UNITED STATES OF AMERICA
NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF MARINE SAFETY

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

INVESTIGATIVE INTERVIEW OF:
PER SOPP, FIELD SERVICE MANAGER
Caterpillar Diesel

~~Friday~~Thursday, June ~~6~~12, 2003

In Attendance:

TOM ROTH-ROFFY, NTSB
BRIAN CURTIS, NTSB
MICHEL LAMBERT, BUREAU OF VERITAS
TERRY STEINFORD,USCG
KEN OLSEN, USCG
JOHN RILEY, NCL CONSULTANT
KEVIN HISLOP, BAHAMAS AUTHORITY
CHRIS OELSCHLEGEL, USCG

P R O C E E D I N G S

MR. ROTH-ROFFY: The National Transportation Safety Board is a Federal Government agency charged with investigating transportation accidents in the United States. We -- we do all modes of transportation, aviation, railroad, highway, marine, pipeline.

Anyway, I'm an employee of the Office of Marine Safety in Washington, D.C., and we're here to investigate the accident that occurred aboard the SS Norway on May 25th, 2003, and the reason we've asked you to come by is because we think you might have some information that might assist us in our investigation.

Our investigation is a safety investigation, not a legal investigation. The function of our -- the purpose of our investigation is to determine the cause of the accident, if we can, and then to make recommendations to agencies or persons or companies aimed at preventing similar future accidents.

Once again, our -- our investigation is strictly a safety investigation, not a legal investigation. We have no interest in assigning blame, liabilities, or rights of any person or party or agency or company.

So, with that, I'd like each person in the room to please introduce themselves to you so we'll know who's here.

MR. CURTIS: Brian Curtis with the NTSB, Engineering Accident Investigator.

MR. LAMBERT: Michel Lambert from Bureau Veritas.

MR. STEINFORD: Terry Steinford, Coast Guard, Marine Safety Office, Miami.

MR. OLSEN: Ken Olsen, Coast Guard Headquarters.

MR. OELSCHLEGEL: Chris Oelschlegel, Coast Guard Headquarters.

MR. HISLOP: Kevin Hislop, representing the Bahamas Maritime Authority.

MR. RILEY: John Riley, independent surveyor for NCL.

MR. ROTH-ROFFY: Okay. Mr. Sopp, during the interview, if at any time you need to take a break for whatever reason, just let me know and we'll -- we'll, you know, stop and take, you know, a break.

MR. SOPP: Okay.

MR. ROTH-ROFFY: So, let me begin by just asking you your -- your background, where -- you know, where you became involved in the -- in the marine

industry and -- and if you would, just kind of lay out your career for us, you know, who you worked for, in what capacity, and what sort of jobs you've held.

MR. SOPP: I started sailing at sea back in 1959. Training school, on sailing trips, and then sailed on marine ships, took my engineering, second engineering and first engineering degree, and sailed with many companies. I started with Chevron Oil back in '71 and I stayed with them for almost -- well, 11 years, close to. During that time I was there, I was doing engineering in new building construction, supervising, sailing as an engineer, and then I quit there back in 1981, and then I came to NCL, started from the SS Norway as first engineer, steam, because I had long steam experience, and then sailed on the Norway for close to a year, started as a support engineer with NCL in July 1982 and then stayed with them until August 1999. That's basically the -- I was a port engineer for the whole time, these 18 years, I was there, except for the one first year where I was sailing.

MR. ROTH-ROFFY: I'm sorry. I missed the company that you started sailing with and that was in 1971. You started with who?

MR. SOPP: Chevron Oil Company.

MR. ROTH-ROFFY: Okay.

MR. SOPP: And I did -- I worked for Chevron Oil for close to 10 -- between 10 and 11 years, and during that time, did everything from sailing to supervising of new building construction.

MR. ROTH-ROFFY: Okay.

MR. SOPP: Living in Japan part of the time.

MR. ROTH-ROFFY: And during those 10 or 11 years with Chevron, you sailed on -- principally on steam ships?

MR. SOPP: Tankers. No, not all steam. We have some motor ships as well. But I would say 90 percent of the time on steam ships.

MR. ROTH-ROFFY: Okay. And since leaving NCL in August of '99, could you describe your --

MR. SOPP: I started to work with Caterpillar as a service engineer for repair of diesel engines, marine and pumping stations, and I'm basically getting all the claims from the customers and taking care of the claims and sending out people to do repair and surveys and whatever they need to do. We cover in Canada, North America, and South America.

MR. ROTH-ROFFY: And is that your current position?

MR. SOPP: That's my current position.
MR. ROTH-ROFFY: Okay. During your time with Norwegian Cruise Lines, you say you started in July '82 --
MR. SOPP: Hm-hmm.
MR. ROTH-ROFFY: -- till '99, were you the -- the primary port engineer on the -- on the Norway?
MR. SOPP: Yeah. I was the only port engineer on the Norway for that time. I had people above me, but that was one of my primary jobs. I had other ships as well to take care of, but that was one of them.
MR. ROTH-ROFFY: Could you name those other ships?
MR. SOPP: Oh, I did Summerbird. I did the Starbird. I did the Skybird. I did Norwegian Majesty, Norwegian Crown. Might have been more, but I -- that's what I recall at the moment.
MR. ROTH-ROFFY: And -- but the Norway was your -- your primary --
MR. SOPP: Yeah.
MR. ROTH-ROFFY: -- ship?
MR. SOPP: That was -- took most of my time. Yeah.
MR. ROTH-ROFFY: Okay. And could you describe your duties as a port engineer with -- with NCL on -- on the Norway? What --
MR. SOPP: Well, my duty on the Norway was everything from propulsion to carpets, I guess, and I had to help them out with any problems they had, write the specification for drydocking, day-to-day problems, whatever came up, I was the one that they talked to. Ship was going here to Miami, so I was on board every Saturday or Sunday, all these trips.
MR. ROTH-ROFFY: Okay.
MR. SOPP: And there wasn't many that I was not there.
MR. ROTH-ROFFY: And during that time, did you have any assistants to assist you with the work that you were doing on Norway?
MR. SOPP: Not really that I can recall. I had -- I had -- at the beginning, we had senior vice president that just took care of the Norway, but he was my immediate boss. He's dead now, but he was there from '81 until '86, maybe.
MR. ROTH-ROFFY: What was his name?
MR. SOPP: His name was Leif Borresen. He was a civil engineer on Norwegian. Worked for the Underwriters for some years before he came to Norwegian

Cruise Lines.
MR. ROTH-ROFFY: And after Mr. Leif Borresen, who was your supervisor?
MR. SOPP: After that, it was Kam Trollerud. K-A-M. You probably know the spelling. T-R-O-L-L-E-R-U-D, Trollerud. And he was my immediate supervisor all the way until I was fired.
MR. ROTH-ROFFY: And what was Kam Trollerud --
MR. SOPP: Trollerud.
MR. ROTH-ROFFY: Trollerud.
MR. SOPP: Yeah. His position was superintendent. That was -- he was above all the -- all the port engineers. There was like three other port engineers.
MR. ROTH-ROFFY: Do you recall what his title of his job was?
THE WITNESS: Superintendent.
MR. ROTH-ROFFY: Superintendent.
MR. SOPP: And his immediate supervisor was Mr. Sven Dahl, senior vice president for the operations, ship operations.
MR. ROTH-ROFFY: Could you spell that last name? Sven?
MR. SOPP: Dahl, D-H- -- D-A-H-L.
MR. ROTH-ROFFY: Okay. And you were -- your title was port engineer or superintendent?
MR. SOPP: Port engineer.
MR. ROTH-ROFFY: The title superintendent, is that --
MR. SOPP: Well, they changed it later afterwards, but it's --
MR. ROTH-ROFFY: Okay.
MR. SOPP: It was just -- just titles. It was -- it was like four -- four port engineers and then there was one superintendent.
MR. ROTH-ROFFY: And was there a VP of Technical Operations at that time?
MR. SOPP: Well, Mr. Dahl, he was VP both of Technical and -- and Maritime and whatever else.
MR. ROTH-ROFFY: Okay.
MR. SOPP: Yeah.
MR. ROTH-ROFFY: Okay. I think we've got probably enough on your background.
Anybody have any -- want any clarifications on anything that's been mentioned?
(No response)
MR. ROTH-ROFFY: Okay. I guess now what I'd like to ask you about is -- is your experience with the

boilers, you know, from the time you started, you know, the sorts of things you've done on the boilers and observations and concerns. It's kind of an open-ended question, but if you could.

MR. SOPP: Because it started all the way from the major black-outs. They had -- before I came, just before I came, they had a major black-out and they -- they had pumps into the boiler and operated a descaling agent into the boilers and that's extremely not good, I can tell you, and suddenly all the pipes on one boiler were just like -- it was leaking all over, and this acid is very, very destructive to steel, mainly come from the high temperature, high pressure. That was one -- one of the things which we had to redo that boiler. That was Number 24.

And then, in '82, we had the massive fire in the forward engine room, and we went in drydock for three months, and during that time, we retubed three boilers. It was probably 23, 21, 22 and 23, I believe it was. I can't really recall now, but I believe it was.

MR. ROTH-ROFFY: You believe it was which? Say those numbers again.

MR. SOPP: 21, 22 and 23. I think those were the ones that was retubed in '82.

Many retubing, that means the gauges, the walls, not the superheaters, and normally not the covers or any of the -- you know, the major structural pipes were changed ever, and then --

MR. ROTH-ROFFY: Could you back up? You say there was a fire in '82 in the --

MR. SOPP: Yeah. Major fire.

MR. ROTH-ROFFY: -- forward engine room. Did that cause the -- was that the reason for the retubing?

MR. SOPP: No, no, no.

MR. ROTH-ROFFY: The retubing was --

MR. SOPP: But then -- then we had to go to drydock, --

MR. ROTH-ROFFY: Okay.

MR. SOPP: -- and they were going to stay there for three months, and the boilers, you know, they've been in lay-up for seven-eight years before. This was the first drydock after they took the ship over, you know. So, there was a lot of things, that the boilers were not in good condition. The tubes had lots of leaks and lots of stuff happening.

I had just come in there, so I didn't really know, I don't know who took the decision or whatever that we should retube these boilers, and it was done,

and, you know, it was put back in service after all the regulatory tests and whatever, and we installed the diesel engines at the time because the ship did not have back-up diesel engines. So, you couldn't -- if you had a black-out, you could not start that ship up hardly.

MR. ROTH-ROFFY: Where was that work done? Did you say Bremer?

MR. SOPP: Bremer.

MR. ROTH-ROFFY: Okay.

MR. SOPP: Yes. But they installed them, the diesel engines, and then -- then went back in service. We had very, very few problems for quite a few years. There was then -- I don't remember -- a study done on the boilers, and the study was done by Dutche Babcock, I believe, because using a lot of the drydock people, now there was cracks, microcracks in the drums and they were grinding, and then there was a study being done on these microcracks and what caused the microcracks and all of this.

Then there is a report about that, NCL and on the ship about it, these things, and this report tells you basically that all this, lighting up the boiler and setting them down, it's very destructive to the material. The welding procedure back in '61, I assume they had problems because the -- next to -- next to the valve in the drums, you had an area where you get all these microcracks, and these microcracks, you could grind them away but they would emerge again after some time, if -- if -- especially if you were lighting up, taking up pressure past, you know, doing this, lighting up, you know.

On a time table, you probably shut down the boiler once a year. Here, you do it every year -- every week, maybe twice a week. It's very, very bad for the boiler. That's why at one point, I don't remember now when, one of the drums were welded, but that was on 21 boiler.

MR. ROTH-ROFFY: That was on 21?

MR. SOPP: Yes.

MR. ROTH-ROFFY: Do you recall --

MR. SOPP: I can't remember if it was -- I have a very strong feeling it was the one that went. That is my -- that it was the -- the one.

MR. ROTH-ROFFY: Well, it was 23 that went.

MR. SOPP: I mean 23, yeah.

MR. ROTH-ROFFY: So, you seem to recall 23 was welded?

MR. SOPP: 23, yes, yes, and I think that the

welding was done and they have it, but I'm not 100 percent sure because this is so many years ago.

MR. ROTH-ROFFY: You don't recall where the welding was done?

MR. SOPP: The welding was done by Dutche Babcock, I believe, and it was done at sea, actually.

MR. ROTH-ROFFY: Done at sea?

MR. SOPP: Yeah. But BV were present and -- and they -- they have the procedure correctly with -- with the kneeling and the whole thing. But I -- I don't -- I'm not 100 percent sure when. In that report, it should be somewhere. You should see that.

MR. ROTH-ROFFY: And the year? The approximate year? Can you even --

MR. SOPP: I'm saying '87 or something like that.

MR. ROTH-ROFFY: '87?

