UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

Investigation of:	*	
	*	
LOSS OF THE SUBMARINE *TITAN*	*	
IN THE NORTH ATLANTIC OCEAN	*	Accident No.: DCA23FM036
ON JUNE 18, 2023	*	
	*	

Interview of: BOB SHUMAN, Chief Operating Officer
OceanGate

via Microsoft Teams

Tuesday,
August 15, 2023

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I N D E X

ITEM	PAGE
Interview of Bob Shuman:	
By LT [redacted]	8
By Mr. [redacted]	21
By Mr. Muise	23
By Mr. Barnum	26
By Ms. Shvets	31
By Mr. Barnum	32
By Dr. Kramer	33
By LCDR [redacted]	35
By CAPT Neubauer	46
By LCDR [redacted]	50
By Mr. Barnum	51
By Dr. Kramer	57
By LT [redacted]	58
By LCDR [redacted]	60

I N T E R V I E W

(12:01 p.m.)

LT [redacted] Okay, so today is August the 15th, 2023, it is currently 12:01 Eastern Standard Time, and we are starting an interview related to the *Titan* submersible incident which occurred on June 18th, 2023, approximately 435 miles south of Newfoundland, Canada and St. John's.

If you could, we're going to go around the room, we're going to ask everyone to state their first and last name and spell their last name for us, and their affiliation. Since we have several parties in here, I will just call each person out and then allow them to come on and speak. I'll start with myself. My name is Lieutenant [redacted] I am the recorder for the Coast Guard's Marine Board of Investigation related to the *Titan* submersible incident.

Mr. Barnum.

MR. BARNUM: Hello, sir. Bart Barnum, NTSB. B-a-r-n-u-m. I am a marine casualty investigator.

LT [redacted] Mr. Shuman.

MR. SHUMAN: Hi, my name is Bob Shuman, spelling, S-h-u-m-a-n. I am with OceanGate.

LT [redacted] Mr. [redacted]

MR. [redacted] Hello, good morning. My name is [redacted] my name is spelled [redacted] and I'm a marine investigator and also a technical advisor to the MBI.

LT [redacted] Mr. Kramer.

DR. KRAMER: Yes, good day. My name is Dr. Donald Kramer, I am a materials engineer with the National Transportation Safety Board, and Kramer is spelled K-r-a-m as in Mary-e-r. Thank you.

LT [redacted] Mrs. Shvets.

MS. SHVETS: Yes, hi. Jane Shvets, spelled S-h-v-e-t-s, counsel for OceanGate.

LT [redacted] Mr. Muise.

MR. MUISE: Hello, sir. My name is Marcel Muise, M-u-i-s-e, I'm the investigator in charge for the NTSB.

LT [redacted] Mr. Neubauer.

CAPT NEUBAUER: Hello, good afternoon, sir. My name is Jason Neubauer, spelled N-e-u-b-a-u-e-r, and I'm the chair of this Marine Board of Investigation, which you'll also hear as MBI. Thank you for being with us today.

LT [redacted] Mr. [redacted]

LCDR [redacted] Hello, everyone. [redacted] [redacted] legal advisor to the MBI. Last name is spelled [redacted] Thanks for being here.

LT [redacted] Mr. [redacted]

LCDR [redacted] Good morning, Mr. Shuman, my name is Lieutenant Commander [redacted] [redacted] spelled [redacted] and I am an investigator with the Marine Board of Investigation. Thank you.

LT [redacted] Ms. [redacted]

LCDR [redacted] Good afternoon, my name is Lieutenant

Commander [redacted] last name is spelled [redacted] and I am a technical advisor for the Marine Board of Investigation.

LT [redacted] And Mr. Malkin, I've held you for last just because I know we're going to go through the counsel piece of it and I would allow you to come on and introduce yourself then.

So Mr. Shuman, are you currently represented by counsel?

MR. SHUMAN: Yes, I am, by Mr. Malkin.

LT [redacted] Okay, Mr. Malkin, you can come online and introduce yourself.

MR. MALKIN: Sure. My name is Harold Malkin with the law firm of Morgan Lewis, I am here representing Mr. Shuman today. The spelling of my name is Harold, the last name, Malkin, M-a-l-k-i-n.

And just one question, Ms. [redacted] you had mentioned that we were transcribing this interview. Is it also true that it's being videotaped or just transcribed?

LT [redacted] It is being recorded, as well.

MR. MALKIN: Thank you.

LT [redacted] And just as a note to that transcription piece and the recording, sir, once we conclude the interview and the transcription is complete, you will have the opportunity to review it. Anything that you do not agree with, you can appeal, and we can change and amend. And also, if there's anything that you'd like to add, we can also do that at any juncture, just notify the

Board.

MR. SHUMAN: Okay, thank you.

(Crosstalk)

LT [redacted] Yes.

MR. MALKIN: Ms. [redacted] one other thing. There were a couple people who, when they identified themselves, did not appear on video. My assumption is, is that when people are posing questions to Mr. Shuman, that they will turn their cameras on, is that correct?

LT [redacted] That is correct, except for, I believe, we have a few that may have called in. If not -- is there anyone who's called in or are unable to utilize their camera at this time?

LCDR [redacted] Ms. [redacted] I am currently having difficulties using my camera, but I am working to remediate that, so hopefully I'll be up and running by the time I'm up.

LT [redacted] Very good. So that was Lieutenant Commander [redacted] So if he has any questions at this time, he may not be able to come on camera, but he will address himself. Is that okay?

MR. MALKIN: Yeah, I just think it's a matter of common courtesy to Mr. Shuman, if he's being asked questions by somebody, he should be able to connect and see them, so that was my only -- that was the reason for my question.

LT [redacted] Absolutely. And everyone, let's just make -- bring that on record, that if you are directly addressing him,

please do come on camera and then once you complete your line of questioning and his response, you can go back off camera.

MR. MALKIN: Thank you.

LT [redacted] My pleasure.

So Mr. Shuman, once again, thank you for joining us, I appreciate your time here today. I will go ahead and just start off with a few questions, if that's okay with you. And my first question is do you have any questions for us?

MR. SHUMAN: Oh, thank you. No, not at this time.

INTERVIEW OF BOB SHUMAN

BY LT [redacted]

Q. Okay, very good. So I'll get started. If you could just provide me with a little bit of background information on yourself, professional background information, and then lead me up until how you came to learn about OceanGate and then become the COO of OceanGate. And time stamps, please, I guess expound as much as possible, so as detailed as possible as you can, give us like a nice, long journey that led you to OceanGate's doors.

MR. MALKIN: And Ms. [redacted] I'm sorry, one other interjection and I won't keep doing this. I thought that this was going to be made clear to Mr. Shuman, but simply, as the ground rules were for the other folks who've been interviewed so far, just to let him know that if at any time he -- assuming this is acceptable to the Coast Guard and to the Board, any time that he may feel he'd like to speak with his counsel during the interview,

he's free to express that, express that desire. And also, that if he needs to take a break or anything for any reason, he's got a family member who's got some medical issues that may necessitate him taking a brief break and I just wanted to make sure the Board understood that and that it's okay for him to let the Board know if he needs to take a brief break for that reason. Or any other reason.

LT [redacted] Yes, sir, absolutely. And I guess this is a little different than our last setting when we were in person and you were sitting right next to him, so yes, any time that you would -- if you need to speak to counsel, please just allow us -- we'll allow the opportunity, as well, or if you need to step away, that's perfectly fine, just ask us and we'll pause the recording. In about 50 minutes into the interview, we'll also try and take a break then, if that's okay.

MR. SHUMAN: All right, sounds good. Yeah, anything that my son might call for will be unpredictable, so -- anyway, yeah.

LT [redacted] Roger that, we're tracking all that, yes, sir.

MR. SHUMAN: Okay. Oh, so back to your question?

BY LT [redacted]

Q. Yes. So I'll go ahead and repeat that question for you. So if you could just provide me a background on yourself, professionally, as well as how you came to know about OceanGate or learned about OceanGate and how you became the COO of OceanGate, if you could just provide us with as much details as possible.

A. Okay. I am trained as an engineer, I have two college degrees, one bachelor's and one master's in mechanical engineering. My specialty in that was heat transfer. So I -- after I graduated, I went to Bell Laboratories for 15 years and basically, in that light, built boxes for electronics, essentially, racks of equipment that were used in telecommunications, and did that up until probably 1992 about, and then I took on more of a management role on the digital cellular systems that were being developed at the time. They're the ones that -- like Verizon and such companies, Sprint, used.

