NATIONAL TRANSPORTATION SAFETY BOARD

AIRCRAFT ACCIDENT OF ALASKA AIRLINES FLIGHT 261
BOEING MD-83, N963AS
PACIFIC OCEAN NEAR PORT HUENEME, CALIFORNIA
JANUARY 31, 2000
ACCIDENT: DCA-00-MA-023
PUBLIC HEARING

Board Room and Conference Center
National Transportation Safety Board
429 L'Enfant Plaza, SW
Washington, D.C. 20594

Friday, December 15, 2000
11:00 a.m.

Board of Inquiry

JOHN HAMMERSCHMIDT, Chair

JOHN C. CLARK, Acting Director
Office of Aviation Safety

DR. VERN ELLINGSTAD, Director
Office of Research and Engineering

BENJAMIN A. BERMAN, Chief
Major Investigations Division
Office of Aviation Safety

Technical Panel

RICHARD G. RODRIGUEZ
Investigator in Charge/Hearing Officer

JEFF GUZZETTI
Systems/Powerplants Group Chairman

FRANK McGILL
Maintenance Records Group Chairman

JOE EPPERSON
Metallurgy Group Chairman

DR. JOSEPH KOLLY
Fire and Explosion Investigator

LORENDA WARD
Structures Group Chairman

DR. DAN BOWER
Aircraft Performance Group Chairman

DR. MALCOLM BRENNER
Human Performance Specialist

CAPTAIN DAVE IVEY
Operations Group Chairman

Parties

HAROLD W. DONNER
Federal Aviation Administration

CAPTAIN KEVIN FINAN
Alaska Airlines

RONALD J. HINDERBERGER
Boeing Commercial Airplane Group

CAPTAIN BILL WOLF
Air Line Pilots Association

DAVID G. PATRICK
Aircraft Mechanics Fraternal Association

WITNESS LIST

WITNESS: PAGE:

Dennis Jerome, Principal Engineer
Boeing Materials Technology
Bearings and Lubricants Group
Seattle, Washington

A. Role of Grease in Jackscrew, and Grease Selection for Jackscrew
B. Approved Greases and their Characteristics
C. Grease Use (Substitution, Monitoring, Recommended Practices, Correspondence)

Interviewer: Joe Kolly

Dale Moore, Director
Aerospace Materials Division
Naval Air Systems Command
Patuxent River Naval Air Station
Patuxent River, Maryland

A. Overview of Laboratory Capabilities and Experience
B. Description of All Laboratory Testing Performed (Including Purpose and Objectives)
C. Discussion of Laboratory Test Results

Interviewer: Joe Kolly

Jay Maloney, Former Director of Engineering
Alaska Airlines
Seattle, Washington

A. Duties and Responsibilities at ASA
B. Maintenance Program Change Request -- ME-01 97-002974
C. Change to AeroShell 33 Grease
D. Interrelationship of Engineering and Maintenance Tooling at ASA

Interviewer: Frank McGill

WITNESS LIST

WITNESS: PAGE:

Wright McCartney, Manager Reliability
Alaska Airlines
Seattle, Washington

A. Reliability Program
B. Evaluation of the Continuous Airworthiness Maintenance Program
C. Development and Approval of Maintenance Program
D. Escalation of Intervals (Including J/S Lube and End Play Check)
E. FAA Maintenance Review Board (MRB) and Alaska Airlines MRB
F. On-Aircraft Maintenance Planning Report (OAMP) Maintenance Steering Group (MSG)-2 and -3

Interviewer: Frank McGill

Jim Davey
Assistant Vice President, Engineering
Alaska Airlines
Seattle, Washington

A. Development and Approval of Maintenance Program
B. Escalation of Intervals (Including J/S Lube and End Play Check)
C. FAA MRB and ASA/MRB
D. OAMP MSG-2 and -3
E. Change-Over to AeroShell 33
F. Maintenance Task Cards (Design and Application

Interviewer: Frank McGill

WITNESS LIST

WITNESS: PAGE:

Robert Falla
Former Manager of Base Maintenance for
Alaska Airlines
Seattle, Washington

A. Duties and Responsibilities at Alaska Air
B. Base Maintenance Procedures in SEA and OAK
C. Knowledge of N963AS C-5 Check
D. Activities Involving Grease and Lubrication
E. Lubrication of the Jackscrew
F. Participation in ASA Internal Meetings (RAP and Staff Meetings)
G. Sharing the Duties of Assistant Vice President of Maintenance

Interviewer: Frank McGill

Robert Hinman
Former Director, Line Maintenance
(Former Director, Base Maintenance)
Alaska Airlines
Oakland, California

A. Duties and responsibilities at Alaska Airlines
B. Activities involving MD-80 heavy checks
C. Knowledge of C-5 check on N963AS
D. End play check tools
E. Lubrication of the jackscrew
F. Participation in ASA internal meetings (RAP and staff meetings)
G. Sharing the duties of Assistant Vice President of Maintenance

Interviewer: Frank McGill

WITNESS LIST

WITNESS: PAGE:

Art Fitzpatrick
Director, Base Maintenance
(Former Director, Line Maintenance)
Alaska Airlines
Oakland, California

A. Staffing and Supervision
B. Activities Involving MD-80 Heavy Checks
C. Adherence to Procedures
D. End Play Checks and Tools
E. Lubrication of the Jackscrew
F. Mechanic Training Pre- and Post-Accident
G. Line Maintenance
H. Knowledge of C-5 Check on N963AS
I. Participation in ASA Internal Meetings (RAP and Staff Meetings)
J. Sharing the Duties of Assistant Vice President of Maintenance

Interviewer: Frank McGill

Bill Weaver, Vice President
Maintenance and Engineering
Alaska Airlines
Seattle, Washington

