

UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

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Investigation of: *

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ENGINE FAILURE ABOARD *

OSV *OCEAN INTERVENTION* * Accident No.: DCA21FM012

ON APRIL 21, 2021 *

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Interview of: BLAIR MATHERNE, Maintenance and Repair Manager
Oceaneering International

Via Telephone

Tuesday,
May 25, 2021

APPEARANCES:

BRIAN YOUNG, Marine Accident Investigator
National Transportation Safety Board

██████████, Chief Warrant Officer (CWO)
United States Coast Guard

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I N T E R V I E W

(1:00 p.m.)

1 MR. YOUNG: It is May 25th; 1:00. We're conducting an
2 interview for the engine failure aboard the *Ocean Intervention*.
3 My name is Brian Young with the NYSB, and the spelling of the last
4 name is Y-O-U-N-G, and we'll just go around the room we'll ask
5 everyone to spell the name, and from the Coast Guard?

6 CWO [REDACTED]: Chief Warrant Officer [REDACTED]

7 MR. YOUNG: Thanks [REDACTED] And from Oceaneering?

8 MR. MATHERNE: Blair Matherne, Maintenance and Repair
9 Manager; M-A-T-H-E-R-N-E.

10 MR. YOUNG: Great, thanks. And Blair, just so we're clear,
11 as we discussed before, just so you understand, we are recording
12 this and would like you to at least acknowledge that this
13 recording will be recorded, the interview recorded, and a
14 transcription sent out.

15 MR. MATHERNE: Yes, sir.

16 MR. YOUNG: Great, thanks.

INTERVIEW OF BLAIR MATHERNE

17 BY MR. YOUNG:

18 Q. Just to open up the interview, Blair, if you don't mind,
19 maybe talking a little bit about your experience as a port
20 engineer and how you got the position you're at today.

21 A. I've been with Oceaneering for -- it'll be 14 years in June.
22 I was, I was originally hired as a Port Engineer and then about

1 eight years ago, I was promoted to maintenance and repair manager.
2 Prior to that, I worked for Bollinger Shipyards and I performed a
3 lot of maintenance jobs for Oceaneering, and I had a really good
4 working dialogue with my current manager, and hired on with
5 Oceaneering.

6 Q. Great, and how many vessels are you responsible for?

7 A. Seven.

8 Q. Seven? And what are your responsibilities as maintenance
9 manager?

10 A. Day-to-day maintenance and operation of the vessels, planning
11 for shipyards and dry dockings, tracking any and all upcoming
12 maintenances.

13 Q. And how do the vessels track their maintenance and how are
14 they aware, and how are you aware, of what maintenance is due?

15 A. Some of our vessels, we rolled out a Helm system. It's a,
16 it's an electronic based maintenance system similar to kind of
17 like NS5 that ABS has, except this was not server based. It's,
18 it's based on a local server on the vessel, which, it has an off-
19 line and an on-line feature. So if they don't have internet
20 service, they can work off-line, and then as soon as they resume
21 service, it automatically uploads. And then it sends, it tracks,
22 you know, maintenances that are coming up due, overdue
23 maintenances, it sends us messages. Hey, you have this
24 maintenance coming up due in 10 days, you know, it -- and we also
25 track like, a -- the deficiency reporting on it, requests for

1 repairs, and it's not fleet-wide yet. We are rolling it out to
2 other vessels, but the vessels who aren't part of the Helm CONNECT
3 System, we just use a spreadsheet-based system. They track weekly
4 deficiency reports, requests for repairs, you know, vessel to
5 office correspondence, and that's basically how we do it on the
6 maintenance side.

7 Q. Okay. And at the time of the engine failure on the *Ocean*
8 *Intervention*, what system were they using?

9 A. The -- just -- the internet system, you know, just our
10 internal reporting system using various spreadsheets and, and
11 excel forms.

12 Q. Okay. And is that something that you are updated on, or
13 receive regularly, or are aware of the maintenance that is either
14 due, or overdue?

15 A. Yes.

16 Q. And how does that get communicated to you?

17 A. Via email.

18 Q. Email, and that's ---

19 A. If it's a, yeah, via email, and if it's a, an emergent
20 matter, you know, of course they contact us via phone, and then
21 we, we, you know, we start a correspondence via email.

22 Q. Okay.

23 A. Whether it's setting up a vendor, or what it is, you know,
24 whatever it is.

25 Q. Okay, great. At the time of the accident, we had, we had

1 received and reviewed the crew's statements and it sounds like the
2 engineering department was right there in the control room when it
3 had occurred, and the chief engineer was involved with damage
4 control and casualty control. Can you talk a little bit about the
5 chief engineer's experience with Oceaneering and how long you guys
6 have worked together?

7 A. Chief engineer, I believe that was James that was on the boat
8 --

9 Q. Yeah.

10 A. -- at the time of the incident. James has been working with
11 us approximately two to three years, if I remember correctly.