MR. SOPP: I'm not 100 percent.

MR. ROTH-ROFFY: Sure.

MR. SOPP: And then the following year, we did inspections, random inspections in the drum to see if there was more cracking. Most of the boilers, there was no really any cracks we could see. There was -- the last inspection I was attending on this was we had drydocking in Southampton in 1996, I believe. I think so.

MR. ROTH-ROFFY: You said that's the last time you attended a survey of the boilers?

MR. SOPP: No, no. That was when we had the -- the crack inspection and the specialists in there to do crack inspections.

MR. ROTH-ROFFY: That was the last time that you know that --

MR. SOPP: Yeah.

MR. ROTH-ROFFY: -- cracks were --

MR. SOPP: Yeah. That was done in the crack inspection on it.

MR. ROTH-ROFFY: And what was found at that time?

MR. SOPP: I can't really remember it. But it should be in BV's papers, I'm quite sure. There was -- no. There was -- I know there was not enough that we would do anything with it. So, it was nothing -- it hadn't gone any further really. So, because in going further, the class would have come and said no, we have to do something with it.

MR. ROTH-ROFFY: And you said that was done in Southampton?

MR. SOPP: I think it was Southampton in '96.

MR. ROTH-ROFFY: And do you recall the company that did the survey or -- by chance?
MR. SOPP: No, I can't. I -- I think it was actually done by -- by BV itself. They were in checking. That's what I recall.
MR. ROTH-ROFFY: And was there a report written?
MR. SOPP: Yes, I think there was a report written.
MR. ROTH-ROFFY: I'd like -- I'm sorry. Go ahead.
MR. SOPP: Okay. Maybe you want to continue on that line a little bit because I was going further the next --
MR. ROTH-ROFFY: Yeah. Actually, I -- I'd actually like to back up --
MR. SOPP: Yeah.
MR. ROTH-ROFFY: -- even a little bit more. So, you mentioned there was a report that had been written -- a report or a study and you -- you say it was done by Lord Werft?
MR. SOPP: No. I think it was Dutche Babcock.
MR. ROTH-ROFFY: Dutche Babcock.
MR. SOPP: Yeah. I'm -- I'm not 100 percent, but I think it was Dutche Babcock that did the report because they did the crack analysis and they went through and wrote the report.
MR. ROTH-ROFFY: Okay. Actually, I'm referring to the one that you said during the drydock, you found lots of microcracks and then a study was done that said lighting off and shutting down was -- was destructive to the boilers. That report was written by Dutche Babcock?
MR. SOPP: I believe it was Dutche Babcock. I -- Lloyd Werft were the people. I think they came from Dutche Babcock.
MR. ROTH-ROFFY: Okay. And do you recall about what time that -- that report or study was done?
MR. SOPP: '86-87. Some time like that. Maybe it was before because I have a feeling Mr. Borresen was still involved in it and he was -- he left in '86, I think. So, maybe it was in '86, and then it was all the way -- this report, it was stressed running up and running down, especially running up of the -- of the turbines. They had to be done very, very carefully to -- to take care of the big variation in pressures and the load of the boiler.
MR. ROTH-ROFFY: Okay. So, was the operating

procedure for the boilers modified as a result of the -- of the report findings?
MR. SOPP: Yes, there was a modified.
MR. ROTH-ROFFY: And --
MR. SOPP: Not really modified, everybody was told that there is a problem in it. You have to be careful when you're maneuvering. You cannot say to the captains they cannot maneuver because then they -- they -- they were told that this had to be done very carefully.
MR. ROTH-ROFFY: Could you get into more details about what they were told that they had to do carefully?
MR. SOPP: They -- they were told that -- that the maneuvering had to be not -- you couldn't take it from -- from -- and try to do that because it will -- you would have tremendous -- and you know, you have -- you have minimum flow of the boiler for a fixed time at 900 liters or kilos, I don't know what -- in two-three minutes, it does not release it all. That's very bad. That's very stressful for the boilers.
MR. ROTH-ROFFY: And were they given guidance regarding starting and stopping in the boilers?
MR. SOPP: Oh, yes, yes. Everybody know that has to be done, but in many instances, I know that they lost a boiler for some reason, they had a leak or whatever, and they lost a boiler, and they -- they had light up the boiler and they took it up too fast and it just -- you know, these boilers, the big boilers, you need, I would say, eight hours. Usually they were kept warm, I mean, hand warm, but, you know, to take them up in four hours, I think that's too fast, and I know in certain instances, it was too fast.
MR. ROTH-ROFFY: And so, what was the company's guidance to the crew in terms of lighting off and shutting down? Did you give them specific recommendations on --
MR. SOPP: No.
MR. ROTH-ROFFY: -- time?
MR. SOPP: Nothing specific, except for the -- for the -- this study was given to everybody to see. There was nothing specific from -- from the shoreside management or not as far as I can recall were we given anything written specifically, except that it was told that this is not very good. You are limiting the life of the boilers by doing these things too fast.
MR. ROTH-ROFFY: At that time, can you tell us who your supervisors were when -- when the study was made?

MR. SOPP: When the study was made, that was Mr. Borresen, because he was the one that got the study made.
MR. ROTH-ROFFY: And could you spell that last name again?
MR. SOPP: B-O-R-R-E-S-E-N. And he passed away a couple of years ago.
MR. ROTH-ROFFY: He's deceased. Okay. Do you know if there's anybody else that was -- had been involved in reviewing that study and evaluating the findings?
MR. SOPP: Well, the chiefs on the ship was involved, and I was also involved in it, and I cannot recall. It's really a little bit too long. I have to go back and look in papers. I don't have these papers anymore.
MR. ROTH-ROFFY: Do you recall who the chiefs were at that time?
MR. SOPP: Yeah. Mr. Fossen, F-O-S-S-E-N. He is retired for 12-13 years now.
MR. ROTH-ROFFY: Anybody -- the other chief engineer? Do you recall his name?
MR. SOPP: At the time, I wonder if Gringstad was there. Gringstad. He was there, that's for sure, but I -- I don't know if he was the chief or assistant chief.
MR. ROTH-ROFFY: Okay.
MR. SOPP: And Mr. Hammerdold.
MR. ROTH-ROFFY: Could you spell that name?
MR. SOPP: H-A- -- H-A-M-M-E-R-D-O-L-D. Hammerdold. He's chief on one of the other NCL ships at the moment, the Norwegian Sky. He knew very well about these studies because he used them, and he was very good at looking after them.
MR. ROTH-ROFFY: All right. You said after this study, during the following years, you did random inspections.
MR. SOPP: Hm-hmm.
MR. ROTH-ROFFY: Now, was it -- was it really random or did you have some kind of a sequence that you --
MR. SOPP: Every time we went, we had -- usually there's drydock, Lloyd Werft came with the people that did the study for us, and they inspected the boilers for us.
MR. ROTH-ROFFY: So, every time you're in drydock, you did -- how many boilers would you inspect? All of them or one of them or --
MR. SOPP: Well, no. Usually we do a couple

of them, and if we found out if there were cracks -- there were grindings on most of the drums, I believe, and they could be grinding off a certain number, and then after that, we could not find any more. Then you have to go in and do welding. There was a minimum thickness and that's a calculation you have to do according to the ship.

MR. ROTH-ROFFY: So, as a result of some of those inspections, you -- some of the cracks were welded initially. Then afterwards, you started welding or --

MR. SOPP: Well, only on one boiler and that was Number 23.

MR. ROTH-ROFFY: That's the only one you're aware of that --

MR. SOPP: Yeah.

MR. ROTH-ROFFY: -- the cracks had been welded?

MR. SOPP: Yeah. There might have been more, but I -- I'm -- I don't recall any more than one.

MR. ROTH-ROFFY: You say that was around '87?

MR. SOPP: Yeah. In that area down there.

MR. ROTH-ROFFY: Do you recall any welding on -- on any of the boiler drums in the '90s? In the 1990s?

MR. SOPP: No, no, no.

MR. ROTH-ROFFY: And you said the last time that an inspection was done was in around '96.

MR. SOPP: Hm-hmm.

MR. ROTH-ROFFY: Subsequent to '96, there were no more inspections of the -- of the boilers in that way?

MR. SOPP: Well, I was in one more drydock, and then we did the retubes to two boilers and that was the same, Number 23 boiler, and 22 was done, too, which meant screen tubes and walls and we probably did some economizers as well, I believe so.

MR. ROTH-ROFFY:

MR. ROTH-ROFFY: And --

MR. SOPP: But I don't recall we did any inspections of our drums at this drydock. I don't think so. That was '99.

MR. ROTH-ROFFY: Were the floor tubes -- were they addressed? Did these boilers have floor tubes?

MR. SOPP: Yeah.

MR. ROTH-ROFFY: Right. Were those retubed at that time?

MR. SOPP: All the way -- all the way down to the headers.

MR. ROTH-ROFFY: Now, you say you don't believe you did any inspections at that time. Was it -- had you changed your policy? Because you say you're doing --

MR. SOPP: I don't really -- I don't recall it. The policy was not -- not changed, and then we was always involved in this thing. So, they -- they also -- BV said to inspect more cracks and more cracks.

MR. ROTH-ROFFY: You're saying BV would require that you inspect --

MR. SOPP: Yes, right.

MR. ROTH-ROFFY: -- the boilers? And did you only inspect it when BV told you to do it?

MR. SOPP: No, no. We did more than that because in the beginning, BV didn't ask us for nothing. We started the whole thing.

MR. ROTH-ROFFY: And so, subsequently, BV put -- put additional requirements on you?

MR. SOPP: Yeah. Because they saw what -- what the results were, and after we had done this microcrack inspection, you know, which were very through -- it was because this was things we couldn't see with the naked eye and you have to use special instruments to find these things. You couldn't see anything.

MR. ROTH-ROFFY: You --

MR. SOPP: Around the weld itself, it was about so much on the side of the weld.

PARTICIPANT: Could you restate that, please? Was it on the weld?

MR. SOPP: It wasn't on the weld itself. It was about half an inch outside the weld.

MR. ROTH-ROFFY: So, the repair procedure was to grind that out and then apply another weld?

MR. SOPP: Yes, yes. Well, it was grind out a certain and it came to the minimum, then you had to do the weld on it.

MR. ROTH-ROFFY: I see. So, --

MR. SOPP: So, this procedure of the weld, it took about two weeks to -- to grind it and kneel it and weld it up and then kneel it again.

MR. ROTH-ROFFY: So, you say in '96 is the last time you recall that such inspections were done on any boilers, is that correct?

MR. SOPP: Yeah. That's -- that's the point in time, yes.

MR. ROTH-ROFFY: And -- and the findings in '96 were such that you --

MR. SOPP: There was nothing that we felt was

urgently requiring anything at the moment.
MR. ROTH-ROFFY: Was it decided -- decided at that time to discontinue the --
MR. SOPP: No.
MR. ROTH-ROFFY: -- periodic --
MR. SOPP: No. That had never been decided to discontinue anything.
MR. ROTH-ROFFY: I'm sorry. I didn't --
MR. SOPP: It was never -- they -- we never decided to discontinue any inspections.
MR. ROTH-ROFFY: Okay. But they were not -- not done in '96, though?
MR. SOPP: No, it was not done, as far as I know.
MR. ROTH-ROFFY: Can you explain why they were not done?
MR. SOPP: I cannot explain it because I was very busy right -- maybe it's an oversight, maybe it's -- I can't really remember at the moment.
MR. ROTH-ROFFY: And what about for subsequent drydocks? I guess you had left the company by that time.
MR. SOPP: I don't know. I know they haven't stayed in touch. I don't know.
MR. ROTH-ROFFY: So, in '96, did you say who -- who was your supervisor in '96? I'm sorry.
MR. SOPP: It was Mr. Kam Trollerud.
MR. ROTH-ROFFY: Okay. Do you know if he's still with the company?
MR. SOPP: He's not there anymore. He still lives here in Miami, though.
MR. ROTH-ROFFY: Do you know who he works for, by chance?
MR. SOPP: He works for Llewenhaas Shipyard, German Shipyard, and if you want his phone number, I can get that out for you.
MR. ROTH-ROFFY: Sure.
MR. SOPP: 305- --
MR. ROTH-ROFFY: Actually, let me pause this tape here.
MR. SOPP: Right.
(Pause)
MR. ROTH-ROFFY: Okay. I just paused the tape momentarily to -- to get a phone number for a person.
MR. SOPP: Right.
MR. ROTH-ROFFY: Actually, I'm going to go ahead and -- and let some of the other investigators ask their questions rather than me.