A. Organizational Philosophy
B. Quality Control
C. Quality Assurance
D. Safety
E. Increased Utilization of Aircraft
F. Reliability
G. Maintenance Planning and Material Control
H. Outsource Maintenance Contracting

Interviewer: Frank McGill

WITNESS LIST

WITNESS: PAGE:

John Fowler
Former Executive Vice President
Technical Operations and System Control
Alaska Airlines
Seattle, Washington

A. Duties and Responsibilities
B. Organizational Philosophy
C. Quality Control
D. Quality Assurance
E. Safety
F. Increased Utilization of Aircraft
G. Reliability
H. Maintenance Planning and Material Control
I. Outsource Maintenance Contracting

Interviewer: Frank McGill

Michael Cohen, Senior Vice President
Maintenance and Engineering
Alaska Airlines
Seattle, Washington

A. Duties and Responsibilities
B. Post-Accident Changes in Maintenance and Operations
C. Alaska Airlines Airworthiness Operations Action Plan

Interviewer: Frank McGill

P R O C E E D I N G S

11:01 a.m.

MR. HAMMERSCHMIDT: Let's please come to order.

Good morning. Welcome to all to this third day of the National Transportation Safety Board public hearing on the January 31, 2000, accident involving Alaska Airlines Flight 261 off the coast of Port Hueneme, California.

We will be proceeding with our next witness Mr. Dennis Jerome momentarily.

I would like to point out a few administrative thoughts before we begin. We -- we took account of the pace that these witnesses have been taking up to this point after we concluded last night, and just to make sure that everyone is -- is totally informed as to our projections in terms of additional days for this hearing, we have considered different options to expedite the hearing, including the thought of perhaps deleting a witness here or deleting a witness there. Have decided at this point that, really, that's not the best approach and we will continue on course with the witnesses as they appear on the witness list, of course subject to change, but

that's our -- our plan at the moment.

And if we continue at the current pace -- and we've been asking a great many questions of the witnesses thus far, and that has taken up a greater than projected amount of time in terms of completing the hearing. If we continue this pace then we may be looking at a -- at a five-day hearing instead of a four-day hearing. And if that turns out to be the case, we will perhaps need to finish the hearing on Monday of -- of next week.

I just want to give you a -- a heads-up that that is a -- looking to be like a distinct possibility at this point, and you might want to consider making some arrangements -- some logistical arrangements in terms of hotel rooms and flights, et cetera, in that -- in that regard.

We will be keeping everyone up-to-date as to what our definite plan will be once it's established, but that is also a function of how long the witnesses today take and what our estimate of the witnesses tomorrow will be. But at the -- at the moment it looks as though we will need an additional day to conduct the interviewing of these witnesses in the -- in the way that it needs to be accomplished. So I just wanted to

make sure that everyone was at least aware of our current thoughts on -- on that subject.

If anyone thinks that this is going to produce a hardship, please let us know because we will try to make every accommodation because the hearing is running slower than -- than had been announced.

But we are also faced with a few technical issues in terms of the closed-circuit TV that's being provided to the west coast. And we were working on those technical issues at the moment as well as the -- the live Web cast. Therefore, we are dealing with -- with what needs to be done to maintain those hook-ups so that the families on the -- on the west coast and, for that matter, people around the globe will be able to log in to this hearing and -- and hear what we are doing.

And I would also say in that regard that we certainly this morning wish to say hello and welcome to those who are on the west coast viewing this hearing, the family members there, and Belleview, Washington, and San Francisco, California. We welcome them back to the hearing as well as, of course, the family members attending here in person.

Mr. Rodriguez, as Hearing Officer, are there

any loose ends from yesterday that we need to address before we proceed to the next witness?

MR. RODRIGUEZ: None other than what you've covered, sir. You could call the next witness.

MR. HAMMERSCHMIDT: All right. The next witness is Mr. Dennis Jerome.

Mr. Jerome, we welcome you, sir. Please proceed to the witness table.

Whereupon,

DENNIS C. JEROME

was called as a witness, and first having been duly affirmed, was examined and testified as follows:

Interview of Dennis Jerome

MR. RODRIGUEZ: Would you state your full name?

THE WITNESS: Dennis C. Jerome.

MR. RODRIGUEZ: And your business address?

THE WITNESS: The Boeing Commercial Airplane Company, Box 3707, Seattle, Washington, 98124.

MR. RODRIGUEZ: And would you briefly describe your aviation background for us?

THE WITNESS: I'm currently a principal engineer in the Boeing Materials Technology Bearings and Lubricants Organization. I've been assigned as the

technical focal for lubricating grease since the beginning of 1998. Prior to that, I was a supplier quality control representative for 22 years. Prior to that, I worked for Boeing Aerospace Company up until 1973. Prior to that I attended Mississippi State University, where I received a Bachelor of Science and Master of Science in Metallurgical Engineering.

MR. RODRIGUEZ: All right, sir. Can we get that volume up a little? He's about as close to the mike as he can get.

And Mr. Kolly will question the witness.

DR. KOLLY: Thank you. Good morning, Mr. Jerome.

THE WITNESS: Good morning.

DR. KOLLY: Mr. Jerome, what engineering procedures were originally performed to select and recommend a grease for use on the jackscrew?

THE WITNESS: In my review of what was performed in Long Beach at the time I was unable to speak to people who had first-hand knowledge who were there when the MD program was first certified. However, I can relate to you the basic procedures that one would follow in determining the appropriate lubricant for a specific application.

The primary factors to consider are of load that's on the bearing surface; the area that's -- the load is being distributed over; the kind of motion, whether it's inter-directional or oscillating or intermittent; and the temperature range that the unit has to operate at; and also whether or not the system is relubricated or permanently lubricated.