12 Q. Okay.

13 A. He reported the incident to my marine manager. With, and
14 it's kind of a strange case with the vessel because of the client
15 they're working for --

16 Q. Yeah.

17 A. -- because of securing clearances, we only have a select few
18 people who are approved to get, you know, certain reporting, so,
19 you know, when my manager deems it -- it's -- it needs to come
20 down to me for assistance, then he coordinates that with me. That
21 way there's only the select few people who approved to get certain
22 information, are privy to that information.

23 Q. Understood. And do you, as a representative of the company,
24 are you involved with any sort of evaluations for the chief
25 engineers throughout the fleet?

1 A. No, that's -- that falls on the operations manager and the
2 marine manager, and also our personnel manager.

3 Q. Okay. And understanding after the accident that Force Power,
4 which is a subsidiary of Louisiana CAT, did the repairs and the
5 overhaul, and all the engine work, is that a company that you have
6 dealt with in your experience with Oceaneering?

7 A. Yes, sir. They've -- they perform the majority of our
8 Caterpillar maintenance and overhaul work. We've been working
9 with Force Power since they've come into existence, you know, and
10 we've had a really good working relationship with those guys. The
11 number three was swapped out with our spare. We have a fleet set
12 of spare engines that we keep stored at Force Power in Houma, so
13 you know, immediately, once we coordinated it, we made
14 arrangements to have the engine shipped to Honolulu which, it was
15 supposed to be a quick repair, but it, you know, it, once we
16 investigated the damages, it turned into a lot more than just a
17 three to four week repair timeframe.

18 Q. Yeah, understood. I know you said you had seven vessels, can
19 you estimate, or if you know of the top of your head, how many of
20 those vessels have Caterpillar engines aboard them?

21 A. Five of those vessels have Caterpillar engines. From main
22 engine propulsions to generators, you know, be it diesel electric,
23 or whether it's just a natural genset on the vessel supplying
24 (indiscernible) power and back deck distribution power.

25 Q. Okay. And I know that 3516 is the one that had the issue

1 aboard the *Ocean Intervention*. Are there several of the 3516
2 models throughout your fleet?

3 A. Yes. We have, we have one more vessel that has 3516 models,
4 which is the *Ocean Intervention II*. It is a sister ship to the
5 *Intervention*, it's just -- it's slightly different. Just one
6 change in configuration is, the *Intervention* has two 3516's and
7 one 3508. The *Intervention II* has two 3516's and two 3508's for
8 generator power.

9 Q. Okay. And, on the *Ocean Intervention*, I think some of the
10 documentation I read said that it had three 4000-horsepower
11 engines. Is that incorrect?

12 A. Yeah, that's incorrect.

13 Q. Okay. So it's got the two 3516's, do you know what --

14 A. And one 3508.

15 Q. Okay. And the big engines, are they rated for 4000? Do you
16 know?

17 A. I don't think they are rated for 4000.

18 Q. Okay.

19 A. The generators are 1825 PW (ph.).

20 Q. Okay.

21 A. The 3516's and the 3508 is, is rated at 910. Now the
22 horsepower rating is probably coming from, that's probably coming
23 from the drive motors --

24 Q. Oh, right.

25 A. -- because it is dies-, diesel electric and we have four

1 drive motors on the vessel, so what you have on the port side, is
2 you have two GE-752 drive motors that are in tandem and connected
3 directly to the port Z-drive and the same thing on the starboard
4 side. So, I think those motors are rated at, they're rated at
5 about 1000 -- and don't get me wrong -- don't hold me on this,
6 it's just a guess, but I think they're at about 1000 horsepower a
7 piece, if I remember right.

8 Q. Okay. And I would assume that vessel has some sort of bow
9 front arrangement as well?

10 A. Yes, it has two fixed bow thrusters.

11 Q. Okay, thanks.

12 A. And it's the set, the same size motors but vertical motors.

13 Q. Okay.

14 A. It's two GE-750, 752's.

15 Q. Okay.

16 A. One per thruster.

17 Q. Okay. And then the propellers' back aft, are they Azimuth
18 (indiscernible) thrusters or are they straight propellers? --

19 A. No, it's Azimuth.

20 Q. Azimuth.

21 A. It's -- yeah, U.S. 2011's.

22 Q. Okay.

23 A. Aqua Master is the brand of them.

24 Q. Oh, okay, yeah. Talking a little bit about the engine
25 failure, I read a crew statement form that the Product Status

1 Report didn't show any sort of anomalies or anything. Can you
2 just talk about what a Product Status Report is from a Caterpillar
3 engine?

4 A. As far as the download from the ECM?

5 Q. Yeah.

6 A. Yeah. The download from the ECM is going to show you, you
7 know, if you had any codes that came up, you ran any high temps,
8 or anything like that, and the ECM, with it being a mechanical
9 failure and happening so quickly, the ECM did not record anything.
10 You know, up until the shutdown, it recorded normal functions of
11 the engines, you know, normal water temps, normal pressures. It
12 didn't, it didn't give us any fault indications at all.

13 Q. Okay.

14 A. And that was to be expected.

15 Q. Right, right. And just because I'm not familiar with the
16 vessel, does any of those alarms or temperatures from the ECM show
17 up on any sort of a monitor for the crew, or is this all contained
18 within a module that would just need to be downloaded?

