four. Oh, okay.

Q. I'm sorry, yeah. Four, C-4. I apologize.

CDR WADDINGTON: Page 13.

MR. VAUGHN: I have it.

MR. DENLEY: You got it? Okay.

CDR WADDINGTON: Okay.

BY MR. DENLEY:

Q. Do you recognize that, Mr. Vaugh?

A. That's the engine.

Q. Do you recognize whether that's the port or the starboard engine?

A. (No audible response.)

Q. If I could just represent for you and the --

A. Is it the port?

Q. -- the investigating officer can disagree. But can I represent for -- to you that that's the port main diesel engine?

A. Okay.

Q. And that we are in the inboard side looking outboard?

A. Mm-hm.

Q. Okay, so just to be clear. You can't really point out where the turbo is on that?

A. No.

Q. Okay. You -- can you really point out any other components on that?

A. I'm not an expert on these engines.

Q. Okay.

A. So, no.

Q. And just to be clear. The one photograph in your report that you -- that you did choose to take of the port main diesel engine

was --
A. No, there were a lot of pictures taken. That may have been just the only one --
Q. I'm saying the one that you chose to include --
A. Yeah.
Q. -- in your report was which one? You've already said you didn't include the turbo charger.
A. Oh, I'm sorry.
Q. You've already said --
A. I believe -- I believe it was the one from kind of over the top of it.
Q. -- okay. Do you know whether that was at the forward side of the engine or the aft side?
A. The forward.
Q. Forward side.
A. Yeah.
Q. Do you know where the turbo chargers are? Are they on the forward side or the aft side?
A. I -- I'm not sure. I don't know.
Q. Taking a look at this particular image. Would you say that the burn patterns are more, you know, more extreme in the forward side of the engine or in the aft side of the engine?
A. In this picture it looks more in the forward, forward section.
Q. Okay. Could you go to the next image, which is Charlie 5, C-

5?
A. Mm-hm.
Q. Again, if I could represent to you that this is the same engine and it's, you know, an image of where you indicated the picture that you took. Where is this image taken?
A. That looks like it's at the top forward section of that port side engine.
Q. Okay. And then is -- do you observe damage over to the right?
A. Where the shelving was? Is that what you're talking about?
Q. Yeah, so aft. I guess on the outboard side of the engine.
A. Yeah.
Q. And then to the right, which is forward.
A. Right.
Q. So in general, would you say the damage from a fire perspective and from a destruction perspective. Was it more extreme or intense on the --
A. On the front side.
Q. -- on the outboard side or the inboard side? Was it towards the skin of the ship towards the shelving, or was it towards the inside?
A. It came toward the -- it looks more towards the inside here, like the fire starts on this engine and comes towards the starboard side.
Q. What do you base that on?

A. The, I mean, the shelving is -- I mean, the shelving's damaged, heavily damaged, you know.
Q. Absolutely. It's --
A. On the outboard side.
Q. -- that's the outboard side.
A. Yeah.
Q. That's the outboard.
A. It starts in that area and pulls towards the starboard side is what I'm trying to get at.
Q. Okay, and going back to the last image that you looked at, C-4? So we're looking at the inboard side of that engine? Does the damage on that side of the engine appear to be more or less than the outboard side of the engine? And again, I'm -- want this to be based on your inspection.
A. Well, I'm not seeing a picture of the outboard side. I'm -- of the engine.
Q. Fair enough.
A. I'm seeing the shelving.
Q. That's fair enough. We know the shelving was damaged. If you could go to C-6. Now, if I could represent to you that that is a picture of the outboard side of the port main diesel engine. And if I could represent to you -- and I'll wait for the recorder to check -- to catch up. Yeah, right there.
CDR WADDINGTON: So, for the record. What are we looking at?
MR. DENLEY: Yeah.

BY MR. DENLEY:

Q. So if I could represent to you that this is the outboard side of the port main diesel engine. And if I could represent to you that the -- on the right-hand side of that photograph, the red and black metal pieces there?