DR. KOLLY: Who -- who at the manufacturer would approve of the selection of this grease?

THE WITNESS: The design engineering organization responsible for the overall system or unit would have -- in Long Beach division they have a design approval engineer who is a specialist for specific systems. That individual would be the immediate approver of the assembly drawings, which would include the lubrication call-outs.

DR. KOLLY: And this selection in particular in the maintenance manual for the jackscrew is identified by a mil spec. Can you explain what a mil spec is and its associated QPL?

THE WITNESS: Yes. Military specifications are compilations of the property requirements through standard tests that the lubricant must comply with. It -- it also includes tests that the lubricant must

undergo before it's shipped: lot acceptance test. The -- the specification in this case has a QPL, or Qualified Products List. It includes all lubricants that have been submitted to the custodian organization and have passed a specific set of performance tests and are -- are therefore considered as meeting the specification.

DR. KOLLY: So any grease on the QPL can be used to satisfy the call-out for the mil spec?

THE WITNESS: Yes. If a drawing calls for a mil spec grease, any one grease on there will comply.

DR. KOLLY: Alaska requested that Boeing issue a NTO regarding the switch to AeroShell 33, and I'm wondering if Boeing followed the same type of procedures for identifying and recommending greases that you had just -- just discussed?

THE WITNESS: What they did was have a comparison test performed -- series of tests comparing AeroShell 33 grease to Mobil 28 grease. Based on that comparison they found that the relevant properties, such as anti-wear, extreme pressure, corrosion protection, et cetera were reasonably close enough so that the greases could be -- the AeroShell could replace the Mobil 28 in the applications.

They did also find that the temperatures were not compatible. The -- the upper limit for the AeroShell grease was 250 Fahrenheit. Also the -- the wash-out resistance -- water resistance of the two greases were different. The Mobil was more resistant.

DR. KOLLY: And we're concerned here today about two types of greases: Mobil 28 and AeroShell 33, in particular. And I'd like to know if you could describe briefly the general characteristics of Mobil grease 28?

THE WITNESS: It is a high-temperature lubricating grease. It can operate up to 350 Fahrenheit. It's thickened with a clay base compound, and it's a synthetic hydrocarbon base oil.

DR. KOLLY: With regard to the jackscrew, could you describe the service history of this grease or -- or of the 81322 mil spec grease?

THE WITNESS: From my understanding of reports back to the Long Beach Service Engineering Organization, there's been a satisfactory service history with respect to the jackscrew system in question with the exception of two or three occurrences. Those specific occurrences they believe were attributed to lack of lubrication based on

examination of units returned.

DR. KOLLY: So with that history in mind, would there be a -- would you see a need to switch to a new grease for the purpose of improving performance?

THE WITNESS: Not solely for that purpose.

(Pause)

DR. KOLLY: I'd like to talk a little bit about AeroShell 33. Could you describe -- essentially, Boeing developed a -- a Boeing specification for that grease. Could you describe why that was done and the evolution of that?

THE WITNESS: Yes. Boeing Seattle-designed airplanes use a somewhat different lubrication philosophy from the Long Beach airplanes. They use lubricants that are primarily of a lower temperature nature. Maximum temperature 250 Fahrenheit. But they are still fluid and pliable down to minus 100 degrees Fahrenheit. That allows our actuator systems to work with less resistance and less wear and tear on drive systems. The specification for that grease is Mil G23827. However, that grease -- the greases in that -- under that specification were not providing what was considered to be optimum performance. We were getting quite a few complaints from the airlines.

Boeing did a study and determined that the two primary problems experienced with that grease were rust, corrosion of steel, and wear. So they undertook a program which initiated early 1993, culminated in 1995, of this -- establishing the properties that needed to be included in a new grease, working with various lubricant vendors, and finally qualifying a new product and releasing the BMS specification in mid -- mid-1995.

DR. KOLLY: Now, when -- so when Boeing recommended the use of this grease, did it in fact have a mil spec associated with it at the time or was it a Boeing spec?

THE WITNESS: It was a Boeing spec.

DR. KOLLY: And subsequently in 1999, it did meet the 23827 mil spec --

THE WITNESS: Yes. The producer of the -- of the lubricating grease, Shell Oil wanted to also get coverage under mil 23827 so that they could broaden their spec coverage.

DR. KOLLY: And what -- what are -- again, similar to what you -- how you stated the Mobil grease characteristics, could you -- could you give me a -- the similar characteristics for AeroShell 33?

THE WITNESS: Yes. It's a low temperature, minus 200 to plus 250 Fahrenheit operating range. It is a lithium soap complex-thickened grease, and the base oil is a blend of synthetic hydrocarbons and diester base oils.

DR. KOLLY: And Boeing recommended that BMS 333 AeroShell 33 could replace -- could replace 23827 greases in the Boeing aircraft when -- when -- when the product was available?

THE WITNESS: That is correct.

DR. KOLLY: What has been the service history of -- of AeroShell 33?

THE WITNESS: The first grease was produced in late 1995, and so it only went into service in the start of 1996. So far we have had good results. There's been no occurrences of repetitive nature of problems with corrosion or wear.

(Pause)

DR. KOLLY: Specifically, are you aware of any adverse effects of deficiencies in aircraft service to copper-based materials?

THE WITNESS: For the AeroShell 33 grease?

DR. KOLLY: Yes, for AeroShell 33.

THE WITNESS: As a result of a test that was

recently run by the grease group --

DR. KOLLY: Well, may -- may I ask about specifically to aircraft service. We'll get to that --

THE WITNESS: Right.

DR. KOLLY: -- in a minute.

