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OFFICE OF MARINE SAFETY

SS NORWAY ENGINEERING GROUP
MAJOR MARINE ACCIDENT
DCA 03 MM 032
INVESTIGATIVE INTERVIEWS

INVESTIGATIVE INTERVIEW OF:
TROND KRISTENSEN
SS NORWAY

Wednesday, June 4, 2003

In Attendance:

TOM ROTH-ROFFY, NTSB
BRIAN CURTIS, NTSB
CHRIS FOONG, NCL
CHRIS OELSCHLEGEL, USGC
KEN OLSEN, USCG
JOHN RILEY, NCL CONSULTANT
ERIK LASALLE, USGC
RICHARD LEHRER, ESQ.

P R O C E E D I N G S

9:15 a.m.

MR. ROTH-ROFFY: Good morning, Trond.

MR. KRISTENSEN: Hi.

MR. ROTH-ROFFY: It's about 9:15 and the date is June 4th, 2003, and we're resuming our interview with the Second Engineer Trond Kristensen.

For the record, I'd like to go around the room and everybody in the room to please identify themselves. Starting with me, my name is Tom Roth-Roffy, and I'm with the National Transportation Safety Board.

MR. LASALLE: Lt. Erik Lasalle, the senior investigating officer, Miami, U.S. Coast Guard.

MR. CURTIS: My name is Brian Curtis with NTSB, Marine Engineering Accident Investigator.

MR. OLSEN: Ken Olsen, Coast Guard Headquarters, Office of Investigations and Analysis.

MR. LEHRER: Richard Lehrer on behalf of Engineer Trond Kristensen.

MR. KRISTENSEN: My name is Second Engineer Trond Kristensen.

MR. RILEY: John Riley, Independent Surveyor for NCL.

MR. FOONG: Chris Foong, NCL.

MR. ROTH-ROFFY: Okay. Chris, you're the Director of Technical Operations?

MR. FOONG: I'm the Vice President for Technical Operations.

MR. ROTH-ROFFY: Okay. All right. We'll resume them. I believe when we left off, left off yesterday, Ken Olsen was -- had his questions going.

Ken?

MR. OLSEN: Okay. Were you ever on board the vessel during the period that it entered the shipyard or -- or repair dock or anything like that?

MR. KRISTENSEN: Pardon me?

MR. OLSEN: Were you ever on board the vessel during a shipyard period or repair dock period?

MR. KRISTENSEN: Yes. Two times.

MR. OLSEN: And what kind of repairs or work was being done at that time?

MR. KRISTENSEN: Normal work.

MR. OLSEN: Normal work. Would that normal work include boiler work?

MR. KRISTENSEN: Sometimes, yes. I guess they have an inspection of the boiler.

MR. OLSEN: Inspection of the boiler. So, during these -- during these inspections that may have

occurred, did you ever witness anyone entering any of the steam drums or mud drums?
MR. KRISTENSEN: No, no witness that.
MR. OLSEN: During these inspections, did you ever witness Classification Society personnel in the boiler room?
MR. KRISTENSEN: Yes, in the boiler room, yes.
MR. OLSEN: In the boiler room. All levels or just some levels or did you see them peer into any drums? Looking -- not enter but look into a drum?
MR. KRISTENSEN: I don't know what they look into, but I see them in the boiler room.
MR. OLSEN: In the boiler room. In and about the boiler room?
MR. KRISTENSEN: Yes.
MR. OLSEN: Were you on board the vessel in 1999 when they did the retubing?
MR. KRISTENSEN: Yes, on board. I just come on board.
MR. OLSEN: Just come on board. Who -- who might have -- who from the ship's crew might have gone in and inspected that boiler when the retubing was done?
MR. KRISTENSEN: I guess like the first engineer.
MR. OLSEN: The first engineer on board at that time?
MR. KRISTENSEN: Yes, that's normal, yes, but -- yeah.
MR. OLSEN: And -- and that work was done by Norris Diesel, is that --
MR. KRISTENSEN: No, not Norris Diesel. The English company called -- I don't remember now.
MR. OLSEN: Okay.
MR. KRISTENSEN: It's not Norris Diesel.
MR. OLSEN: Okay. Did -- would --
MR. KRISTENSEN: Sorry. Harrison.
MR. OLSEN: That's right. Harrison.
MR. KRISTENSEN: Harrison.
MR. OLSEN: Did any of the -- did any of the Norway's crew assist? Did the Filipino laborers assist some of the boilermakers? Can you recall that?
MR. KRISTENSEN: I cannot remember that.
MR. OLSEN: You cannot remember that. Okay. That's it for now.
MR. ROTH-ROFFY: Okay. Trond, I just have a couple of questions.
Yesterday, you talked about some kind of a