Brian?
MR. CURTIS: Brian Curtis.
On the -- on the boilers, were there any other -- going back -- any other big areas of concern, aside from these microcracks? Any other big areas?
MR. SOPP: A problem with the tubes over the years, you know. That's why they were retubed, and leaking tubes. There were economizers changing. We changed the economizers a couple of times.
MR. CURTIS: Pretty much all the boilers or --
MR. SOPP: Yeah. Well, there was maybe one left when I -- maybe 24 were left. They had done some of them but not all of them.
MR. CURTIS: Regarding hydrostatic pressure tests in the boilers --
MR. SOPP: Hm-hmm.
MR. CURTIS: -- when you were there, what were the requirements for doing hydrostatic testing? When were they done?
MR. SOPP: Well, we had one and a half pounds of boiler pressure, I remember. I think I recall.
MR. CURTIS: And do you recall the last time?
MR. SOPP: In 1999, when we -- when we had retubed the -- the boilers.
MR. CURTIS: And that was one and a half times?
MR. SOPP: That's what I recall, because it was done. There was a mistake when they did it with cold water and everybody was very, very upset.
MR. CURTIS: At that time?
MR. SOPP: Oh, yes. You don't do that with cold water.
MR. CURTIS: And by -- would you just explain why you -- you wouldn't do it with cold water?
MR. SOPP: Well, that's against everybody in the marine industry's -- it's not good for a boiler.
MR. CURTIS: Just for the record, what -- what could be the consequences of doing it with cold water?
MR. SOPP: Well, I don't want to -- I don't want to play on that line for you.
MR. CURTIS: Okay. So, at the time -- at the time of these microcracks were found, all the -- all the chief engineers were aware of the situation?
MR. SOPP: Yes.
MR. CURTIS: And do you know if they kept a specific log of that to themselves? Were you aware of any reports?

MR. SOPP: Well, they have all -- they have all the reports from every drydock, every report on the ship. They should be in their paperwork. The same, we had one file also in the office with all these reports.
MR. CURTIS: And those are held in the superintendent's office? The port engineer's office?
MR. SOPP: Well, when I was there, we had a special room that all drawings and files were locked up in the room. I don't know what they keep anymore in that space. Everything was kept.
MR. CURTIS: And during the process of repairs, if they're plugging tubes, would they make periodic inspections --
MR. SOPP: Oh, yeah.
MR. CURTIS: -- beyond these?
MR. SOPP: Every -- every time the boilers were taken out of service and cleaned and inspected, we show the inspection and, you know, during the operation, you will find out if there's a leak or whatever, you have to prepare something.
MR. CURTIS: I'm not sure if this was asked before, but were -- was one drum more troublesome than another drum or --
MR. SOPP: Well, not that I really recall. I think there was one boiler which was more -- had more cracks than other boilers. I can recall.
MR. CURTIS: And which -- which boiler was that?
MR. SOPP: 23.
MR. CURTIS: 23?
MR. SOPP: I have -- that's -- that's my recollection, but I -- I --
MR. CURTIS: I understand.
MR. SOPP: I think it is correct, actually.
MR. CURTIS: And any -- all the drums, this was on 23?
MR. SOPP: No, it wasn't one specific one.
MR. CURTIS: Which -- which drum was that?
MR. SOPP: I think that was the water header.
MR. CURTIS: The water header? That's all I have right now. I'll pass it along to Mr. Lambert.
MR. LAMBERT: Yes. Sir, do you remember when you went to shut down the boiler, how many times it takes to have the pressure drop from the working pressure to about two pounds?
MR. SOPP: Well, you know, every time, if it was a normal shutdown, they just opened the valve and to take off and they have the vents slightly open and slowly go down. If it goes catastrophic, shutdown. If

there was a tube leaking or something, -- but normal, it's some hours before they have the pressure down. They didn't -- they didn't release the pressure and take it right down.

MR. LAMBERT: How many -- some hours? You don't remember, not precisely, to know if -- how many times it takes?

MR. SOPP: How many times? If we have no problem?

MR. LAMBERT: Yes, if there are no problems.

MR. SOPP: Yeah. No.

MR. LAMBERT: Normally?

MR. SOPP: Two-three hours to -- to -- from the shutdown and then the pressure was down and they -- because they had a vent open.

MR. LAMBERT: Hm-hmm. But you don't remember that.

MR. SOPP: Usually, sometimes they -- they just had the vents open for awhile and then they shut it off and then it goes slowly down.

MR. LAMBERT: Yeah.

MR. SOPP: It was depending a little bit on the situation because the -- sometimes they -- they wanted to boil it all the next day and -- and then you didn't really take the pressure to a totally off. They kept it at a 10-bar pressure or something like that and you could take it up pretty fast.

MR. LAMBERT: Just another question. Do you remember the procedure to oxygen content in the water in the boilers?

MR. SOPP: Yeah.

MR. LAMBERT: Yeah? The tubes?

MR. SOPP: Hmm?

MR. LAMBERT: The tubes?

MR. SOPP: Oh, yeah. The tubes twice a day.

MR. LAMBERT: Twice a day for?

MR. SOPP: Twice a day, they took boiler water samples.

MR. LAMBERT: The boiler. What -- what's -- in water of boiler?

MR. SOPP: What -- I can't remember right now what -- what it was supposed to be, but that was -- this is so many years, that I can't remember, but it is -- it is the standard procedure. That's -- that's what -- like you go to do that, they will tell you right away what you're supposed to have. But I don't remember exactly that right now.

MR. LAMBERT: Hmm.

MR. SOPP: But all the -- all the tests were

done twice daily.
MR. LAMBERT: Okay.
MR. OLSEN: Hi.
MR. SOPP: Hi.
MR. OLSEN: Ken Olsen.
While we're talking about it, while it's more fresh, and I'm sorry to be redundant, but I need to be very clear on this issue. We can start from the most recent past, the '99 shipyard --
MR. SOPP: Hm-hmm.
MR. OLSEN: -- and work back in terms of problems that were discovered and who they were communicated with and just work backwards.
I have a couple old e-mails that maybe will help --
MR. SOPP: Hm-hmm.
MR. OLSEN: It's not an e-mail. It's a memorandum.
MR. SOPP: Memorandum.
MR. ROTH-ROFFY: Okay. The tape is about to finish. So, maybe it would be a good time for you to review some of this while we switch the tape.
(End Tape 1, Begin Tape 2)
MR. ROTH-ROFFY: Okay. We've just switched over the tape. It's about 5 minutes after 3. We're continuing with Ken Olsen.
MR. OLSEN: We -- we have before us two documents. One, a Norwegian Cruise Lines Interoffice Memo from Per Sopp to Sigs Sigablu, and the -- it's just a short introduction to -- to several other pages that detail boiler problems. This document is dated March 16th, 1998.
The other document that we have in front of us is a 1987 Drydock Repair Spec, --
MR. SOPP: Hm-hmm.
MR. OLSEN: -- beginning with the Bates Number 000117. These have been provided to Mr. Sopp for review just as a memory-jogger.
Back to the question, and the question is: could you kindly go slowly from the most recent past backwards and then from about 1999 and discuss what knowledge you had about the cracks and whom else you might have discussed those issues with?
MR. SOPP: Everybody in Technical Operations, Mr. Sven Dahl, Mr. Kam Trollerud. They know about these things. Mr. Borresen that started it the first time. So, that was known. I think everybody that was -- all the chief engineers.
MR. OLSEN: On --

MR. SOPP: And captains.
MR. OLSEN: On this vessel or on other vessels?
MR. SOPP: On this vessel.
MR. OLSEN: All right. Chief engineers and captains, and how did the captains -- why were the captains informed about this information?
MR. SOPP: Because they had to review it all for the operation of the vessel and maneuvering.
MR. OLSEN: And this was in around the 1999 time frame, is that correct?
MR. SOPP: Well, you know, it started back in the '80s some time.
MR. OLSEN: Okay. But all the chief engineers and captains. Anybody else besides those three persons that you mentioned or four persons that you mentioned in the shore staff?
MR. SOPP: No. Only when it comes to money, you know, you have to go and ask for money to do -- to do the repairs. You can't just go and do it.
MR. OLSEN: Hm-hmm.
MR. SOPP: That's why this is one of these things that comes up on the table before we can get them some money for it.
MR. OLSEN: We -- we understand or we have learned through our collection of documents at NCL Headquarters that there has been some proposals to repower the Norway. Was the justification or was the reason for repowering -- did that have anything to do with the conditions of the boiler or was there other reasons?
MR. SOPP: No. There was other reasons, as far as I know.
MR. OLSEN: Excuse me?
MR. SOPP: As far as I know, there was other reasons for that.
MR. OLSEN: Yeah. Okay. It wasn't related just to the boiler?
MR. SOPP: No.
MR. OLSEN: One thing we've learned in our investigation is that the boiler was certified for 70 bar working pressure.
MR. SOPP: Hm-hmm.
MR. OLSEN: And we've learned now that they typically operate around 60 bar.
MR. SOPP: 60 bar, yeah.
MR. OLSEN: Do you know why that pressure changed?
MR. SOPP: Cannot recall that. I remember --

I think it was done all the way back when they picked up the boiler in France and they put it into operation. For what reason, I don't know.

MR. OLSEN: You indicated that in the shipyard period, the -- the -- the cracks in the welds -- the cracks in the seams were inspected, but you also indicated that they were not necessarily visible to the naked eye.

MR. SOPP: Hm-hmm.

MR. OLSEN: So, how -- what types of inspections took place over the years?

MR. SOPP: They -- they did microphotographing of them.

MR. OLSEN: Microphotographing.

MR. SOPP: Because I -- I can remember -- not only that, I think they also did x-ray photographing of the welds, but I have seen x-ray photographs somewhere of welds.

MR. OLSEN: If we were to look for those x-ray photographs of the welds, where would we find them?

MR. SOPP: Should be in the office at NCL for sure.

MR. OLSEN: Office at NCL.

MR. SOPP: Yeah. Because I don't think they would be -- they might be on the ship.

MR. OLSEN: But it was actually like x-ray film?

MR. SOPP: Yeah. Long strips, long strips like -- I think this was from the early beginning of the first study, you can say, of the boilers. I can't recall the year it was, but it was before '87.

MR. OLSEN: Okay. Can you -- who is the last person ashore that you can associate with those long strips of microfilm?

MR. SOPP: Oh, I don't know.

MR. OLSEN: No.

MR. SOPP: I am probably the only one that remembers.

MR. OLSEN: Okay. This was kind of in the '90s that we're -- we're talking, is that --

MR. SOPP: No. This was -- the microphotography, that was probably in the '80s.

MR. OLSEN: In the '80s. Okay.

MR. SOPP: Yeah. Probably in the '80s, yeah.

MR. OLSEN: Okay. Was the ship provided any additional equipment to examine these welds when they were not in the yard period or -- or did it always take a technician to do that examination?

MR. SOPP: No. It was a technician from

specific company. I think it was Dutche Babcock. I believe it was Dutche Babcock, but I'm not 100 percent sure. I mean, there is one -- one man that knows this and that is probably Mr. Satow from -- he used to work for Lloyd Werft before.

MR. OLSEN: Could you spell that name, please?

MR. SOPP: S-A-T-O- -- S-T-O-W, I think it is -- that's how his name is spelled.

MR. OLSEN: And what city is he in?

MR. SOPP: Bremerhaugen.

MR. OLSEN: Bremerhaugen?

MR. SOPP: Yeah.

MR. OLSEN: And it was a Lloyd?

MR. SOPP: Yeah. He -- I don't know if he's retired today or whatever, but he might be, but Lloyd Werft, they know where he is. He was very much involved in this study.

MR. OLSEN: I don't know. Can you explain that?

MR. ROTH-ROFFY: Yeah. Sorry. Just a note to Ken. That's the Lloyd Werft fellow that we interviewed along with the seaman's rep last week some time or a couple of weeks ago.

MR. OLSEN: Okay. Okay. I'm sorry. I didn't remember that. Thank you.

Okay. Let's go back to -- to procedures. Did -- obviously in -- and I'm referring to the interoffice memo of March 16, 1998. Obviously people ashore knew the procedure of lighting off and lighting on boilers and that was somewhat detrimental to the condition of the boilers.

MR. SOPP: Right. This was brought all the way up to the president level.

MR. OLSEN: All the way up. So, who is Sigablu?

MR. SOPP: He was a senior vice president at the time. He was only with NCL for a short time, maybe two years or so.

MR. OLSEN: And -- and then, who was the president at that time?

MR. SOPP: In '98? They had so many, that I don't remember.

MR. OLSEN: Okay. Did -- as it went up, did it go across to other vice presidents? Did they know that?

MR. SOPP: I assume they knew. Probably Mr. Lamar Kohler would know. Probably because he was sitting on the finances.