THE WITNESS: Boeing recently ran a evaluation of our BOCOM database going back to 1996 looking for any -- any evidence of complaints from operators or questions from operators regarding corrosion or staining or darkening of copper, of bushings or any materials on the airplanes attributable to grease or AeroShell product or BMS 333. There were no occurrences where there was a relationship.

DR. KOLLY: Thank you. Mr. Chairman, we are about to discuss some of the tests performed on grease by the U.S. Navy's Aerospace Materials Laboratory. These tests are still in progress. At this point in the investigation we have not begun the analysis of these results.

Therefore, I request that the questioning regarding testing be focused on the test methods and results and not to an analysis of these results towards the wear of the accident aircraft jackscrew.

MR. HAMMERSCHMIDT: Thank you, Mr. Kolly. I

think that's a good observation to make at this time and we will limit the -- the future questions to that -- that area that you've described.

DR. KOLLY: Thank you. Mr. Jerome, as a member of the group formed to investigate grease and lubrication issues, have you -- have you reviewed the results of the tests performed by the U.S. Navy with regard to copper corrosion testing of -- pure AeroShell 33 and pure Mobil grease 28?

THE WITNESS: Yes, I have.

DR. KOLLY: Would you briefly describe those -- how those tests were performed? There was two different types of -- test methods performed and they were performed on two different types of materials.

THE WITNESS: That is correct. There's -- the standard test is run with a pure copper specimen. The surface of the specimen is -- is cleaned and prepared prior to the test. A duplicate set of tests were performed using aluminum bronze alloys simulating the gimbal nut material.

The hundred percent pure Mobil 28 and hundred percent pure AeroShell 33 grease were both subjected to a test wherein they were either fully immersed in grease or partially immersed in grease. The fully --

full immersion represents an ASTM test method which is -- is referenced and required by Mil 81322 spec, Mil 23827 spec, and also the BMS spec. The Federal standard partial immersion test was also included because the grease group suggested it.

The Mobil 28 pure grease did not show any evidence of discoloration above a Class 1B. 1B reference is a reference standard called out in the ASTM test. And it's basically described as -- as an orange or dark orange color.

The AeroShell 33 grease also was acceptable for the full immersion test under the ASTM procedure. The -- the partial immersion test resulted in a dark line or band at the interface of the grease and air on the -- for the AeroShell 33 grease. That results in that being categorized as a "fail" at the interface.

CAPTAIN FINAN: Mr. Chairman? Excuse me for the interruption. Can -- can --

MR. HAMMERSCHMIDT: Yes?

CAPTAIN FINAN: -- Mr. Jerome confirm that it's Exhibit 16(B)?

MR. HAMMERSCHMIDT: I just want to recognize who's talking.

CAPTAIN FINAN: Oh, thank you very much.

MR. HAMMERSCHMIDT: Captain Finan.

CAPTAIN FINAN: Can Mr. Jerome confirm that it's Exhibit 16(B) that he's referring to?

THE WITNESS: Yes, 16(B).

CAPTAIN FINAN: Thank you. Thank you, sir.

MR. HAMMERSCHMIDT: And I might mention from a procedure standpoint that when the witnesses -- if there's other witnesses in the room, when you are referring to information it's always helpful to those who are trying to follow through the exhibits to indicate page number, exhibit number, or whatever the pertinent thing is in the exhibit, if it's an illustration or whatever.

THE WITNESS: Yes, sir.

MR. HAMMERSCHMIDT: Just a word of -- just a hint. Okay. Please proceed, Mr. Kolly.

DR. KOLLY: So when we're talking about the pure greases in these tests, there was -- between Mobil 28 and AeroShell 33 there was only one test that exhibited a failure. That was with the Federal method using AeroShell 33?

THE WITNESS: That is correct.

DR. KOLLY: What would be -- what would be the potential significance of this finding?

THE WITNESS: Relative to an in-service application, we do not know what the significance would be. This would need to be determined by further testing. There are surface analysis techniques that are very sensitive to determine what the compound is on the surface, whether it's a chemical interaction or whether it's possibly just a deposit of a precipitate from the grease.

DR. KOLLY: And so would you agree that the next step in this -- in this process should be an analysis of -- of what exactly this stain -- this staining deposit or corrosion, whatever it may be to identify what it is. And --

THE WITNESS: Yes. To make a determination of the significance of this, you would have to do additional testing.

DR. KOLLY: And then -- and then we would most likely, upon those results, further analyze this and its effect -- possible effects on wear. Do you agree with that?

THE WITNESS: That's correct. Yes.

(Pause)

DR. KOLLY: When the "no technical objection" was given for AeroShell 33 to be used as a substitute

for Mobil 28, was it intended that AeroShell 33 be used exclusively?

THE WITNESS: As I understand the request and the Long Beach response, it was intended that the AeroShell grease 33 would be used in place of the Mobil 28 grease.

DR. KOLLY: Once that switch was made, was -- was there any guidance or -- or suggestion to Alaska Airlines restricting them not to -- let's say if they had initiated the switch to AeroShell 33, not to go back and use any reserves of -- of -- of 28?

THE WITNESS: There was --

DR. KOLLY: Of Mobil 28?

THE WITNESS: There was -- there was nothing mentioned in the response to the "no technical objection." And there -- it is -- an unwise practice, I guess I would say, to switch back and forth between greases. It's generally accepted that you'll get better results with a single grease. Sometimes you do run into compatibility problems between different brand names of grease even under the same specification.

DR. KOLLY: I know you're familiar with the jackscrew and -- and how it's lubricated. It's lubricated in two methods -- or by two -- two methods,

one using a -- through a grease fitting and the other through an application by hand or by brush of the screws. When -- when this lubrication process is done, is there an opportunity for -- upon relubrication that the new lubricant and the old lubricant become mixed in the jackscrew?