salt problem that you were having with -- was it a condenser tube leak that you were having salt problem? Could you describe that again?

MR. KRISTENSEN: Yes. The salt problem is -- happened from time to time and leaking in the main condenser. We get salt water into the fresh water side causing oxide.

MR. ROTH-ROFFY: Okay. Do you have -- currently have that problem?

MR. KRISTENSEN: From time to time.

MR. ROTH-ROFFY: No. I mean, is there currently a leak in the -- in the condensers that --

MR. KRISTENSEN: I don't understand that question.

MR. ROTH-ROFFY: Right now, is there a leak?

MR. KRISTENSEN: Right now? There was a leak before the explosion. I guess the leak is still there.

MR. ROTH-ROFFY: Okay. And could you describe when that leak was noticed and how long you -- you've had it?

MR. KRISTENSEN: I think the leak come about four-five days after I sign on. So, I sign on the 4th of May. It was there on the 10th of May, something like that, that I remember. The leak start.

MR. ROTH-ROFFY: Okay. So, it started about the 10th of May and you had not -- the leak had not been corrected before the explosion, correct?

MR. KRISTENSEN: You have the leak on the -- on both condensers. Starboard condenser and portside condenser. So, when we come to St. Martin, that's the only port, they try to fix it. It's a big job. So, we take one condenser -- I don't remember starboard or portside, but one of the condensers take and plug this thing.

MR. ROTH-ROFFY: Okay. So, you fixed one of them and you --

MR. KRISTENSEN: Yes.

MR. ROTH-ROFFY: -- still have a problem with the other one?

MR. KRISTENSEN: Yeah.

MR. ROTH-ROFFY: When was that scheduled to be repaired?

MR. KRISTENSEN: The next time we come to St. Martin, I think. I'm not -- I -- I don't know the answer. I don't know.

MR. ROTH-ROFFY: Right. St. Martin, you spend the most time in port in St. Martin?

MR. KRISTENSEN: St. Martin is the only port I see which fixes condenser. To open it for cleaning

and for plugging, if we have some leaks.
MR. ROTH-ROFFY: Is -- is that the port that you spend the most number of hours in?
MR. KRISTENSEN: Yes.
MR. ROTH-ROFFY: How long do you stay in St. Martin normally?
MR. KRISTENSEN: We stay in St. Martin about 8:30 -- 7:30 in the morning and leave about 6-7:00 in the evening.
MR. ROTH-ROFFY: Yeah. So, about 12 hours.
MR. KRISTENSEN: Something like that.
MR. ROTH-ROFFY: And the other ports, you don't have that much time in, is that correct or not?
MR. KRISTENSEN: No. That's the port we stay longest.
MR. ROTH-ROFFY: Were you involved in the -- the plugging of the condensers last time?
MR. KRISTENSEN: It was not my job at the time.
MR. ROTH-ROFFY: Do you know who was involved in that -- that job?
MR. KRISTENSEN: Yes.
MR. ROTH-ROFFY: Could you give us their names, please?
MR. KRISTENSEN: The first one was the first engineer, so he was involved, and I know Carlo Fidel was involved, and that's the only name, but I think it was all the day crew, the Filipino, was involved. But I don't remember the name of them.
MR. ROTH-ROFFY: Okay. Do you know how many -- how many tubes they found leaking?
MR. KRISTENSEN: I think they said it was 25 tubes.
MR. ROTH-ROFFY: So, they made that repair, and did you think it was only one condenser leaking?
MR. KRISTENSEN: I know --
MR. ROTH-ROFFY: Did you --
MR. KRISTENSEN: I know there was two condensers leaking.
MR. ROTH-ROFFY: Oh, how did you know that?
MR. KRISTENSEN: Because we can see the alarm for high salinity.
MR. ROTH-ROFFY: Okay. And -- and --
MR. KRISTENSEN: And I X on the manual tests of both condensers.
MR. ROTH-ROFFY: Did both leaks happen about the same time or different days?
MR. KRISTENSEN: Well, I remember the first one start leaking, big leaking, but they used some