19 A. We do have a, a customer CAT data link that goes to -- just
20 to a regular computer monitor, and it just -- and you can go -- it
21 just shows engines individually, which like, you can select on
22 like generator one, two or three, and it will show you the, the
23 current RPMs, the current -- it's got like, a couple of
24 temperatures that it shows you, water temperature, oil
25 temperature, oil pressure, and none of that stuff is recorded.

1 It's just taking data from the data link on the control panel of
2 the, whatever particular engine you have selected.

3 Q. Okay, okay. We also -- again, we're trying to understand as
4 much as we can, we are reading the chief's -- the report of the
5 incident, and he said he was trouble shooting a hunting issue with
6 the generators. Do you think, and I know it sounds like, maybe, a
7 control module was replaced and then calibrated, and then we
8 talked to Caterpillar, and they said that's a possibility, that
9 that could have been some sort of an indication that some of the
10 bearings were starting to, you know, adhere themselves together
11 and affect the speed. Is that something that you would agree
12 with, or do you have any other takes on what the hunting issue may
13 have been, prior to?

14 A. Yeah, I don't think that control module had anything to do
15 with resolving that hunting issue, because, you know, when you go
16 back and you read through those reports, of course, you know, once
17 something like that happens, it's always easier to go back and
18 say, yeah, this is, this was a tell-tale sign that tells us we
19 should have looked in this, in this area.

20 Q. Right.

21 A. But the hunting issue, after the smoke cleared and, you know,
22 we really started looking and that hunting issue, in my opinion
23 was a direct indication that we mechanically, we had something
24 going on.

25 Q. Um-hmm.

1 A. Which, you know, no loss of oil pressure, and no loss, and no
2 high temps, or anything like that, indicated that, hey, we have a
3 mechanical issue. We need to shut it down.

4 Q. Right.

5 A. And, I mean, putting myself in his shoes, the hunting issue,
6 I probably would have started at the same spot that he started at.

7 Q. Yeah.

8 A. You know, something, it's a control module, whether it's a
9 diode on the generator, or, you know, it's something in that EG2
10 module, within that FCR panel, for that particular generator, so
11 it, really and truly, he started in the right place, in my
12 opinion.

13 Q. Right, and that's what Cat -- Caterpillar said as well, well
14 the Force Power guys too. In your experience at a Port Engineer
15 and in the industry for a while, have you ever experienced an
16 engine throwing a rod at all? Or is this something new to you?
17 Or have you seen this?

18 A. I've seen it a couple of times, unfortunately.

19 Q. And are any of the symptoms related to what you're seeing
20 here?

21 A. No. This happened on this vessel in the exact same location,
22 a little over five years ago. Different engine, of course,
23 because we threw a rod through a side of the block and, and we
24 replaced the engine. So, but nothing we could see on either
25 failure where we would have had an indication of hey, we need to

1 check here. One of the things we are looking at how, Brian is,
2 Caterpillar, the OEM does not offer oil mist detectors on this
3 engine, but one of the things that we are looking at is we're
4 currently working with Caterpillar. They think they have a system
5 that we can implement on these engines, an internal oil mist
6 detector at each main bearing location, that would indicate, you
7 know, a puff of oil mist, smoke, a rod bearing starting to get
8 hot, a main bearing starting to get hot, that would be tied into
9 an alarm system, and would give you an indication of, hey, we
10 detect an oil mist. You need to do an inspection, whether it be
11 drop a main bearing, or drop a rod bearing. You have a problem
12 that fixing to come up. You need to look into it. I actually,
13 yesterday, I was talking with, with Hunter Tieken at Force Power.
14 He -- you probably talked to him already, if you interviewed
15 anybody from there.

16 Q. Yeah.

17 A. They are working with Caterpillar right now, their technical
18 side. There are some oil mist detectors and a system that we
19 should build to modify to fit the 3500 series. They're commonly
20 put on the 3600 series, which is a newer model of, you know, these
21 style engines, but to date, they have none on 3500 series. But
22 we're exploring the option of, probably we're going to do is we're
23 going to put it on the spare that is now a back-up in our spares
24 inventory, and we'll probably run some trials on that, you know.
25 And if it looks like we can make it work, then we're going to push

1 it out to the *Intervention* and the *Intervention II*, and have them
2 installed, you know, as soon as availability that we can come up
3 with.

4 Q. That's great. Is Caterpillar receptive to do this? Or are
5 they understanding of it? What's their take? You know,
6 obviously, you're dealing with, you know, probably the engineering
7 department of Caterpillar. What are they saying? Is this
8 something they, you may, you see that they may, you know, send out
9 to every Caterpillar engine across the country? Or do think --

10 A. It's possible, it's possible. They've really been onboard
11 with us and trying to, you know, find any kind of -- anything we
12 can add to help prevent this from happening again. Whether or not
13 they're going to push it out, like as a company-wide, you know, a
14 company-wide notification to all our customers or clients that
15 have 3500 series, I don't know. We hadn't gotten that far in
16 discussion. We were just doing the leg work on trying to get this
17 put into our vessel, our fleet of vessels to try and stop this
18 from happening again, but that is a very good question. They
19 hadn't made any statements to that effect.

