DEPARTMENT OF TRANSPORTATION
NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF MARINE SAFETY

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In the Matter of:

MAJOR MARINE ACCIDENT,
DCA 03 MM 032
_____

May 28, 2003

INTERVIEW OF:

CURT SATOW and HUST GIERING

The above entitled matter came on for hearing, pursuant to notice.

PRESENT:

TOM ROTH-ROFFY, NTSB
BRIAN CURTIS, NTSB
KEN OLSEN, USCG
CHRIS OELSCHLEGEL, USCG
STEVE CMAR, NCL
CARMONE DOWNEY, ATF
JOHN BUTCHKO, Miami Dade Homicide
NANCY MCATEE, NTSB

P R O C E E D I N G S

MR. ROTH-ROFFY: Okay. The time is now about 3:30 in the afternoon on the 28 of May 2003.

My name is Tom Roth-Roffy, with the National Transportation Safety Board in Washington, D.C. I, and several other investigators have come down to investigate the accident that occurred aboard the S.S. Norway on May 25, 2003. The reason we have asked you to come and talk to us is because we believe that you may have some information that may assist us in investigating the accident.

The National Transportation Safety Board conducts safety investigations. Our interest are strictly safety. We are interested in determining the cause of the accident, if we can. And to make recommendations aimed at preventing similar, future accidents. We are not conducting a legal investigation. We have no interest in any legal matters. We will not try to assign blame to any person or any organization. We are only interested in safety of ships.

So, with that I would like those interviewers that will be participating this afternoon, to go and introduce themselves and their affiliation.

MR. CURTIS: Brian Curtis, NTSB, Marine Engineering Accident Investigator.

MR. OLSEN: My name is Ken Olsen, I work at Coast Guard Headquarters in the Investigations Program. And again, our interest are safe as NTSB, to prevent further occurrences. That is our goal and understanding of what is happening here.

MS. MCATEE: Nancy McAtee, NTSB, Fire Explosion Specialist.

MR. OELSCHLEGEL: Chris Oelschlegel. I am a Coast Guard Traveling Inspector from Coast Guard Headquarters.

MR. DOWNEY: Carmone Downey, Alcohol, Tobacco, Firearms and Explosives.

MR. BUTCHKO: I am John Butchko with the Miami Dade Police Department, Homicide Bureau.

MR. CMAR: Stephen Cmar, Norwegian Cruise Lines.

MR. ROTH-ROFFY: Okay. Well, thank you. With that we will go ahead and begin our questioning.

We have with us participating or being interviewed is Mr. Curt Satow of Lloyd Werft and Mr. Hust Giering, with The Siemens Company. Sirs, welcome and thank you for coming. I know English is not your native language, so if at any time you don't understand the question, I will be very happy, you know, to say it over again in a different way or whatever it takes.

And so, I am not sure exactly how we are going to proceed. You know, we just have some general questions about the boilers, controls and the automation system. And I understand that they kind of overlap, that you, from Siemens, do the electronics and you do more of the mechanical, Curt, is that correct?

MR. SATOW: That is right.

MR. ROTH-ROFFY: And maybe you could, for starters, go ahead and explain, you know, what your areas of interest are on the boilers, if you could, sir. We will start with Mr. Giering. If you could explain all of the components of the automation system, which Siemens is responsible for.

MR. GIERING: On this ship or on --

MR. ROTH-ROFFY: On this ship, sir, yes.

MR. GIERING: We have a boiler control, burner control. We have a turbine control, alarm system and generators. And my part is only boiler control and burner control.

MR. ROTH-ROFFY: Okay. And could you explain what components of the boiler control and burner control that you work on?

MR. GIERING: You mean now the control loops.

MR. ROTH-ROFFY: Yes.

MR. GIERING: No, I have a load control and fuel oil flow control, combustion air control, super temperature control, worker level control, feed belt control, fuel oil pressure control and fuel oil temperature control. That is all. And then --

MR. ROTH-ROFFY: The last one was?

MR. GIERING: Fuel oil temperature control. This is many times it is manual. This is not on auto.

MR. SATOW: And the last what he say was the burner logic.

MR. ROTH-ROFFY: Burner logic, okay.

MR. SATOW: Burner management has power, by itself. And then the boiler, if the burner or the boiler can line, the burner control takes over and control the pressure and what Mr. Giering explained.

MR. ROTH-ROFFY: Okay. And Mr. Satow, could you explain the components in the boiler that are your responsibility?

MR. SATOW: The burner logic or the control works on mechanical or the burner control, or burner management works on mechanical paths. For instance, if I start one burner, I have to ignite, I have to, first I start the logic of touching the boilers, then this part under fire, to adjust the fire and correctly, but, I do, just gearing to get up. And then the, if the starter, first burner and igniter has to go in, just has to be open, this all works to get in mechanical site. The fuel allows this open and so the fire, at

least the flame scanner takes over the flame, the flame is stable. That is my part on the mechanical side. And also sometimes that is all -- to get up to hold adjustment and also to control valve is -- is the branch name, to look to the mechanical -- and so on. But, therefore, we take over date and make the maintenance on this, that is all.

MR. ROTH-ROFFY: Mr. Giering, is there a technical manual for the boiler automation and control system for the boilers on the Norway?

MR. GIERING: I don't understand.

MR. ROTH-ROFFY: Is there a Siemens' document with technical drawings and description?

MR. GIERING: Yes, there is.

MR. ROTH-ROFFY: Okay. Is there also a similar document for the mechanical equipment that would come under your responsibility?

MR. SATOW: Yes, that is from, it was from, by of the vessel, was all the documents there for burners for logistic and all the burner logic and all the boiler control. I don't know if it is helpful, I can maybe explain how the beginning is for installed stuff like this.

MR. ROTH-ROFFY: Yes, if you could.

MR. SATOW: Yes. This ship was converted from the France to the Norway. -- was given from Lloyd Werft, at this time it was -- Lloyd Werft, to -- shipyard, to make this ship complete with automatic burner management and boiler control. Going from the -- shipyard, I was involved for the complete commissioning, installation of this vessel in '79. Normally, the -- shipyard decide which kind of boiler control or burner management will be installed. And there is, at this time it was Siemens the best technical things which you get in boiler control and, and burner management and therefore, we installed this installation. Before was the complete vessel and manager, and for the stokers downstairs and put fire by, by torch and staff was on this we build up for automatic. We go in and we burner, five burners instead of seven, which was before by the French people. So, therefore, when this whole thing, I was, have responsibility.

MR. ROTH-ROFFY: Okay. And you say that was in which shipyard, can you spell that?

MR. SATOW: That was, that was in Lloyd Werft in Bremerhalf, in '79, '80. But, this part was made, it was, this part boiler and also the generator installation that is on was subcontracted from Lloyd Werft to -- Shipyard.

MR. ROTH-ROFFY: Okay. And at that time you were working for Lloyd Werft?