sawdust to go help this leaking, and that everybody speaking about St. Martin, that we need to take this condenser, but just before St. Martin, this leaking stopped, and after two days after St. Martin, we get this leaking again, and the following St. Martin, the tank is leaking, and I think this second condenser started to leak about two-three days before we come to St. Martin, maybe it was Miami. I know it was before this explosion.

MR. ROTH-ROFFY: Okay. Would that have been logged somewhere in your -- your log book or the --

MR. KRISTENSEN: Sometimes I log it. If -- if I cannot skim the condenser, I used to log it when I would have leaking. Skim the boiler. Sorry.

MR. ROTH-ROFFY: Right.

MR. KRISTENSEN: I would write down that we have a leaking on the condenser, especially if we have so much, because it was eight or seven or eight ppm or so. 16 is very, very high.

MR. ROTH-ROFFY: I'm sorry. How high was it?

MR. KRISTENSEN: The highest I write in my log book was 800 and something.

MR. ROTH-ROFFY: Okay. Yeah. That was the pretty high.

MR. KRISTENSEN: Yeah.

MR. ROTH-ROFFY: And all the boilers salted up that were running?

MR. KRISTENSEN: Yeah. All the boilers salted up.

MR. ROTH-ROFFY: And who did you discuss this chloride issue with? Who did you -- who do you notify?

MR. KRISTENSEN: Everybody's supposed to hear that.

MR. ROTH-ROFFY: I'm sorry?

MR. KRISTENSEN: I speak with everybody so they can hear about that, about this problem. I think it's so much.

MR. ROTH-ROFFY: Right. But, I mean, who would -- who did you --

MR. KRISTENSEN: Normally, I would tell it to the first engineer or the staff chief that's in there.

MR. ROTH-ROFFY: In this case, when -- when you first discovered it, you told the first engineer maybe or staff chief or do you remember?

MR. KRISTENSEN: I don't remember who I told it first.

MR. ROTH-ROFFY: Okay. To control this chloride on these boilers, did you -- did you sometimes do a bottom blow?

MR. KRISTENSEN: We never bottom blow if the boiler is on line. Only skimming of it.
MR. ROTH-ROFFY: Okay. Did you ever take the boiler off line and then do a bottom blow to -- to control the --
MR. KRISTENSEN: No. Just skimming.
MR. ROTH-ROFFY: Is there a conductivity sail on the -- on the condensate line that's electronic or do you -- did you find that problem just by water testing, chemical testing?
MR. KRISTENSEN: We have -- we have an electronic Pc on the first one. We got it on alarm speed and we have two, on this monitor and we have some things for the red light. We have -- I forget the English name, but we have like a --
MR. ROTH-ROFFY: A needle?
MR. KRISTENSEN: Right. You can see the -- about how much salt we have.
MR. ROTH-ROFFY: And that's the way you first learned of the salt problem?
MR. KRISTENSEN: Right. Or I see -- maybe the first time I see the salt test of this boiler, I would see this.
MR. ROTH-ROFFY: Okay.
MR. KRISTENSEN: That's a way to see it, too. Normally we see it on that.
MR. ROTH-ROFFY: Okay. I think that's all I have for now.
Brian?
MR. CURTIS: I'm all set.
PARTICIPANT: I've just got a couple follow-up questions to what Tom was asking you about.
Do you know how many grains per gallon of salinity was in the condensate system?
MR. KRISTENSEN: I don't know how many grains per gallon, but I know we take this salinity test. We used parts per million.
PARTICIPANT: ppm.
MR. KRISTENSEN: ppm, yes.
PARTICIPANT: Do you know if your condensate system ever dumped back to your distilled water storage tank?
MR. KRISTENSEN: Not to the storage tank.
PARTICIPANT: Where does it --
MR. KRISTENSEN: Not possible to the storage tank.
PARTICIPANT: It doesn't. You don't have a dump?
MR. KRISTENSEN: A dump. I'm sorry. Of