MR. OLSEN: And his -- he was -- could you give me his --
MR. SOPP: Lamar Kohler. He is probably vice president, Finance, at the moment, also.
MR. OLSEN: Okay. Your -- your memorandum only talks about stresses to tubes. Were these other --
MR. SOPP: Well, stresses to drums and everything.
MR. OLSEN: Yeah. Was there discussion of stresses to drums to these other people?
MR. SOPP: Yeah.
MR. OLSEN: Yes, there was?
MR. SOPP: Yeah.
MR. OLSEN: So, you're indicating that there were other discussions beyond just what's indicated here?
MR. SOPP: Right, yes.
MR. OLSEN: Okay. Was there a time when -- when somebody made a decision not to repair or not to replace all the boilers? Was that ever --
MR. SOPP: No, it wasn't discussed about replacing the boiler. It was more discussion about doing the proper -- you know, we had that -- this time, there was a lot of boiler tube failures, and also the way the boilers were operating and the schedules that we had for shutting down and starting up and shutting down and starting up.
MR. OLSEN: Could you -- could you tell us why they chose to shut down the third boiler instead of leaving on three boilers with fewer burners? Why did they shut -- always -- why did they have a tendency to shut down that third boiler? Could you tell us why?
MR. SOPP: Saving fuel.
MR. OLSEN: Saving fuel. Now, with respect to saving fuel, do chief engineers have a bonus program, incentive program?
MR. SOPP: No. As long as I was there, they had no incentive program. We have nothing. I never got bonus ever from NCL.
MR. OLSEN: Hm-hmm. Okay. Okay.
MR. SOPP: Nobody got it. There was -- the captains and the chief engineers got bonuses for -- but they got it for different merits, not saving fuel or whatever.
MR. OLSEN: Was -- was it for overall operating budget or was it for something else?
MR. SOPP: Yes.
MR. OLSEN: Staying within a budget?

MR. SOPP: Yeah. Right.
MR. OLSEN: Could the fuel costs have contributed to that budget or is it not excluded?
MR. SOPP: It could have. I -- I cannot say that for sure.
MR. OLSEN: Okay.
MR. SOPP: I -- I shouldn't speculate on it.
MR. OLSEN: Who -- who could answer that question for sure?
MR. SOPP: Today, I don't know. There is nobody left.
MR. OLSEN: Okay.
MR. SOPP: That's the problem. There is nobody left to tell you about it. Maybe Sven Dahl. That's the only one I can say.
MR. OLSEN: Going back, you said earlier something along the lines that when the vessel entered the yard period, a -- a typical procedure was to have those seams inspected.
MR. SOPP: Hm-hmm.
MR. OLSEN: Is that correct?
MR. SOPP: Right.
MR. OLSEN: Okay. In that regard, can you tell us when that procedure may have been stopped? Was it -- am I correct in saying that they didn't do it in '99?
MR. SOPP: Yeah. That's the only time I recall that we had not done it, but I'm not 100 percent sure because I cannot really remember because it was so many things going on at the time. We installed three new diesel engines at the same time. We retubed two boilers. I don't remember every detail.
MR. OLSEN: Okay. Could you tell us who might know -- know of that inspection in yard periods after 1999?
MR. SOPP: After 1999, it must be Mr. Greenstaad, the only one I know of, because he is there at the moment. I don't know how long he have been there, but I just -- I believe he's the one.
MR. OLSEN: Is -- is this type of issue something that would be forgotten by shoreside personnel or --
MR. SOPP: Not things like this, it doesn't get -- I don't think so. Mr. Greenstaad, he was also there back in the -- in the -- all of the '80s, and he knew very well about these cracks and the microcracks and whatever because he was involved in it from Day 1.
MR. OLSEN: What kind of involvement?
MR. SOPP: Well, he was the chief engineer,

assistant chief engineer, on the vessel probably '88-89, then he went to another vessel.

MR. OLSEN: Did you ever see the crew or vendors on board the vessel doing high-pressure welding, either welding within the boiler or welding on high-pressure pipes outside the boiler, steam piping, boiler piping?

MR. SOPP: Yeah. I have seen that, but that has been by certified welders, because in the retubing, we did welding and that was done by Harris Pipe and they had also others.

MR. OLSEN: Who ashore would develop the policy of lighting off -- of either keeping boilers on or keeping them off?

MR. SOPP: It was up to the chief engineer. He was totally in control of the -- of it, as long as he kept it in the -- within the -- he was the chief engineer on the vessel and he could do almost anything he wanted, as long as it was a safe operation.

MR. OLSEN: What could occur to a chief engineer if he chose not to secure the third boiler during the part of the run that it wasn't needed?

MR. SOPP: I don't really know what because nothing ever -- ever occurred to any of them really. So, -- so, I don't think -- there is nothing that would happen. But anybody, they should save the fuel and try to -- to be as economical as possible. But I don't think there is a written policy about that.

MR. OLSEN: I think that's it for now. Thank you very much.

MR. SOPP: Okay.

MR. OELSCHLEGEL: Chris Oelschlegel, Coast Guard.

Let's see. Can you describe what your level of concern was with the boilers, knowing the repairs that had been done to the -- to the fractures or any -- any repairs done --

MR. SOPP: I was concerned that it's -- as it says in the memo here, that something could really happen if we went up to starting to take some actions down there, and I was basically fighting to get money for these things because there was not money -- money was not easy. The company was almost bankrupt for awhile. Back in '95-96, it was very close to bankruptcy.

MR. OELSCHLEGEL: Can you clarify a question here on the -- on the repairs to the drums, the process that was done? I -- there was some reports that indicated that they -- they ground --

MR. SOPP: They ground down --
MR. OELSCHLEGEL: -- down, and -- but that was -- the report wouldn't go beyond that. Could you describe that?
MR. SOPP: They ground it down, the microcracks, and then they tested them for cracks again, and then when you -- you can only grind so much when you -- when you go down more than so many percent of the thickness of the -- of the shell there, then you have to do something, and either you change the boiler or you change -- or the drum or you do something, and then the weld procedure was approved by the Bureau of Veritas to do the welding of the tubes -- of -- of the -- of the drums.
MR. OELSCHLEGEL: Okay. And can you describe -- you may have answered this already, but can you describe again, if you did already answer it, how -- how the initial microfractures were discovered or found? Because you said they were very difficult.
MR. SOPP: They were difficult to see because --
MR. OELSCHLEGEL: How were they --
MR. SOPP: Because the ship was very old. It was just after they bought the ship, maybe two-three-four years later, and there had been, like I said in the beginning, this incident where they found the -- the -- the -- they wanted to do a treatment of acid into the boiler where we had all this tremendous leaks, you know. So, they were kind of worried about that this had -- what happened, when you do this, is that the molecules on there are obviously acid, goes into the steel, expands 10,000 times and you get cracks daily. It goes through the sealant and it's very, very -- we did a study on the thing after that and that's what they were really worried about. That's why we started with checking in the boilers, and then they found these microcracks which had nothing to do with these things, and this had to do probably with the welding procedures back in the, you know, '50s or '60s when they built that ship, and that's what Dutche Babcock said. It's most likely the welding procedures that made these microcracks.
MR. OELSCHLEGEL: You said a study that was done after the acid treatment.
MR. SOPP: Yeah.
MR. OELSCHLEGEL: Was that -- was that a formal study done with a report at the end?
MR. SOPP: That was, yeah. Yeah. This was from back in '81-82.

MR. OELSCHLEGEL: I see. Okay.
MR. SOPP: It happened before I started, but I -- I -- I saw this report afterwards.
MR. OELSCHLEGEL: Hm-hmm.
MR. SOPP: And that was also from the Lloyd Werft, I believe.
MR. OELSCHLEGEL: I see. In your opinion, would it be possible for a chief engineer on the Norway to not know about the condition of the boilers?
MR. SOPP: Well, he shouldn't be chief engineer if he doesn't know about the condition. Most of these people that is there and has been there, they've been there a long, long time, and they have gone from third engineer and up, and they know. They know these things.
MR. OELSCHLEGEL: Hm-hmm. Are you aware of anyone that was -- that NCL fired or let go because of concerns that they brought up regarding boilers or other engineering equipment?
MR. SOPP: No.
MR. OELSCHLEGEL: And can you -- last -- one last question. Can you explain to me the restriction, the maneuvering restrictions that were placed --
MR. SOPP: I think --
MR. OELSCHLEGEL: -- because of -- you said they were because of the boiler, the demands placed on the boiler.
MR. SOPP: Right. I think the captains were informed back when this study was done, but how it was passed on from captain to captain, I don't know.
MR. OELSCHLEGEL: I see.
MR. SOPP: But the captain -- we had a lot of the same captains going on, like Captain Luken. He was there for years and years, and he knew about these restrictions, and I assume that he passed on these problems to everybody. I don't know if they had regular meetings where they discussed these things. I don't know, because I was never in one of those meetings. I was only there the first time when -- when we did the study, and I believe there was also a written memo after the study to the ship where it was told that they should be very careful with the way they took up or they -- they maneuvered and also when they were in a racing speed from after going out to sea.
MR. OELSCHLEGEL: I see.
MR. SOPP: Because -- because of these cracks.
MR. OELSCHLEGEL: I see. And this would have been from the -- this would have -- in other words,

this would be --
MR. SOPP: This --
MR. OELSCHLEGEL: This would potentially be in place today as well?
MR. SOPP: I assume so. They should be there.
MR. OELSCHLEGEL: Okay.
MR. SOPP: But when I left there, there were all of these things.
MR. OELSCHLEGEL: That's all I have. Thanks.
MR. SOPP: Okay.
MR. HISLOP: Kevin Hislop.
Would you -- would you agree that these microcracks, where it was noticed, the heat affected them?
MR. SOPP: Yeah. I don't know if it was the heat effect. All these microcracks, as far as I could recall, was in -- in the vicinity of the -- of the valves.
MR. HISLOP: Yes, you said that was far away from the welds.
MR. SOPP: Yeah. Right there. So, they were never -- they were never in the weld itself.
MR. HISLOP: No, no. The heat affected it around --
MR. SOPP: Yeah.
MR. HISLOP: -- the welds?
MR. SOPP: Right. Yes. Exactly. Between the cold zone and the hot zone.
MR. HISLOP: I see.
MR. SOPP: Exactly. That's where they were and that would be -- we're discussing this actually.
MR. HISLOP: Okay. Good. In your opinion, in the water headers, --
MR. SOPP: Yeah.
MR. HISLOP: -- were there any surface cracks or linear indications or -- or pitting or any corrosion that could have been detected by just visual examination?
MR. SOPP: Very little. I never saw any -- any. I could see in the water headers, there was pittings in the water headers.
MR. HISLOP: Hm-hmm.
MR. SOPP: But I never saw pittings in the -- in the water drum itself, no.
MR. HISLOP: Would -- in your opinion, would you say that a good examination of the water headers would entail someone actually getting inside or could they see -- examine the drum in entirety by putting

their head inside with a flashlight?
MR. SOPP: No. You have to go in.
MR. HISLOP: You have to go inside?
MR. SOPP: And it's a very, very cramped space. Not everybody can get in there.
MR. HISLOP: Would -- okay. Did you ever see in your time anybody entering -- actually getting into them?
MR. SOPP: I've been in there myself. Not today, but 15 years ago, I was in there.
MR. HISLOP: You went in there?
MR. SOPP: Yeah.
MR. HISLOP: So, you actually physically went in?
MR. SOPP: Yeah.
MR. HISLOP: Okay. Did you ever see anybody else?
MR. SOPP: Yeah. I seen people in there. Oh, yeah.
MR. HISLOP: Any -- any Veritas people?
MR. SOPP: Yes. I seen them.
MR. HISLOP: They have been inside?
MR. SOPP: Oh, yeah.
MR. HISLOP: Okay.
MR. SOPP: Yeah. All the -- Mr. Moore from the Bureau of Veritas, he was 75 years old and he was in there.
MR. HISLOP: Okay. Good. So, you said it's obviously better to get inside there and examine --
MR. SOPP: You have to because you cannot see what's inside, no.
MR. HISLOP: You said -- was that -- okay. Okay. Fine.
MR. SOPP: It's almost impossible to -- to see anything if you don't get into it.
MR. HISLOP: Impossible. Thank you.
Moving on, it is no secret in this part of South Florida in the marine industry, in the cruise industry, that there have been a significant number of changes within management at NCL.
MR. SOPP: Yeah.
MR. HISLOP: Could you just briefly just say what that has been attributed to, would you say?
MR. SOPP: Well, there was selling was -- I think they were sold. I mean, the company was sold from one company to another company, and I assume they let everybody go.
MR. HISLOP: Okay. Okay.
MR. SOPP: But I don't know. All the

presidents, they were here for one or two years and they were gone. I don't know. I was never on that level.

MR. HISLOP: Okay.

MR. SOPP: I don't know.

MR. HISLOP: Okay. The -- any plugging of water header tubes, any plugs fit in, would that be done by a crew?