MR. SATOW: No, for -- Shipyard.
MR. ROTH-ROFFY: Could you spell that, please?
MR. SATOW: A-G -- A-G-W-U-A-S.
MR. ROTH-ROFFY: Okay. Thank you.
(Pause.)
MR. ROTH-ROFFY: Okay. What changes have been made to the boiler automation system since 1979 in terms of design or performance?
MR. SATOW: No major, no major changes.
MR. GIERING: The only change new -- control.
MR. SATOW: Yes.
MR. GIERING: Where they have no -- the old one is finished. We change -- control. And most of the -- control is only the pneumatic station and the -- is
old -- system.
MR. ROTH-ROFFY: Okay. I am not sure I understand. What kind of components was that? Could you say it again?
MR. SATOW: The C Path controller. A transmitter, this was the telephone system.
MR. GIERING: No, it is a special system from Siemens where you have 12 controllers inside and this looks like an indicator and inside is a 12 controllers and many -- and other thing and we need the -- for the automatic station where they need the signal outside to the old telephone system. This is all what was changed in this time. And the transmitter, you know, -- and then we must change in the new type.
MR. SATOW: The old type was regionally and not anymore available and therefore, we changed, Siemens changed to the new type C Path controller, but we only use from the C Path controller -- itself, at least for the, for the signals. And this works, still works on the old electronic.
MR. ROTH-ROFFY: And when was that worked on?
MR. GIERING: Oh, we start, I mean, '69, we started first time.
MR. SATOW: Ninety six.
MR. GIERING: Or '96, yes, we started first time. Only four and then we start more in less time.
MR. SATOW: But, that is not a major change of this. The system is still the same, but the transmitter different now. They have not -- still the same.
MR. ROTH-ROFFY: Could you tell us about the last time you were aboard the vessel before? It was 1999 in the shipyard and we did a general overall and everything?
MR. GIERING: I was 1999 in the shipyard. General overall and everything.
MR. SATOW: 2001.

MR. GIERING: 2001.
MR. SATOW: It was --
MR. GIERING: Yeah, 2001.
MR. SATOW: 2001 was the last shipyard.
MR. GIERING: Yes, I am sorry. And then I was in February of this year.
MR. ROTH-ROFFY: Okay. Starting from say February of this year, what work did you do in February?
MR. GIERING: I only adjust the boiler. The boiler was out of symmetry. One boiler make more load than the other one and I bring in symmetry and then I go after, I have a job maybe for four days and then I am finished.
MR. ROTH-ROFFY: So you were onboard for about four days.
MR. GIERING: No, one trip for Miami to Miami, seven days.
MR. SATOW: But, the work was four.
MR. GIERING: Yes, yes.
MR. ROTH-ROFFY: And what was the nature of that work? What did you have to do to repair that problem?
MR. GIERING: It was only, you mean now that I bring in --
MR. ROTH-ROFFY: Correct.
MR. GIERING: I see, you can see the fuel load flow, you can see, you can see the steam flow, so then I bring a little bit in ballasts and that was all. Yeah, I am only looking for my fuel and my steam flow and then I bring in the ballasts, a little bit higher, a little bit lower, then I was waiting to stabilize and then I am looking and bring a little bit more, and then we make maneuvering. We are finished, we make maneuvering, we stop and go on stand and everything and all the work and everything was okay. Then my job is done.
MR. SATOW: We adjusted --
MR. GIERING: It was only put in some --
MR. SATOW: Yeah, put in some -- on the --
MR. GIERING: Backside.
MR. SATOW: -- on the backside from the boiler.
MR. ROTH-ROFFY: Okay. The backside of what particular controller? Unfortunately, I haven't seen the drawings, but if you could just --
MR. SATOW: Sure, and steam --
MR. ROTH-ROFFY: The steamer controller.
MR. SATOW: The fuel oil load controller.
MR. OLSON: Ken Olson. You are talking about the main panel in the center, between --
MR. GIERING: No, no, no.

MR. SATOW: Oh, no, the control room.
MR. GIERING: The control room.
MR. OLSON: In the control room.
MR. GIERING: Now on the backside you have all the controllers inside.
MR. SATOW: Downstairs is no any controls.
MR. OLSON: There are no controls, okay.
MR. GIERING: No, only the flame --
MR. SATOW: The flame scanner is only downstairs and the burner logic is --
MR. GIERING: That is in the control room.
MR. SATOW: -- downstairs, start and stop the burners. No control downstairs.
MR. ROTH-ROFFY: Okay. Tom Roth-Roffy back again.
All right, and before February of this year, the last time you were onboard was 2001.
MR. GIERING: Yes.
MR. ROTH-ROFFY: And it was in the shipyard.
MR. GIERING: Yes.
MR. ROTH-ROFFY: And could you describe the work that you did then?
MR. GIERING: The work is, every time we must check all valves. We have open all valves, looking on the spinner, if the spinner is okay, we change the main one, or many valves is automatic valve, so we change he main one inside and then we change positioner, made a new positioner on the works. And then we check transmitter. We can check the transmitter, inside you have a, you can simulate 12 -- you can see upstairs, you have the -- and everything. And then we also check safety line for the burner logic, pressure pump. We have a pressure pump with high pressure and we can check the oil pressure and fuel pressure, what we need. And then we check the flame --
MR. SATOW: And we have, in this shipyard, I make a plan for the commissioning since, I would say since 1999, '80 for me. And in this plan we have, take down what all we have to do, check the burner logic, check the safety device, and check, check then later on the burner control. For this we pressure check all the transmitter, make the correct adjustment. We have two, I call it hot check and cold check. We start as a cold check with all end switches on the manual, ER, his caller is upstairs, I open downstairs by myself, the manual sees that the switch is working and that the signal is, signal comes up through the board in the control room. Now we go bar by bar through -- work, from me anyway, but, we do it and safety is -- we check the safety, the opened end switches by the pneumatic fuel oil -- We have a program where I check the pneumatic logic. That was all what we call check.

Pressure test and adjust the transmitter for the burner control, therefore, the boiler controls. And if this is done according to our program, we have set the time schedule for that, and then I make the hot check.

The hot check means that I start the perching, check the perching time by the instructions, and start the first boiler without fuel only and in a moment and then igniter was in, the photocell, see that everything is open, the signals for the closing valves goes open, upstairs and if I have my, my flame on, it is not a flashlight, it is a real flame from a burner, for pound burner, and then we are sure that this kind is okay. And then I check backside, if I have this burner in, with the flame, I stop the fan, the safety fan must come with closing valve shut off and also just otherwise check everything. I simulate fuel oil pressure, close the fuel oil valve, fuel oil drops. That is what I call hot check. If we are sure everything works. I do that on every boiler, every boiler.

If we are sure that works, then I have designed, decided with the chief engineer, which boiler we start first. This boiler which we start first, I check the safety from the diesel oil. You have to start this diesel oil first to warming up. On this kind of logic, it is not possible to burn diesel oil to get this fuel oil. If you open the manual valve by the diesel oil, immediately the fuel oil valves will be stopped. And this is what I call diesel oil safety check. And if that is okay, then we start the first boiler, the first boiler is the first one and diesel oil and we rise the pressure.

If the pressure is so far rise that we have a water level in, then we try, we test the water level, close, real test, close the feed water valve, and drop the water level down so we can see on the transmitter and also on the water level, that the water goes down and the boiler has to stop. So, that is the normal procedure. We check this safety device and if everything is working, we have the boiler pressure, then we bring it, show the classification society that is recommended, safety devices are working. That the recommended safety device by the classification society as in this case, they are not -- automatic and this vessel is official, not automatic vessel, it is a manual vessel. But, there are -- on the safety device, that meets the flame scanner, that meets the water level, fuel oil pressure, and, no, drum pressure high, yes, drum pressure high, it is set a little bit under, meets the safety margins. And force a draft --

I hope I haven't done forgot something. And then the air pressure, control air pressure.