So in 1990 -- so I did that for 15 years. In 1997, I went to a small company and moved from New Jersey out here to the Seattle area and went to a small company that was doing smart antennas, which is an offshoot, another piece of equipment in the cellular world, which is a fancy antenna that was used to try to help the systems work better.

And then I worked at several other small companies that did voice over internet, VoIP, an early one of those, and then worked on a software system, a company that built a software system for physical security, for facility security, and that was really a large database system to bring all of the sensor information together, and so I worked there as a vice president and a COO there and eventually became CEO. It was a small company, probably 25, 30 people. And then went from there to education briefly, for about a couple years, and then moved into satellite communications

for 6 or 7 years, so that was like 2012 to 2018 or so, and that was with a new type of ground system for satellite communications. And then I was -- at that point I had left there to do some consulting and then I talked to -- somewhere along the way I talked to Stockton and he was interested because he was expecting to grow his company significantly after their first *Titanic* expedition in 2019, so he wanted me to consider coming to his company to help grow the company with the experience I had in larger organizations.

And so I -- let's see, in the end of 2018 I went on a test mission in the Bahamas with the team and then I started doing part-time consulting, helping them with project management as they were getting ready to go out to the *Titanic* in June of that year. And then in April he hired me, I agreed to come on as the COO there.

Q. And could you describe roles or what the expectation of your roles were, as far as beyond growing the company, what that looked like --

A. Yeah.

Q. -- from the day-to-day?

A. Yeah, so -- well, in the beginning, so the idea of the role would be to basically try to help organize and manage the different organizations as they were getting ready to do their missions. So my role really in the beginning was -- I didn't know much at all about maritime nor about, like, the carbon fiber

materials, but -- you know, so I really took on an organizational role, trying to look at whether they had what appeared to be the right people in the right places and trying to get up to speed as fast as I could on how the submersible world worked. So we did that and then in -- right before the expedition started in June, the ship that was supposed to take us out canceled and so that threw a wrench in the works.

And then very soon thereafter, they found what looked like a possible defect in the hull of the submersible and so at that point there was the need to go investigate that and so I flew to the Bahamas, really, as an observer as the engineering team looked at what was a hairline crack in the fabric or the material on the inside of the hull and as they looked and investigated that, I went out to oversee -- oversee is probably the wrong word, but to observe. I was new in the game then. And then, at that point, they decided to take the sub and go take it for more testing because the crack was about a half inch deep, it was just on the -- you know, on the very surface.

So at that point, my role kind of changed to one of organizing the outside work, I started talking to the Deep Ocean Test Facility and trying to figure out how to get it in there as soon as possible and, you know, put together project plans for getting the sub ready to go, which was really to strip off all the other equipment except for the pressure hull and then put some electronics inside and so really just trying to coordinate and

make sure, because getting in there was difficult because they were a very busy place, doing a lot of government work. It was run by Northrop Grumman at the time. And so we went in to do testing and then, based on the testing, the hull would be de-rated from -- oh, I don't remember exactly, but it was originally rated at 4,000 meters and was de-rated to like 3,000 or 2500 or something like that.

And so at that point my job kind of changed because it was determined that what was needed was to rebuild a new carbon fiber hull, so I became more of a business development person trying to work with and bring options to the company about, you know, what they wanted and then what would be done, you know, where could that be done, right?

So there was talking to different carbon fiber manufacturers and getting them to talk to Stockton and try to figure out, you know, what they offered and how that fit in, and then different manufacturers, looking at where could something of this size and the uniqueness be built and -- and there's all -- there's various people, there was an analysis group that we talked to that could do physical design analysis, finite element analysis, to look at how to lay up and do the manufacturing and -- yeah. So at that point my role changed. So we hired -- I believe Tony, the head of engineering, left the company in that process and there was someone named Dan Scoville, who was hired in. He was actually hired about when I was, but he was then promoted to head of

engineering before we went to the Deep Ocean Test Facility and did that testing. So I continued to be an outside role trying to get options for the company about what could be done and where, and I went and talked to NASA and brought them in as an option and that was an option that Stockton decided to take because they had a lot of experience with carbon fiber and doing prototype and sort of unusual work with carbon fiber, instead of airplanes, which is a typical thing or, you know, I mean, bicycles.

There's all kinds of things carbon fiber is used for but using big, thick carbon fiber, you know, was something that NASA was interested in. So we signed an agreement with them to get their help and consulting and manufacturing and then testing of the carbon fiber for the new hull. And so that continued on with them as our main consultant, and then we did the analysis work for another few months and the hull was -- then COVID hit and so that, again, threw a little bit of a wrench in our work as a company, right?

So they shut down Marshall Space Flight Center, which is who we were working with at the time, and so then it became a job of really going out and finding who -- and what would be the best way to build it if Marshall Space Flight Center is closed, because a lot of other companies were in a hampered mode at that time. So we found that the manufacturer of the company -- the manufacturer of the equipment that NASA used was based up here near Seattle and they had the ability to do prototyping and the willingness and

interest in doing something new. And so that was actually an excellent find for us to be able to work with them and NASA stayed on as a consultant to sort of listen in on the phone calls and look at how we were doing it and see if they had any advice for us in how it would be manufactured, which is the detail of how the carbon fiber is laid up and such. So yeah, I continued in that kind of a role as the company went and built several small-scale models and tested them.

And so it was a matter of coordinating with the test facilities, coordinating with different pieces on the outside to do it, and then the engineering was done really by Dan and Stockton on how -- the choices of how to wind it and what direction to put it in and that kind of piece. So then that hull was built and tested and put into use and it went on the 2021 *Titanic* expedition.

So at that point I didn't go on the expedition because of the family health issues and COVID at the time, so I stayed back and became, I guess what we call ground support, you know, so I stayed back here and did that. And at that point, my role kind of shifted more so into looking to find other outside contracts for the other two subs we had and, you know, of course if there was another outside contract on *Titan*, that would be fine, too, but it was really trying to utilize more resources and utilize more of our assets, so I started calling out and talking to salvage companies, a little bit of oil and gas, talking to other companies

in between that wanted to -- one company, for instance, wanted to use that unique platform that OceanGate uses, you know, they wanted to use it for ROVs, so there were some ideas on that. There were people who wanted to do documentaries, that was a whole like another side of it, and then were there any science projects that could be funded, and worked on that. So really, 2021 was a successful expedition, and so then I continued to be the outside person trying to find new revenue on that side, on new projects for the other subs.

We did a four-subs dive with the University of Rhode Island with *Cyclops* and the smaller or the less deep version of one that I think you guys are going to see in North Carolina. Anyway, that's really what my role remained up until today. In 2022 I had a health problem, so I didn't go on the expedition and then 2022, as far as the company went, was the same as 2021 in terms of going on to the *Titanic* and then coming back and working on finding other business is what I did.

And then in April of this year I left the company for a couple reasons, (1) it was clear I wasn't going to be going on any expeditions and that was certainly disappointing and I didn't really fit in that well, and (2) I wanted to go and spend time with my family, take my son -- the goal had been the summer, we had purchased a camper and the goal was going to be, since he can't really fly and can't really go out and do other things, we were going to go camping, but that didn't happen. So then I

continued to offer to be ground support while the expedition was out this year; much less contact with the company, really, but then when the sub lost communications on the 18th, I got much more involved again and jumped back in as a volunteer at first, you know, just doing what I could to support the team and everything that was going on at the time from the land side.

And then probably 2 weeks after that, the company hired me back in to help with answering the Coast Guard and just doing what was needed as we -- in the aftermath, you know, to try to help since I at least had some familiarity. And that's where I am today.

Q. Thank you. I think that helps me to again organize a few other questions after that, the breakdown. I did have a question about different manufacturers for carbon fibers.

A. Yeah.

Q. Did you have any -- what was the conversation like between determining which manufacturers you would choose or ultimately led to the decision of the manufacturer, that conversation, if you could kind of expound on that a little bit?

A. Yeah. Yeah, so on the carbon fiber side, Stockton had a couple different directions he was looking at. One is having another hull built by the same vendor, Spencer Composites, which would -- and I wasn't too familiar with that because I don't know that we landed on that for very long, but that was one type of carbon fiber I never really went to help find sources for that.