20 Q. So would it be fair to say --

21 A. But they feel real, you'd feel real confident that we can
22 make this work on a 3500 series.

23 Q. And would you say that Oceaneering is leading the way with
24 this extra, you know, addition to the engines, and update, or is
25 --

1 A. Yes, sir.

2 Q. Okay. Have you seen or heard any sort of notification out to
3 other Caterpillar engine users of the incident that you guys were
4 faced with? Is there any, has Caterpillar made anyone else aware,
5 that you know of, about what you may have gone through?

6 A. Not to my knowledge.

7 Q. Do you regularly receive Caterpillar service bulletins at
8 Oceaneering?

9 A. Well we do on the newer series engines, it's just on these
10 older series engines, we have the latest up to date publications,
11 you know. If Caterpillar has made any changes, any updates, and
12 normally, like, if they make like a program update for these
13 engines, they'll send us a notice and then, and then we move
14 forward with it.

15 Q. Okay.

16 A. But in our fleet, you know, we don't have the latest and
17 greatest engines in our fleet. You know, it's --

18 Q. Yeah.

19 A. -- these boats are pushing 20 years old, so you know as well
20 as me, when they were built, that series of engines was probably
21 already 10, 15 years old, you know, that's, that's how it goes,
22 you know.

23 Q. And always does. Yeah. I do understand talking to Force
24 Power, that for the two engines aboard the Oceaneering -- *Ocean*
25 *Intervention* that they added a pre-lube pump.

1 A. Yes, sir. We added pre-lubes to the 3516's.

2 Q. And in addition to the vessel that had the engine failure,
3 can you talk about other improvements that you have made
4 throughout the fleet that, concerning these engines?

5 A. We, we, and as soon as we did that, we planned to add pre-
6 lube pumps to both 3516's on the *Intervention II*, which had just
7 completed, about a month ago, a shipyard parrot (ph.) in Norway,
8 and we performed some overhauls on the 3516's. We also added the
9 pre-lube pumps to their 3516's.

10 Q. And again, is that something that maybe you're seeing on the
11 newer series of engines that comes as, as part of the package, as
12 opposed to an option? Is that something that Caterpillar, that
13 you're aware of, has supported, or, or requested to put on, or is
14 it just completely up to the purchaser?

15 A. On, on the 3600 series engines, I do believe, in doing all
16 this research, we've understood that pre-lube systems are, are
17 supplied with 3600 series engines.

18 Q. Okay. And with these engines, probably now you're talking
19 two engines have been modified on the *Ocean Intervention* and two
20 engines on the OI two, is there any plan to open up the bearings
21 and look and see, to compare and see if there is any improvement
22 in wear, compared to the --

23 A. Yes. We discussed that internally. Probably what we're
24 going to do is when we do our next valve lashing adjustment, which
25 is at the 4000 hour mark, which 4000 hours, depending on the, on

1 the work of the vessel, usually it ranges from, from nine months
2 to a year from us hitting 4000 hours of run time, and what we've
3 discussed internally is to drop bearings and do, you know, do an
4 inspection like, like maybe more so on the end that we had the
5 failure, drop like the, the one, two, three, and four rod
6 bearings, and do an inspection, and then maybe come back towards
7 the mid to back part of the engine and drop a couple rods, a rod
8 bearing on each side just to compare. Because when, when we did
9 the failure analysis, and I was there for the disassembly of the
10 engine at Force Power, all of those rod bearings were pretty
11 consistent in the amount of, you know, of wear damage.

12 Q. Um-hmm. Based on your experience, would you say that that,
13 those bearings were in a condition worse than you expected at
14 20,000 hours, or about normal? And especially too, I understand
15 Number-one and Number-three were both overhauled around the same
16 time, is that, you know, was there a difference between the two?
17 Was Number-three worse? Is there anything you can remember?

18 A. They were pretty much the same, but both engines, the wear on
19 the rod bearings was a little worse than I would have anticipated
20 seeing, you know, at that hourly mark.

21 Q. Um-hmm. Is there any discussion or plan or talking
22 discussions about altering the bearing inspections, other than
23 what we just talked about, that I know it, I think it's 22,000
24 hours is what the recommended is, amount of hours is, but is there
25 any talk about maybe doing it sooner, based on these failure?