MR. GIERING: And super -- temperature.
MR. SATOW: Yeah, okay, that is safety from the classification society. And then we will check the classification together.
MR. ROTH-ROFFY: About what month was that done in 2001?
MR. SATOW: It was done in the yard time from, mostly we start by the beginning when the vessel is there. I don't know if the date was September, I think. September, November we were finished. December we was here. I have to look. I have to --
MR. ROTH-ROFFY: Yes.
MR. SATOW: What I do is usually over 20 years.
MR. ROTH-ROFFY: Sure, I understand.
About how long does that, that work usually take?
MR. SATOW: That work, over the whole shipyard time.
MR. ROTH-ROFFY: About how many days or weeks?
MR. SATOW: Normally this vessel it is three weeks, four weeks in the yard. According to the other jobs. And according to that schedule, we try to bring it also in this, if we have some things to change and so on, then we do that also in that time.
MR. ROTH-ROFFY: Do you have some sort of a written document that shows what sort of testing you did and how you did it?
MR. SATOW: Yes.
MR. ROTH-ROFFY: Is that, does the ship have a copy or would you be able to provide a copy?
MR. SATOW: Normally I give to the chief engineer before we start, all the test schedule and then afterwards, I give also a copy to the ship. It must be in the file. I have others.
MR. ROTH-ROFFY: Okay. And do you have a name for that document, so that we can ask to see a copy of it? Does it have a title or something?
MR. SATOW: Time schedule for commissioning the boilers. I guess, I must look upstairs for it.
MR. ROTH-ROFFY: Okay. We would probably like to, you know, just look at that to see the sort of work that you did or usually do on the boiler.
MR. SATOW: You would like to get that?
MR. ROTH-ROFFY: Yes. We would like to see that. So, I am going to put it on list of documents. I just want to know what to call it, so, you know, they know what to ask for. So, I will call it --
MR. SATOW: Time schedule for commissioning, the name may be a little changed.
MR. ROTH-ROFFY: Okay. Time schedule for commissioning of the boiler.

MR. SATOW: Yes and testing.
MR. ROTH-ROFFY: Okay.
MR. SATOW: I can show you that.
MR. ROTH-ROFFY: Okay. And then at the end of that three weeks of work, do you give the ship a report showing the results of all the tests, whether they are satisfactory or not?
MR. SATOW: Yeah, mostly one of the engineers is with me and look at some of the electronic and the boiler engineer with me and which we show them what, we are down and up and whatever.
MR. ROTH-ROFFY: Do you recall which engineer worked with you during that period from the ship?
MR. SATOW: Oh, I don't know their names, really, but, it is different, which is boiler engineer at this time or not, I cannot remember which was last time.
MR. ROTH-ROFFY: Okay.
MR. SATOW: So, I am not so --
MR. ROTH-ROFFY: Sure.
MR. SATOW: I don't know.
MR. ROTH-ROFFY: Okay. And prior to September 2001, can you recall when the last time you were onboard this ship, to work on the boilers?
MR. SATOW: In 2001.
MR. ROTH-ROFFY: Before 2001?
MR. SATOW: Before 2001. For me was the yard time before, it was '99, it was '99.
MR. ROTH-ROFFY: You worked both together in '99 as well?
MR. SATOW: Yes. In the meantime, there was -- It was '99, too. In the yard time again. Also '96, also '93 in Newport News Shipyard, we were there, '90, '87, '84, '82 by Lloyd Werft and '80 was the commissioning.
MR. ROTH-ROFFY: Okay, so it looks like about every three years you came forward to do testing.
MR. SATOW: According to the classification society, they recommend two yard times or drydockings in five years. And this we followed.
MR. ROTH-ROFFY: I see.
MR. SATOW: And sometimes, in some cases, in the earlier, in the beginning, we was, it had been altered, yes.
MR. ROTH-ROFFY: So, in 1999, did you do the same type of work --
MR. SATOW: Same procedure.
MR. ROTH-ROFFY: -- as 2001.
MR. SATOW: Yes. Every time same procedure.
MR. ROTH-ROFFY: Okay. I am going to go ahead and let some other folks ask some questions.
MR. CURTIS: This system as it is in this

vessel, do you have any particular reoccurring problems with the combustion control, flame scanner going out more frequently, any components of the system that you seem to have more trouble with than other parts of the system?

MR. SATOW: Not really, no.

MR. CURTIS: Sorry, this is Brian Curtis.

MR. SATOW: Not, I don't understand your question correctly. Do you mean the flame scanners or something not working properly that we, that has to be changed or could be better or --

MR. CURTIS: More frequently than other parts of the system. Any parts of the system that you seem to see more problems with?

MR. SATOW: No, no. Not really. No.

MR. CURTIS: You mentioned, Mr. Giering, that you made some adjustments not long ago to balance the system.

MR. GIERING: Yes.

MR. CURTIS: Would the crew ever do that on their own if you weren't available or is that only done by you as a representative?

MR. GIERING: I --

MR. SATOW: I think the question was that, that if balancing or change of control will be done only from Mr. Giering or also could be with the crew together or --

MR. CURTIS: Is the crew capable of and do they do it themselves?

MR. GIERING: Yes. The electronic engineer works on this system.

MR. CURTIS: So, he may make those adjustments if you are not available.

MR. GIERING: Yes.

MR. CURTIS: Do you know of any instances where they have done that, that they have told you about?

MR. SATOW: You question was that they mentioned to him that they have done something.

MR. CURTIS: Yes, yes.

MR. GIERING: The last time, yes. They say they have a problem and he don't know what he must do, so I fix it. It was not a big problem. It was only, maybe he touched one, and forget to position it.

MR. SATOW: And what they tell him, when he comes onboard or when we come onboard, what is wrong and what is not so good and then so, and they are also able to, to work themselves.

MR. CURTIS: Okay. Is your method, if we wanted to test the system, is there say in a test mode where we can actually sequence a burner in the condition the vessel is in now? Is there a way we

could test the burner?
MR. GIERING: No.
MR. SATOW: You mean prior in the vessel, the boiler in service that you have a test mode, change over and test the --
MR. CURTIS: Yes.
MR. SATOW: No, no. It is not, it is really not necessary. If a, for the test of the flame scanner, I take one off from the burner and the burner has to shut off. Then I have tested them.
MR. CURTIS: Okay.
MR. SATOW: I have to be sure that the resistor is closed and the fuel is closed, by each burner, by themselves.
MR. CURTIS: Yes.
MR. SATOW: That is each burner, its -- closing on fuel oil.
MR. CURTIS: I am interested in the sequencing of the logic.
MR. SATOW: Yeah, it is not the test mode then. I think it is also not necessary.
MR. CURTIS: So, the only way to test it, would be by individual components.
MR. SATOW: Yes, or by the boiler, I shut them off, and start as I explained before, what I call hot test.
MR. CURTIS: And in any of your previous visits to the vessel, have you ever come upon where you found that the crew had bypassed a portion of the system to keep it running?
MR. GIERING: No.
MR. SATOW: No. It is also not a good --
MR. CURTIS: That is all I have right now.
MR. OLSON: I have got a few similar.
You understand the whole system. You understand how the controllers effect the output devices, make the changes, whether it is a ratio controller or a square root extractor, you can see how that, how your changes affect the final end valve or operation. Do you think the electronics persons onboard the ship have sufficient knowledge to understand the complexity of the system?
MR. GIERING: Yes.
MR. OLSON: You do.
MR. SATOW: Yes. They have a very good electronic engineer and he understands it very good system.
MR. GIERING: From my private opinion, I don't like it really. He should, judge people which he works three weeks together -- It is a little bit difficult to answer this question.
MR. OLSON: Yes, it is just general.