Then the other side was working to go with the high use, very commonly used, a lot of experience with the carbon fiber used for the passenger jets, like the 787 and the 777 and, you know, I suppose Airbus, too, but there was a very basic type of carbon fiber called prepreg, which was placed, instead of wound, it was placed by robots and that was kind of the best possible, the material with the most experience on it.

But meanwhile we also went down and looked at -- talked to 3M, who had a new kind of carbon fiber that they thought might be good in compression for the hull of the sub. Had that tested by NASA, it didn't work out very well, so tested it on a little test strip, you know, they just had a small sample of it. They had high hopes for it, but it didn't work out nearly as well as the prepreg that was common in the aircraft, you know, in that kind of a comparison.

And then we talked to a company, I don't even remember the name, in New York State that had a thermoplastic, which is a very different kind -- not very different, but a slightly different kind of carbon fiber material. But they were very new in what they were doing and so there wasn't much experience with it on the manufacturing or use side, so Stockton wasn't interested in that. And so it really came down to the carbon fiber that was used on the aircraft, and since it was known to be pretty tough and again, had a lot of use, so we talked to -- well, he talked to Hexcel, I don't think I really interacted with them that much, as one

company, and then Toray Composites, which actually has their U.S. headquarters about a half hour south of here, and so that turned out to be pretty handy, especially in the COVID world. Although we did most of the work by phone, it was still sort of good to have them in the area, it certainly made shipping and receiving a lot easier and those kinds of things. So we talked to them and that was who Stockton ended up choosing as the vendor for the carbon fiber.

And then the other, like, little piece to that is once you have a vendor for prepreg, it has to be wound on the spools and that was done by a company called, I believe, Web Industries. I think they're in Georgia. They're really just a processor of the carbon fiber, they take it in whatever form, I don't even really know how it comes from Toray, but they wind it onto the spools that go onto the robotic placement machines.

So once we knew the specs, we got the specs from Electroimpact, who did the -- was the one that built the machine, built the hull in their prototype shop and got the specs from that and that went through Web Industries. So that -- I don't know if you have any questions, that should be the answer to part of your questions on carbon fiber.

Q. Very good, sir, thank you. And just going back a little bit to NASA and that relationship, and you said that was more on a consulting level and what exactly were they assisting in that consulting piece?

A. Okay, yeah, once COVID hit and their facility closed, it became consulting. And so there's -- when you build a carbon fiber hull, what I saw was that there were a lot of parameters to consider in how it's -- how the fibers are laid up together and what angles they're laid at and it has to be baked in an oven and so how that's done and how often that's done.

You know, they had a lot of experience with carbon fiber, so they would really -- and I don't even remember how often, but at least every few weeks or months they would get together with us and we'd sort of review where we were at with EI and NASA and -- well, EI and NASA and to some extent, Toray, but it was really manufacturing at that point, that they would help with that. Just give Stockton advice, things to think about or, you know, an okay on what they were doing.

Q. And when they would go on expeditions, you were -- like you said, you were ground support. So typically, in that juncture of time period, you were more so looking for alternative, I think you said outside contracts, different ways to grow the business as far as potential income?

A. Yeah, yeah. That's right.

Q. And outside of the *Titanic* explorations, as far as with the *Titan*, was there any other thoughts or plans for it to be used or was it used any time outside of that?

A. Well, it was not used any time outside of that, but the thoughts and plans were a couple-fold, (1) to do more -- Stockton

always wanted to do scientific work, so it was really kind of looking at where there was something useful to accomplish with it outside of the *Titanic*, which -- so there were hydrothermal vents they had a goal of going to see and those typically were around the Azores, and then there was some consideration of work in the Bahamas since OceanGate Expeditions had an agreement with the Bahamas for commercialization and doing work down there. So there's some deep water down there and so there was some interest in going down, doing exploration down there.

So those were the two things. In longer term, there were ideas about the Mediterranean, maybe in the South Pacific at the World War II wrecks there, if the Navy would give us the okay on that, those were the -- those were the places we looked at.

Q. And then at any time of your conversations did you -- were you aware or did you guys discuss getting oceanographic research certification from the Coast Guard for the *Titan*?

A. Yeah. Stockton handled most of that, I don't -- I don't know. I mean, it felt like there was some discussion along those lines, but I don't really know what occurred with that.

LT [redacted] Okay, thank you. I think I'm going to open it up, I won't take all of your time, and I'll allow or ask if Mr. [redacted] would you like to come on and do you have any questions for Mr. Shuman?

MR. [redacted] Yes.

BY MR. [redacted]

Q. Good day, sir.
A. Hi.
Q. I had a couple questions for you. For the new hull, did you keep the ring and the domes, were they reused for the hull?
A. Good question. Yeah, they were. We had looked at getting some new ones made, but there was very -- it was like an uncertain timeline, I think -- it was Ti Fab that did the hull, the domes, and the segments originally, and I wasn't around then, but I re-contacted Ti Fab, but the getting -- getting titanium at the time seemed to be very hard, it was short supply, and so it seemed like the best decision was to -- to reuse the ones that were there.

So that is what we did and I -- what I remember of that is they had -- you know, they had to cut off, and you probably saw the remaining piece of the old hull there, which got kind of, you know, ruined, they just cut it right off, and then they cleaned out the grooves and cleaned all the carbon fiber out to make it pristine again for putting in and reassembling the whole unit once the carbon fiber was built.

Q. Okay. That said, then the viewing port was also reused?
A. Yes. Yeah, yeah, the viewport was reused.
Q. Do you know if there was any changes done to the way it was mounted?
A. I don't know. I don't know the answer to that, I don't remember any.

MR. [redacted] That's all I have, thank you.

MR. SHUMAN: All right, thank you.

LT [redacted] Okay, Mr. Neubauer, do you -- would you like to ask any questions?

CAPT NEUBAUER: Thank you, [redacted] Let's go to the NTSB at this time and I'll kick it over to Mr. Muise.

BY MR. MUISE:

Q. Good afternoon, sir, this is Marcel Muise. Can you talk a little bit about the culture at OceanGate, like the relations between yourself and Stockton and with the board and likewise, between yourselves and the employees, you know, was there free communication between or was there pressure in any which direction?

MR. MALKIN: Excuse me for a second, this is Harold Malkin. If there could be a little more sort of precision to the questions and specific questions, I think it would be helpful. I'm not sure I understood that question, I don't know whether Mr. Shuman did, but there seemed to be several questions about nature of interactions, frequency of interactions, maybe we could just take them one by one.

BY MR. MUISE:

Q. Okay, all right, let's just start with the board, then. What was your relationship with the board like?

A. Well, mine, I sat in on most of the board meetings but I didn't really have a relationship with the board, if you know what

I mean. The relationship, yeah, I didn't have a relationship with the board, the relationship with the board with the company was straightforward, I guess is a good way to put it. It wasn't contentious.

Q. Okay.

A. And -- yeah.

Q. Was there a chairman to the board, as well?

A. Stockton was the chairman of the board, I think.

Q. Okay.

A. I'm pretty sure.

Q. And did the board give ideas to the company or the other way around, did the chairman go to the board for approval for his ideas? Or both.

A. What I saw was Stockton going to the board for approval for his ideas. I don't -- I didn't see it go the other way.

Q. Okay. And with the employees, who were your direct reports as COO?

A. We had a bit of a nebulous org chart, so in terms of direct reports were -- I don't even actually know. To some extent, I believe most people in the company, off and on, directly reported to me, but operationally, you know, operations and engineering operationally reported to Stockton and sometimes the sort of marketing reported to me, but that was -- it was very nebulous, to be honest with you, but I did whatever, whatever he wanted me to do.

Q. Okay, how about engineering, did they report to you or straight to the director of engineering or straight to Stockton?
A. That sort of got handed back and forth based on what Stockton wanted to do. Sometimes he would say hey, can you keep an eye on engineering while I go work on other things, so -- yeah.
Q. Can you talk a little bit about the culture of communication, was there just free flow of ideas going from engineering or was it a top-down "hey, this is what we're going to do" kind of thing?
A. Stockton was a pretty transparent fellow, so there was a lot of free flow of information. When I got there, though, the -- the relationship between the organizations was, I'd say, maybe contentious a bit. There was a lot of territorial discussion going on and I'd have to say it wasn't as open as it ended up being probably 6 months later.
Q. How about specifically regarding design safety of any of the vehicles?
A. There were often meetings about design safety and open discussions Stockton would hold. When there was dives, he'd hold pre-briefs and debriefs that were completely open discussion and then he was wandering around the shop talking with people, so I'd have to say it was more open than I've seen at other places I've been.
Q. Okay.
A. In terms of access to him and the ability to ask him questions or make requests.