course. We dump back to the storage tank, yes.
PARTICIPANT: Yeah. Do you know if this storage tank was contaminated by this salt water within the condensate system?
MR. KRISTENSEN: When we change storage tank, we always take water test of storage tank, and if there's too much salt, we -- we -- we dump the water.
PARTICIPANT: Okay. So, that's probably what you -- was that what --
MR. KRISTENSEN: If it's too much salt --
PARTICIPANT: Okay.
MR. KRISTENSEN: -- in the storage tank, yes.
PARTICIPANT: Did you ever see any gauge glasses salt up, turn white, in the blow of the drums?
MR. KRISTENSEN: No.
PARTICIPANT: Could you -- could you tell me about the procedure? When you come into port and you take steam off the engines, you have finished with engines, could you tell me about the procedures in which you cool down and then later on warm up your main engines?
MR. KRISTENSEN: Well, you want to hear the procedure for maintenance?
PARTICIPANT: Yeah. Just -- just generally, and cooling -- and cooling. Do you ever take steam off the engine?
MR. KRISTENSEN: Yeah. Every time when we're in port, we take the starting gear off. When we finish with engine, when we finish with engine, they trip the main engines, and we take the starting gear off, and the electric motor turn the shocks and the turbines until maybe at, say for example, 4:00. We fix the gauge turning gear, start idling for the turbines. The minimum time is 10 minutes, idling the turbines.
PARTICIPANT: Okay. Minimum amount of at least 10 -- at least 10 --
MR. KRISTENSEN: At least 10 minutes.
PARTICIPANT: -- for warm-up. Okay. Did you ever have any concerns about that procedure? Anything?
MR. KRISTENSEN: No.
PARTICIPANT: Okay. All right. That's all I have.
MR. RILEY: John Riley.
Can I just clarify a point, please? I think you referred to the chlorides at one time being over 800 parts per million.
MR. KRISTENSEN: Yes, yes. On one boiler.
MR. RILEY: And did you then say that the alarm set point was 16 parts per million?

MR. KRISTENSEN: We don't have an alarm set. We don't have an alarm on -- on the boiler. We have only an alert on the condenser, and the alarm set points on the condenser, I think it was 2 ppm, but the maximum -- the maximum we have on the boilers before we start skimming is 16, but we don't have an alarm or something else.

MR. RILEY: So, the -- the main condenser --

MR. KRISTENSEN: Two ppm, as I remember.

MR. RILEY: Two ppm per alarm point.

MR. KRISTENSEN: Yeah.

MR. RILEY: And then, the -- the operating normal is -- at 60 ppm, --

MR. KRISTENSEN: 16.

MR. RILEY: 16, you start skimming?

MR. KRISTENSEN: Yes.

MR. RILEY: Sorry. I misheard you.

MR. KRISTENSEN: Okay.

MR. RILEY: 1-6.

MR. KRISTENSEN: Right.

MR. RILEY: Thank you very much.

MR. ROTH-ROFFY: What is your procedure on burner cooling? Normally, at sea, when you have a boiler running, you have five burners in operation. Could you describe at what point you would pull a burner, you know, turn off one of the burners and which one it would be?

MR. KRISTENSEN: Every night, evening, from between 8 or 12, they change all the burner on one boiler.

MR. ROTH-ROFFY: Okay.

MR. KRISTENSEN: That's one time we do that, but then we have full speed ahead.

MR. ROTH-ROFFY: Right.

MR. KRISTENSEN: Change one-by-one. We take the four because we don't have so much load. We take off one and two burner. Normally, it would be Burner 4, 5 or 1, 5 or 1.

MR. ROTH-ROFFY: At what point would you -- is there a set point that you would pull a burner?

MR. KRISTENSEN: Yes.

MR. ROTH-ROFFY: When would you do that?

MR. KRISTENSEN: I don't do that. The stoker would usually do that. That is determined by the staff chief call and say we can take the burner down. Start off the burner. So, when this stoker hear that, he do that.