MR. GIERING: Okay. Then --
MR. OLSON: General responses. If he comes onboard a ship and finds people have been messing with something that they shouldn't have, he certainly is the person who could give us an opinion as to whether or not, you know, somebody is adequately competent in doing what they are doing.
MR. SATOW: They have a very good electronic engineer.
MR. OLSON: They do, okay.
With respect to servicing, do you have an annual service contract with NCL? No. So you are just called on when they have a problem.
MR. SATOW: Yes.
MR. OLSON: Is it accurate then that the last time you were called out to look at the system was 2001, when you had that major review? So you haven't been called out in the last few years to look at this system?
MR. GIERING: Yes, in February.
MR. OLSON: Excuse me?
MR. SATOW: February.
MR. OLSON: This year.
MR. GIERING: Yes.
MR. OLSON: Okay. I missed that.
Have you had any, not necessarily on this ship, but in your other servicing of other ships, and other fleets, have you come across times when the cylinode valves or they are pneumatic, quick closing valves in the fuel system, have they ever failed? Have you seen incidents where maybe the valve binded, or the valve, surface valve or is there any history of problems?
MR. GIERING: Then I have order from my company, I must go immediately.
MR. OLSON: Yes. But, you have never come across those types of failures?
MR. GIERING: No, no. We have a big explosion in Ambrook, for many years, and we have strict order when we see that everything is all right, I must go to work.
MR. OLSON: Yes. But, you --
MR. SATOW: This, this, you know --
MR. OLSON: Is there any way that an engineer can hold open a valve, mechanically, once it has been opened electronically?
MR. GIERING: I cannot understand really your question.
MR. OLSON: Okay. The burner light is off, the fuel oil cylinode valve, I keep calling it cylinode, the pneumatic valve opens up, is there a way to put something in there to keep it from closing?

MR. GIERING: We have a little history on this vessel, but I, I, that is my -- to answer this question.
MR. OLSON: Well, what do you mean that, a little history?
MR. GIERING: I mean, from the beginning on, in the first commissioning, there was, is something, but I have to speak with Mr. -- NCL, to mention or not.
MR. OLSON: Okay.
MR. GIERING: That is not in my responsibility.
MR. OLSON: So we can just think generally that there may have been instances where the valves were held open mechanically.
MR. GIERING: No, that is impossible.
MR. OLSON: It is impossible.
MR. GIERING: That is -- Well, in this case, completely impossible. At least you have a quick loading part.
MR. OLSON: Right.
MR. GIERING: And you have for each burner two double quick loading --
MR. OLSON: Okay.
MR. GIERING: So, and you cannot open or to get a mechanical case, that is impossible.
MR. OLSON: I don't mean altogether at once, I mean, if they have a problem with the photocell and I don't know the system well, is there a way for me to hold open the fuel valve?
MR. GIERING: No.
MR. OLSON: No.
MR. GIERING: I can show you that on, if you can go in there and I can show you that is impossible. I cannot hold open by the burner, if the photocell fails, then she fails and the closing valve from this burner close.
MR. OLSON: Okay. Have you seen any additions where they may have hooked up air lines to hold that pneumatic valve open, additional air lines or connections?
MR. GIERING: In, in --
MR. OLSON: For the pneumatic valve.
MR. GIERING: In this vessel?
MR. OLSON: Yes, this vessel or other vessels.
MR. GIERING: No. In this vessel, as I mentioned just before, we have to speak with NCL about, in the beginning. But, this arrangement was never used, so, I don't know.
MR. OLSON: Okay. We won't go there right now.
The ship is 41 years old. It is an old ship. Components are wearing out even though they are relatively new since '80, so they are 20 year old

components, if you want to think that way. The fact that you are not hired to go out there sooner and examine these systems, is that of any concern? Have you ever thought in your own mind, that gee, maybe they should have called me out there sooner to look at the system or to make a repair?

MR. GIERING: No, only what I have mentioned, sometimes that we have to look to our part, C Path controller that we get not any more spare parts for different kind of -- that we have to replace something to have still spare part. You know in this modern times, companies change designs, and so very quick, this is 20 years old, the companies run out of spare parts and that was one, like the C Path controllers and so on.

MR. OLSON: So then you would communicate that, those issues with the technical staff of NCL?

MR. GIERING: Yes, yes. And mention them, may let them look to change.

MR. OLSON: Okay. Are you aware of the class society and their role in ship board operations obviously. Have you ever witnessed BV's test procedures? They are involved with testing and examining the automation system. Have you ever witnessed their test, that test or their involvement in such a test?

MR. GIERING: As I mentioned before, that I have hand it over, or test the safety devices.

MR. OLSON: Yes, no, I understand your role, but have you seen or have you ever had an opportunity to witness BV inspector do the test?

MR. GIERING: No usually BV, people doing the test. They only witness the test.

MR. OLSON: Witness you, watch you.

MR. GIERING: Yes, also normally test. If you are on a shipyard, you, you, I was -- for testing, all their equipment, which was installed, and you always have BV or the classification society, behind you, not that they work on this stuff and make test by themselves.

MR. OLSON: Okay.

MR. GIERING: They only witness, that is normal.

MR. OLSON: Okay. But, so you are not, you are not in any way aware of what their methods of testing when you are not there.

MR. GIERING: No.

MR. OLSON: Okay. Are there burners straight mechanical burners or are they steam assisted? And are they all the same?

MR. GIERING: Steam -- not steam assisted, and not the steam --

MR. OLSON: Okay.
MR. GIERING: Burner.
MR. OLSON: Okay. And are they all the same?
MR. GIERING: All the same, yes.
MR. OLSON: How about the one that is used when you light off with diesel?
MR. GIERING: Then they are --
MR. OLSON: Straight.
MR. GIERING: Straight, yes.
MR. OLSON: Okay.
MR. GIERING: Diesel is without steam.
MR. OLSON: Okay.
MR. GIERING: But, that is only for, we bring the boiler to 18 bar and then we change over.
MR. OLSON: Cold start.
What is the danger with low fuel oil pressure? Why is that a problem?
MR. GIERING: The flame is not any more stable. The aft can blow the flame away, in this case, if you have a certain pressure, low pressure, then to avoid this, that the flame will blow away, you have to trips the boiler, the boiler trips automatically or the burner, let me say.
MR. OLSON: If there is a problem --
MR. ROTH-ROFFY: Sir, the tape is about out. We will go ahead and before you ask that question, we will stop the tape.
(Change of tape.)
MR. OLSON: If there is a problem with the fuel oil pressure regulator, that could cause low fuel oil pressure?
MR. GIERING: Yes. Probably within the -- and you can get low pressure. The system is, that we have a pressure, fuel oil pressure from 18 bar or 20 bar, 20 bar and the controller controlled the quantity of fuel oil before the burner, and according to the note, the fuel oil pressure rising from four to 16 bar.
MR. OLSON: And what, about roughly what is that low pressure cutout set at?
MR. GIERING: It is 2.5 or three bars, 2.
MR. OLSON: When an alarm, when a primary alarm sounds with the combustion control, like fuel oil pressure, is that something that would be captured by the engine room logging system, the printout?
MR. GIERING: No.
MR. OLSON: Okay. When the alarm signal goes up to the engine room, I don't need to know the details, I don't want to know the details, is that data stored anywhere? Is there a hard drive like on a computer that that data is stored? Is there is a history other than the sheet?
MR. SATOW: Ask alarm --