Q. I just have one follow-up from Kelly's line of questioning. You mentioned a 2019 expedition, was that just on the drawing board or did that actually happen, a 2019 expedition to the *Titanic*?

A. That is the one that the ship canceled on and then afterwards they found the -- the defect in the hull, so that was all planned and ready to go, but did not go.

MR. MUISE: Okay, all right. Well, thank you, sir.

MR. SHUMAN: Yeah.

MR. MUISE: Jason, I will pass it back to you. Or [redacted] sorry.

CAPT NEUBAUER: Thanks, Marcel.

Why don't we go to Mr. Barnum, if you have any other NTSB questions.

BY MR. BARNUM:

Q. Yes. Thank you, Mr. Shuman. A couple questions regarding the carbon fiber hull. You mentioned already, I didn't catch all of it, that Electroimpact built the second hull for the *Titan* and then you said the -- who was the manufacturer of the actual carbon fiber?

A. Toray Composites.

Q. And then you also mentioned Web, was that correct?

A. Web Industries, I guess you'd say, was a processor of the composite, they're the ones that put it on the spools.

Q. Okay. Now, did Electroimpact have to build a special machine

to wind this hull?
A. They didn't have to build a special machine. They used the tooling. The round tube that you wound it on was ours. That had to be modified a little bit for their machine to have enough room on each end for how this type of winding would go. And then I believe -- and I don't remember the details because I wasn't directly involved, but they did some modifications to their existing equipment. I don't think they were major, but they made some modifications to the existing equipment to help, to help do this, to help wind our -- I shouldn't say wind, place the fiber.
Q. Okay. Did they also make scale models, not scale models, but test hulls --
A. Yeah.
Q. -- like one-third scale? They did?
A. Yeah, two of them, yeah.
Q. Okay. And then my understanding, after the hull was produced, you also tested that at one of the deep ocean testing facilities, is that correct?
A. Yeah, yeah.
Q. Okay. And then how about real-world testing of that hull, could you explain, was there any of that done?
A. Yeah. The real-world testing of that hull, I'm a little fuzzy on exactly what happened in May of that year, but after the Deep Ocean Test Facility, that hull was taken up to -- to St. John's and I believe the first week of the 5 or 6 weeks, 6 weeks

out there, was designated for testing the new hull.
Q. Okay, so this is 2021 --
A. Twenty-twenty, yeah.
Q. -- *Titanic* expedition, the first week or two was set aside as the first initial real-world testing of this hull.
A. Yeah.
Q. How about the one-third scale hulls that were made, where were those tested? Or were they --
A. Those were tested, those were tested at the University of Washington here, they're small enough to fit in its much smaller chamber and so those were tested here. Probably, that was in 2020, like the summer of 2020.
Q. Okay, so help me with the timeline. The new hull and the one-third models were built late 2019?
A. Okay. No, late 2019 there was -- was when -- in October of 2019 is when the first hull was tested at the Deep Ocean Test Facility and was then, you know, de-rated.
Q. Sure.
A. And so then, at that point was when we started to pull together all of the different options on how to build the second one.
Q. Um-hum.
A. And then after those options kind of got pulled together and manufacturing was lined up, they built the first two scale, one-third scale, models that can be tested here in Seattle at the

University of Washington and that was in the summer and then -- then there were some other test pieces made at full diameter that weren't able to be tested because they weren't a pressure hull, but they were tests of the winding and the lay-up and those kinds of pieces using the full-sized mandrel, but only making them, I don't know, a foot wide or so. And so they did those and those were also -- I don't know if you were out here, those were out in the back of the parking lot to see. There was one fully 5 inches thick and then there was one of a couple layers done.

Q. Okay.

A. And that was in the fall of 2020 and then, you know, in late 2020 they started -- based on the information they garnered, they started winding the second full-sized hull that would go in the *Titan*.

Q. Sure, okay. You might have alluded to this, but like how exactly did they test the one-third models up in Seattle or the University of Washington?

A. I was less directly involved in that, so I can say that they built two end caps to put on, they wound a cylinder, they put two end caps on and then they instrumented it and put it down into the chamber. But I don't really remember the test plan and those kinds of -- that kind of detail.

Q. So other than the pressure test, do you know if they did any other nondestructive testing, any kind of thermography or X-ray or any other sort of NDT?

A. I don't remember exactly what all they might have done to that. I did -- because I was more, again, involved in outside work, because we did hire somebody and I don't remember the name of the company in Seattle that tried to do some nondestructive testing of the 5-inch-thick sample and they weren't able to penetrate it. And so we paid them to do like a test run, it didn't really work, and they were pretty experienced from the aviation world, but they weren't able to successfully get any meaningful information out of it and so we stopped using them.

Q. Do you remember who that was?

A. I don't remember who that is.

Q. Okay.

A. Sorry.

Q. No worries.

A. We used them, you know, I mean, it didn't go long and it didn't go well, so I don't -- it didn't stick in my mind. I assume I can go figure it out.

Q. And that was the second hull, carbon fiber, the one scale model.

A. Yeah.

Q. Or one-third scale, okay.

A. It's either the one-third scale or it was the larger --

Q. Five-inch.

A. -- 5-inch ring test.

Q. Okay.

A. I don't know which it was.
Q. All right. So the *Titan*'s second hull went to St. John's following the deep-ocean testing. Was there any NDT, nondestructive testing, of that hull, the full-scale model?
A. I don't remember any.
MR. BARNUM: Okay. All right. That's all the questions I have right now, thank you.
MR. SHUMAN: All right, thank you.
LT [redacted] Thank you, Mr. Barnum. Thank you, Mr. Shuman. We're going to -- would you be fine with taking a break right now? Would you like to take a break right now?
MR. SHUMAN: Yeah. No, that would be fine.
LT [redacted] Okay. If it's okay with everyone, we're going to take a 15-minute break and then we'll re-adjourn and open up the -- yes, Ms. Shvets.
MS. SHVETS: Ms. [redacted] can I just ask one clarification question to what Mr. Shuman just said regarding the nondestructive testing for the full-scale new hull?
BY MS. SHVETS:
Q. Just to clarify, you said you don't remember any -- you're not counting the deep ocean testing facility test as --
A. Right, because that's potentially destructive testing.
Q. Got it, okay.
A. Right, nondestructive testing is where you would radiate it or try, you know, like to use X-rays or ultrasound or something

else to try to see what's inside, just sort of observe inside of it to see if there's gaps and void, I know that much, but I don't really remember any details.

MS. SHVETS: Understood, thank you.

MR. SHUMAN: All right.

BY MR. BARNUM:

Q. Sorry to jump back in here, but this was my line of questioning, so I do want to follow up on that. Was there any talk of that, of giving this hull additional NDT?

A. I don't remember. I mean, I know that there was the failure of the one group to do it and -- but I don't really remember the conversation after that.

MR. BARNUM: Okay. All right, thank you.

LT [redacted] Thank you, sir.

We'll re-adjourn at 6 minutes after the hour. I will pause the recording at this time.

(Off the record at 12:51 p.m.)

(On the record at 1:06 p.m.)

LT [redacted] I've returned to recording and it's now 1:06 p.m. Eastern Standard Time.

Mr. Shuman, I would like to ask if there's anyone with questions, if you could just raise your hand and then we'll go through the -- Mr. Neubauer, does that work with you or would you like to go ahead and start with the next questions?

CAPT NEUBAUER: It looks like -- Dr. Kramer, it looks like

you're on. Why don't we finish up the NTSB and then I'll (indiscernible). Thank you.

LT [redacted] And I believe Lieutenant Commander [redacted] also has questions.

DR. KRAMER: Sorry. So should I proceed with my questions then or does Commander [redacted] want to?

CAPT NEUBAUER: Sir, why don't you go ahead and finish the NTSB ones.

DR. KRAMER: Okay. All right, okay. All right. Well, thank you.

BY DR. KRAMER:

Q. So I'm a materials engineer, so my questions are going to be mostly engineering related. As far as the winding of the hull, were you -- were you able to attend that or not?