A. Mm-hm.

Q. Does that to you look like the shelving that's been previously discussed?

A. Correct.

Q. Okay. And would you -- how low do you see burn patterns on that shelving?

A. Down to about a foot.

Q. Yep. And then if you could look over to the left-hand side of the image which is the engine itself, you can see an orange, you know, component?

A. Correct.

Q. Do you see any damage or fire damage in the vicinity of that engine?

A. No.

Q. Okay. In the middle of that engine, do you see what? What does that look like? Are those wires?

A. Yes.

Q. And so your representation is that there are wires, fairly thick wires in the vicinity of this particular engine.

A. There appear to be.

Q. Okay. And so, isn't it possible that again, there was some testimony that the first indication -- it's been very consistent that the first indication was gray or white smoke. One gentleman during this hearing testified that he thought he smelled an electrical smell initially.
A. Mm-hm.
Q. Is it possible that, from a hypothesis perspective. Again, not changing your conclusions at all. But from a hypothesis perspective, is it possible that an electrical failure of some sort could have been the cause?
A. It's also -- I guess you're right. It could. It could have caused. But it also could be the fact that maybe fire was attacking the electrical wiring that was running through there. Maybe it could have been that as well, I mean.
Q. Fair point. I'd like to draw your attention to City Cruises C-9, So a couple pages further, Mr. Vaughn. So I'm going to represent to you that this image is of the bulkhead, which is the wall that is just forward of the port main diesel engine.
A. Mm-hm.
Q. Okay? So on the left-hand side is the outboard side. And on the right-hand side is the inboard side. So just purely from a fire investigation perspective. Where did this particular fire originate and burn hottest, based on this image?
A. Well, I'm not going to say it originated there, but it certainly looks like there's more fire damage on the left side of

that image than on the right.
Q. Okay.
A. On the outboard side than on the inboard side.
Q. And why? Why do you make that --
A. Because it's almost like a -- like this gentleman asked earlier about a -- half (ph.) V-pattern. And it looks like the half-V (ph.) pattern coming off that wall.
Q. So --
A. Now that doesn't necessarily mean that that's where the fire started. You could have had some fire up above and it drops down and starts a second smaller fire below. I mean, it doesn't necessarily mean that.
Q. Yeah, and I appreciate your comment. Because what you're saying is it could have come from a component maybe that was up high and dropped down. It could have come from any number of -- piece of equipment up high and then dropped down. But what's fairly certain about this is that it, I mean, the fire pattern is a lot lower, to the left.
A. Correct.
Q. I mean, as you go -- as you go to the right it gets higher and higher and higher.
A. Correct.
Q. And it also appears to be more intense to the left. So it generally appears to be more intense and lower on the outboard side --

A. Correct.
Q. -- than on the inboard side.
A. Correct.
Q. Would it surprise you to know that it was the inboard turbo charger that was supposed to be replaced?
A. No, it doesn't surprise me.
Q. I guess the final image I'd like to show you is, it's City Cruises C-13, please? So I'm going to just again represent to you that this is a picture of the port main diesel engine. This is the inboard side. And this is the turbo charger. And again, just you've already indicated that you didn't inspect turbo charger. You didn't inspect the lagging, which is fire protective equipment or it's, I don't know. I'm a lawyer. But it's stuff they put over the turbo charger to protect it.
A. Right.
Q. But if -- if the turbo charger was subjected to intense heat, wouldn't you expect to see some kind of damage to the lagging which is around it to protect it? Or if it was leaking. Do you think that it would be soaked up with oil or it would -- you would -- we would actually see. I mean, this is post-fire. We would actually see some kind of physical evidence that that was a -- was an origin source. Because we just looked at some pictures of where you can see some pretty intense burning and some pretty intense heat, low, in the engine room.
A. Okay.