MR. GIERING: That we have, this is not working.
MR. OLSON: It is not working.
MR. GIERING: No, at this time.
MR. SATOW: There was a printout, there was the mechanical, yeah. From the printer was broken or is broken, so, no any more printout --alarms.
MR. OLSON: And then the question was then is there a hard drive or some other memory area that --
MR. SATOW: You mean, hard drive, what do you mean on a hard drive?
MR. OLSON: Like on a computer.
MR. SATOW: No.
MR. OLSON: No. So the alarms just go right to the printer.
MR. SATOW: Or on the screen.
MR. OLSON: Or on the screen, okay.
MR. SATOW: To get an alarm --
MR. OLSON: If you had low fuel oil pressure and, and it reached the low point, describe to us the cycle of what should normally happen, what does that low fuel oil pressure do, sounds an alarm, then does what?
MR. SATOW: I believe the stoker or engineer, which is downstairs, has to look at the pressure in the fuel line on the, on the pump itself, it is incorrect, and correct level, if not then normally that will be, that he can see, on the control room, the pressure is controlled by, by controller. He can only open manual or bypass this controller, if it not works correctly. Then the pressure rise again or drops, whatever.
MR. OLSON: So, the low fuel oil pressure is in a cutout.
MR. SATOW: It is a cutout. It is a trip --
MR. OLSON: It does trip, all right.
MR. SATOW: Yes.
MR. OLSON: All right, describe what happens with the automation, not with the engineer, what does the automation do? Does it, does, it secures the main cylinode valve, it secures the burner valves, how does that all work and then how is it tied into enable a relight?
MR. SATOW: The question asked is what the complete burner controller management say, do when the fuel oil pressure gets low.
MR. OLSON: Yes. Say, it goes low.
MR. SATOW: Goes low and this level where, the closing valve immediately stops, you have a pressure switch in the fuel oil line, and this pressure switch is one of the components which we test by pump every, every time. And if this pressure switch show a, get low pressure, then it cut immediately the quick closing

valve, the main quick loading valve for the complete boiler.

MR. OLSON: Okay. So then --

MR. SATOW: That is one of the safeties.

MR. OLSON: Yes.

MR. SATOW: That I mentioned before.

MR. OLSON: So, to restart, somebody would have to go and hit a button to start the purge cycle. Is that correct?

MR. SATOW: First he has to bring up the pressure again.

MR. OLSON: Okay. Right, right.

MR. SATOW: If he has no fuel oil pressure, it will do nothing. The logic, the purging cannot run if the fuel oil pressure is too low.

MR. OLSON: Okay. In the controller system to many of the sensors in, in your controllers, is there any maintenance that has to be done, maybe filter or -- filter? No.

Let's talk about the override switch. You know the override selector switch. Can you explain what that is used for?

MR. SATOW: In the control room.

MR. OLSON: No, in the engine room.

MR. SATOW: Yeah, in the engine room, sorry, in the boiler room. That is, you can override one of the, of the, let me, one of the safety, one per time, not every one, only one per time you can override for some reason, instead you blow the water level through, so, but we have two water level trips, so you can override one. But, still you have water level trips.

MR. OLSON: Is that a good thing to have on the system?

MR. SATOW: I think we have no, we have no override for the safety things like flame scanner, and we have no override for the fuel pressure and we have no override, we have only override for the water level and I have to look --

MR. OLSON: There was quite a number, there is like six different items that could --

MR. SATOW: Yes, but, they are only, all by --

MR. OLSON: It is not all attached?

MR. SATOW: No, you see, for the four -- you have two faucet -- One you can override and there is another one that is working.

MR. OLSON: Okay.

MR. SATOW: You have two water level override, and one you can override and then you cannot override the fuel oil or the -- you can only one by the time.

MR. OLSON: One item. So, if I wanted to change that pressure switch on the fuel, on the main fuel, I might be able to switch it to that, work on it

and --
MR. SATOW: No, I don't, I am not sure at the moment. We cannot override the fuel oil.
MR. OLSON: Okay.
MR. SATOW: We are not sure.
MR. GIERING: You have to look downstairs, let's go down and we make --
MR. OLSON: Yes. In front of the boilers there is a plate that warns the operators in English, "beware of explosion and make sure you purge the boiler." It doesn't use the word "purge", some other word is used. Why would that plate be necessary if they are operating the boiler automatically and so on?
MR. SATOW: In Germany you have on each boiler this plate, never mind it is automatic purging or adjust to give the people that operate the boiler the idea that purging is important thing, so I would explain this.
MR. OLSON: Yes, maybe, maybe it is an old rule --
MR. SATOW: It is an old rule, also you have always box to extinguish some fire, that is from --
MR. OLSON: Yes, we still have those requirements for the sand in the engine room.
MR. SATOW: Yes.
MR. OLSON: How difficult is it to adjust the purge cycle? Is that something the electronics could do easily?
MR. GIERING: You cannot do that. You must change one resistor inside.
MR. OLSON: Capacitors resistor.
MR. GIERING: Yes.
MR. SATOW: Capacitors resistor.
MR. GIERING: And one electronic card and the card is in the engine control room. So there is no chance.
MR. OLSON: No chance.
MR. GIERING: And then we have two cards watching, for the ignition time you have two cards, two -- where you have seven seconds and then after seven seconds, everything.
MR. SATOW: Understand --
MR. GIERING: Igniting time.
MR. SATOW: Igniting time, he means the purging time.
MR. GIERING: The same.
MR. OLSON: Yes.
MR. SATOW: He has to go in the boiler, itself and change some of this cap --
MR. OLSON: Capacitors.
MR. SATOW: Capacitors, condenser -- German.
MR. OLSON: If they, if they were lighting off

the burners manually for, say their ignitor were not good, what other controls would you still have in the circuit? Would you still have all the protections that are --

MR. SATOW: Yes, sure. But, do you mean ignite manually, you --

MR. OLSON: Torch.

MR. SATOW: It is impossible.

MR. OLSON: Impossible.

MR. SATOW: You can only, you can only ignite if you have, the whole burner logic has to work, otherwise it is impossible and then you can go with electrical ignitor in and try by hitting the forth and back, that you can reach the, let me say the flame. But, after this ignition safety time is over, seven seconds, then the thing stops. If the flames cannot see, no flame in a certain time, seven seconds, everything will be stopped.

MR. OLSON: Are you aware of any of the crew doing and now this is really not a good question, because you wouldn't be aware, but, crew member is working on the cylinode valves, did you ever come on a ship and maybe not the Norway, but, any ships, that they have done adjustments to the pneumatic actuators or --

MR. SATOW: I don't know. If, if, if they are mostly spring operated, that they will be closed, I don't know really your question.

MR. OLSON: Okay.

MR. SATOW: You have pneumatic -- on the closing valves and the cylinode valves in the air side, vent the pneumatic air out.

MR. OLSON: Have you, I asked you about the --

MR. SATOW: If it is not a cylinode valve operated the complete valve.

MR. OLSON: Yes --

MR. SATOW: If they are piston, which would be operated by air.

MR. OLSON: Yes.

MR. SATOW: And the air went out by the cylinode valve.

MR. OLSON: Yes, I asked you earlier about the main valves, the valves that secure the fuel, have you ever had problems with the air cylinode valves that supply the air to the actuators? Often do you see?

MR. SATOW: It was this, this map on the air valve, the old ones, they was sometimes -- and then the logic, which is in this pneumatic cannot, it doesn't work if you have not the resistor pneumatically opened, the post fuel valve will be not go or other way, if the resistor fails for some reason, immediately, never mind about the electronic, the closing valve go also closed.