A. No, that was during COVID.

Q. Okay.

A. I was not -- I mean, I did try to walk through off hours and just sort of look over things, but --

Q. Yeah.

A. -- that's different than really watching over.

Q. Yeah, absolutely. So I have a couple of questions about the end rings. I guess the end caps of the carbon fiber hull. You said that those were reused from Hull 1?

A. The titanium pieces, yes.

Q. Yeah, the titanium pieces, yeah. Do you happen to know if

they were like modified in any way before or while or when, like when or if or how they were modified?
A. I don't recall any modifications to them.
Q. Okay.
A. I can't guarantee that, but I don't recall that.
Q. Yeah, for sure. And were you able to witness when the rings were attached to the second hull?
A. No, I was not. I saw some photos of it, but I was not a witness to it.
Q. Yeah, okay.
A. Right.
Q. I guess my only other questions are about the real-time monitoring system. I gather Hull 1 and Hull 2 were both equipped with some form of real-time monitoring?
A. Yes.
Q. And who was in charge of the real-time monitoring system for Hull 2?
A. In charge, I'm not sure. They really -- okay, so who was in charge of it was Phil Brooks.
Q. Okay. I guess what I'm wondering is if there was any redesign or any changes that you're aware of that were made to that system or any reevaluation of it after what was learned with Hull 1.
A. I believe there was -- to my recollection, there were some processing changes having to do with how the acoustics were

processed, they were software kinds of changes --
Q. Uh-huh.
A. -- like sampling rates and how the data was compiled and shown. To my knowledge, I don't remember any, you know, hard system changes to it. It was pretty much --
Q. Right.
A. -- probably the same circuit boards.
Q. Yeah, so no major overhaul of the physical -- like the hardware systems, so --
A. Not that I remember, no.
Q. And do you know how that data was being used on Hull 2 and who had access to it?
A. The data was used in real time, it was shown to the pilot of the sub during the dive, it was used at the Deep Ocean Test Facility in real time, and then there was some post-processing where it was put into plots for the dive.

DR. KRAMER: Okay. Okay, that's really -- those are the only questions that I have, so thank you very much.

MR. SHUMAN: Oh, thank you.

LT [redacted] Commander [redacted]

LCDR [redacted] Yes. Mr. Neubauer, do you want to go ahead of me or do you want me to go right in?

CAPT NEUBAUER: No, [redacted] why don't you go. Thank you.

LCDR [redacted] Okay, great.

BY LCDR [redacted]

Q. Thank you, sir, thank you for being with us again today, really appreciate everything. I've got a bunch of follow-up questions, so if I jump all over the place, I apologize, and I'll try and keep it in some type of flow that doesn't get us all off of whack here. So just one kind of quick question, what was the *Titan* rated to? What depth?
A. I believe we talked about it being 4,000 meters. The first *Titan* hull, the way I'll caveat that, the first *Titan* hull was supposed to be good to 6,000 meters, but it was never used beyond 4,000.
Q. And how did they get that determination?
A. I don't -- I wasn't around then, I don't know. That seemed to be the carbon fiber part. I don't believe the other -- so when you say the hull was rated, I guess that's more than just the carbon fiber, that includes the titanium and the viewport, and so I'd say those were rated to either 3800 or 4,000, I don't really know exactly what Stockton used as that guideline.
Q. Okay. And just so I'm clear, you're not sure how they got -- was it from the Deep Ocean Test Facility or was it based upon previous builds or how did we get to that number of 3800 or 4,000?
A. For the first hull, I don't know. For the second hull, we went to the Deep Ocean Test Facility and tested it past 4,000.
Q. And were you there when they tested it?
A. No.
Q. No. Were you able to ever see the report that they created?

A. I saw -- I don't even -- I don't know if it was a stapled report, I did see -- I did see outputs from that time.
Q. Okay. So yeah, I was just wondering, actually, if when you go and do the Deep Ocean Test Facility, they come back and they say okay, this is now rated to this based upon the test that it was, just kind of figure out exactly how that works.
A. Yeah. There was not, I believe, official documentation as to the rating, it was just generally known that it was 4,000 and it was stated as such. There may be a document, I'm not going to say there wasn't, I just don't remember like a placard or something like that that went with it. Yeah.
Q. Okay. Thank you, I appreciate that. And did you ever attend any of the expeditions, the *Titanic* expeditions?
A. I went to the Bahamas for testing, the testing which wasn't really an expedition but, you know, it was in -- before 2019, right before the *Titanic* dive in 2019, I went in April. I went in December of 2018 on -- for a couple days and then I attended in April of 2019, but no, none of the real expeditions, none of them.
Q. And who was responsible for the *Titan* and all of its equipment post-expedition and then pre- the next year, so in between expeditions, who was responsible for the *Titan* and all of its associated equipment?
A. I don't believe there was one person responsible for it. I mean, in the end, Stockton was responsible for it and then there's different pieces that he would ask to have worked on and different

people would work on those pieces, sometimes people out of operations and sometimes people out of engineering.

Q. Are you familiar, can you speak to actually how -- what the *Titan* did, where it went, for the most part, like roughly? So say, did it stay in St. John's, did it come back to Seattle, what happened after, say --

A. Yeah.

Q. -- for the 2021 expedition, where was the *Titan*?

A. All right, thank you. So after -- after 2021, it came back to Seattle, I don't remember exactly when, but it was shipped back to Seattle and then before the '22 expedition, probably in April, May, it was shipped back to St. John's. Then after the '22 expedition, it stayed in St. John's over the winter and the team went up several times to make small modifications to it and adjustments to it before, but it was up in St. John's.

Q. Do you know where it was stored in St. John's?

A. Not exactly. It was stored in at least two places and I'm not the best to speak to that. Sorry.

Q. Do you know if it was in a warehouse, in a climate-controlled warehouse, was it out in a parking lot, was it in a field?

A. That's the part I don't know. Sorry.

Q. Okay. Do you know somebody who would better know?

A. Scott.

Q. Okay, thank you. So as the COO, I know you went through all of your basic overall responsibilities and they changed over the

years to many things, so I just want to speak specifically to like the pre-2023 expedition, who would be responsible for operations?
A. Pre-2023, that would've been Ryan. Yeah. I mean, in the end, to be clear, Stockton was responsible for just about everything. We were, you know, down to 10 people, 12 people, he was responsible for just about everything. But yes, Ryan was formally there, the lead below Stockton.
Q. And we know and we've seen that OceanGate had a good amount of procedures, policies, procedures with regards to the *Titan*, you know, training and those types of things. Who drafted those, who was responsible for drafting, say, the training procedures?
A. My experience was that the training procedures were drafted before I joined, many of them, because it's effectively the same sub and the platform. And then after I was there, probably the operations group and/or Stockton were responsible for drafting and reviewing the training procedures, so that would be Ryan and Stockton.
Q. So for the operational training procedures, that would be the operations group or operations division, we should say. So for, per se, if we were going to -- I don't know, probably, probably not necessarily division, I get it and I understand what you're saying, but -- so for like engineering procedures or testing, and I don't mean testing, but engineering procedures specifically with a real-time monitoring system, who was -- was there a post-dive inspection procedure for the real-time monitoring system on the

hull?
A. I don't know the answer to that. There was a post-dive printout or availability of plots out of the system, but in terms of inspection of the hardware, I don't know.
Q. Okay. And I'm going to be specific on a question, so you know or you don't know. So if the hull were to have, say, an anomaly, they say there's some -- you know, whether there was abnormal strain or there was an excessive amount of acoustic -- acoustic measures during a dive, was there a procedure after the dive to then inspect from those acoustics and/or strains, if you kind of get what I'm saying.
A. I don't know for sure.
Q. Okay. Great. You had mentioned in an earlier question about territorial behaviors at some point. Can you go a little bit deeper into that for me?
A. All right. I will narrow the question to what I was referring to at the time, which was when I got there in April of 2019 there were just bickerings between different organizations and it was a little bit -- you know, it added noise to the -- to the organization. And that's the best I could -- I don't know how to frame it other than I think you all know what organizational bickering can be and it's very hard on a small company to have that going on because, you know, if you want information you don't want it to have been run through the boss first, right, you just want to go talk to the engineer and find out something, right?