1 A. Yes, we talked about -- because the bearings are not
2 recommended to be changed until 22,500 hours, which is normally
3 the hourly interval for an in-frame overhaul, but if you look in
4 their overhaul recommendations, it goes by hours or fuel burn.
5 And we primarily do our overhauls by fuel burn, but what we do is,
6 like, your top-end is 7500 hours, you do your first top-end, and
7 then Caterpillar, on the 3500-B series, you do a top-end at 7500.
8 They recommend you do another top-end at 15,000, and then 22-5
9 would be your next 7500 mark, you do an in-frame. So you have two
10 top-ends and then one in-frame, then you start the cycle all over
11 again. So what we were talking about doing is, at every top-end,
12 we change bearings. It's a, it's a minute cost to try to help
13 avoid this from happening again, you know. I'd much rather change
14 out a cylinder kit and a rod bearing --

15 Q. Yeah.

16 A. -- even a crank, versus go through what we just went through.

17 Q. So instead of the 22,000 hour bearing replacement, you're
18 talking about doing it every --

19 A. -- 7500, or when we do a top-end because sometimes on the
20 top-end overhauls you're not going to burn, in the overhaul
21 interval on fuel consumption, that's 528,000 gallons on the
22 3516's. So, you're not going to burn 528,000 gallons at 7500
23 hours. It usually goes to about 9, 10, 11,000 depending on the
24 load, and those overhaul intervals are based at 50 percent load on
25 those generators.

1 Q. Hmm.

2 A. And, and with our, with our load sharing systems on the
3 vessels, you know, when we set up on DP (ph.), and this one --
4 this vessels in a little bit of a -- little bit different job
5 market than it was originally designed to be in. You know, when
6 they were working in the marine industry working for, like, BP and
7 Shell, when these boats are set up on DP, with the load sharing,
8 they might run 30 percent load.

9 Q. Yeah.

10 A. So, with running 30 percent load, you're going to recycle a
11 lot of fuel. So you may have a lot of hours, but you're not going
12 to have the fuel consumption that required at overhaul. So what
13 we do is, at the 7500 hour mark, we do a top-end overhaul
14 inspection, which we pull the two back heads, Head 15 and 16, and
15 we do a valve guide clearance with some go, no-go, gauges. We pop
16 the valves. We pop the intake and exhaust valves out of the
17 heads, and we insert gauges. If it doesn't go, we don't have
18 enough wear to do top-end overhauls. So, what we do with that is,
19 we push it down a couple of more thousand hours, and we monitor
20 the fuel burn at that time. So, when we get close to that fuel
21 burn, and those gauges start getting to where they want to start
22 to go in those valve guides, then we schedule and plan to do our
23 top-end overhauls.

24 Q. Okay. Wow, that's, that's a great program. And was it
25 coming close to scheduled time to do maintenance on the Number 3

1 engine? Was it all in the works and plans?

2 A. Yeah, we planned to do overhauls in Honolulu, you know. We
3 planned to do top-ends and with us being right at 20,000 hours, we
4 were going to change main (indiscernible) rod bearings. We had
5 all that stuff planned out.

6 Q. Wow.

7 A. So, we, we, the only thing we switched is we did overhaul on
8 the Number 1, and we wound up doing all the repairs and engine
9 exchange on the Number 3, you know, and then we also, we did a
10 infame overhaul on the Number 2.

11 Q. Wow. And if you can recall, was anything that got your
12 attention when Number 1 was being overhauled such as the condition
13 of the bearings?

14 A. Yeah, rod bearing looked pretty much in the same shape as the
15 Number 3. And, you know, at Caterpillar they, they can't put
16 their finger on why sometimes when you drop a bearing, you have
17 more, I'm trying to remember the term that they use, how they
18 describe that, that bearing wear.

19 Q. Cavitation erosion?

20 A. Yeah, cavitation erosion is what they call it, and sometimes
21 you have less on some bearings, sometimes you have more, you know.
22 You would think on the bearing wear that your rear main bearing
23 would be in the worst shape, all the times, and that's not always
24 the case. Because your rear main bearing seized the brunt of the
25 load, you know, from whatever load is being demanded from the

1 engine to ramp up in RPMs, to maintain RPMs and power --

2 Q. Right.

3 A. -- but it's not always the case. And they can never put
4 their finger on exactly why it's like that.

5 Q. Hmm.

6 A. Because there's no exact science to put it that way, you
7 know.

8 Q. Right. And have you run it past CAT about adding the lube-
9 oil pre-lube pump? If anything they say, yeah, great idea? You
10 know, you should have done it before, or would, they're not even
11 aware of it, or is it something that they, you know, kind of say
12 --

13 A. They, when we first started discussing that, they never
14 really said that. Yeah, it's guaranteed it's going to prevent
15 this failure from happening again. It's going to help it from not
16 happening again, you know, and there's a lot of things that we've
17 done on these engines that are above and beyond what the OEM
18 recommends. We're always constantly working on how to improve our
19 operations and our maintenance policies and procedures.

20 Q. Hmm.

21 A. You know, if we spent a little bit more time and money on the
22 front end, and we get these engines to last, and we don't have
23 these, these cases, these incidents happening, it's a win for us,
24 you know.

25 Q. Yeah.

1 A. And when you, when you put one of these new checks in place,
2 and then, you know, you set an interval, and you go back at that
3 interval and you check it, and it's made a difference, then it's
4 worth all the costs and effort you've put in to it. And we are
5 constantly working on that. And my boss is a stickler for that.
6 If you come up with an idea that can possibly save the company
7 down time and loss of revenue, and money on the, on the back end,
8 he is all for it.