MR. SOPP: Yes.

MR. HISLOP: The crew did the water plugging?

MR. SOPP: Yes.

MR. HISLOP: They would -- would they -- the welds around the plug, would they do that?

MR. SOPP: Not as far as I know, that they -- they did --

MR. HISLOP: The hammering.

MR. SOPP: The hammering, but they might have been done. I don't know for sure.

MR. HISLOP: Okay.

MR. SOPP: I cannot say.

MR. HISLOP: No. Okay. When were you last associated -- do you recollect when you were last on board when the complete survey was carried out by Class?

MR. SOPP: I was there in May, May 1999.

MR. HISLOP: May 1999.

MR. SOPP: That was during lighting up, and then we had --

MR. HISLOP: When was the drydock?

MR. SOPP: May 1999, April-May '99.

MR. HISLOP: Where?

MR. SOPP: In Bremerhaugen.

MR. HISLOP: In Bremerhaugen. Okay.

MR. SOPP: Then immediately after, they had a fire in the -- in the auxiliary turbine room, and I was just back in Miami. I came back again to Barcelona, and then after that, it was also another survey done by BV because of the big fire.

MR. HISLOP: But in April-May 1999 in Bremerhaugen, you were on board when the complete survey was done?

MR. SOPP: Yes.

MR. HISLOP: Everything was up?

MR. SOPP: Yes.

MR. HISLOP: Number 23, I'm talking about now.

MR. SOPP: 23, I don't think was finished when we left Bremerhaugen.

MR. HISLOP: Okay.

MR. SOPP: Because one of the boilers were not ready and I think 23 was not ready by that point.
MR. HISLOP: Okay. But in general, when they did the -- the survey in -- in April-May 1999 in Bremerhaugen, they -- the surveyor did a complete --
MR. SOPP: Yes.
MR. HISLOP: -- survey with access inside the boiler, the drums --
MR. SOPP: Yeah.
MR. HISLOP: -- and everything? Okay.
MR. SOPP: But one of the boilers was not operating when we left the shipyard. I know that.
MR. HISLOP: All right. And finally, you referred to a cold water hydrotest. Who actually carried that out? Was that --
MR. SOPP: I think that was done by -- by Bureau Veritas.
MR. HISLOP: In Bremerhaugen?
MR. SOPP: Right.
MR. HISLOP: Okay. Thank you. Thank you very much. I'm finished. No more questions.
MR. RILEY: John Riley.
Mr. Sopp, I haven't had a chance to see any of the log books yet, but the -- the shutting down and lighting up of the third boiler, --
MR. SOPP: Hm-hmm.
MR. RILEY: -- was -- would this be routinely entered in the engine room log book?
MR. SOPP: Yeah, yeah.
MR. RILEY: How about when they had problems with sort of -- you described it as a catastrophic stoppage for tube failures.
MR. SOPP: Yeah.
MR. RILEY: That would be in the log books?
MR. SOPP: That would be in the log books.
MR. RILEY: The occasions when you're in port or Bremerhaugen and there are internal examinations of the header and the drums, would that sort of item be also entered in the log book?
MR. SOPP: In the end, I don't know if it was in the end log book. It's -- because in the end, we got the complete report from the surveyors and I think that report, you couldn't put all that in the log book.
MR. RILEY: No. But --
MR. SOPP: It was a complete report.
MR. RILEY: But generally speaking -- sorry.
MR. SOPP: Yeah. No, that's fine.
MR. RILEY: Generally speaking then, any -- any repairs to the boiler or any abnormalities, in your

experience, would have been put in the log book by the operating engineers?

MR. SOPP: They will put in they shut it down because of certain things or they started it up, but they wouldn't put it in the log book what was done with the boiler because it's too much and there is no space to put that in. There is a -- they have a working -- like a workbook where they put all the maintenance and work that has been done on the boilers and all -- and any other equipment on the ship, and I think that they have a computer system.

MR. RILEY: All right. But in your time, though, they also had a workbook?

MR. SOPP: Yeah.

MR. RILEY: For the engine room?

MR. SOPP: Yeah.

MR. RILEY: Do you know offhand who kept that?

MR. SOPP: It was usually kept by the -- I think it was the assistant chief engineer that had the log book or other senior first engineer.

MR. RILEY: Thank you.

MR. SOPP: One of the guys.

MR. RILEY: Right. When you have the boiler survey, particularly a complete survey, did you usually accompany the BV surveyor?

MR. SOPP: I usually was there during drydocking. I was either doing it myself or I had the chief engineer to do it.

MR. RILEY: Do you remember offhand how long the BV surveyor would typically take to review the log book with the chief engineer or review the workbook with the engineers?

MR. SOPP: He could -- he could be there for -- from Miami and go to St. Thomas like two-three days and do the surveys and review all the paperwork and see and do his inspections.

MR. RILEY: So, the BV surveyors did routinely examine the log books --

MR. SOPP: Oh, yes.

MR. RILEY: -- to see the operating conditions and --

MR. SOPP: Oh, yes.

MR. RILEY: Thank you. When you were responsible for the Norway, did you have direct contact with the representatives of Drew, Hammeroid, who were supplying the -- the boiler chemicals?

MR. SOPP: Yes.

MR. RILEY: The -- did they attend the vessel

every week? You mentioned not many Saturdays and Sundays.

MR. SOPP: They were there, I will say, every week. They could be maybe once in a blue moon they were not there, but I would say every week, they were there. They had a contract to do that, so they -- and I saw them there all the time.

MR. RILEY: So, were you the chief liaison then with -- with the Drew --

MR. SOPP: Yeah. Because I worked with them for years and years. It was different people, but I still worked with them.

MR. RILEY: Yes.

MR. SOPP: I mean, we would never change chemical company because we felt more -- we didn't like to change chemical company mostly because the people were very well routinely knowing what to do, what chemicals they were using because we had seen disasters with changing and different chemicals being used.

MR. RILEY: Of the individuals that you met with at Drew, Hammeroid, and you worked with regularly, had any of them sailed aboard the Norway?

MR. SOPP: No. But they have several of them that were steam engineers, very good capable people.

MR. RILEY: And experienced with main boilers --

MR. SOPP: Right.

MR. RILEY: -- and turbines? So, they knew --

MR. SOPP: Right.

MR. RILEY: They knew what was going on --

MR. SOPP: Oh, yes, yes.

MR. RILEY: -- in the engine room?

MR. SOPP: Yes. One of them, he's no longer there, he's at Ashland and his name is Dam Chllenger, he knows them very well.

MR. RILEY: Could you please spell that?

MR. SOPP: I don't know Dam, and I think it's C-H-L-L-E-M-G-E-R, Chllenger or Chllenger.

MR. RILEY: Chllenger.

MR. SOPP: Yeah. Something like that. He's -- he's very, very -- everybody knows him in the -- at Drew.

MR. RILEY: And he -- he was personally responsible for the Norway?

MR. SOPP: When he was here in Miami, he was personally responsible. He sailed with the Norway frequently and -- and trained the engineers in the chemical treatments of the boilers.

MR. RILEY: How long ago was that?
MR. SOPP: Back in the '80s.
MR. RILEY: Back in the '80s.
MR. SOPP: Maybe early '90s as well. He's still with Ashland which is chemicals.
MR. RILEY: Right. At the time you were responsible for the Norway, what chemical, please, were you using for oxygen scavenging, if you -- if you remember?
MR. SOPP: I don't remember where we -- where we pumped it in.
MR. RILEY: Yeah. No, no. What -- what chemical you were using, if you remember?
MR. SOPP: I can't remember.
MR. RILEY: You -- do you remember anything at all about chemicals and changes of chemicals --
MR. SOPP: I remember using hydrazine in the beginning, but I think hydrazine then -- I don't think we no longer used that anymore because it was coming through, so we changed it to something else, but I don't remember the name at the moment.
MR. RILEY: That's fine. Do you remember, was this towards the end of your attendance of the Norway or sort of in the mid-'90s or --
MR. SOPP: We used hydrazine at least up to '88 or something like that, maybe '90, and then after that, I can't really remember the name of the chemical.
MR. RILEY: But you -- but you do recall that another chemical was substituted?
MR. SOPP: Yeah. Plus I believe hydrazine was not -- not sold anymore.
MR. RILEY: Understood. If I mention the name Amarzene, does that ring a bell?
MR. SOPP: Yes.
MR. RILEY: Does that ring a bell?
MR. SOPP: Yes. Amarzene, yeah.
MR. RILEY: Now, is that the chemical that was substituted or is that another name for hydrazine, if you remember?
MR. SOPP: I -- I cannot remember. No, I don't.
MR. RILEY: Hm-hmm.
MR. SOPP: If I remember, I would tell you, but I don't know. Just speculating.
MR. RILEY: Thank you.
MR. SOPP: The name rings a bell, but I don't remember.
MR. RILEY: Just if I may just switch the subject very slightly, during the period when you were

-- excuse me -- when you were responsible for the Norway, do you remember any discussion about the arrangements for the sliding feet of the header and of the drum?

MR. SOPP: Oh, yes. That they were to be greased weekly and checked up and so that was one of the main things.

MR. RILEY: Now, at the moment I mentioned sliding feet, you reacted as though it was something you remembered.

MR. SOPP: Oh, yes.

MR. RILEY: Can you tell us why it's --

MR. SOPP: Well, because it -- if -- if you have feets that doesn't -- that are frozen and you light up the boiler, it will -- you will have something seriously happening. That is, you know, this was one of the first things I learned when I was an engineer.

MR. RILEY: Right.

MR. SOPP: You have to take care of your sliding feets.

MR. RILEY: Do you recall anything in particular about the sliding feet ever being a problem on the Norway?

MR. SOPP: No, not that I recall.

MR. RILEY: Thank you.

MR. SOPP: But we discussed it at many -- because I was working in that, and I said, "Hey, are you doing something about the feets?" I was looking to see if they were greased and --

MR. RILEY: And you would personally have a look from time to time?

MR. SOPP: I would walk through the engine room every day.

MR. RILEY: Thank you. That's all I have.

MR. STEINFORD: This is Terry Steinford.

Just going back, I believe you said you became the port engineer in July 1982 and you were the first engineer before that on board. Was that continuous or was there a gap in there?

MR. SOPP: No. I was on vacation for a few months in between.

MR. STEINFORD: Okay. Do you recall if the ship was drydocked in 1982?

MR. SOPP: Yeah. We were in drydock from April until July or the end of June or something.

MR. STEINFORD: Okay. And so, you would have been the first engineer or the port engineer for that drydock, correct?

MR. SOPP: I was the first engineer for the

drydocking, yeah.
MR. STEINFORD: Do you recall if any cracks were found in the drums or headers at that time?
MR. SOPP: No.
MR. STEINFORD: Okay.
MR. SOPP: I don't. I wasn't really involved with the boilers during the drydocking.
MR. STEINFORD: Okay. How about any later drydockings? What's the first drydock you can recall where any cracks were found in the drums or headers?
MR. SOPP: I wonder if it was '84.
MR. STEINFORD: '84?
MR. SOPP: I wonder if it was '84, but I'm not 100 percent sure.
MR. STEINFORD: Okay.
MR. SOPP: Or if it was not in drydock at all, it was something we found when we started with the study and this study was done during normal operation, I think.
MR. STEINFORD: Okay. Do you recall a drydocking by Lloyd Werft in 1987 where cracks were found in the drums or headers?
MR. SOPP: I believe so.
MR. STEINFORD: Okay. Do you recall if any welded repairs were done then?
MR. SOPP: That's when I think it was, yes, but not in drydock. I think it was done after drydock.
MR. STEINFORD: Okay. So, maybe -- what was the sequence? How did that happen?
MR. SOPP: Because I -- I kind of recall it was done and then some time later, during when the ship was operating, it was welded.
MR. STEINFORD: When you say operating, would that be operating out of Miami?
MR. SOPP: Yeah.
MR. STEINFORD: Okay. So, would that have been done while the ship was in service on a regular voyage?
MR. SOPP: Right. Yeah.
MR. STEINFORD: Okay. And who would have done that work?
MR. SOPP: Dutche Babcock.
MR. STEINFORD: Okay. And do you recall if a BV surveyor attended on board while that work was being done?
MR. SOPP: He was there, but I can't go into recall, but I -- I'm -- I know he was there.
MR. STEINFORD: And do you recall any approvals by BV of the procedures to be done?