And so -- and then, you know, engineering calls ops like they're another group, right, instead -- you know, with a little more differentiation between them and who does what, "oh, that's my person, they should be doing this," and that was what I meant by that. You know, it's not uncommon in my experience in organizations, but it is something you want to minimize.

Q. Of course. And how did Mr. -- was Mr. Rush the one who would handle those or would you hear, you know, bickering, how was it handled internally in the company?

A. Oh, handled. I guess I would -- I would point it out, especially because I was early, I'd go to Stockton and say what's up with this, you know what I mean, why is this going on, you know, and you know, usually try to find a way to just sit two people down and say what's going on here, you know, let's try to figure this out and, you know, why are you not telling them the information they're asking for and stuff like that. I mean, you know, I don't want to overplay it, it wasn't -- you know, it was there and it was noticeable, you know.

Q. Who would handle all the hiring and firings within the organization when you were there?

A. That varied. So most often it was the manager, the "so to speak" manager, which would be like the head of engineering did the hiring and firing, the head of operations did the hiring and firing, Stockton would ask me to do the hiring and firing sometimes, you know, like I helped -- I helped Tony get in a

project manager, right. I like to interview people, you know, especially just as sort of an administrative person just trying to vet and look at who's coming in. So I would help with the hiring and then in terms of firing, that was really situational. Sometimes Stockton would want to do it himself, sometimes he'd ask me to go do it. You know, again, it wasn't that big a company, so it just kind of was not regimented in how that was done.

Q. I don't see -- you came in, in April of 2019, correct?

A. Yeah.

Q. So were you -- you were not employed at the same time with David Lockridge, is that true?

A. Yeah, I never met the fellow.

Q. Okay. Just a few more questions. You said that you were in charge and responsible -- respond -- sorry, in charge and responsible for finding new excursions for the other two subs or whatever for the subs, reaching out. Who was responsible or in charge of identifying customers or clients?

A. What do you mean by that? I don't understand your question, different from -- yeah.

Q. I'm trying to differentiate. So for the *Titan* sub, who was responsible for identifying clients and/or mission specialists --

A. Okay.

Q. -- to go on the *Titan* sub?

A. That was between Stockton and Kyle, between those two people. I didn't really get involved in the *Titanic* expedition and those

kind of pieces.
Q. And how do you understand the term mission specialist and what their responsibilities were?
A. I understand mission specialist to be someone who financially helps support the mission and in exchange comes on the mission, is given tasks to do, jobs to do, trained to do whatever they can be trained to do, sometimes depending on what their background is, and then -- and then they'd be given a crew position for a dive, which then might also include responsibilities on the dives, and they'd go out for a given week, a given mission, which is the whole expedition was broken into five missions, and so the mission specialists would go out on a mission and be on it for the whole 8 days.
Q. Were you ever aware of any -- we'll call them domestic missions that were taking place with any of the three -- the *Antipodes*, like *Cyclops 1* or the *Titan* sub within the U.S. domestic waters?
A. Well, I don't know, what are -- how much I know --
Q. Okay. So --
A. So what are domestic waters?
Q. So let's just say -- Mr. Malkin?
MR. MALKIN: No, no, I was going to ask for a similar clarification.
LCDR [redacted] I'll try to clarify.
MR. MALKIN: You said domestic missions and those may have,

you know, legal meanings versus what Mr. Shuman is understanding, so maybe domestic and missions we can just clarify.

LCDR [redacted] Roger. So I'll rephrase the question, if you would like.

BY LCDR [redacted]

Q. Were you aware of any missions as used from OceanGate as getting under way to do -- to go do submarine operations from a U.S. port within U.S. waters and back to a U.S. port?

A. Yes. So there was a mission called -- two missions called the Hudson Canyon that went out to the Hudson Canyon, that were based in New Jersey/New York, somewhere in that port area. There were those two. And then there --

MR. MALKIN: Excuse me, can you just say which vessels those entailed?

MR. SHUMAN: Oh, that was for *Cyclops*. And then there was a mission, I think it was based in Rhode Island, that went out, it was to look at World War II subs that were off of Long Island somewhere, and there was that mission.

MR. MALKIN: Which vessel was that?

MR. SHUMAN: That was also *Cyclops*. And, you know, I -- I don't know that there were any other missions. I don't remember any other missions. There was one in the Puget Sound that was a -- they were all scientific, but there was one in the Puget Sound that went out looking for methane bubbles.

MR. MALKIN: Which vessel was that?

MR. SHUMAN: That was *Cyclops*. And there were test dives of *Antipodes* and *Cyclops*, but I don't believe that's what you're referring to, [redacted]

BY LCDR [redacted]

Q. No, no. I greatly appreciate that answer and just a follow-up on that. I believe you had mentioned the three specific ones, the Hudson Canyon, Rhode Island, and then Puget Sound, all with the *Cyclops 1*. Did those entities -- I don't know -- I don't want to call them clients, whoever, did they pay to use the sub?

A. I believe so, yeah. Yeah. And I believe the Coast Guard was involved or notified, I know that they came to visit before the Hudson Canyon one and talked to Stockton.

Q. Was that in New York/New Jersey or was that in Seattle?

A. New York/New Jersey.

Q. Okay. Appreciate that. And do you have a rough --

(Audio malfunction.)

MR. SHUMAN: -- and then I don't know what the four subs was, the one off of Long Island, that was sometime after that.

LCDR [redacted] That's the Rhode Island one you're speaking to.

MR. SHUMAN: Yeah, yeah.

LCDR [redacted] Okay. That's all the questions I have for now. Mr. Shuman, thank you again so much, I greatly appreciate it. Thank you.

MR. SHUMAN: Thank you.

LT [redacted] Mr. Neubauer.

CAPT NEUBAUER: Thank you, [redacted]

BY CAPT NEUBAUER:

Q. Good afternoon, Mr. Shuman, again. This is Jason Neubauer, just some follow-up questions from the lines you've already been asked. Sir, I have some interest in the 3M carbon fiber that you mentioned. Then you said, if I have this correct, that a small sample was tested and it didn't do well, if I have that right.

A. Yeah.

Q. Do you know how they tested that sample?

A. I believe it was what you would probably call a coupon test, where it was -- I remember it being a small square of the material, you know, and it was put in a compression device. You know, it wasn't -- it was more sort of standardized but maybe not representative of a pressure hull, but really just as a cursory comparison.

Q. Okay, thank you. And do you know if the same test was done with the Toray Composites carbon fiber?

A. I don't know for sure. I don't know for sure. I mean -- let me change that. The materials that were used on the aircraft were pretty highly tested, so it was a very different situation than the 3M, which was a brand-new, out-of-the-lab material. So it's kind of a different situation, so there were -- I'm pretty sure there were a lot of test results on the Toray fiber. Just, we didn't run them.

Q. I understand, thank you. And then one question on the hull

monitoring system, did you ever review post-dive data from the monitoring system, the first one?

A. When you say the first one, what did you mean?

Q. Did you ever review the data, like from the *Titan*, the second -- the actual -- the second *Titan* hull, after the dives, did you ever look at that hull monitoring system data?

A. I looked at the data after the Deep Ocean Test Facility. I don't remember looking at the data from the dives, I remember talking to Stockton about that, but I might have. You know, I don't really know, there were -- there were no, like, incidents that would've brought that to the forefront, that I remember.

Q. Okay, that was my follow-up question. When you did talk to Stockton, do you remember any concerns being discussed about the hull monitoring data?

A. I do not, and I do remember specifically asking him because the pilot watches it, right, you know, watches the system during the dive, were there any actionable incidents or things and he said no, it was pretty quiet, so --

Q. Now I want to talk a little bit about -- more about the Bahamas operations. You mentioned that there was an agreement between OceanGate and the Bahamas that was set up for an actual business model in that area, is that correct?

A. Yeah, yeah.

Q. And I was wondering, is the -- is OceanGate, the structure, is the owner out of the Bahamas? Is there a branch of OceanGate

that is in the Bahamas or is it really OceanGate is a Washington company that owned and operated the *Titan*?

A. I'm not the best person to ask about the corporate structure of that. I'm sorry, but I -- you know, I haven't even really read the documents, so I wouldn't -- I shouldn't be guessing.

Q. Okay. Do you know who would be the authority on that?

A. It would've been Stockton, he was doing all of that. So I don't know, I don't know the answer to your question.

Q. Okay. And then speaking about the Bahamas, are you aware that OceanGate attempted to register the *Titan* in the Bahamas?