THE WITNESS: Yes, that is possible. It's -- it's preferred to remove all of the old lubricant, but typically that is just not possible without disassembling an entire airplane. It's common practice when switching lubricants to in -- to put in fresh lubricant trying to displace and push out as much of the old lubricant as possible. And then on subsequent relube cycles you'll reduce the -- residual old lubricant even more.

DR. KOLLY: That -- that's most appropriate -- we call that purging through -- through a grease fitting.

THE WITNESS: That's -- that's --

DR. KOLLY: How -- how would -- is there any guidance given to a similar application to -- to the screw itself? Is there -- how do you -- how would you perform a purging or a removal of the old grease before putting on the new? Is that specifically called out in

-- in -- by Boeing?

THE WITNESS: The -- the maintenance manual for the MD-80 does have in the general section an indication that for vented bearings, which a -- the Acme screw gimbal nut interface is in fact a bearing, that you should in general relubrication practice pump in new grease until all of the old grease is -- is extruded out. That's really good practice whether you're switching greases or not because greases become contaminated with dirt and that needs to be removed from the moving joints.

DR. KOLLY: I'm thinking directly about the screw --

THE WITNESS: Right.

DR. KOLLY: -- the exposed screw.

THE WITNESS: The instructions in the MD-80 maintenance manual simply say to apply fresh lubricant on the surface of the screw by hand. That would be by brush or rag. There -- the screw would be accessible if one were aware of the need to remove old lubricant for a switch-over cycle, and it could be fairly well removed from the screw.

DR. KOLLY: What do -- what is known in the lubrication community about intermixing of greases?

THE WITNESS: Often you can incur varying degrees of incompatibility. Back in the '50s incompatibility became very well known when wheel bearing greases started incurring problems when they switched from sodium-thickened greases to lithium-thickened greases. This was an -- there were extreme incompatibility incurrences where the greases turned to a complete liquid and ran out. We seldom see problems that severe, but it does highlight the potential problem for incompatibility.

Generally, it happens when you have dissimilar thickening agents. Thickener in the grease is responsible for making the oil into a gel. If the thickener effectiveness is compromised, then the consistency or firmness of the grease can significantly change.

(Pause)

DR. KOLLY: I'd like to -- I'd like you to turn your attention to Exhibit 16(A), which is the results of the Pax River testing. And there were some compatibility tests run between these -- these two greases. Could you please describe the methods that were used?

THE WITNESS: Yes. In Exhibit 16(A) I

believe there's a summary of the results on page 18 and a description of the compatibility on draft page 5.

The -- the ASTM 6185 compatibility evaluation procedure was used. And this -- this procedure is relatively new. It was first published in January of 1998. It was prior to that -- only one of the procedures that is utilized in the AS -- the new procedure was utilized. That was -- the traditional method was sheer stability, which measures how well the grease maintains its consistency over the lifetime of being worked in a bearing.

The -- the ASTM procedure involves doing a series of -- of three tests in -- in steps. Strictly interpreted, the -- the procedure allows you to stop testing -- declare the grease incompatible and stop testing if any one of the early tests fails. For that reason we only have two of the three test results at this time.

The -- one of the tests was a dropping point test. It's a standard ASTM test. It's a measure of the heat resistance of the grease. The -- the test showed that there was no incompatibility or it indicates compatible for a mixture of 90 percent Mobil, 10 percent AeroShell, and 50 percent Mobil, 50 percent

AeroShell.

At the 10 percent Mobil, 90 percent AeroShell, the results were slightly outside of the normal parameters but the margin was less than the accuracy or error inherent in the tests, so it was classified as borderline.

The other test that was run is a elevated temperature, storage stability test simulating what might happen to the grease in a -- in a container over a long period of time. The test is run by holding the -- the grease and the grease -- the grease mixtures at a temperature of approximately 250 degrees Fahrenheit for 70 hours. The worked penetration of the grease prior to exposure is measured for each of the -- each of the mixtures, the worked penetration after exposure is measured, and if the change is outside of the band width for the pure greases, then by the -- the criteria of the spec the grease mixtures are declared incompatible.

The results of the test were that for the 90 Mobil 10 Aero -- 10 percent Aero shell mixture and for the 10 percent AeroShell, 90 percent Mobil mixture the results were outside of the consistency band width far enough to be declared incompatible. For the 50/50

mixture, 50 percent AeroShell, 50 percent Mobil, the results were within the band width margin and were declared compatible.

DR. KOLLY: Would -- would the result of these greases being considered incompatible be sufficient to determine that that had an adverse effect on wear?

THE WITNESS: No. This is not a -- not a wear test. It is a test of a physical property of the grease. The -- there's generally two categories of properties for greases. The physical, which is the consistency is one of those measures, and they're -- they're measuring the firmness of consistency of the grease here. The other properties would be such as wear or extreme pressure tests.

DR. KOLLY: The copper corrosion testing that was done was also done with mixtures of greases, which would also have been -- be a measure of the compatibility -- the chemical compatibility of the two greases. Could you briefly describe the results of those tests?

THE WITNESS: Yes. Referring to Exhibit 16(B), Sheet 1, the two greases were mixed in varying proportions. 90 percent/10 percent, 50/50 and 10

percent/90 percent. They were tested on aluminum bronze specimens. There were two methods of testing, as indicated before for the pure greases: the ASTM full immersion method and the Federal standard partial immersion method.

The results were somewhat interesting. The 90 percent Mobil/10 percent AeroShell and the 50 percent Mobil/50 percent AeroShell mixtures failed for both kinds of tests, the full immersion and the partial immersion. The 50 percent -- the 90 percent AeroShell/10 percent Mobil passed for both the full immersion and the partial immersion.