MR. ROTH-ROFFY: So, when you engage the turning gear, the stoker would turn off one burner?

MR. KRISTENSEN: Yes.
MR. ROTH-ROFFY: Okay.
MR. KRISTENSEN: One or two, sometimes two.
MR. ROTH-ROFFY: Sometimes two?
MR. KRISTENSEN: Yeah.
MR. ROTH-ROFFY: If they turn off two, which one -- other one would they turn off?
MR. KRISTENSEN: That would be -- if they have turn off Number 5, that would be Number 1 they turn off.
MR. ROTH-ROFFY: If they turn off Number 1, it would be Number 5?
MR. KRISTENSEN: Yes.
MR. ROTH-ROFFY: So, 1 and 5, if there's two out?
MR. KRISTENSEN: Normally, yes.
MR. ROTH-ROFFY: Okay. Can you tell us why the -- when you shut off a boiler after -- at some point in the -- in the void, you run three boilers, right?
MR. KRISTENSEN: Yeah.
MR. ROTH-ROFFY: And -- and at some point, you shut off one boiler?
MR. KRISTENSEN: And run two.
MR. ROTH-ROFFY: And run two, correct. When you shut off that one boiler, can you -- can you tell us why -- why you don't keep the pressure up? Why do you bring the pressure all the way down to zero?
MR. KRISTENSEN: Why? I never thinking about that. But I think -- I know it's very difficult to keep the pressure up all the time. If you want to keep the pressure up, we need to have a burner to -- to steam it up sometimes.
MR. ROTH-ROFFY: Okay. But if you were to take the fire out and, you know, let it vent for maybe five or 10 minutes through the superheater and close that superheater vent, and you close everything else, how long would it take for the pressure?
MR. KRISTENSEN: I answered that question yesterday.
MR. ROTH-ROFFY: Without -- I mean, if you were just to not open any drains and shut off the four --
MR. KRISTENSEN: If you don't open any drains and close the boiler and how many hours it takes for the pressure, I really don't know because I never have seen that.
MR. ROTH-ROFFY: Okay. Do you know why the -- you don't do it that way?

MR. KRISTENSEN: No. They always -- that's very important to do that. They always train the superheater and the boiler down a little bit, drain down the pressure, bottom blow, because, for example, for other stuff in the water, and always open this -- this starting line, as we call it, and take off of this for -- from 60 bar to 55 bar, we close this starting line. After we configure this bottom blow down, about 20 minutes, and we stop then and how much pressure, I really don't know. I never have checked.

MR. ROTH-ROFFY: And you also open up the drains, I believe you say?

MR. KRISTENSEN: Yes, that's important.

MR. ROTH-ROFFY: All the drains?

MR. KRISTENSEN: Yes.

MR. ROTH-ROFFY: And you -- you have the four-strap fan running?

MR. KRISTENSEN: Yes.

MR. ROTH-ROFFY: With the damper about 15 to 20 percent?

MR. KRISTENSEN: Yes.

MR. ROTH-ROFFY: But you don't know why it's important to cool it down, why you just don't close it up?

MR. KRISTENSEN: I guess they want to save fuel. They want to keep the pressure in the boilers. It's not a problem to do that.

MR. ROTH-ROFFY: Right.

MR. KRISTENSEN: You always need to have one burner running. It's no problem to do that, but I guess it's a fuel-saving thing or sometimes they take off the boiler to be able to do some maintenance or that, want to take inspection.

MR. ROTH-ROFFY: But if you know you're going to start the boiler up in a couple of days, right, if it's off, how many days would it be off before you started?