A. No. I mean, I did -- I thought I heard that it was registered in the Bahamas, but that's -- I don't know, not really, no.

Q. Okay. You had mentioned sometime during the questioning that OceanGate had pared down the staff, I think you said to about 10 or 12 employees at the end, near the end of the operation. Did you have any concerns about that, as the staff was being reduced? From like a safety standpoint of being able to -- continuity of operations.

A. Yeah. I did, although again, I was a little sideways of that in terms of the organization, I wasn't -- I was no longer involved in field operations. I did ask Stockton, with that many people, how -- how is he going to do the operation and he said with the contractors, you know, to staff up for the expedition via contractors rather than permanent employees. And given that

they're usually pretty experienced, that sounded like a reasonable answer to that, since they often have a lot of experience.

Q. Thinking about back to the Bahamas operations with the prototype hull, that -- if I recall, your statement that was the deep -- there was deep-water testing done and there was a defect found on the prototype hull, like a crack ripped after one of the -- after the deep dive.

A. Yeah. That was on the first hull, yes.

Q. Okay. And you were present during those, you said, down in the Bahamas for the testing of the prototype hull?

A. Well, two different pieces to that. I will take your question in two pieces there, as I was present in the Bahamas in April when there was a 4,000-meter dive done. I was not present in the Bahamas when they found that hairline crack. I did fly to the Bahamas after they found it and sort of watched, you know, what happened. You know, Tony was there and was scraping it away.

Q. All right. And that time period is what I'm interested in. Did you have any communications with Stockton at that time? Did you have interface with him as the -- as the problems with the prototype hull were coming to light?

A. Yeah, I'm sure I did. Yeah.

Q. I'm curious about his mindset at the time. Was there any pressure, you know, to -- due to that failure, were there -- was there like -- was he feeling investor pressure to get operational again? I'm kind of curious of your thoughts on his state of mind

as that prototype hull was coming into some difficulty.
A. Yeah. He sent me out because he was afraid there wouldn't -- he just wanted to make sure there was full transparency on what was going on.
Q. Um-hum.
A. And as soon as we talked about it, he said okay, let's ship it back and, you know, sort of deactivate it until it was tested. So I saw no evidence of reacting to any pressure, although he must have felt some.
Q. So just to clarify, that was one of the reasons you went out to kind of be the verifier of the --
A. Yeah. Yeah, I mean, I didn't have -- I didn't have engineering analysis capability of the situation, but I could at least report back to him what was found to make sure that it was clear.
CAPT NEUBAUER: Sure. Thank you. I believe that those are all the follow-up questions I have at this time. I want to go back and see if there are (indiscernible) from any of the -- well, actually, I'm sorry, we do have a Coast Guard engineer from our safety center, Lieutenant Commander [redacted] I want to check with her to see if she has any questions for you, sir.
BY LCDR [redacted]
Q. Thank you. And good afternoon again, sir, I do have one question. So you mentioned that you researched finding a person to complete the physical design analysis or the FTA for the *Titan*.

A. Yeah.
Q. Did you end up finding someone to complete that analysis?
A. Yeah, yeah. We -- it was actually through a recommendation of NASA, we talked to a company called Colliers, who -- they're the company that makes the software that does fairly sophisticated analysis and so we felt pretty grateful that they agreed to actually do our analysis because they were pretty much the experts, given that they wrote it. Yeah, so that's who we chose and used.
Q. Okay. And was that specifically for the second hull or was it for all hulls of the *Titan*?
A. Oh, that was just the second. We didn't even --
Q. The second one?
A. Well, I don't know that we knew them before then.
LCDR [redacted] Okay. Okay, great. Thank you, that's all I have.
MR. SHUMAN: Oh, all right. Thank you.
LT [redacted] Mr. Barnum.
MR. BARNUM: Yes. Thanks, [redacted]
BY MR. BARNUM:
Q. This is Bart Barnum, just a couple more questions, sir, for you. A clarification on one line earlier, we were talking about the second hull in the *Titan* after it was sent up to St. John's to go on the 2021 dive. Was there any unmanned dives of the *Titan* or were they all manned?

A. I don't know.
Q. Okay. Do you know who could answer that for us?
A. The data is probably in the dive plans that we sent to you.
Q. Okay, I just haven't had a chance to review those yet, so --
A. Yeah. And there's a lot of them, yeah.
Q. Thanks. And then NASA has come up a few times. I just want to know if you could tell us a little more about that, was it a team of scientists there or was it a single point of contact or -- I know you said the relationship changed a little bit during COVID and it became more remote. Is there any more you could tell us on that?
A. Well, there was, I would say, a small team of people there that worked the automated placement machine for the carbon fiber and -- yeah, there was a small team of people we interacted with there with -- I don't remember who had what role on their team, exactly, and then the sort of organizational contact there was Justin and I don't remember his last name. Jackson, maybe. I'd have to go look that up. But you know, in terms of the lead on the consulting, you know, there were different people who had different roles, I just don't remember which had what, but it was a small team that worked there. And --
Q. And what -- sorry. Go ahead, continue.
A. No, I was just going to say it got even smaller after COVID, I mean, they all -- you know, there were maybe two or three people involved, at most, with our discussions.

Q. Um-hum. And what was your, OceanGate's opinion of their involvement, was it -- was it -- did they -- was it useful or was it --

A. Yeah, I think it's hard to be specific, Bart, I mean, you know, that's kind of subjective. We were thankful that they continued to help. I don't remember if there was something you could hang your hat on as concretely beneficial, but they were certainly interactive and I remember them making many suggestions and we were grateful that they continued to work and help. We were grateful for anybody that worked to help on this new idea.

Q. Did they have any, you know, negative feedback or any safety concerns that this was going to be used as a manned submersible?

A. NASA did. Not so much from an engineering view, but more conceptually, you know, liability-wise, they seemed to be concerned about it. But I don't remember what happened with that and it might have -- I don't remember what happened with that, but you know, their role decreased to consulting, anyway, so when they weren't manufacturing, you know, I don't remember it continuing on as a discussion.

Q. How did they voice that opinion?

A. There was an introductory meeting where they asked like, were we -- that was before COVID, just before COVID, that was my last plane flight I've ever taken, to -- in Marshall Space Flight Center there was an introductory meeting where they were asking lots of questions about how submersibles worked and how carbon

fiber played into it and that kind of piece. And then later on, and I don't remember the timing, it was probably Justin said to me that they were concerned, management continued to be concerned about the -- taking human beings in a carbon fiber hull and just with uncertainties, there was nothing specific associated with it. And I'm not sure what really happened at that point, but we continued with consulting.

Q. Did their involvement decrease after that discussion?

A. I remember their -- I don't remember the answer to that. I remember their participation decreasing after COVID hit.

Q. Okay.

A. And you know, as manufacturing went on, there were less questions for them, so I don't know, I don't remember.

Q. And were those conversations with Justin over the phone or were they e-mails?

A. Over the phone, I believe.

Q. Okay. All right, thanks for that. Kind of my last line here was a little bit more about the initial hull, the testing of that hull, and the testing in the Bahamas and the discovery of the hairline crack. Did you observe any interactions between Stockton and Tony, what were their -- were you privy to any of their conversations about the failure of that first hull?

A. I must have been, but I don't remember any details.

Q. Okay. What could you tell me about Tony's leaving? I mean, you know, why he left and --

A. Tony left that summer. There were two reasons I remember for Tony leaving, (1) his relationship with having designed that hull and led the design on the hull and then (2) that, you know, he didn't really have great working relationships with the other organizations and there was a lot of arguing and that was disrupting, you know, a normal flow, but those were two very different things, in a way. And --

Q. So what did you mean by his involvement with the first hull, because it had failed and they lost confidence with him or --

A. Yeah. That's what I remember.

Q. Was it Stockton that lost confidence or the board?

A. Yeah. I don't know the board's relationship in that, but I know that Stockton did.

Q. Okay. So the -- were you or the -- you said you were in the board meetings, correct?

A. Yeah.

Q. So are you a member of the board?

A. No.

Q. Okay. In any of the meetings you were in, did you -- was the board ever made aware of any reports produced by Tony prior to his departure, that were given to Stockton, of the initial hull, the first hull?

A. I don't know quite what you mean by that. There were --

MR. MALKIN: Excuse me, Bob.