9 Q. Understood.

10 A. We do a lot of look and sees.

11 Q. Um-hmm, yeah.

12 A. Let's look and see if this possible. Well, what affect is it
13 going to have on the operation, and what affect is it going to
14 have on the overall, you know, on the overall job of the vessel?

15 Q. Right.

16 A. So.

17 Q. Right. I know there are either post-accident, the vessel had
18 been sending out lube oil samples for analysis and it sounds like
19 one of the samples, most recent, had been lost in the mail. Do
20 you know if that's -- updated?

21 A. We have not been able to locate that. We went as far as
22 going to UPS's, UPS's area and try to look for it ourselves. What
23 happened to them, because it wasn't just the engine oil sample, it
24 was a lot of oil samples that were misplaced. And I don't know if
25 it was the agent, or if it was UPS that dropped the ball, but our

1 normal procedure when we sent the oil samples back to the states,
2 is we put a copy of the Safety Data Sheets inside the box and we
3 attach a copy of the Safety Data Sheets to the EMO. Then
4 whoever's picking it up signs as accepting responsibility of it,
5 and they said the reason why it didn't get shipped the right way
6 is because there was no Material Safety Data Sheets.

7 Q. Hmm.

8 A. So the agent, I, I mean, the whole time I was there, I was in
9 Honolulu 51 days.

10 Q. Wow.

11 A. So the whole time I was there, like almost every other day,
12 you know, after the first week when they tell me they couldn't
13 find them, I was like, you know what? This guys really going to
14 hate me by the time I leave here. So I was on his butt almost
15 every day, because I know you guys are going to ask for it. You
16 know, I mean, it's, it's our procedure to do oil analysis every so
17 often, you know?

18 Q. Right.

19 A. And when, and I know that that was going to be a big thing
20 that was going to be asked for. Would the oil sample have told us
21 we had a failure coming down, because of the type of failure we
22 had? More than likely not.

23 Q. Right.

24 A. But I think I supplied some oil analysis reports from
25 previous --

1 Q. Yeah.

2 A. -- and, you know, you could see what's monitored there.
3 Unless you'd take an oil analysis that day, and you process it
4 onboard, you're not going to, you're not going to show that rise
5 in copper, tin, iron. It's not going, it's not going to rear its
6 ugly head quick enough for you to shut it down and prevent a
7 failure.

8 Q. Right.

9 A. You know the things that it is going to show, if you have a
10 high-water count in your oil, or a fuel dilution, you can catch
11 that. If you got an injector that's dumping fuel in the engine,
12 you can catch that many hours ahead of time and prevent an issue
13 from happening. You know, like a hydro-lock or, you know, a lot
14 of oil in your oil, a lot of water in your oil to prevent what,
15 prewashing of the bearings, but, when you pull that sample, you're
16 going see that fuel and water dilution in the oil.

17 Q. Right.

18 A. Right.

19 Q. You can smell it.

20 A. Yes.

21 Q. Was the fuel any concerns, any issues with that fuel quality?
22 For the --

23 A. No. And on that vessel, we have a, we have a fuel
24 centrifuge, and when we pump from our bulk tanks, it gets
25 constantly circulated. The fuel centrifuge circulates all the

1 fuel going into the day tanks, and the day tanks are constantly
2 circulated.

3 Q. Okay.

4 A. And the day tanks hold roughly about 10,000 gallons a piece.

5 Q. So it's constantly being purified?

6 A. Yes, sir. When we have, we have Reicorps (ph.) filters, we
7 have the fuel filters that are supplied by Caterpillar that are
8 equipped, you know, the dual filter housing that are clipped on
9 the engine, as per ABS, and, I mean, these guys stay on top of it.

10 Q. Yeah. It seems it. I'm working another accident where they
11 found debris in the engine. And it also threw a connecting rod.
12 And they're kind of narrowed it down and trying to figure out what
13 it was that was found floating throughout the engine. Was there
14 any sort of debris found during the overhaul that may--, caused
15 you guys any concern when you're, with the engine down?

16 A. Other than a -- other than normal piston parts, connecting
17 rod parts, you know, bearing parts, no, nothing, no foreign debris
18 that should not have been in the engine during this type of
19 failure.

20 Q. Okay. And then in the Failure Analysis Report, there was a
21 range of pictures of the vibration damper fluid, and it showed
22 that it was somewhat discolored, but it sounds like the test
23 results were out still?

24 A. It's out still. That stuff has to be sent to Germany and
25 then with, you know, with COVID, of course everybody's using the

1 COVID excuse, some of it's factual, some of it's not, I would
2 assume. But typically, it does take a long time to come back from
3 Germany for analysis. Actually, in preparation for this call
4 today, I was -- I did talk to Hunter Tieken this morning and he is
5 checking to see what's the status on that vibration damper oil
6 analysis; they have not received it yet.

7 Q. Okay. Okay. And another thing that they sort of made
8 mention in the report with the engine isolators, it looked like
9 they could have been getting close to being worn. Do you know the
10 status of them? Were they replaced on Number 1 and Number 3
11 engines?