These are somewhat interesting because if you had purged the system with AeroShell grease 33, you would have put more likely in the range of 90 percent AeroShell/10 percent Mobil, which did not seem to have a reaction with the aluminum bronze. If you had not adequately purged or if you had switched back and forth between greases, it's possible a chemical reaction could have occurred.

The -- the failures in this case are -- involved the whole area of grease contact. They are not limited to the air-grease interface. This suggests that there may be a chemical interaction with the

greases.

DR. KOLLY: Based on these results, what would you suggest the next line of analysis would be?

THE WITNESS: To understand how these might relate to the jackscrew, specifically the gimbal nut, you would need to do additional testing to determine, for instance, the -- the depth of an attack, the kind of chemical compounds that are occurring. Possibly some kind of a wear test could be devised wherein the greases could be aged or conditioned.

DR. KOLLY: So at this time we have -- do we have any idea whether this -- this staining would have played in a role in increased wear?

THE WITNESS: At this time we do not. All it is is an indicator that we need to follow up and investigate this particular condition.

DR. KOLLY: What guidance is given by Boeing to the -- to the operators regarding mixing of greases? And in particular, I'd like to talk about Exhibit 16(F).

(Pause)

THE WITNESS: Exhibit 16(F) is a Boeing -- is a Boeing service letter. It's an informational document -- that communicates general information to

all airlines relative -- in -- relative in this case to the various lubricating greases that are used on the Seattle-designed aircraft. Within that, it mentions that greases' different thickening systems, even though they are on the same QPL, can exhibit compatibility problems. And they -- therefore, intermixing of brand-name greases which use different thickening systems should be avoided.

DR. KOLLY: Based upon the results that we now have on the mixing of Mobil grease 28 and AeroShell 33, would you clarify the compatibility statement that is in the Boeing "Airliner" article, Exhibit 11(R) that regards the compatibility of AeroShell 33 greases with other greases?

(Pause)

DR. KOLLY: I'm referring to page 7 of Exhibit R, the bottom of the middle column. Bottom paragraph of the middle column.

THE WITNESS: Yes. Exhibit 11(R), marked as page 7 of the January through March, 1996 "Airliner Magazine."

"Additional testing has -- has shown it," referring to AeroShell grease 33, "it is compatible with existing greases and has performed well in some

actual components." The results cited here were based on sheer stability compatibility testing. Sheer stability was the traditional -- has been the traditional method for determining compatibility since the early '50s when compatibility was first determined to be a problem. Boeing, at the time of developing the BMS 333 specification, used a -- modification of a compatibility test that Mobil had published in their technical bulletin on evaluating greases.

The Mobil method indicates that you would test 100 percent of each of the pure greases and after prolonged working. That's subjecting the greases to 100,000 double strokes in a standard grease worker. That extrudes the grease back and forth through a steel plate with a bunch of holes in it similar to a hamburger grinder. This causes the grease to be sheered severely and can tend to break up some thickening agents. The result says the consistency or firmness of the grease can be changed.

The -- the Mobil method indicates that after performing a sheer consistency test and getting a -- a -- penetration reading for the 100 percent pure greases you would draw a straight line on a graph through the two pure greases. You would then test a mixture of the

greases and plot the point on the same graph. If the -- if the sheer stability penetration number for the mixture is from zero to 30 points within the ideal line, it would be considered compatible. If it's 31 to 60 points from the ideal line, it would be considered borderline. And if it's 60 points or greater, it would be considered incompatible.

The testing performed in 1995 in support of BMS 333 found that the results for Mobil 28 and AeroShell 33 were within 30 points.

(Pause)

DR. KOLLY: Mr. Jerome, I have one -- one follow-up question here. In testimony yesterday it was stated that Alaska Airlines wanted to switch to AeroShell 33 because it was a better grease. What -- what would be the basis for that -- for that idea or statement?

THE WITNESS: Primarily, protection of steel parts from rust. The AeroShell 33 grease is formulated with specific additives to protect steel surfaces from corroding. The performance test within that spec is a modified dynamic rust test in which a alloy steel -- non-corrosion resistant alloy steel bearing is lightly coated with grease, is put in a plastic pillow block,

the bearing is spun with -- halfway immersed in distilled water and then it's allowed to sit. Then it's repeated. It's spun again for a while and allowed to sit. And it's done a third time and then it's allowed to sit for a long period of time. That's the standard test.

The requirement for -- the requirement is that no rust appear on any surfaces in this alloy steel, in this case 52100 steel bearing. The requirement for the Boeing BMS 333 grease is that this test be done not with fresh water but with salt water.

DR. KOLLY: How relevant would that characteristic be for the -- for application to the jackscrew?

DR. KOLLY: It would only apply to the jackscrew shaft, which is manufactured from alloy steel. The -- the aluminum bronze article, generally those do not require protection from atmospheric corrosion.

DR. KOLLY: Thank you, Mr. Jerome. Mr. Chairman, I have no further questions.

MR. HAMMERSCHMIDT: Thank you very much, Dr. Kolly.

Are there other questions at this time from

the Technical Panel?

(No response)

MR. HAMMERSCHMIDT: Very well. We now proceed to the parties to the public hearing for their questions. And let's begin with the Aircraft Mechanics Fraternal Association first, and we'll work in a clockwise manner around with the parties. Mr. Patrick?

MR. PATRICK: Thank you, Mr. Chairman.

(Pause)

MR. PATRICK: Good morning, Mr. Jerome.

THE WITNESS: Good morning.

MR. PATRICK: Prior to the accident did Boeing ever suggest mixing of any grease should be avoided, that you're aware of?