MR. SHUMAN: Yeah.

MR. MALKIN: I'm not sure the question is clear. When you say reports, can we be specific about what you're asking Mr. Shuman, whether he knew about?

MR. BARNUM: Sure.

BY MR. BARNUM:

Q. Was there any failure reports or analysis reports that were conducted by Tony following the failure of the first *Titan* hull that were presented to the board?

MR. MALKIN: Thank you.

MR. SHUMAN: I don't know the timing. Clearly, there must have been a report on the -- the finding of the crack being a half inch deep. I don't remember the details of who presented what to whom, to be honest with you, but Stockton was pretty transparent with the board, I'm sure he showed them whatever he had.

Any analysis of that was not done before Tony left, you know, the Deep Ocean Test Facility and the evaluation of how -- what depth did it do well at from an acoustic monitoring perspective, that was all, you know, months after Tony left.

BY MR. BARNUM:

Q. Okay, so they weren't looking at any RTM data from those initial Bahamas dives prior to when Tony left?

A. That's a different question, kind of. There was RTM data from the initial dives, I don't know how much of it and to what extent that was all reviewed with the board. They probably saw some photos of some of the plots, but on that, my mind sees them

but I don't really remember the details.

Q. Okay, that's fine.

A. I was pretty new then.

Q. Right.

A. Trying to learn it all myself.

Q. Do you know if -- do you remember if anybody on the board or within OceanGate, you or Stockton, were -- your reaction to any of that data from the -- the RTM data from the original hull? What's your understanding of that?

A. I don't remember. You know, again, I was new, just kind of watching everything. I don't really remember reactions.

MR. BARNUM: Okay. All right, thank you for your time very much. That's all the questions I had. Yeah, that's the only thing.

LT [redacted] Okay. Thank you, Mr. Barnum.

Mr. Kramer, I see you have a question.

DR. KRAMER: Yeah, I just -- thank you.

BY DR. KRAMER:

Q. I just want to follow up on one question that Mr. Barnum asked and it was kind of in regards to Tony's association with Hull 1. Were there -- I guess what I'm trying to say is was there a feeling that there were deficiencies in Hull 1 and if so, do you know what those were, whether they were in the design or the manufacturing and -- well, let's just start with that.

A. The only -- I came in after it was built. The only

deficiency that I remember now is when they found the hairline crack.

Q. Um-hum.

A. So that was -- that was the clear deficiency.

Q. Right. And so when it came time to -- to make Hull 2, were they -- I guess, did they make changes to the design? Sorry, for the manufacturing of Hull 2, in response to the hairline crack that was found in Hull 1. In other words, I guess, did the crack that was found in Hull 1, did that drive some aspect of the engineering for Hull 2?

A. That drove the -- sort of throw it open to new materials, new carbon fiber materials --

Q. Um-hum.

A. -- right, that was what drove that whole conversation about finding different carbon fiber providers and different manufacturing methods. So that was pretty much the whole reason for that part.

DR. KRAMER: Okay, thank you.

MR. SHUMAN: Yeah.

BY LT [redacted]

Q. Mr. Shuman, I just have -- I have one question just as a follow-on or alibi to this, this interview. Is it possible, could I share my screen with you for one moment, just for visual purposes?

A. Yeah.

Q. It's going to be this. Can you see this picture here on the left-hand side? Or is there a picture --

A. Yeah.

Q. Do you know what that is?

A. It looks like what we call the -- they called it the segment, it was kind of the ring that -- that attached.

Q. To the hull?

A. It attached to the carbon fiber and, you know, to the ends of the carbon fiber and then the domes were attached to it, I believe. It's what it looks like.

Q. Okay. And if you could just think back to when you first came on and with the original *Titan*, the first hull, was this cat eye attached to that or could you -- do you remember at all?

A. No, I'm sorry, I don't.

LT [redacted] Okay. Okay, that was -- I just wanted some clarity on that, I had a question related to that, but that's --

MR. SHUMAN: Yeah.

LT [redacted] -- all I have for that, okay.

Mr. Neubauer, any last remaining questions or anything?

Mr. Kramer, is your hand just still up from your last line of questioning? Thank you.

DR. KRAMER: Is it still up?

LT [redacted] It's down now, thank you.

DR. KRAMER: Okay. Yeah, I -- okay. I'm good, thanks.

LT [redacted] Mr. Neubauer.

(No response.)

LT [redacted] Commander [redacted] does, yes.

LCDR [redacted] Yeah, I have one alibi, real quick.

BY LCDR [redacted]

Q. Mr. Shuman, a quick question. With using the -- is everybody frozen?

A. I can see you and hear you.

Q. Okay, well --

A. I don't know about everybody else, yeah.

Q. Okay, that's all that matters. So when they used the *Cyclops 1* in -- for the Hudson River and for the Rhode Island, I'm going to call them missions, what did they use as the tow vessel? How did that work, did they use the 25-foot -- we call them an RB-S, Response Boat-Small, but the one that, you know, has the -- is here in North Carolina or did they use another vessel?

A. They used another vessel. I don't remember the name of the company, but it was a company based off of Staten Island, you know, a significantly larger vessel than the -- than our ex-Coast Guard boat. I don't know, 80, a hundred feet, something like that. Yeah, so they used that because that was out like a hundred miles or something, so -- right, so it was not -- it was a larger vessel. And then in Rhode Island they used a leased vessel but it was smaller, they didn't have a long tow there with that, so I don't remember the name of that one either, that was sort of an ex-fishing vessel, I think.

LCDR [redacted] Okay, great. Thank you, that's all I have. Again, appreciate all your time, thanks.

MR. SHUMAN: Oh, sure.

LCDR [redacted] Yeah, Mr. Neubauer, he is frozen in Teams. I don't know if he's able to come back in or not.

LT [redacted] Roger that. Well, let's see, can he chat and just see if there's any questions? Before we close out, does he have any last things or if he wanted to go ahead and close the interview?

(Pause.)

LT [redacted] We can even allow an opportunity to kind of leave out --

LCDR [redacted] Yeah.

LT [redacted] -- and come in again.

LCDR [redacted] I think we're good to close. So let's go ahead and -- he said go ahead and close it out. He's frozen, he can't speak, so we're all set here, [redacted] if you want to go ahead and close. Sorry, technology is crazy these days, so we apologize.

MR. SHUMAN: Yeah.

LT [redacted] Roger. Mr. Shuman, do you have any questions for us, or Mr. Malkin, either of you, before we close today?

MR. SHUMAN: Yeah, I don't have a question, but I'd like to say thank you for investigating this for us. It's important.

LT [redacted] Thank you, sir. And any, you know, last parts or, you know, even going forward, if there's anything else you can

think of or that comes to you after this, because a lot of times, you know, you're getting fireballs of questions and sometimes things may not come immediately to mind. I know I'm not the best off-the-cuff person, so I could understand that.

And Mr. Malkin?

MR. MALKIN: No, nothing from me. We look forward, I'm sure Mr. Shuman does, that having a chance to look at the transcript and see if there's anything that requires clarification, but other than that, appreciate the courtesy of this group, as always.

MR. SHUMAN: Yeah, yeah.

LT [redacted] Is there anything --

LCDR [redacted] Mr. Neubauer passes on his thanks through a text through me, so thank you from Mr. Neubauer, as well.

MR. SHUMAN: No, I mean --

(Crosstalk)

LCDR [redacted] -- Mr. Malkin.

MR. SHUMAN: You're very welcome. Again, I appreciate the work you're doing.

LT [redacted] Yes, sir, the Board does appreciate your time and assistance in helping us with this investigation.

And all persons on the line, thank you all for joining us today.

I will conclude this recording, it is now 2:01 Eastern Standard Time, and thank you.

(Whereupon, at 2:01 p.m., the interview concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF:	LOSS OF THE SUBMARINE *TITAN* IN THE NORTH ATLANTIC OCEAN ON JUNE 18, 2023 Interview of Bob Shuman
ACCIDENT NO.:	DCA23FM036
PLACE:	via Microsoft Teams
DATE:	August 15, 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.

David A. Martini
Transcriber

NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF MARINE SAFETY
WASHINGTON, D.C. 20594

Errata

Interview with Mr. Bob Shuman

Loss of the submersible *Titan*
DCA23FM036

Page/ Line	Original	Correction
50/25	FTA	FEA