Q. Would you expect to see --
A. I don't know enough about the component to be able to answer that question.
Q. Okay. Similarly, if there was fuel leaking from the engine and it went down into the bilge. Wouldn't we have expected to see some of those burn patterns low in the engine or in the bilge?
A. If that's where it started?
Q. Yeah.
A. I would expect to see some, some pattern.
Q. Did you see any burn patterns in the bilge?
A. I saw -- I don't recall specifically.
Q. Did you see any burn patterns underneath the engine?
A. I saw a lot of burning all around the engine.
Q. But what about underneath it?
A. I don't recall specifically.
Q. No further questions. Thank you.
CDR WADDINGTON: Mr. [redacted] do you have some follow-up questions?
MR. [redacted] Yes, Commander. I do.
BY MR. [redacted]
Q. So as a trained investigator you mention that there's a term that memory is perishable. So if you were to interview a witness after a -- an event, and then you were to interview a witness seven or eight months after an event, would there be a -- based on your experience as an investigator. Would there be a potential

for his recollections or her recollections seven or eight months later to change?

MR. ABELL: Objection --

MR. VAUGHN: Yes.

MR. ABELL: -- leading. I wasn't allowed to testify. I would hope that Mr. [redacted] is not allowed to testify either.

MR. [redacted] That's -- that's fine, sir.

MS. LEE: Answer the question.

MR. VAUGHN: I would say that --

CDR WADDINGTON: Answer the question.

MR. VAUGHN: -- when I do investigate a fire in D.C., we'll interview the witness on scene. And then I usually wait five or six days and reinterview them, and then you'll try to put them into the grand jury to get them to say their -- what they recollect pretty soon. Because six, eight, nine months later it's going to -- they're going to forget some things or not recollect what they initially did.

By MR. [redacted]

Q. Is it fair to say that a witness that gives that a witness that gives false or misleading statements to an investigator conducting an investigation on behalf of the federal government is punishment -- punishable by fine or possible imprisonment?

A. Yes.

Q. Please turn your attention, and we'll put it -- we don't have the exhibit there, sir.

A. Okay.

Q. So I'm going to read it to you and we're going to put it up on the screen. Coast Guard Exhibit 7-1, page 13. These are preliminary interview transcripts conducted of Mr. Brian Bracey on June 9th, 2022, two days after the fire event, where Mr. Denley was available as counsel for this witness. Page 13. Mr. Bracey was being asked eyewitness questions based on his eyewitness accounts of the fire that took place on the *Spirit of Norfolk*. He was asked to describe generators, put a mark on a chart or diagram to show where he saw fire or flame. Line 23, he answered, "This is -- my generator's here. I'll just put a G for generator because there are two of them. Then the mains are here and I could clearly see the flames over here on the main." I'm assuming from his testimony, and correct me if I'm wrong, that he could be talking about the main diesel engine.

MR. ABELL: Objection, speculation.

MR. [redacted] Thank you, sir. "And was the main and not the generator, because of the flames, would have been closer? This would have been closer. The heat would have been closer. There was no heat at the door when I opened the door. Do you understand what I'm saying?" The investigator goes on to say, right, yeah. The answer was, "So it was the main, and I can clearly see across. There was no me looking this way because the door opens like this. I opened said door and the generator would have been that wall, that corner." The investigator the questioner says, um or uh-hum.

And the -- Mr. Bracey says, "And the main would have been behind it. And I see the flames as clear as day right now."
A. Okay.
Q. Do you see that in that transcript?
A. Yes, sir.
Q. So moving on. You and I had a discussion because I asked you to appear in this as a witness based on your involvement in the ATF investigation into this event. I mentioned to you, would it be fair to say -- well first of all, let me say this. There have been two cause and origin investigations undertaken by the companies that are represented here today. We do not have any information about the circumstances of the investigation, the reports, the conclusions or anything else. Would it be fair to say that when you and I had that conversation about the fact that there were two cause and origin reports, I said there may have been different conclusions or something to that effect?
A. That may have been what you said, yes.
Q. I want to revisit the furnace effect of rising water. You were asked questions about as the water rose with burning diesel fuel. And what would have -- what would be the effects? What -- was the overhead area on the starboard main diesel engine as damaged as the port main diesel engine?
A. The overhead of -- the overhead of what?
Q. No, I'm saying was the top of the starboard main diesel engine. Did it have as much damage -- given this furnace effect