You cannot manipulate one or the other valves. So, if one of the air valve or this pneumatic valve doesn't work, you cannot handle this whole thing.

MR. OLSON: Okay.

MR. SATOW: It is a logic also in this pneumatic --

MR. OLSON: Okay.

MR. SATOW: A safety logic.

MR. OLSON: This fuel oil pressure sensor, whereabouts is that located? Is that on the boiler front somewhere or it is some other part of the engine room?

MR. SATOW: No, no, it is on the boiler, in this boiler of our design, there we have three pressure switches, one for the fuel oil, one for the scheme and one for the diesel oil.

MR. OLSON: Is it pressure closed? I am sorry, pressure closes the micro switch or is it open? Normally closed or normally open?

MR. SATOW: I don't know. Pressure open -- I don't know, really.

MR. OLSON: Yes. And have you ever seen those jumped out for any reason?

MR. SATOW: What do you mean jumped out?

MR. OLSON: Electrically.

MR. SATOW: You mean the jumper and override is --

MR. OLSON: Yes.

MR. SATOW: No, no, no. I show you the place where it is located. Nobody will go there and make something --

MR. OLSON: I have just for fun, I have seen engineers build a bypass around a cylinode.

MR. SATOW: Aw.

MR. OLSON: And so, they can be very inventive.

MR. SATOW: Yes. Okay.

MR. OLSON: That is it for me now. That is it. Thank you.

MR. SATOW: All right.

MS. MCATEE: I just have a couple of questions. What happens in system when you get -- Oh, this is Nancy McAtee, NTSB.

When you get a high fuel temperature alert, what happens in the system?

MR. SATOW: The alarm. Alarm.

MR. GIERING: Alarm.

MR. SATOW: Only alarm.

MS. MCATEE: Just the alarm. It doesn't shut anything down.

MR. SATOW: No. See in the beginning we are --

MR. GIERING: No, it wasn't --
MR. SATOW: There was some alarm switch, usually alarm trips which are normally are in what the commissioning this, as I remember, the owner doesn't want it. Different trips. I am not sure yet which trips it was, maybe the high temperature alarm.
MS. MCATEE: Okay. Inside the burner, itself, if you get a higher temperature fuel, how does that change how it burns?
MR. SATOW: Inside the burner, you cannot get a higher temperature.
MS. MCATEE: Okay. It doesn't it, it doesn't make it burn in a different way.
MR. SATOW: Yeah, but then you have, if you have the heater and the common fuel oil to each, to the burner, you have this high temperature and there is an old burner high temperature. But, then you can have, that is the phase in this fuel oil if the temperature is so high, but, you have the 10 bar fuel oil pressure, the four burner and to get the gas phase, high rise temperature of 200 to 250.
MS. MCATEE: Okay. So, 10 or 15 degrees isn't going to change that.
MR. SATOW: No, no.
MS. MCATEE: When you were, to change just a little, when you were talking about the cold start, where you introduced the --
MR. SATOW: Yes.
MS. MCATEE: During normal operation, is it possible to switch that valve, you talked about, when switching from diesel to the heavy fuel oil, is it possible to switch that valve during normal operation?
MR. SATOW: That is a manual valve. It is underneath, underneath from this burner right, where all the valves are in. If you opened it, there is an end switch, if you open this, immediately, if the end switch goes out from the closed position, you immediately the complete burner stops.
MS. MCATEE: So it shuts down.
MR. SATOW: Shuts everything.
MS. MCATEE: Okay. That is all I have.
MR. OELSCHLEGEL: Yes, I just have one question. I am Chris Oelschlegel, I am with the Coast Guard.
Back in 1979, when the system was installed and I just want to make sure I heard your correctly, you have been onboard for every classification survey, every two and a half years.
MR. SATOW: Yes.
MR. OELSCHLEGEL: As they test the automation.
MR. SATOW: Yes.
MR. OELSCHLEGEL: Okay. Okay. And do you go

by, I think you have probably already answered this, so, I don't mean to ask the same question, but, when you are going through their, do you go through their test procedure, the classification society's test procedure or do you go through your own test procedure? In other words, do you do what they tell you to test or do you --

MR. SATOW: Oh, I go through my test procedure.

MR. OELSCHLEGEL: You go through the whole thing.

MR. SATOW: This, this burner arrangement and the complete burner logic was, was a standard procedure from the Augilla Shipyard, I mention this name very often, developed by Exxon in the 70s. This, the Exxon has pulled at least, I think 10 or 30 tanker, crude oil tanker by Augilla Shipyard. And for this whole testing procedure and for the burner logic, they developed a test program. And this test program we follow since this time. It was in the Augilla Shipyard one accident, the boiler and according to this, they have changed the, the burner that, after the burner shut down, they blow out with steam the, the burner lens, so that no steam, no fuel oil is anymore in, but this whole logic was developed to Esso standards and this we have followed since, I can show you that, it starts with stupid things that are not possible, and then you do that and this we follow all the time. And also the whole, the arrangement was according to this logic.

MR. OELSCHLEGEL: That was all I have, thank you.

UNIDENTIFIED SPEAKER: I have just one question. It has kind of been touched already. When you are onboard, and you are servicing the system, that is why you are onboard. But, does the crew have the opportunity to work with you and learn or --

MR. SATOW: Yes.

UNIDENTIFIED SPEAKER: And of course, it just depends on who onboard at the time, because it is different people all the time.

MR. SATOW: Normal, from the beginning, it was our task to show the crew how it works and then also in the beginning after the complete plan was new, we have made some training courses in electronic and the pneumatic and everything. So, that was from the beginning also there.

UNIDENTIFIED SPEAKER: Okay. Thank you.

UNIDENTIFIED SPEAKER: I have no more questions.

MR. ROTH-ROFFY: Okay. Just a couple more.

What is your contractual arrangement between your company and NCL? When you are, when they have

some work for you, servicing work, who do they contract, Lloyd Werft or Siemens?

MR. GIERING: Each of us get the, if they are Siemens from the NCL, and I am from, also from NCL.

MR. ROTH-ROFFY: Okay. Is either Lloyd Werft or Siemens the lead contractor? I mean, does Siemens work for you or do you work for Siemens or do you both work for --

MR. GIERING: We work together.

MR. SATOW: I understand what you mean. We are in long time, we are together, I cannot say that I am the leader. He is better in the electronic and in the control, but if we adjust the combustion, I handle the boiler manually and he make that adjustment behind the thing, so, in this case, it is no any company leader. By the beginning, by the commissioning, the shipyard the leader and I am, I was this one which make the commissioning and the responsibility for everything and so on.

MR. ROTH-ROFFY: Could you describe your current employment? What other sorts of work you do? Are you currently employed by Lloyd Werft?

MR. SATOW: Yes.

MR. ROTH-ROFFY: On a full time basis?

MR. SATOW: Yes.

MR. ROTH-ROFFY: What other work do you do? Do you travel a lot or are you mostly work in the shipyard or --

MR. SATOW: It is a little bit, on the shipyard in the moment, I am employed for environmental, I am an environmental engineer on Lloyd Werft. But, in '80, I have made this vessel, the commissioning of the vessel and in '82, Lloyd Werft asked me to come over to get employment by, by Lloyd Werft, for do some services, whatever and since this time, I, at least I do, make studies on turbine ships for conversions, for automation, or something like this and I have also, still this Norway, only now in the last years or in the years before, I have done different things, not really services on ships like on the Norway. The Norway it is some kind, let me say baby or which I -- I am original marine engineer, I was many year at, years at sea on turbine ships and was testing and commissioning engineer -- shipyard, so, therefore, I do this on the Norway, too.