12 A. We, we had -- we have a spare isolated that's onboard. We
13 had some technicians check them out and they were all still
14 intolerant. We're also kind of looking in to see if there's
15 something we can improve on those. Of course, you know, with
16 frame height, and the design of the frame, there's only so much we
17 can do with that, but replace, like for like.

18 Q. Okay.

19 A. But there was one, I think there was one or two of them that
20 showed a little bit of deterioration on a rubber grommet, which
21 the guys found it, you know, to be acceptable.

22 Q. So everything in terms of inspecting the engine isolators was
23 within the acceptable range?

24 A. Yes.

25 Q. Okay. Are you aware if there was any maintenance that was

1 overdue on that engine that would have contributed to this
2 accident?

3 A. Nothing that contributed to it.

4 Q. And I think we already -- you've already answered this
5 question about modifying the maintenance schedule. It looks like,
6 you will absolutely look at the top end, look at the bearings
7 during the top end inspections. And is that just on the
8 *Intervention*? Or would it be on the *II* as well?

9 A. On the *II* as well.

10 Q. There were really good pictures taken of Number 3 after the,
11 or during the rebuild and the overhaul and the inspection. Do you
12 know if there were pictures taken that, of Number 1 during its
13 rebuild?

14 A. I believe there was. I would have to go back to Force Power
15 and see. I mean the only thing that would have taken pictures of,
16 more than likely, would have been the main and rod bearings.

17 Q. Um-hmm.

18 A. Just to compare, you know, we just had a failure on this
19 engine, you know. We made, the decision was already made because
20 both engines were north of 20,000 hours, but still below the
21 change-out interval is, we're going to change the main and rod
22 bearings on both engines, and we change fasteners as well.
23 Because on the, on the main and rod bearings, you're only supposed
24 to reuse those bolts, I think it's five times. So, we made a
25 point to just, we're going to change the hardware as well.

1 Q. Within the connecting rod, to hold the con-rod (ph.)
2 together?

3 A. Yeah, connecting rod bearings and main bearings.

4 Q. Oh, okay.

5 A. We changed all the fasteners.

6 Q. Okay. You probably don't have this number at the top of your
7 head, but do you think at some point, and I'll send you an email,
8 you could give us the final damage amount? Because we do need to
9 include that in our reports.

10 A. Yeah, I thought that was shared already. I thought that was
11 something that Joe or Darren shared, but I can, I'll make a note
12 of it.

13 Q. Okay.

14 A. So did the final -- anything that was pertained to Number 3,
15 as far as rebuilding the engine, install any kind of wires, all
16 that stuff?

17 Q. Yeah, it did, yeah.

18 A. And that's something, and that's something that Joe did a
19 really good job of tracking throughout this whole process. He
20 should be able to, with Darren's permission, should be able to get
21 that number pretty, fairly quickly for your guys.

22 Q. Okay. But I'll send it in an email to you, just so you can
23 respond, reply to it, and we'll carbon copy [REDACTED] from the Coast
24 Guard.

25 A. Okay.

1 Q. And just as a -- somewhat as a lesson learned kind of thing,
2 other than adding the pre-lube pumps, other than increasing the
3 inspection of the bearing, other than looking into the oil mist-
4 detectors, what else has Oceaneering done to advise the fleet, or
5 to, you know, improve the process. Can you think of anything else
6 that may have been done additionally to all the other steps you've
7 already taken?

8 A. No, I think that's about it. Other than, you know, other
9 than keep your ear to the ground, and be more vigilant on, you
10 know, hey, with that noise is, you know, increasing checks, you
11 know, when you, when they do it, because every hour they do a walk
12 through on the engine room, every hour, and they check for leaks.
13 They check for strange noises, you know. They look at the gauges
14 on the engines and just kind of make sure everything's in a normal
15 range. Other than that, no, I think we've done everything humanly
16 possible to take a good step in trying to avoid this from
17 happening again.

18 Q. Yeah.

19 A. And if there's something that we read in a, in a study that
20 somebody else has done, or I mean, if you guys hear of something,
21 please pass it on. You know, because we're more than willing to
22 go the extra mile, because I mean, I would hate -- I would dare to
23 say that this repair cost is, is probably north of a million.

24 Q. Hmm.

25 A. Could be, I could be fudging those numbers a little bit. I

1 wasn't tracking it, Joe was. But, I know it, it's pretty costly
2 because just the, just the engine re-build to get our engine back
3 up in the spare, was a little north of 300,000, so. You know,
4 replacing a block, or replacing a crank, I mean, a block is 65
5 grand by itself. And then all the in-shop, you know, all the
6 heads, the cylinder kits, there was a lot of parts that were
7 damaged on that engine that we cannot get core returns for from
8 Caterpillar. So, if you don't have a usable core to return, then
9 you pay at a core deposit, and a lot of times, if a head costs
10 \$1,600, the core deposit is \$1,600.