of the rising heat -- was the damage the exact same or close?
A. I imagine it was -- I don't recall exactly.
MR. ABELL: I'll object to speculation if we're imagining.
MR. [redacted] I'm sorry.
MR. VAUGHN: I don't recall exactly.
BY Mr. [redacted]
Q. Did you observe?
A. I observed there was a lot of heat damage at the ceiling level, and radiant heat would be putting down on every object in the room. I can't cite -- I don't recall exactly the level of damage over the starboard engine versus port side engine.
Q. And just as a clarification. Is it really today, knowing what we know, a fire triangle? Or does -- is it more of a tetrahedron where we have a component of chemical reaction as a source for possible fire?
MR. ABELL: Objection, leading. Once again, Mr. [redacted] is testifying.
CDR WADDINGTON: He's asking a question, Mr. Abell.
MR. ABELL: I was also, but I was told I couldn't, Commander, because it was considered testifying, sir.
CDR WADDINGTON: Objection noted. Mr. [redacted] please continue.
MR. ABELL: I just ask for a level playing field. That's all, sir.
CDR WADDINGTON: Understood and objection noted for the

record. Please continue, Mr. [redacted]

BY MR. [redacted]

Q. I'm just asking, does a fire need just fuel, just oxygen, just ignition? Or is there something else that can cause and support a fire?

A. You need --

Q. For example --

A. -- you need something to bring them all together. The fire tetrahedron, you're talking? The spontaneous, uninhibited chain reaction to bring the three together?

Q. Correct, like magnesium burning or some other --

A. Yeah.

Q. -- component.

A. Correct.

Q. Thank you, sir. That's all I have, sir.

CDR WADDINGTON: CDR Roy, do you have any questions?

CDR ROY: Yes, I do. Thank you, sir.

BY CDR ROY:

Q. Just want to go back to some of the questions that Mr. Abell was asking about the boat fire. Is there a difference in process, scientific method on causing -- on determining cause and origin on a vessel versus a structure?

A. I do them exact -- I do them the same way, whether it be vessel, car, residence, business.

Q. So based on your NFPA manual there, there's --

A. That's right. I always start areas of least damage, go to the areas of most damage.

Q. Also we were talking earlier about, and part of your testimony was talking about fire and how fire will burn up. Is there a way that fire will burn to the side, down, based on maybe ventilation or some other effect?

A. Sure. Fire is going to try to pull towards where oxygen sources. In this one you have a pretty contained area. So you have vents. They're going to want that oxygen so it's going to try to pull in that direction to sustain itself. And that could also speak to why we have as much damage, like Mr. Denley was asking about, over in that port side engine. Because I believe that's where one of the oxygen sources was. So the fire is going to be burning hotter over there, initially anyway.

Q. You also were testifying, we talk about on or about the port engine. And we also had a lot of discussion in question and answers about that fire load, as I would call it, on that wall with all the boxes. And is that a significant part of your investigation, as far as causing -- determining the cause and origin?

A. Yes.

Q. Thank you. That's all the questions I have.

CDR WADDINGTON: NTSB, do you have any follow-up questions?

MR. FLAHERTY: Yes I do, Commander. Thank you.

BY MR. FLAHERTY:

Q. Sir, I know we've been talking a lot about the area around the diesel generator -- or excuse me, diesel engine, port diesel engine. Could you summarize when you entered the space how you proceeded and what examined first? And what was your process for investigating the fire in that -- in the entry room space?
A. I made entry from -- the galley enters into the engine room. And started on the port side on where the diesel tank was. We noted the -- then we looked to the diesel tank on the starboard side and there was the split there.
Q. Mm-hm.
A. I believe Mr. Karr was with me when we both noticed the issue with the hydraulics. We noted that issue. I saw that the port side engine was less damaged than -- I'm sorry, the starboard side engine was less damaged than the port side engine. So I went over and examined that and then worked my way past the generators and into the area that was most damaged, near the port side engine. That's generally how I do all my fires.
Q. And were you there by yourself or were you there with a team?
A. There was a whole bunch of people down there.
Q. Well --
A. Probably seven or eight people at one point.
Q. -- specifically other members of the ATF?
A. There was one other member of ATF. There was a couple people from your agency there as well.
Q. And did the -- just to clarify. Did the other member of the

ATF team that was there with you, did he assist you with writing that report?