MR. ROTH-ROFFY: Okay. And you, sir, do you, do you work on other steam plants for Siemens?

MR. GIERING: Yes. Gas tanker. Now and in the last time, only gas tanker.

MR. ROTH-ROFFY: Can you give me an idea of how many similar type systems are on ships today, on steam vessels?

MR. GIERING: Today, I am in 10, nearly 10.
MR. ROTH-ROFFY: Ten and they are all about since 1980?
MR. GIERING: 1980 or we have in the, we have more than 150 before, tanker, container ship, gas tanker.
MR. SATOW: As I mentioned to you, Esso built at least 10 or 30 ships with oil burner management. It is the same logic and the same kind of controller.
MR. ROTH-ROFFY: Okay. And is this a particular trade name or number for this particular system? Does the overall design have designation number?
MR. SATOW: It has --
MR. GIERING: This system as we have on four station.
MR. SATOW: -- is the branch that --
MR. GIERING: Telepan System, Telepan C.
MR. ROTH-ROFFY: Telepan C.
MR. GIERING: Yes, that is the Siemens' name for this system.
MR. ROTH-ROFFY: And you say only about 10 ships currently are operating --
MR. GIERING: No, no.
MR. SATOW: They are left and all the steam ships are gone. All in the United States not any more much steam ships.
MR. ROTH-ROFFY: And how long have you been working on the Telepan C System?
MR. GIERING: We start in 1970, I mean, and then 15 years, we are working with the Telepan C and then we change on C Path controller, where we have no --
MR. ROTH-ROFFY: So, the C path is the successor to the Telepan?
MR. GIERING: Yes, yes.
MR. ROTH-ROFFY: When was that change over?
MR. GIERING: 1995, I mean, we changed to the C Path.
MR. ROTH-ROFFY: So, the Telepan was built from 1970.
MR. GIERING: Seventy, yes.
MR. ROTH-ROFFY: Do you normally, are you the one that works on the other 10 ships as well as the Norway or there other Siemens engineers that --
MR. GIERING: No, I am the last one.
MR. ROTH-ROFFY: Have any other ships built with the Telepans control system experienced boiler explosions in the last 30 years?

MR. GIERING: No. I cannot, I have no -- No, I have no --

MR. SATOW: In Germany there was a boiler accident made in the Long Shipyard. There was a mistake and at this time the rules in Germany were very strictly, it was not allowed to override photocells or override cylinode valves, whatever. And that is strict was in, in Germany, according to this, it was not allowed for shipyards to build something like that. I mean, can override something.

MR. GIERING: This explosion occurred 27, yeah, people.

MR. SATOW: That was a real explosion, they start, the test, the safety markers and override the photocells and burn the boiler with diesel oil. So, the diesel oil fails, and then they start again without purging all the oil, and it comes again and then it explodes the whole boiler. Killed 29 people.

MR. ROTH-ROFFY: And what year was that?

MR. SATOW: Seventy-six. But, it was not Siemens boiler controller and not burner management. I just mentioned that at this time there was --

MR. GIERING: I was assigned by my company when I see the override on the safety line, I must go.

MR. OLSON: You must call the company?

MR. GIERING: No.

MR. SATOW: We have to go to the vessel.

MR. OLSON: I am sorry, I don't understand.

MR. GIERING: When I see everything from the safety line was override, then I must go directly.

MR. SATOW: Leave the vessel.

MR. OLSON: But, how about to correct the problem that is causing them to override?

MR. SATOW: If you see a vessel which runs with override on the, let me say, flame scanner, he leaves the vessel and then he says or he stopped the boiler and say, okay, we, we correct them, but, which, follow when some guy comes and says stop the boiler.

MR. GIERING: We have many nationality. We have Greek people or other people, then he must -- the ship.

MR. SATOW: That has never happened.

MR. OLSON: So, the only time you, theoretically, the only time stay when you see that override switch being used is when the boiler is off.

MR. SATOW: Which override?

MR. OLSON: The safety line.

MR. SATOW: Here?

MR. OLSON: No, not here, anywhere.

MR. SATOW: You have not normally a switch to override the flame scanner or so.

MR. OLSON: Okay.

MR. SATOW: It is not allowed in Germany at least.

UNIDENTIFIED SPEAKER: Okay.
MR. ROTH-ROFFY: And that was Ken Olsen who interjected himself there.
MR. OLSON: Pardon me.
MR. ROTH-ROFFY: Okay. Sir, just a couple more questions.
We are going to meet with you later on and go through the control system and maybe look at some of the drawings and we hope that you will be able to assist us in understanding how the system works.
Also I believe probably, has NCL contracted with you to test the boiler control systems to determine possibly if there was a malfunction there? Why are you here now?
MR. GIERING: Now?
MR. ROTH-ROFFY: Yes.
MR. GIERING: Yes, we made assessment, yeah, how to bring the boiler back in service, in order to bring the plan back in service. That was --
MR. ROTH-ROFFY: Okay.
MR. GIERING: -- the company, maybe to see how we can bring it back or --
MR. ROTH-ROFFY: Okay. Are you going to be testing the system to see what possibly may have gone wrong with it?
MR. SATOW: On this broken boiler?
MR. ROTH-ROFFY: Yes.
MR. SATOW: But, let me say if, if, if we should start the plan again, then I will recommend to test this procedure, the whole thing as I mentioned to you and the same procedure, everything. But, the broken or the destroyed boiler, there we can only check what is may in the safety, was on, and so, but, I have made a roughly looked to that to date and all the quick closing valves are closed. They are all in the end switches. Only the manual valves are open. But, the end switches -- was all closed, all closed.
MR. ROTH-ROFFY: Okay. Were all the manual valves open?
MR. SATOW: Yes, they are open.
MR. ROTH-ROFFY: All five of them?
MR. SATOW: Nobody was any more there to close them.
MR. ROTH-ROFFY: All five manual valves were open?
MR. SATOW: Yeah, only the, yeah, all was open, I mean, as I looked downstairs.
MR. ROTH-ROFFY: Okay. Any other observations that you saw regarding the controls, their current position?
MR. SATOW: No, no, too short of time.
MR. ROTH-ROFFY: Okay. We are going to, you

know, want to work very closely with you in testing this system, to try to see if there is a problem with the safety systems. And --

MR. SATOW: When we can go in there.

MR. ROTH-ROFFY: Right.

MR. SATOW: I would like to stay there --

MR. ROTH-ROFFY: So, later after this interview, we would like to meet with you and discuss how we are going to proceed with doing further testing.

MR. SATOW: It is a little bit up to the owner, what they want.

MR. CMAR: Steve Cmar, NCL. Maybe that is something we can talk about when we have the meeting tonight.

MR. ROTH-ROFFY: Okay. Anybody have any other questions? Ken?

MR. OLSON: Yes, I do.

MR. ROTH-ROFFY: I am sorry, Brian Curtis, first.

MR. CURTIS: Brian Curtis. Just a question regarding the recording of the data. The printer failed and so --

MR. GIERING: I mean, they have ordered a new one.

MR. CURTIS: Yes. The system has no ability to archive and save those alarms?

MR. GIERING: We can only make three or four pages on the screen -- And when you have more alarms you have a blackout, plenty alarms coming, then you lose first alarms.

MR. SATOW: So, on the screen it is only the last alarms on, how many?

MR. GIERING: Four pages.

MR. SATOW: Four pages and the other pages goes out.

MR. CURTIS: So, there is no extended memory.