MR. KRISTENSEN: Normally, after the last drydock, most of the time, when I have been on board, we have run all the time with three boilers or four boilers because the ship loses a lot of speed after this drydock, and so normal before this drydock, when it have run on two boiler from -- from -- from -- and to -- come to St. Thomas again, and we start lighting off this boiler, the third boiler or, for example, it's four boiler, in St. Thomas, we start 8:00 in the morning and finish about -- when we leave, about 6 and we start the blow and that is if we have normally two boilers. We change between one or otherwise. So, why

they take -- that's the way I know that we do that.
MR. ROTH-ROFFY: Okay. Yeah. I just thought you might know of a good reason why you did it that way.
MR. KRISTENSEN: I never have thinking about that, but I don't know why.
MR. ROTH-ROFFY: Okay. Ken Olsen, go ahead and follow up.
MR. OLSEN: If you did bottle up the boiler and that's the term -- the U.S. term, bottom the boilers, shutting the fin, shutting the vents and the drains. Do you think it would maintain pressure or would it lose pressure quickly?
MR. KRISTENSEN: If we don't drain or don't use normal, it would take a long time to get the pressure down.
MR. OLSEN: Yeah. And the reason I'm asking that is I'm trying to identify if there's many leaks within the boiler.
MR. KRISTENSEN: I understand what you are speaking about.
MR. OLSEN: Yeah. So, is the answer no?
MR. KRISTENSEN: At that time, it was all the boiler was in good condition when we're speaking about leaking.
MR. OLSEN: Hm-hmm.
MR. KRISTENSEN: After this retubing.
MR. OLSEN: Okay. Where's the hydro pump on this ship?
MR. KRISTENSEN: The hydro pump?
MR. OLSEN: Hm-hmm.
MR. KRISTENSEN: I don't know what the hydro pump is.
MR. OLSEN: To test the boiler.
MR. KRISTENSEN: The pump they use to test the boiler for leaking?
MR. OLSEN: Yeah.
MR. KRISTENSEN: Normally, it would be -- I never have done that, but I know they use some of the bigger pumps to open the valves to fill it up with water.
MR. OLSEN: Hm-hmm.
MR. KRISTENSEN: And they try to get pressure.
MR. OLSEN: Okay. You don't know if you have a separate hydro pump?
MR. KRISTENSEN: They have -- they have one electrical pump they use. When you lose the pressure on the boiler after a black-out or something, they have

to be able to have steam to this -- to this -- steam feeds the water pump. We have an electrical pump for that.

MR. OLSEN: Is that a portable pump?

MR. KRISTENSEN: No, no, no.

MR. OLSEN: You have an electrical feed pump?

MR. KRISTENSEN: Yes. That's true.

MR. OLSEN: Is that a reciprocating pump?

MR. KRISTENSEN: No, no. What you mean reciprocating?

MR. OLSEN: Piston pump.

MR. KRISTENSEN: No, no, no. No, no. It's normally a propeller.

MR. OLSEN: Okay. But I -- just to clear it up, is there on board a fixed pump that is high-pressure/low-volume used to test the hydrostatic -- used to perform hydro pressure tests on the boilers?

MR. KRISTENSEN: I don't know.

MR. OLSEN: Okay. Thank you. That's all I have.

MR. ROTH-ROFFY: Just, I think, one more or two more questions for you.

You said you were on -- in the shipyard in 1999 when they did retubing. Do you recall the extent of the retubing? Which tubes actually were replaced?

MR. KRISTENSEN: I don't know what tubes because I was just start to work on the ship. So, I remember, I see the -- I think they redid everything, but I was mostly on the Boiler 22. They retube everything. That's what I remember from this retubing.

MR. ROTH-ROFFY: Okay. I'm sure it's in the records, but we just wanted to --

MR. KRISTENSEN: I don't know.

MR. ROTH-ROFFY: -- see if you remembered. Do you remember how much of Boiler 23 was retubed?

MR. KRISTENSEN: Oh, no.

MR. ROTH-ROFFY: But it was retubed at least partially?

MR. KRISTENSEN: I don't know the answer to that question.

MR. ROTH-ROFFY: Okay. That's fine. We've heard something about an electrical problem that caused a black-out of the complete plant. Do you -- were you on board at that time?

MR. KRISTENSEN: I've been where?

MR. ROTH-ROFFY: No. On the Norway in a -- in the past six months?