A. He did and he reviewed it.

Q. And did he have any recommendations on challenge -- or changes to the report?

A. He supported the conclusions in the report. It was also peer reviewed by two of my colleagues back in D.C., and they agreed with the conclusions.

Q. All right. When you're looking around for both, you know, where the least amount of damage is and where the most about it -- amount of damage is. And we all understand that the fire grows and it expands upward. In the engine room, did you examine the, what we call on the ship the overhead, but it would be equivalent to a ceiling in a building?

A. Yes, we looked at it.

Q. From your -- that perspective of looking at the overhead damage, where was the greatest amount of overhead damage?

A. I don't recall specifically where it was. I know there was quite a bit of damage to the ceiling in the room.

Q. Did you notice any of the structural beams bending more in one area versus another?

A. I do recall that, and I believe that was on the port side, was more damage on the port side than the starboard side.

Q. All right. And then the other thing about fires then with the fire patterns. If you have a fire engaged in one area and

there is some type of a structure between it and maybe the deck behind that structure. Is -- does -- is -- would that show -- that would create a shadow essentially protecting that area behind it from the actual fire.

A. Correct.

Q. And the energy is transferred. You reference radiant heat?

A. Radiant heat, yeah.

Q. Could you kind of go into what that definition is?

A. So radiant heat is when fire's burning, you'll have what we call a ceiling jet up at the ceiling and it will kind of swirl and swirl and swirl. And it puts heat, that swirl up at the ceiling, that ceiling jet, down on all the objects in the room. And if it gets to a certain temperature, you'll have what we call flashover. And everything in the room that's combustible catches fire. And that's generally caused by radiant heat swirling around the room and putting that energy down onto objects in it.

Q. So the higher the fire the taller the flame, the more reach that radiant heat has?

A. Yes.

Q. So in that area of -- if the overhead was damaged, is that due to the radiant heat coming up? Or could that have also been done by the actual contact of the flame to the overhead?

A. On the overhead it was likely from direct flame impact.

Q. All right. And for that to have occurred, the fire would have either -- could have brown from the below deck area. It

could have grown from another structure such as the engine, higher up or something like that.

A. Correct.

Q. All right. And you didn't find anything -- again, just to clarify. You didn't find anything of that nature type of damage in other parts of the engine room.

A. No.

Q. All right. Expanding from the engine room. Were you able to determine the path that the fire took when it finally did leave the engine room?

MR. JACOBSON: That goes beyond the origin and cause or the origin of it and we are not -- ATF is authorized -- Mr. Vaughn, this fact (ph.) that the Special-Agent-In-Charge has authorized Mr. Vaughn to testify to the origin only, not the spread after the origin.

MR. FLAHERTY: All right. I'll just -- appreciate that. Thank you, that's -- no other questions.

CDR WADDINGTON: Bay Diesel, do you have any follow ups?

MR. ABELL: I do, just a couple. Thank you, Commander.

BY MR. ABELL:

Q. Sir, earlier you talked about the fire being pulled in the direction of oxygen.

A. Yeah.

Q. And I believe as part of your testimony you said that the oxygen in that space would have come from the vents, which would

be port and starboard up high in the space, right?
A. Mm-hm, correct.
Q. Okay. Also, earlier you were asked about, in terms of fire investigation, whether you'd do it differently whether it's a vessel or a structure. Do you know whether there are specialized schools, courses, training for marine fire investigation?
A. I believe there is, yes.
Q. Yeah. Do you know why there would be specialized courses for that as distinguished from structure fires?
A. Because you got to face different things in a vessel that you wouldn't face in a -- in a house or a business.
Q. CDR Roy had asked you about the fire load that he -- might have been your words. But in any event, you were talking about the boxes on the shelving on the outboard side of the port main that we seen in the photos and heard testimony about. To be clear. You certainly believe that those boxes at some point were on fire, right?
A. Yes.
Q. Okay. But as you sit here today, you don't know what caused those to burn.
A. That's correct.
Q. Okay. And then the last thing I have for you, sir, is a picture you've seen before. It's C-4, so if you look in -- it's actually Hornblower, City Cruises Exhibit C-4 shows the inboard side of the port main diesel engine. Do you have it in front of

you, sir?
A. I have it.
Q. Okay. And you see where there's a like yellow strap that's kind of hanging down over the -- it's actually a exhaust tube there, to the left side of the picture, right?
A. Mm-hm.
Q. Is that a yes, sir?
A. Yes.
Q. Okay. And then I think as Mr. Denley had indicated. The thing to the right of that that looks like a donut, all of that is part of the turbo charger assembly for the inboard side. Do you believe that a failure of that inboard side turbo charger could have been the ignition source for the combustible material on the outboard side on those shelves on the far side of the engine?
A. I didn't say that.
Q. I know. My question --
A. No. I -- it could -- could it have been? Possibly.
Q. -- okay. Would it matter to you if you knew that it -- that was the turbo charger that was scheduled to be replaced as maintenance on the vessel?
A. I -- Mr. Denley told me that a little while ago.
Q. Yeah. Would it matter to you that it was that one, not the one on the side next to the shelves, that was due to be replaced?
A. I didn't say the turbo charger started the fire.
Q. Sure. I -- I'm -- does it matter to you in terms of your

analysis?
A. No.
Q. Okay. Were you aware that the turbo charger on the side of the engine closest to the shelves was a brand new turbo charger?
A. I assumed it was from the rebuild that it (ph.) went through.
Q. And you don't have any evidence that that turbo charger failed, right?
A. No.
Q. You don't have any evidence that this turbo charger failed, right?
A. No.
Q. I have no further questions.
CDR WADDINGTON: City Cruise, any follow-up questions for this witness?
MR. DENLEY: I do, just one, Commander.
BY MR. DENLEY:
Q. I'd like to draw your attention to -- I don't have the number, and I'm hoping the recorder can help me. It's called Power Cable and Oil Line. It's Coast Guard Exhibit -- I forget which exhibit it's in. I do apologize.
CDR WADDINGTON: Are we able to identify that? If not, we can move on. I want to give Mr. Denley time to find it, but.
MR. DENLEY: May I approach the investigation (indiscernible)?
CDR WADDINGTON: Sure, sure. Go right over to Mr. [redacted] who

has --

(Background conversation)

CDR WADDINGTON: It doesn't sound like it's in our exhibits or your exhibits or Bay Diesel exhibits. We'll move on then, thank you.

MR. DENLEY: Then no questions. I appreciate your testimony. Thanks.

CDE WADDINGTON: All right. Mr. Vaughn, you are now released as a witness at this formal hearing. Thank you for your testimony and cooperation. If I later determine that this team needs additional information from you, I will contact you through your counsel. If you have any questions about this investigation, you may contact the investigation recorder, LT [redacted] The time is 10:22. We will reconvene at 10:40 to set up the teams which is our next interview. Thank you.

MR. VAUGHN: Thank you.

(Whereupon, at 10:40 a.m., the interview was concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF:	FIRE ONBOARD *SPIRIT OF NORFOLK* NEAR NORFOLK NAVAL STATION, VIRGINIA ON JUNE 7, 2022 Interview of Brian Vaughn
ACCIDENT NO.:	DCA22FM022
PLACE:	Virginia Beach, Virginia
DATE:	January 31, 2023

was held according to the record, and that this is the original, complete, true and accurate transcript which has been transcribed to the best of my skill and ability.

By: [redacted]

Suzanne Ventura
Transcriber