MR. SOPP: I don't recall exactly the procedure, but I know there was procedure and BV was involved in it, but I don't really remember that.
MR. STEINFORD: Okay.
MR. SOPP: Any assignment or anything.
MR. STEINFORD: All right. You mentioned dealing with Mr. Moore --
MR. SOPP: Yeah.
MR. STEINFORD: -- from --
MR. SOPP: Right.
MR. STEINFORD: Andrew Moore?
MR. SOPP: Andrew Moore, yes.
MR. STEINFORD: Okay. Is there any other surveyors involved with the Norway in the 1980s?
MR. SOPP: No. I don't know. I think Andrew Moore, he retired in '92 or '93. It must have been only Mr. Moore or when we were in Germany, it could have been German Bureau of Veritas from the Hamburg office.
MR. STEINFORD: Okay. So, while the ship was operating out of Miami, to your recollection, --
MR. SOPP: Right. Mr. Moore --
MR. STEINFORD: -- Mr. Moore was the only surveyor?
MR. SOPP: Yeah.
MR. STEINFORD: Okay. Again, looking back to 1987 when the weld repair was done, do you recall if he rode the ship during that repair or just visited during the port call?
MR. SOPP: I am not -- I cannot really remember if he rode or not. That, I cannot -- but I believe he did, but --
MR. STEINFORD: Okay.
MR. SOPP: -- it's too much time.
MR. STEINFORD: Do you ever recall writing yourself or seeing a drydock or shipyard specification specifically that looked for cracks?
MR. SOPP: I think so. I think so, yes, but I don't have it. I think I have written several times actually.
MR. STEINFORD: Okay. Well, what I was getting at was rather than simply saying open for inspection, did the specs specifically say --
MR. SOPP: I think it was --
MR. STEINFORD: -- a reference to cracks?
MR. SOPP: You know, it might even be in the drydock spec because it might have been done directly with Lloyd Werft afterwards, but I think it has been mentioned with cracks or the crack inspection, also.

MR. STEINFORD: Okay. Other than the drydock or shipyard period, would any of the drums or headers be opened for any purpose?
MR. SOPP: Not if it was not required by anybody or it was a specific BV requirement or whatever, no.
MR. STEINFORD: So, in other words, the ship's crew's not going to routinely dump the water and open the boiler?
MR. SOPP: Well, you open the boiler, but we would take out the internal or the steam drum and you inspect the water and just put film in it and see.
MR. STEINFORD: Okay. Well, how about opening the lower drums?
MR. SOPP: They were opened up and checked for if there was mud in there, but that just open up to inspect and closed up again.
MR. STEINFORD: And how often would that occur?
MR. SOPP: I can't really say, but at least -- at least once a year because we have a 3,000-hour maintenance schedule of the boiler and usually when this was done, it was during the 3,000-hour maintenance schedule.
MR. STEINFORD: Do you ever recall any leaks from the drums?
MR. SOPP: No.
MR. STEINFORD: Okay. That's all I have.
MR. ROTH-ROFFY: You mentioned that -- okay. Getting close to the end of the tape, so I'll ask a couple questions, then we'll have to take a break again.
You mentioned that a lot of the records that -- on the Norway repairs and reports and whatnot were kept in some kind of a locker -- a lockable room. Do you recall where that room was?
MR. SOPP: In NCL's office?
MR. ROTH-ROFFY: Yeah. Yeah. Where was it?
MR. SOPP: It was in the Ship Operation area and there's a file room.
MR. ROTH-ROFFY: Was there a particular file cabinet devoted to Norway?
MR. SOPP: No. It was like these sliding files, you know, that you --
MR. ROTH-ROFFY: Lateral files?
MR. SOPP: Lateral files, yeah, and in there was -- the Norway had its own drawer for the Norway and all the files which I had for the 18 years I was there. Now, some of those files were purged a little bit but

only for things that was not operational. Everything that was of interest was in there.

MR. ROTH-ROFFY: Was it one particular file cabinet where you kept all of your Norway files or was it spread out over several cabinets or --

MR. SOPP: No. It was probably in one -- one row there. That was where it was when I left.

MR. ROTH-ROFFY: And did you also keep some files in your office?

MR. SOPP: Yeah. There was files in the office but not very much because I -- I was particularly trying to keep all the files in the cabinets, not floating around in the office. But I had things that I worked with day-to-day, they were in the office.

MR. ROTH-ROFFY: But your historical records, you kept in this lockable --

MR. SOPP: Yes.

MR. ROTH-ROFFY: And do you remember what that room was called? Was it Document Room?

MR. SOPP: It was the file -- the Drawing and File Room.

MR. ROTH-ROFFY: Okay.

MR. SOPP: And everybody up there should know where it is.

MR. ROTH-ROFFY: Which floor?

MR. SOPP: I believe it is on the 6th floor.

MR. ROTH-ROFFY: On the 6th floor. Okay. All right. Tell you what, since the tape is about to end, I'm going to go ahead and stop now and we'll take a break.

MR. SOPP: Okay. All right.

MR. ROTH-ROFFY: Let's take -- go ahead.

(Whereupon, a recess was taken.)

(End Tape 2, Begin Tape 3)

MR. ROTH-ROFFY: Okay. It's Tom Roth-Roffy, and it's about 15 minutes after 4, and we have changed to a new tape, and we are resuming our interview of Mr. Per Sopp.

Let's see. My last question was about -- oh, the lockable room that -- that had the documents, --

MR. SOPP: Yeah.

MR. ROTH-ROFFY: -- and I think you explained pretty well where that was.

Regarding the operating procedures of the boilers, there was some concerns expressed about, you know, the way the boilers were being lighted off and shut down frequently, you know, to meet ship schedule, and I believe you stated that the main reason for

shutting down one boiler was to save fuel, rather than run three boilers when you didn't need them, if you shut down one boiler, that it would save some fuel.

MR. SOPP: There is also other things to run the boilers on very low load. It can make problems, also. You get -- for instance, you superheat the steam to get up to the temperature, you will have problems with that because of the low load of the boiler. So, I -- it is other concerns also involved in these things.

MR. ROTH-ROFFY: Beyond low superheat temperature, do you have an idea what other problems would -- would result from lightly-loaded boilers?

MR. SOPP: I just know they have problems with the corrosion on turbine blades because of a lot of wet stains, and on one occasion, we had at one point decided to go with less boilers. Also because of this, but also for saving fuel.

MR. ROTH-ROFFY: And it seems to me I'd seen something about some report or problems with steam or with water circulation within the boiler. Had there been --

MR. SOPP: Yeah. Low circulation during certain times. That's why there is some of the tubes in these boilers have raised the boiler water level and this can have a tendency to load very fast and actually some of them is permanently plugged.

MR. ROTH-ROFFY: And the reason they were permanently plugged was?

MR. SOPP: Because the circulation was up in this area, and during certain operations, during low loads, you could have problems with the circulation in the boilers, and this is something everybody knew about, that this -- this is a problem. Nothing -- nothing that was -- nobody was too concerned about it because we plugged these tubes right away and we knew that they were not going to be used. We knew that they could be in certain load conditions where you have very, very bad circulation in the boiler. There's nothing that would tell you, but we knew it from -- from the tube leaks and whatever.

MR. ROTH-ROFFY: Was there ever any type of a study that had --

MR. SOPP: No.

MR. ROTH-ROFFY: -- analyzed the circulation of the boilers?

MR. SOPP: I don't think so. There might have been something in the early, early '80s, but because I have read something. But it could have been from old French papers because it was over something

that came from -- they had problems with -- during that time with the SS France, the circulation in many corner areas.

MR. ROTH-ROFFY: And these circulation problems were in some way related to low load operation?

MR. SOPP: Yeah. It was -- that came from a low load operation, yes. This -- this low load operation was basically in port. That's where we had the biggest problem when you were at a load, let's say, 800 kilos an hour or something like that.

PARTICIPANT: How many?

MR. SOPP: 800 kilos an hour.

MR. ROTH-ROFFY: You said -- sorry. Would that be steam or fuel --

MR. SOPP: Fuel. Fuel.

MR. ROTH-ROFFY: -- flow rate?

MR. SOPP: Fuel flow rate. Actually, we didn't like to be much below a thousand kilos an hour. We'd like to be in that area. It was much more stable flames and everything.

MR. ROTH-ROFFY: Now, couldn't the flame stability be made better with decreasing the number of burners? Instead of, you know, four burners, go down to three or two burners?

MR. SOPP: They did, but still it was not always good because you could get optimizing steam that was wet and then you could blow out the whole thing sometimes. It could happen. Well, you know, except if it was only two-three burners in, but still we didn't like it.

MR. ROTH-ROFFY: And how about the operating procedures as far as cooling down the boiler or shutting it off and -- and reducing the pressure?

MR. SOPP: Well, you know, you shut it down, then you will open up the vents first and you shut it down, and then you have the vent open for 5-10 minutes, and then you can shut it down, and then you let it just cool down slowly.

MR. ROTH-ROFFY: We've heard that --

MR. SOPP: There's many ways to do that.

MR. ROTH-ROFFY: We've heard that the way they do it now and have been doing it for years is that they would shut it -- shut it down and open up the vent for a period of time and open up all the drains and everything would be left open until it went down to, you know, to zero or basically below pressure.

MR. SOPP: Yeah. Right.

MR. ROTH-ROFFY: Is that your recollection?

MR. SOPP: Yeah. It was, but depending a little bit on the circumstances, but for a normal shutdown, yeah, and then they kept the pressure, and if they wanted it on very soon, they kept the pressure on for awhile. Shuts everything down a little later on.

MR. ROTH-ROFFY: And what about the four strap fan? Would they leave that running during the cool-down period or would they shut it off or you don't know?

MR. SOPP: Shut it off.

MR. ROTH-ROFFY: They would shut it off, --

MR. SOPP: Yeah.

MR. ROTH-ROFFY: -- as far as you know?

MR. SOPP: Yeah.

MR. ROTH-ROFFY: Would there be any reason to leave the four strap fan running during a cool-down period?

MR. SOPP: Well, they don't turn it off immediately, but for some time, they shut it off.

MR. ROTH-ROFFY: After about how long?

MR. SOPP: Couple of hours.

MR. ROTH-ROFFY: Couple of hours.

MR. SOPP: Yeah. I think they don't cool it off too fast.

MR. ROTH-ROFFY: Would there be any reason to -- to -- to leave it on beyond a couple of hours after shutting it off that you know of?

MR. SOPP: Just to keep the -- cool down the boiler. I don't know if they should -- why they should have it on more. Not for any particular reason, no.

MR. ROTH-ROFFY: Do you know why the -- the crew would not just close all the vents and drains after a period of time, maybe an hour or something, and just try to retain that steam as a matter of practice?

MR. SOPP: As a matter of practice. There's many different practices. You can read it in the French manuals on these boilers. They fire up these boilers with shut valves, you know, shut drain valves, which to me is a very, very dangerous practice to do, but they fill up the superheater totally full with water, and then they close all the drains and then they let it drop, and to me, I wouldn't do it, but that's -- that was in the -- if you go in the French instruction books and read it, you will see that this is the practice.

So, what is the correct one? You can discuss it, but --

MR. ROTH-ROFFY: Okay. So, as far as you know, the way the boilers were operated, they would

open up all the -- they would -- they would basically continuously vent it until the pressure was reduced to zero?

MR. SOPP: Yeah. To a certain point, depending on how, when we wanted it back on line again, or if they wanted to cool it totally down, maybe they would let it go down after certain hours, a few hours, and then let it go down.

MR. ROTH-ROFFY: Would there be a reason to cool it all the way down if --

MR. SOPP: Yeah. For maintenance, for instance.

MR. ROTH-ROFFY: If there were no maintenance scheduled and -- and they -- even if they needed it in a couple of days, they planned to light off, would there be a reason to bring it all the way down by venting it continuously?

MR. SOPP: No, not really, but the pressure would fall off by itself, you know, after a few hours, three-four-five hours.

MR. ROTH-ROFFY: Even if you were to close all the valves and all the vents, --

MR. SOPP: Yeah.

MR. ROTH-ROFFY: -- the pressure would still continue to fall?

MR. SOPP: Well, fall, and after some time, it will eventually be nothing.

MR. ROTH-ROFFY: All right.

MR. SOPP: Then it cools off.

MR. ROTH-ROFFY: Was there ever any study done to -- to estimate the amount of fuel saving that might be accomplished through shutting off one boiler as opposed to three?

MR. SOPP: Well, I think if we have it just by ourselves, you know, looking at it and we could see what an official study --

MR. ROTH-ROFFY: So, --

MR. SOPP: -- would --

MR. ROTH-ROFFY: But you did -- at some point, you did do some kind of a test to see if there would be a fuel saving? Informal test of some kind?

MR. SOPP: We did this testing, yes.

MR. ROTH-ROFFY: Do you recall about how much fuel savings were -- were --

MR. SOPP: No, I don't know.