THE WITNESS: Yes. The Long Beach division published a close-out focus report item on -- as -- it was a close-out report on a task that they accepted to consider approving AeroShell grease 33 in place of Mil G81322 greases on the MD-80. This was a action item taken during a team maintenance conference. The -- the finalization of that was that they published a close-out report in May of 1999 which stated in part that due to differences noted above Boeing cannot approve the use of AeroShell grease for all applications on Douglas

products. Boeing has in the past issued a "no technical objection" for limited use of AeroShell 33 on Douglas products, and Boeing does not recommend mixing different grease types -- different types and brands of grease. When a change is made from one grease to another, the old grease should be removed.

MR. PATRICK: Thank you. In regards to removing grease, is there any guidance from the manufacturer that you're aware of to the operator regarding purging the system prior to the introduction of a new lubricant? Or did you pretty well cover that?

THE WITNESS: The -- specific to the MD-80, the maintenance manual does -- I believe it's Section 1220 -- I'm sorry. 12-21-00 says when lubricating vented bearings, force grease into fittings until all old grease is extruded. A vented bearing could be considered a sealed bearing with a hole drilled in it to allow escape of water or old grease. It could also be a plain journal bearing pinned at joint, which typically don't have seals. The -- the Acme screw in this case has no seals and it is in a -- a type of bearing.

MR. PATRICK: Thank you. In reference to Exhibit 11(H).

(Pause)

MR. HAMMERSCHMIDT: Mr. Patrick, could you repeat that exhibit number?

MR. PATRICK: 11(H).

MR. HAMMERSCHMIDT: H.

(Pause)

MR. HAMMERSCHMIDT: I might just note that that was not an exhibit that this witness was expected to be prepared on, but please proceed if he's comfortable with it.

MR. PATRICK: Oh, okay. Thank you.

THE WITNESS: Yes.

MR. PATRICK: This telex states that the initial tests were performed on AeroShell 33. Are you aware that these tests from 1997 have been concluded?

THE WITNESS: The -- the tests that were performed in 1997 -- first half of 1997 were limited to a comparison of the standard test properties of Mobil 28 and AeroShell grease 33. That was the basis for Long Beach division issuing a "no technical objection" with limitations on temperature and the fact that the water wash-out characteristics were different.

MR. PATRICK: So has AeroShell 33 been approved, then, for the MD-80 specifically?

THE WITNESS: No, it has not been approved.

MR. PATRICK: Okay. Thank you. That's all the questions I have for Mr. Jerome.

MR. HAMMERSCHMIDT: Thank you, Mr. Patrick. Moving next to the Airline Pilots Association for questions.

CAPTAIN WOLF: Thank you, Mr. Chairman. Good morning, Mr. Jerome.

THE WITNESS: Good morning.

CAPTAIN WOLF: This is kind of a follow-up question to Mr. Patrick's, and I'm sure you've -- have looked at the Acme screw and the design there. Do you feel on the -- on the Acme nut itself that just having the one fitting is effective enough in clearing out or purging all the previous grease to it?

THE WITNESS: It would purge a significant amount. It would not purge all of the grease from the bottom of the fitting. I mean -- I'm sorry. Of the Acme nut.

CAPTAIN WOLF: Okay. But is that something that should be done?

THE WITNESS: It would -- it would be -- it would provide a longer lubrication life. The system has been in use for a long time and seemed to work

adequately when -- when it was lubricated through the fitting apparently -- apparently to the point where mechanics were getting some grease extruding out of the top.

CAPTAIN WOLF: Okay. Thank you. To your knowledge, were there any other air carriers or anybody else, any other operators that had put in a request to use AeroShell 33 on the jackscrew?

THE WITNESS: I'm not aware of any for the MD-80.

CAPTAIN WOLF: Okay. Thank you. Those are all the questions I have, sir.

MR. HAMMERSCHMIDT: Thank you, Captain Wolf. Going next to the Federal Aviation Administration.

MR. DONNER: Thank you, sir. We have no questions.

MR. HAMMERSCHMIDT: Thank you, Mr. Donner. So we'll proceed next to Alaska Airlines.

CAPTAIN FINAN: Thank you, Mr. Chairman. Mr. Jerome, you stated that there was a problem mixing grease and that you believed AeroShell 33 would be used in place of Mobil 28 and that intermixing should be avoided. And I'd like you to refer to Exhibit 11 Quebec and -- and the last -- second-to-last paragraph.

(Pause)

CAPTAIN FINAN: This is a telex from Boeing to Alaska Airlines on February 2nd, two days after the accident, but it addresses issues that were raised prior to the accident. Could you read that second-to-the-last paragraph for me?

THE WITNESS: On page 2?

CAPTAIN FINAN: Page 2, yes, sir.

THE WITNESS: "Boeing also reviewed the use of AeroShell grease -- AeroShell 33 grease used by ASA for lubrication of the elevator hinges and mechanisms. Boeing advised that no compatibility problems could be identified by mixing AeroShell 33 grease with the Mil G81322 grease presently specified in the MD-80 maintenance manual for these lubrication tasks."

CAPTAIN FINAN: To your knowledge, is there anywhere else in the telex or the "no technical objection" letters that addresses purging or disassembly of components relative to the greases?

THE WITNESS: Not in this telex. And what was the other reference you wanted to know?

CAPTAIN FINAN: This -- this telex or -- or the "no technical objection" letter that was sent to the airline.

THE WITNESS: No, I know of no reference to purging in either of those.

CAPTAIN FINAN: You mentioned that the Acme screw is a vented bearing, and I was wondering if any of the Boeing manuals defined a vented bearing or state that the Acme screw is -- is a vented bearing?