MR. KRISTENSEN: Yes. The last black-out we had in St. Thomas, I was on board. The date, I don't

remember. But this is past six months, yes.
MR. ROTH-ROFFY: Were you on watch during that time?
MR. KRISTENSEN: At the time, I working as a day man. I working with the diesel engine. So, I was not working on that.
MR. ROTH-ROFFY: Do you remember about when that happened?
MR. KRISTENSEN: Yes. I think it was about 4:00 in the evening in St. Thomas and that must be Thursday.
MR. ROTH-ROFFY: Do you remember the day -- or the month, rather, the day of the month?
MR. KRISTENSEN: Oh, I don't know.
MR. ROTH-ROFFY: Was it about six months ago or three months?
MR. KRISTENSEN: I don't remember.
MR. ROTH-ROFFY: But you were --
MR. KRISTENSEN: It was shorter than six months ago.
MR. ROTH-ROFFY: Okay. And do you recall how long the plant was down?
MR. KRISTENSEN: The last black-out?
MR. ROTH-ROFFY: Yeah.
MR. KRISTENSEN: I know we used about one hour, one and a half hours to start up this -- the Generator 12. That's the -- that's the first generator we started of the back-ups. So, we used about one and a half hours to -- to get this -- to the -- to the switchboard.
MR. ROTH-ROFFY: You say about one and a half hours?
MR. KRISTENSEN: Yeah.
MR. ROTH-ROFFY: Was there a problem that you couldn't get that generator running?
MR. KRISTENSEN: No problem to start the motor, but I don't know why it took more time. That's the normal time they usually get it through the switchboard or the main board.
MR. ROTH-ROFFY: That's how long it normally takes?
MR. KRISTENSEN: Yeah. The black-out. I have been there. That's normal to take something like that. But I don't know why because I'm not an electrician. I have nothing to do with that.
MR. ROTH-ROFFY: Do you remember what caused that black-out at St. Thomas?
MR. KRISTENSEN: Don't remember.
MR. ROTH-ROFFY: We heard that it was an

electrician pulling some kind of a switch. Does --
MR. KRISTENSEN: I cannot answer that. I don't know.
MR. ROTH-ROFFY: Okay.
MR. KRISTENSEN: Only know there was a black-out.
MR. ROTH-ROFFY: And do you remember how long it took to get the steam plant back up?
MR. KRISTENSEN: At that time, I was not on the steam but only the diesel engine. I don't know.
MR. ROTH-ROFFY: Have you ever been on watch or do you know anything about or have you ever heard about a boiler tripping off while steaming underway and having to reduce speed?
MR. KRISTENSEN: Many times.
MR. ROTH-ROFFY: Many times?
MR. KRISTENSEN: Yes.
MR. ROTH-ROFFY: Can you -- starting from the last time you remember?
MR. KRISTENSEN: I remember the last time. It was on my watch. It was maybe one week before the accident, and they had some problem with one of the burners on Boiler 21. Yes, 22. Sorry. We changed the burner and then we -- I don't remember. We start at least the burner and it's not fired up. We used another burner. So, maybe -- I think the guy should reset this alarm but they pushed on the wrong button, so he stopped the fuel feeding to the boiler. So, we kept the boiler tripped or stopped. That was on my -- in the morning about 3:30.
MR. ROTH-ROFFY: And that was about five days before?
MR. KRISTENSEN: About a week.
MR. ROTH-ROFFY: About a week before the accident?
MR. KRISTENSEN: Yeah.
MR. ROTH-ROFFY: Okay.
MR. KRISTENSEN: It was on line for a few seconds.
MR. ROTH-ROFFY: Who touched the wrong button?
MR. KRISTENSEN: Carlos Perez, Perez.
MR. ROTH-ROFFY: Okay. Could you go back in history and try to remember some of the other times that you tripped -- had a problem with the tripping boiler?
MR. KRISTENSEN: I know there was a tripping boiler just before I come on board -- no. It was -- that was on -- we had a tripping boiler, but I don't

remember if I was on board or before I was on board because they don't view it as a big problem, and I don't remember the exact something after that.

MR. ROTH-ROFFY: I think we've heard about that. Was it a high superheat temperature maybe?

MR. KRISTENSEN: Yes, it was high superheat temperature. That's true.

MR. ROTH-ROFFY: Okay. Do you remember any other -- any instances where the boiler trips?

MR. KRISTENSEN: Oh, I know we have many boiler trips.

MR. ROTH-ROFFY: Right.

MR. KRISTENSEN: It happens from time to time, but I don't remember. It's small things, and I don't remember.