MR. ROTH-ROFFY: -- made? But it was definitely a fuel savings to --

MR. SOPP: Oh, yeah. It's a fuel saving. But I don't know if it was -- there were so many other

ways you could save fuel, how you run the turbine generators, how you run the diesel. It was so many ways. We were always looking for ways, you know. You could see they were running through turbo generators, and I was asking why do you run two turbos? Well, in case one trips off, we have a safety. We have diesels. Why don't you have the diesels? You know, they can sleep good at night. That was one of the reasons. They didn't have to be woken up in the middle of the night with something. It was not a safety concern because there's so much built-in safety on the system, the generators and everything, that everybody likes to sleep well at night. So, that's why we have to push a little bit about the fuel economy as well -- they didn't push too much actually. We just told them that be careful. Nobody was ever reprimanded for ever using too much fuel.

MR. ROTH-ROFFY: You may have already answered this question, I apologize for asking it again, but the microcrack problem that was discovered, was it strictly in one area around the weld seams or was it more of a generalized?

MR. SOPP: No. As far as I remember, it was only around the weld seams.

MR. ROTH-ROFFY: And was it the longitudinal weld seams as well as the --

MR. SOPP: I think it was both.

MR. ROTH-ROFFY: Okay.

MR. SOPP: I believe it was both.

MR. ROTH-ROFFY: And you mentioned that you had established some kind of a practice to go in and periodically inspect the boilers. Was there ever any kind of a memo or directive that was ever formalized this process that -- of going in periodically?

MR. SOPP: I -- I can't recall it now. I don't know.

MR. ROTH-ROFFY: Was -- was it your own practice to do that or was it your boss's practice that they told you to do that?

MR. SOPP: Not my boss's practice, no.

MR. ROTH-ROFFY: I'm sorry?

MR. SOPP: Not my boss's.

MR. ROTH-ROFFY: It was your own practice?

MR. SOPP: Yeah.

MR. ROTH-ROFFY: You had decided that, you know, based on your assessment of --

MR. SOPP: Yeah. From what I was seeing because my bosses was never in there.

MR. ROTH-ROFFY: Okay. And did you ever pass

your concerns on to anybody or recommendation that these boilers periodically be looked at, you know, to --

MR. SOPP: Yeah. We discussed this among the engineers and myself, yes. Chiefs, yes, and the chiefs reminded me, also, at the time, they were also very concerned.

MR. ROTH-ROFFY: They would remind you sometimes to -- to go in and inspect them?

MR. SOPP: No, not to inspect them, but about all these problems, the leaks and whatever, and then I had to go up and fight for money to do something. Actually, this was a constant problem. Almost every week, I had meetings.

MR. ROTH-ROFFY: Almost every week, you had meetings with the chief engineers?

MR. SOPP: Hm-hmm.

MR. ROTH-ROFFY: And you discussed generally problems on the ship?

MR. SOPP: I mean, we discussed the week's problems and then we always discussed boilers and what was going on with the main topics, usually, because it was always something, one way or another, another problem.

MR. ROTH-ROFFY: But specifically the problem with cracks, was that always --

MR. SOPP: Cracks -- cracks were very little because that was -- we didn't really have any catastrophic failures.

MR. ROTH-ROFFY: Right.

MR. SOPP: We had more with the tube failures. But that was what was closest to us all the time, although in the back of the head, the microcracks was always there.

MR. ROTH-ROFFY: So, the problem with -- with a lot of tube failures, what did you attribute that to?

MR. SOPP: Wear and tear, I would say.

MR. ROTH-ROFFY: Did you consider that the tube -- the rate of tube failures was excessive for a boiler of that type?

MR. SOPP: No. Not for the -- not for the -- always it had done -- starts and stops on the boilers. I think -- I think the boiler can almost go indefinitely if you don't light it up and shut it off. I think the biggest thing for a boiler is -- the worst thing for a boiler is to shut it down and start it up again intermittently or all the time. It's the worst thing that can happen and you could see this with all the starts and stops we had there. It was really bad.

MR. ROTH-ROFFY: So, the starts and stops, the frequent starts and stops were mainly causing tube failures and related --

MR. SOPP: Right.

MR. ROTH-ROFFY: -- problems like that?

MR. SOPP: And these are -- had to do -- because of the vessel and the speed you had to go and you had to be there early in the morning and we left St. Thomas late, you know, and suddenly you had to go from cold ship almost to 22 knots in half an hour, and this was a lot of operational things that caused all these rapid start-ups and things, because the engineers, they were very well aware of most of these things. They were very conscious of it.

MR. ROTH-ROFFY: Do you recall if Mr. Steinar Sjohaug was -- was involved with -- with these sorts -- or discussions with these problems with operating concerns and cracks?

MR. SOPP: No, sir. I was not on the ship really when he was there. I know him from long back. He was there for a short time and then he disappeared again. So, I -- I really haven't seen or haven't had him sailing for me on -- on the steam ship. He worked on some of the other vessels where I knew him, but Norway not much.

MR. ROTH-ROFFY: So, I don't know if you know who's on the crew -- on the ship now, but is there anybody currently assigned to Norway that -- that, you know, has a knowledge of the history of the boilers' problems?

MR. SOPP: Probably, yes. I don't know really who it is at the moment, but like Dan Fleseland is one of the first engineers. He's very good guy and he knows probably a lot about it.

MR. ROTH-ROFFY: How about Mr. Anvik? Do you know him?

MR. SOPP: Bjoern Anvik. Yeah. I'm quite sure he knows because he has been there so many years, that he knows the whole story about it, and then, also, Mr. Hammerdold, chief engineer on the Sky, is very into the whole story because he was very concerned about a lot of these things.

MR. ROTH-ROFFY: Okay. A little slightly different topic. Who was responsible for supervising or overseeing the chief engineer, his -- his performance or work?

MR. SOPP: Well, I was one of them, and then it was my boss and his boss, but he answered directly to me actually.

MR. ROTH-ROFFY: So, in fact, you could give him direction on -- on how to operate the ship? Because I think you said earlier that he kind of had a lot of freedom.

MR. SOPP: Yeah. He had a lot of freedom, but he answered -- he's the chief engineer and we regarded him as the man that can operate the vessel in a safe manner and we don't put any restriction on him as long as he do the things correctly. You know, not everything is a written book, you know.

MR. ROTH-ROFFY: Sure.

MR. SOPP: It's a lot of use your common sense.

MR. ROTH-ROFFY: General -- general good marine practices?

MR. SOPP: Yes, exactly. You know, you can see that's why you have this book, the fancy book, fancy stuff is not for nothing because you had a big book in there.

MR. ROTH-ROFFY: Oh, right, sure.

MR. SOPP: The procedures. It's -- it's a good literature for a new engineer, but for anything else, no.

MR. ROTH-ROFFY: Did you actually prepare an evaluation of the chief engineers?

MR. SOPP: No.

MR. ROTH-ROFFY: Do you know who would have done that?

MR. SOPP: I don't know if it was really done at all. I think that was done by the Personnel Department at NCL. But we discussed -- we had meetings about all the crew members or the officers with the Personnel Department. So, we -- and we also had meetings between -- you know, might be a chief engineer and question him the kind of work a little bit. So, we discussed this, but we didn't make evaluations like I'm doing in my present job, the American way of evaluation which takes all week. No, we don't do that. We didn't do that.

MR. ROTH-ROFFY: Did you ever have occasion to have a chief engineer relieved for poor performance?

MR. SOPP: No. Those chief engineers that was promoted to chief engineers, they had many years. We knew them very well. So, it was well thought of before they were -- would become chief engineers.

MR. ROTH-ROFFY: Before, I was asking you about who else might have known about, you know, historical problems with the boilers.

MR. SOPP: Hm-hmm.

MR. ROTH-ROFFY: A couple of second engineers on there. Would they have been knowledgeable about it? For example, Mr. Nicolaisen? Do you recall him ever --

MR. SOPP: Yeah. Nicolaisen probably would know something about it. I believe so.

MR. ROTH-ROFFY: Do you recall ever having a discussion with him or --

MR. SOPP: Not really him because he was in a different unit. He might have been present at some of the discussion but not with him at all, no.

MR. ROTH-ROFFY: Yeah.

MR. SOPP: I think all of the old engineers that was there for a lot of years, they knew about these problems, at least those that have been there from 1990 and onward. I think a lot of them were in there from 1990 and before actually.

MR. ROTH-ROFFY: Who at NCL was -- would usually, if anybody, would look at the log books and the records of the crew of the ship to -- to, you know, see that things were being properly logged and maintained?

MR. SOPP: I did it. I didn't sign it or anything. The captain signed it, I think weekly or every day or I don't know, but I think it was weekly, he signed it.

MR. ROTH-ROFFY: He would sign what?

MR. SOPP: The log book.

MR. ROTH-ROFFY: The engine log book?

MR. SOPP: Yeah.

MR. ROTH-ROFFY: And you would -- you said you would look at it periodically, randomly?

MR. SOPP: Every time I was in the control room, I went to the log book and it was almost weekly. I would say -- I would say almost every day.

MR. ROTH-ROFFY: Was here anybody else in shoreside management who would look at the -- the log books?

MR. ROTH-ROFFY: I don't know.

MR. ROTH-ROFFY: Was there a policy or a requirement for the -- for the ship to return the logs to shoreside for -- for review or --

MR. SOPP: No. They sent the weekly sheets, they sent maybe whatever, how many hours they have on the boilers, how many hours that we were running this boiler, that boiler, turbo jets, main turbines, and -- and water consumption, fuel consumption, and stuff like this. A sheet went weekly, and that was what I really required to have from them. From this sheet, I could

basically figure out if we had any stops on the boilers or whatever, and I would make little remarks. All of those papers were in my office.

MR. ROTH-ROFFY: And these weekly reports they gave you, that included the work that had been done, repair work?

MR. SOPP: Repair work, no, no. Work we discussed when I had my meetings every Saturday with them, and then we discussed what had happened the last week and about -- I can't recall, but I also got some -- for a period of time, they sent me work, what was done. I said I don't want to know what all these pieces of pipe here have been changing. I'm more interested in specifics, like problems with turbines and boilers and stuff like that. So, I said narrow it down to specifics and we discuss it, but they had to keep record on the ship on everything they do.

MR. ROTH-ROFFY: And that was record -- where was that record kept?

MR. SOPP: Senior first engineer, I guess he had the book for the records.

MR. ROTH-ROFFY: And did you ever look at that record book?

MR. SOPP: Oh, yeah.

MR. ROTH-ROFFY: Okay. What about AMOS? Who -- who looked after AMOS?

MR. SOPP: That was -- AMOS. Yeah. This was back -- it wasn't much. We had a little bit AMOS, but most of the maintenance was there, but we didn't get much of it because it was a lot of errors in the maintenance on this AMOS system. So, I was on board. I looked at it and saw what was done on it, but what is written in there and what is done in the review, I -- it's not always said that it is done. So, I looked at it in a skeptical eye because it was in the computer system.

MR. ROTH-ROFFY: And when was AMOS put on the ship, on the Norway?

MR. SOPP: Probably in -- AMOS actually was very early. Probably came in in the '80s some time.

MR. ROTH-ROFFY: Mid or late or early?

MR. SOPP: Mid. Mid to late '80s, yeah. '86-87.

MR. ROTH-ROFFY: So, you would sometimes look at AMOS but really didn't put much --

MR. SOPP: I didn't --

MR. ROTH-ROFFY: -- credence --

MR. SOPP: I didn't have -- I didn't have a screen, so I could go into it from my office because it

was in the early '80s of the computer, and it wasn't as easy as now. So, I -- I went in and I looked at the papers, you know, and I went through the papers and looked at what was done. It was not as easy as it is today. But you can -- we have this weekly meeting where we go much more over what was happening than what I found in the papers. You could sit for two-three hours every Saturday morning and talk with the chief engineer discussing problems, and then similarly other engineers might show up. The electricians would be there usually.

MR. ROTH-ROFFY: How about the staff chief or the first chief? Would they be involved in it?

MR. SOPP: Yeah. They were also involved in it, yeah. Staff chiefs usually were there, and then maybe staff captain usually came once in awhile.

MR. ROTH-ROFFY: Was there anybody else in the office at NCL that would look at the AMOS document or the AMOS records and computer files?

MR. SOPP: No.

MR. ROTH-ROFFY: So, it was mainly just a tool for the engineer on board to --

MR. SOPP: To see, but that was what it was made for also, and then after we -- you know, when we started the safety system, you know, the management system, we had to -- they changed it a little bit, so it was more a reporting tool, but that was -- that happened later.

MR. ROTH-ROFFY: All right. I think I'm going to let Brian ask a couple.

Thank you.

MR. CURTIS: Brian Curtis.

Per, regarding the Class survey areas, who would have been aware of the surveys of the problems involving the cracks?