11 Q. Wow. Hmm.

12 A. And that's every manufacturer of engine models, you know,
13 it's every make of engines they do that, Cummins, CAT, GE, --

14 Q. Um-hmm.

15 A. -- It's the same thing.

16 Q. Wow. And during this investigation that you guys are doing,
17 and have done, I would assume you're dealing with Force Power and
18 Louisiana CAT. Have you spoken with anybody at Caterpillar, say
19 headquarters, or in their engineering, or technical division,
20 above and beyond Louisiana CAT?

21 A. No, we have not. The reason why we don't do that is, is
22 Force Power is a direct Caterpillar representative. They are
23 actually a Caterpillar dealer. So what they do is they have
24 access to all Caterpillar inventory, technical support,
25 engineering; so rather than, rather than going around them and

1 trying to get our own opinion from Caterpillar, we find it's best
2 just to work it through those guys, and if we see something that
3 they are missing, you know, we, we stomp our foot, we get upset,
4 and we tell them no, you need to do it like this, you know. You
5 need to run this angle, you know. Talk to this person, but nine
6 out of ten, we don't have to do that. They go right to engineers
7 and technical support because if they don't, in the future, when
8 something happens again, it's on them, you know. So they want to
9 try and help us avoid any kind of failures, you know. Whether
10 it's adding pre-lubes, or increasing maintenance intervals, and
11 they actually, you know, it's kind of a group decision between
12 myself and Hunter to just say, hey, look, you know, to try and
13 stop this from happening again, let's just at the top-end
14 overhaul, let's just change bearings.

15 Q. Um-hmm.

16 A. You know, materials on bearings is about \$8,000 for a
17 complete set of bearings. So, what's another \$8,000 on a top-end
18 overhaul if it's going avoid us from having to do this again?

19 Q. Right, right. That's great to hear a company being so
20 proactive. Yeah, so if it's okay with you, I'll follow-up on a
21 few say document requests, such as some of the oil analysis, and
22 the damage dollar value, and maybe those pictures comparing one to
23 three, but I'll run everything through [REDACTED], if that's okay with
24 you.

25 A. That's fine.

1 Q. Great. Appreciate you spending the time. I don't have any
2 other questions.

3 MR. YOUNG: We'll see if [REDACTED], if you do?

4 BY CWO [REDACTED]:

5 Q. Excuse me. I just got one. Who was the chief talking with
6 when he was -- he said that he was talking to a technician on the
7 modules when he was trouble shooting those; who was that with?

8 A. That would probably be, you talking about the EG2 module?

9 Q. Yes, sir.

10 A. That would be Mr. Harry Larson.

11 Q. Okay, and who is he with?

12 A. He, he's got his own business. He's an ex-employee of Tech
13 Power. You know, when NLV bought out Tech Power many years ago,
14 that's not a big market for them to pursue. So, a lot of those
15 guys with Tech Power kind of either went to work for drilling
16 companies or offshore vessel companies. Harry started his own
17 business and he's one of the select few that are running around
18 out there that know a lot, have a lot of knowledge about the old
19 Tech Power systems.

20 Q. Okay, so he, do you know what his, so Harry Larson, and
21 what's his business name? Do you know?

22 A. I think it's HLC, something like that. I mean, it's Harry
23 Larson Incorporated, or something like that. I think that's what
24 it is. I'm trying to pull it up on my phone; it's HLECS. Let's
25 see, yeah, I think it stands for Harry Larson Electronic

1 Consulting Services.

2 Q. Okay.

3 A. But that -- that's who the chief was, was talking to. Both
4 of those vessels, the *Intervention I*, and the *Intervention II*,
5 have the same control modules, switch board series.

6 Q. Um-hmm.

7 A. It's all, it's all Tech Power design, and Harry has a long
8 history with these two boats from when it was put out in
9 construction to the up to date, you know, service and operational
10 operations. All the engineers know they can call Harry's cell
11 phone number, or shoot him an email, and he's usually pretty on
12 the spot of being -- you know, having a timely response to those
13 guys.

14 Q. Okay.

15 A. He knows those systems in an out.

16 Q. Yeah, it's just because I'm making note of it, that the
17 trouble shooting before the incident, so my supervisors were
18 asking who was he talking with --

19 A. Okay.

20 Q. -- internal or what? So, yeah, but that's all I've got.

21 A. Okay.

22 MR. YOUNG: Any questions for us Blair before I stop the
23 recording?

24 MR. MATHERNE: No, sir. If you have, if you need any
25 additional information, like I said, just shoot me an email.

1 MR. YOUNG: Okay.

2 MR. MATHERNE: I'm more than glad to supply anything you
3 need.

4 MR. YOUNG: Well thanks, we appreciate it. I'm going to stop
5 the recording now.

6 (Whereupon, the interview was concluded.)

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CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD


IN THE MATTER OF: ENGINE FAILURE ABOARD
 OSV *OCEAN INTERVENTION*
 ON APRIL 21, 2021
 Interview of Blair Matherne,

ACCIDENT NO.: DCA21FM012

PLACE: Via Telephone

DATE: May 25, 2021

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.



Deborah Dowling Sweigart
Transcriber