MR. ROTH-ROFFY: When you stood watch in the engine room, have you ever had the opportunity to -- or have you ever tested the flame scatters?

MR. KRISTENSEN: The flame scanners?

MR. ROTH-ROFFY: Yeah. Correct. Have you ever done anything with them?

MR. KRISTENSEN: No, I never have. No, never. Sometimes if we have a problem with the boiler, we used to change the photo cell. That's one of the things we used to try.

MR. ROTH-ROFFY: Do you have a spare photo cell that you use?

MR. KRISTENSEN: Yes.

MR. ROTH-ROFFY: Where was that located?

MR. KRISTENSEN: We have our phone booth in the boiler room, so there's also this box there.

MR. ROTH-ROFFY: It's a box in the phone booth?

MR. KRISTENSEN: No, no. Outside of the phone booth.

MR. ROTH-ROFFY: Okay.

MR. KRISTENSEN: But on the phone booth.

MR. ROTH-ROFFY: Okay. It's mounted on the phone booth?

MR. KRISTENSEN: Yes.

MR. ROTH-ROFFY: Okay.

MR. KRISTENSEN: Six or seven spare.

MR. ROTH-ROFFY: Okay. Have you had -- have you ever changed a photo cell?

MR. KRISTENSEN: Not personally, no, but I have ordered them to do that.

MR. ROTH-ROFFY: Okay. Why would you order them to do that? What would be the indications?

MR. KRISTENSEN: If they have problems with

the burner and we try a lot of things.
MR. ROTH-ROFFY: If the burner won't start up?
MR. KRISTENSEN: The burner won't start up, yes, and one thing we try is to change the photo cell or try to clean it.
MR. ROTH-ROFFY: Okay.
MR. KRISTENSEN: That's one of the things we do.
MR. ROTH-ROFFY: Do you ever try to adjust the alignment? Is that an adjustable thing?
MR. KRISTENSEN: Oh, that, I don't know because I never have the boiler as my responsibility.
MR. ROTH-ROFFY: Sure, sure.
MR. KRISTENSEN: I don't know so much about the boilers, about those special things to do, no.
MR. ROTH-ROFFY: Do you ever test the flame scanner with like a torch or anything --
MR. KRISTENSEN: No.
MR. ROTH-ROFFY: -- to see that it works?
MR. KRISTENSEN: Not me.
MR. ROTH-ROFFY: Okay. That's all I have. Anybody else have any questions?
MR. OLSEN: I have one follow-up on something you mentioned, Tom. I apologize.
Have you ever seen any of the machinists or whatever they're called, lathe operators, making any boiler plugs?
MR. KRISTENSEN: Many times, I see them making boiler plugs.
MR. OLSEN: Many times?
MR. KRISTENSEN: Yes. Not -- not -- sorry. I'm not thinking about boiler plugs, I'm thinking about condensers.
MR. OLSEN: Okay.
MR. KRISTENSEN: So, I've never seen -- maybe I've seen, but I don't know it was a boiler plug.
MR. OLSEN: Okay. It would have been a big one.
MR. KRISTENSEN: Yeah. The pipe was leaking.
MR. OLSEN: Yeah. The other question is, if you were -- as if you were having problems with the photocell, is there any way to keep that fire lit while you're working the photo cell?
MR. KRISTENSEN: Not as I know.
MR. OLSEN: Okay.
MR. KRISTENSEN: I think that if they take out the photo cell, the burner should shut off.
MR. OLSEN: Yeah. But I was just curious if

there's a way to keep it burning.
MR. KRISTENSEN: Oh, I don't know that. Maybe. I don't know.
MR. OLSEN: Okay.
MR. KRISTENSEN: I don't think so.
MR. OLSEN: All right. Thank you.
MR. ROTH-ROFFY: Okay. The time is now about 10 to 10 and that'll conclude our interview of Trond Kristensen, and sir, thank you very much for coming and talking with us. You've been very helpful.
MR. KRISTENSEN: Okay. Thank you.
MR. ROTH-ROFFY: Thanks.
(Whereupon, at 9:50 a.m., the Interview of Second Engineer Trond Kristensen was concluded.)