MR. SOPP: Mr. Moore. He was aware of it. McBride, I assume he's also aware of it. Yeah. He's aware of it. McBride. Because they -- they -- those were the two guys I dealt with 99 percent of the time. I did have occasional surveys from -- from Hamburg or from -- I think from South Africa, we had one one time, and then they were also interested in the -- in the cracking thing. So, they were bringing it up always.

MR. CURTIS: Mr. McBride was a surveyor?

MR. SOPP: Yeah.

MR. CURTIS: And the other -- the other name? Can you get that? Moray?

MR. SOPP: Mr. Moore.

MR. CURTIS: Moore?

MR. SOPP: What was his first name? Andrew Moore.
MR. CURTIS: Okay.
MR. SOPP: He's still alive but he's very old. I met him two months ago actually.
MR. CURTIS: Okay.
MR. SOPP: But he has a good memory.
MR. CURTIS: And the other survey, Mr. Hofseth, does he have any familiarity with this problem?
MR. SOPP: No. We didn't use him very much when I was there because it -- it was a little bit conflict of interest because he had been working with NCL. So, he was very seldom -- it was only an emergency, Hofseth came on an NCL ship. It was Mr. -- what did I say? Moore and --
MR. CURTIS: McBride.
MR. SOPP: McBride, yes. McBride.
MR. CURTIS: I just have one more question. In your opinion, what organization, be it the owners, Class, or any others you want to identify, would be ultimately responsible for assuring that the problems, such as these on the boiler, are properly identified, repaired and documented?
MR. SOPP: The owner and the Class together. That's what I would say. I think the owner is just as responsible as the Class. You can't just say either. It's a shared problem.
MR. CURTIS: Thank you. Thank you very much. That's it.
MR. OLSEN: I've got a couple questions. Have you -- during your involvement with the Norway, have you ever become aware of any bypassing of safety systems associated with the boiler?
MR. SOPP: No.
MR. OLSEN: Okay. You know, part of this investigation and our investigation procedures is to gain a perspective of NCL and the organization in general.
MR. SOPP: Hm-hmm.
MR. OLSEN: So, in this regard, I'm asking if -- if you ever -- are you aware of any other important engineering-related or maintenance-related issues that we should be concerned about?
MR. SOPP: At the moment, no. I would tell you if I really had something, but I have to think about it, but there's nothing really that I have.
MR. OLSEN: Okay.
MR. SOPP: The only thing that really

concerned me is the cracks in the boilers. That has concerned me for some time. The rest on the Norway, I don't think so. There is concerns with other things, with the machinery there, yes.

MR. OLSEN: Hm-hmm.

MR. SOPP: Like the condensers, condensers are in real poor condition. Maybe some of the valve systems, steam valve systems, probably very outdated and hard to maintain. The condensers have been a concern.

MR. OLSEN: Okay. You indicated that maneuvering was an issue. So, is it correct then that masters -- let me -- let me cancel that question because you already asked it -- answered it.

I -- I guess I just need to understand one more time that when we talk about shipboard engineering personnel concerns about the boiler and stresses, we're not only focusing on tube failures but we're as well acknowledging problems with these microcracks?

MR. SOPP: Hm-hmm.

MR. OLSEN: Is that correct?

MR. SOPP: Can you rephrase it or --

MR. OLSEN: I'm sorry. When -- when the engineers were worried about stresses on board the vessel, they were not only worried about -- were they not only worried about tube failures but also the microcracking?

MR. SOPP: In general, they were more concerned about the tube failures.

MR. OLSEN: Hm-hmm.

MR. SOPP: They were not so much concerned about the cracks because these cracks had never been more than any reports on paper. Nobody or very few of us received them.

MR. OLSEN: Hm-hmm.

MR. SOPP: So, they were not too concerned about this. I think this is more on a different level we were concerned, although we were -- the reports were there for them to read, but --

MR. OLSEN: Yeah.

MR. SOPP: -- I don't know if they really understood the -- the urgency of these things.

MR. OLSEN: Did -- did you ever speak to Newt Cerebo --

MR. SOPP: Yeah.

MR. OLSEN: -- about these cracks?

MR. SOPP: Yeah. Oh, yeah.

MR. OLSEN: Could he tell us more about them?

MR. SOPP: Probably, because he had been

there a -- he was there a long time, yeah.
MR. OLSEN: Okay. Do you know where he lives now?
MR. SOPP: He lives in Drumser in Norway.
MR. OLSEN: Drumser?
MR. SOPP: Northern Norway.
MR. OLSEN: Okay.
MR. SOPP: He has a car repair shop somewhere up there, but I'm not in contact with him, but I just know I've heard about him.
MR. OLSEN: Yeah.
MR. SOPP: Really, he -- he was very much involved in that, yes. So, -- so, he was one of those, and Mr. Hammerdold.
MR. OLSEN: Haverwahl.
MR. SOPP: Hammerdold, H-A-M-M-E-R-D-O-L-D. Hammerdold.
MR. OLSEN: And where does Mr. Hammerdold live?
MR. SOPP: He's the chief engineer on the Norwegian Sky, probably on the ship at the moment.
MR. OLSEN: Could I have the list, please? This doesn't really give the senior engineers.
MR. SOPP: No. It's not a complete list.
MR. OLSEN: Yeah.
MR. SOPP: That is -- that doesn't give you the --
(Pause to review document)
MR. OLSEN: This doesn't really help me right now.
Did -- an engineer named Dan Fleseland, do you know if he would --
MR. SOPP: No, I don't know him.
MR. OLSEN: Okay.
MR. SOPP: I never knew him.
MR. OLSEN: How about Anvik?
MR. SOPP: Anvik?
MR. OLSEN: Yeah.
MR. SOPP: I know him, yeah.
MR. OLSEN: And would he know about these issues?
MR. SOPP: Yeah.
MR. OLSEN: Yeah.
MR. SOPP: Yeah. Anvik had been there so many years, that he should know about these issues.
MR. OLSEN: Okay. We've interviewed a number of people since we've been here, --
MR. SOPP: Hm-hmm.
MR. OLSEN: -- and -- and every time -- every

time we ask about cracks, we've got no knowledge of the crack. Could you tell us why?
MR. SOPP: That's very strange to me. All the older ones that been there before 1990, they should know about the cracks.
MR. OLSEN: Yeah. Okay.
MR. SOPP: So, that's very strange.
MR. OLSEN: Thank you. That's all the questions I have.
MR. OELSCHLEGEL: I just have one question.
MR. SOPP: Okay.
MR. OELSCHLEGEL: Any -- any concerns, let's say, that you have a chief engineer and he has a concern with a piece of machinery.
MR. SOPP: Yeah.
MR. OELSCHLEGEL: He has, say, a safety concern or just some -- and he -- as port engineer, he would tell you about it and then you would have to decide what to do, if you thought it was important or not important, and then you talked about money.
MR. SOPP: I would go to my superior and discuss it. First, I have to tell them about it and then I have to put it on paper and --
MR. OELSCHLEGEL: Okay. Along those lines, was there ever something that you thought was very important on the engineering side of the house that you brought to the attention of the company management and they said we disagree, we don't think this needs to be done?
MR. SOPP: Well, probably, because they probably never put it on paper, but they just said, well, this will not be done. You will not get money for it.
MR. OELSCHLEGEL: Hm-hmm.
MR. SOPP: So, when I -- when I put my list up for -- for drydock, what I want to do in drydock, they would say no, this will not be done, so there is no money for this, and there'd be no explanation more than that. So, there's nothing on the paper on it.
MR. OELSCHLEGEL: Okay.
MR. SOPP: So, this happened, you know, sometimes it was probably not that necessary, but there was other items which was very necessary.
MR. OELSCHLEGEL: So, --
MR. SOPP: Although the company was not when it came to safety, they were not holding back on safety issues really.
MR. OELSCHLEGEL: Okay.
MR. SOPP: But I don't know if they really

understood the urgency of some of these things. They thought about it more like, well, an investment in upgrading the machinery and are we really going to do this now and so maybe it was some that we didn't explain ourselves good enough maybe, although you saw my memo in here. I think I explained some of that pretty good. If they won't listen to that, then there is not much one can do.

MR. OELSCHLEGEL: All right. That's -- that's all I have. Thanks very much.

MR. SOPP: Okay.

MR. HISLOP: Kevin Hislop. Just three. As port engineer, were you ever aware of any discussions regarding -- that existed regarding change in class for the Norway?

MR. SOPP: Yeah. Several times.

MR. HISLOP: Okay.

MR. SOPP: They wanted to go to BV several times but nothing happened really.

MR. HISLOP: Okay.

MR. SOPP: It came to going out and getting bids and I guess -- I was never really involved in the whole scenario.

MR. HISLOP: Thank you. You said earlier that Andrew Moore, you know, --

MR. SOPP: Hm-hmm.

MR. HISLOP: -- despite his age, you saw him go into the --

MR. SOPP: Yes, yes.

MR. HISLOP: -- water drums. He got in there. Can you ever recollect seeing in the course of surveys or -- or hearing about Mr. McBride ever entered into these water drums?

MR. SOPP: Oh, yes. Yeah.

MR. HISLOP: He did?

MR. SOPP: Yes.

MR. HISLOP: Okay. Now, if you were still working for NCL as a port engineer, --

MR. SOPP: Right.

MR. HISLOP: -- what would you -- what would be your confidence level right now today in the other three boilers? In other words, what would you recommend?

MR. SOPP: It's very hard to say because I don't know what has been done the last four years. I have no idea.

MR. HISLOP: Okay.

MR. SOPP: If I had the day-to-day feeling what was happening, yes. I have no idea.

MR. HISLOP: But in the light of the incident that occurred on the 23, would you make some recommendations?
MR. SOPP: I would be very careful before I go out with any further operation on this ship.
MR. HISLOP: An inspection and examination?
MR. SOPP: Yeah. You'd have to do that, yes, but it's -- they have almost -- was it the same when the water's on them, very close to each other. So, -- and the times for lighting up is almost identical. So, they have -- the stress level is basically the same on all the boilers.
MR. HISLOP: Okay.
MR. SOPP: So, I would be very careful, but I -- I assume that this has been -- I mean, it will be tested and everything will be tested. So that, I can understand if people are not willing to -- or want to do -- I would -- I wouldn't be feeling comfortable going down there and lighting up these boilers again.
MR. HISLOP: Okay.
MR. SOPP: No.
MR. HISLOP: Thank you. No more questions.
MR. RILEY: John Riley.
One loose end, please. You mentioned the evaporator cleaning acid getting in --
MR. SOPP: Yeah. Right.
MR. RILEY: -- to which boiler again was it, please?
MR. SOPP: 24.
MR. RILEY: It was 24.
MR. SOPP: Yeah.
MR. RILEY: And you referred to a study. Was that --
MR. SOPP: We done a study after that because, you know, suddenly at night, I read in this report acid was pumped in instead of, I think it was going to be inject phosphate into the boiler and they took the drum standing next to it and they pumped this in, and it started to smell like ammonia down there, strong ammonia smell in the engine room, and then shortly afterwards, it started to like -- all of it, the whole furnace area was exposed and the tubes and all of it.
MR. RILEY: You referred to a study.
MR. SOPP: It was done as --
MR. RILEY: Who -- who by, please? Was that Drew -- did Drew, Hammeroid do that study?
MR. SOPP: I think Drew was involved in it, yes. But I -- I don't -- I'm not 100 percent sure, but

I -- Drew was there and Drew did the study on it or gave a report on it.

MR. RILEY: And approximately when was this again?

MR. SOPP: Late '81 or mid-'81.

MR. RILEY: Thank you. That's all.

MR. SOPP: No. It must have been before middle of '81 because I started there in July of '81, and this was -- I think it happened in May of '81 actually.

MR. RILEY: Thank you.

MR. ROTH-ROFFY: Tom Roth-Roffy. Just to follow up on Kevin's question about the discussions about change of class. You said you were not involved in those discussions. Can you recall who might have been involved in those discussions?

MR. SOPP: Yes. Sven Dahl. He was the senior vice president.

MR. ROTH-ROFFY: And do you have any idea why they might have been considering that?

MR. SOPP: I think it was more -- I don't really know for sure, but I heard it was something with money. It was -- one class was less expensive than the other one, but I don't know for sure.

MR. ROTH-ROFFY: Okay. That's all I have. Anybody else?

(No response)

MR. ROTH-ROFFY: Ken Olsen?

MR. OLSEN: No, no more questions at this time.

MR. SOPP: Okay.

MR. ROTH-ROFFY: Okay. I think we've made it before the end of the tape. It's about 5:00 and that'll conclude our interview of Mr. Per Sopp.

Thank you very much, sir, for coming down to see us.

MR. SOPP: Thank you.

(Whereupon, at 5:00 p.m., the Investigative Interview of Per Sop, Field Service Manager, Caterpillar Diesel, was concluded.)