MR. SATOW: No, no.

MR. GIERING: No.

MR. CURTIS: So without a printer, there is no way to get those archived data --

MR. SATOW: No.

MR. CURTIS: And this computer, the system has no uninterrupted power supply to back it up.

MR. GIERING: No. The -- construct in Germany and he say, when he have, after the four pages, we have no, it is finished. For this you have, normally you have the printer, and when the printer if blocked inside.

MR. SATOW: You called to Germany today or --

MR. GIERING: No, yesterday.

MR. SATOW: Yesterday and asked this question also, but to sign off this system he told him that it

is not possible.
MR. CURTIS: What is the power source for that recording system? Do you know the vessel's power source, emergency?
MR. GIERING: I mean, 24 volt.
MR. CURTIS: Twenty four volt. Okay. That is all I have.
MR. ROTH-ROFFY: Let me just follow up, Ken. This is Tom Roth-Roffy.
Have you examined those four pages of alarms and, and are they available now, the last four pages?
MR. SATOW: It was all gone, we start today with the alarm system, and --
MR. GIERING: Nothing.
MR. SATOW: And there was nothing on.
MR. ROTH-ROFFY: No alarms at all?
MR. SATOW: No, no, nothing. There is nothing, no.
MR. ROTH-ROFFY: Not, not, zero, nothing.
MR. SATOW: Yeah, not stored something.
MR. ROTH-ROFFY: Right.
MR. SATOW: The alarms now you can see the screen again, but, not the stored alarms.
MR. ROTH-ROFFY: Okay. So we can see the screen with the alarms.
MR. GIERING: Yes.
MR. SATOW: Yes.
MR. ROTH-ROFFY: Okay. What is the oldest alarm on the screen?
MR. GIERING: I don't know, I don't know.
MR. ROTH-ROFFY: Okay. Maybe we can look at that to see how, how old the alarms are.
Ken Olson.
MR. OLSON: You guys have been in the boiler industry, shipping industry, steam plant for a long time, obviously. So, obviously you are experts in your industry and so on. With that knowledge, what do you think could cause a causality like that this?
MR. GIERING: I cannot answer this question.
MR. OLSON: You have no, no idea. All right.
MR. SATOW: It is, theoretically, it was, I was with Mr. Giering very shortly downstairs, so --
MR. OLSON: How about on, like on another ship, furnace explosions, what could cause that?
MR. GIERING: Furnace explosion can cause, normally by if they start a combustion, not enough air or something like this or I have some fuel, remaining fuel oil and start hot air on it or something like this and then I get, if I have not correct purge. But, that looks not so.
MR. OLSON: If I had a furnace burning, we talked about another ship, but if I had burners burning

and I had one bad burner go a flame out.
MR. GIERING: Yes.
MR. OLSON: Of just dribble oil, maybe a bad tip on the burner.
MR. GIERING: Yes.
MR. OLSON: And that oil entered the boiler, would that oil burn, or would it gather?
MR. GIERING: That will only burn uncontrolled on the bottom, maybe. Mostly not, but if you have stabilized fire in the furnace, it will not get an explosion by dripping in some oil or something like that.
MR. OLSON: It would burn but maybe burn dirty, burn with a lot of smoke, maybe in the periscope.
MR. SATOW: Then you have smoke indicator.
MR. GIERING: Then you have smoke and see the smoke and you will do something that you can see on the screen on the control room smoke and also they have to watch, especially in the United States, that they have no black smoke.
MR. OLSON: Yes.
MR. GIERING: I think that was really not, not possible. And although the -- has since, the beginning on so many, so plus air, it will not smoke for this reason.
MR. OLSON: Even if you had a bad burner.
MR. GIERING: Even if you had a bad burner. That I am sure.
MR. OLSON: Okay. You already answered. On other ships that might have had a furnace explosion, you already described that. Okay.
I know you --
MR. SATOW: But, if you have a furnace explosion then the furnace must be destroyed.
MR. OLSON: Yes.
MR. SATOW: And at the moment I could not see that the furnace was destroyed.
MR. OLSON: Okay.
MR. SATOW: On this boiler.
MR. OLSON: Did these boilers, the air box is only in the front of the boiler, right?
MR. SATOW: No, it is complete around.
MR. OLSON: Completely around.
MR. SATOW: It is double, the boiler sign is double the --
MR. OLSON: Double casing?
MR. SATOW: Double casing was here around the boiler.
MR. OLSON: Does that include the top and the sides and the back?
MR. SATOW: The top is open for smoke gas. It

is closed, the casing, the other casing for the air is closed by the economizer -- We can look in the drawings.

MR. OLSON: Okay.

MR. SATOW: You can easily see that.

MR. OLSON: But, the side wall might not be air cooled.

MR. SATOW: Sure.

MR. OLSON: Oh, it could be.

MR. SATOW: Everything --

MR. OLSON: Yes. The back wall?

MR. SATOW: Also. You were always down?

MR. OLSON: Yes.

MR. SATOW: You can see the back wall is --

MR. OLSON: Yes. But --

MR. SATOW: The furnace is still inside, okay.

MR. OLSON: Okay. If there was a furnace explosion in the boiler, what could we expect to see in terms of damage within the furnace?

MR. SATOW: At least that these tubes, the walls, the tubes, this -- would be in the tubes -- And the tubes are bent.

MR. OLSON: Bent.

MR. SATOW: Outside.

MR. OLSON: Outward.

MR. SATOW: Yes. I saw this membrane boiler, there is an explosion, the tubes, the membrane was like a drum.

MR. OLSON: Swollen like.

MR. SATOW: Yes.

MR. OLSON: What other things could we look for to determine if it was a furnace explosion?

MR. SATOW: I do not understand.

MR. OLSON: Okay. Forget that.

If it was an explosion in the, in the outer casing and then air, what do we call it?

MR. SATOW: In box, air --

MR. OLSON: Yes, what could be things that we could look for to verify that?

MR. SATOW: That is difficult. Maybe some, some extra stuff in there, maybe fuel oil.

MR. OLSON: Could we assume that we would naturally see fuel somewhere below the burners when looking in and it is down, you know, in the --

MR. SATOW: In the in box, you mean?

MR. OLSON: Yes.

MR. SATOW: The leakage is there, you should see that.

MR. OLSON: Would we find fuel in the back of the boiler? Could fuel get to the back of the boiler?

MR. SATOW: Normally not, no. No, in the back, no.

MR. OLSON: Okay.
MR. SATOW: Only underneath the burners.
MR. OLSON: Okay. So, that is where we should expect to find fuel if it was --
MR. SATOW: Something like that, yes.
MR. OLSON: Okay. This, is it right for me to think that the item that you need to talk to NCL about, that you didn't want to discuss, is that, is it right for me to think that that could have possibly been some unsafe operating practice?
MR. SATOW: No, personally, I will not, I am sorry, I have to speak with NCL first.
MR. OLSON: Okay. All right. Okay. That is okay, thank you.
MR. ROTH-ROFFY: Okay. I think that is about all the questions we have for right now. Later on, as we, you know, meet you on the ship, we would like to go through some of these drawings with you and discuss with you how we might go about testing the systems to see if there is a problem.
We are all interested in finding out what happened and we appreciate your help in determining, if we can, the cause of this accident.
Thank you very much, sir.
MR. SATOW: Thank you.
MR. GIERING: Thank you.
MR. ROTH-ROFFY: The time is 17:10.
MR. SATOW: Thank you.
(Whereupon, at 5:10 p.m., the interview was concluded.)