THE WITNESS: A vented bearing, whether it's vented or sealed, would be generically the two kinds of bearings. Generally, a sealed bearing will have some kind of an elastomeric lip seal or O-ring in place to prevent contaminants from entering the bearing and the lubricating medium, grease or oil, from leaving the bearing.

CAPTAIN FINAN: To your -- to your knowledge, do any of the Boeing manuals state that the Acme screw is a vented bearing?

THE WITNESS: No.

CAPTAIN FINAN: Thank you, Mr. Jerome. I have no further questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. And now we go to Boeing for any questions.

MR. HINDERBERGER: Mr. Chairman, I -- excuse me. I would just like to offer that as -- as a response to one of the earlier questions from the

Mechanics Association that Mr. Jerome read from a -- from a report that we would be happy to make available to the Board, if it so desired, in order to -- to help complete his testimony with -- with factual documentation.

MR. HAMMERSCHMIDT: Mr. Rodriguez, are you following that request?

MR. RODRIGUEZ: I'm told that I am, but I wasn't. I'm sorry.

MR. HAMMERSCHMIDT: Oh. Well, Mr. --

MR. RODRIGUEZ: -- Mr. McGill or Mr. --

MR. HAMMERSCHMIDT: -- Jerome read from a document that we don't have, and do we need that for the factual record? I would assume we do.

MR. RODRIGUEZ: Yes.

MR. HAMMERSCHMIDT: All right. Therefore, we will enter that appropriately, and we would appreciate Boeing submitting that. And we will work out the proper designations later on.

MR. HINDERBERGER: Okay. Thank you very much. I have no further questions.

MR. HAMMERSCHMIDT: Thank you, Mr. Hinderberger.

Moving next to the Board of Inquiry for

questions, beginning with Mr. Berman.

MR. BERMAN: Thank you, Mr. Chairman. Sir, do you have any service experience with the effects of skipping a -- one or more grease applications?

THE WITNESS: No, I do not have any data where we've done something of that nature in a controlled environment. I do not -- I do not know what the results might be.

MR. BERMAN: Boeing had made a finding, I guess, that in the few units that experienced excessive wear or end play of the Acme screw and nut that it looked like a lack of lubrication. How did you make that determination?

THE WITNESS: It's my understanding that when the units were returned they were disassembled for examination and that -- at that time they found that the grease had -- was essentially dried out.

MR. BERMAN: Okay. Thank you very much.

MR. HAMMERSCHMIDT: Thank you. Mr. Clark?

(Pause)

MR. HAMMERSCHMIDT: Dr. Ellingstad, any questions?

(Pause)

MR. HAMMERSCHMIDT: Any other questions from

the Technical Panel for this witness?

(No response)

MR. HAMMERSCHMIDT: In that case, Mr. Jerome, let me thank you for your participation in this public hearing and for sharing with us your extensive knowledge and expertise in this area. You may stand down.

(Whereupon, the witness was excused.)

MR. HAMMERSCHMIDT: The next witness is Mr. Dale Moore.

Mr. Moore, please proceed to the witness table.

Whereupon,

DALE LEE MOORE

was called as a witness, and first having been duly affirmed, was examined and testified as follows:

Interview of Dale Moore

MR. RODRIGUEZ: And would you give us your full name?

THE WITNESS: My name is Dale Lee Moore.

MR. RODRIGUEZ: And your business address?

THE WITNESS: I work for the Naval Air Systems Command in Patuxent River, Maryland in the

Becker Materials Laboratory.

MR. RODRIGUEZ: And would you briefly describe for us your professional experience?

THE WITNESS: I have 18 years of experience in aerospace materials and processes, including research development, acquisition development, and in-service engineering.

MR. RODRIGUEZ: Mr. Kolly will question the witness.

DR. KOLLY: Thank you. Mr. Chairman, I would -- I would like to again remind that -- that Mr. Moore is going to be presenting results from a test program that is still in progress, and as such we have not been able to make any analysis or interpretation of these results at this time.

MR. HAMMERSCHMIDT: All right. Well, I've -- the -- the parties to the public hearing have heard your observation and -- and are so advised. Thank you, Dr. Kolly.

DR. KOLLY: Thank you. Mr. Moore, could you describe the lab's qualification and experience particularly relating to the testing that was -- that was done?

THE WITNESS: The testing that was done in

this case was done by three of our laboratories. We have a National Materials Competency Organization. It's in the Naval Air Systems Command. Our experience and -- ranges research and development, acquisition engineering, in-service engineering. We support over 4000 active aircraft, in including 10,000 engines, 48,000 missiles, 40 -- 148 different acquisition programs.

The Aerospace Materials Division in Patuxent River has 14 individual laboratories within it. We are ISO 9001 certified across the board, and I -- ISO IEC Guide 25 in Mechanical Testing for Composites in Metals and Chemical Testing.

DR. KOLLY: What -- what kind of work or tests are done in your laboratories?

THE WITNESS: We do a full range of testing on all the materials that are in the aircraft systems: mechanical testing, chemical testing, non-destructive evaluation, corrosion, microscopy. We do processing evaluations. The full range of materials and processes technology required to develop, maintain, and support a naval aviation aircraft or weapons system.

DR. KOLLY: Who -- who are your customers, so to speak? Or who -- whom do you do this work for?

THE WITNESS: We support a broad range of customers, acquisition program managers such as the FA Team, the P3, the F14, all of our acquisition programs. We support research from the Office of Naval Research, Chief of Naval Operations. We support DARPA activities. Again, the full life cycle and full spectrum of aerospace materials and processes.

DR. KOLLY: Your laboratory is in fact the steward of the mil specs that we're talking about today, is that correct?

THE WITNESS: That is correct.

DR. KOLLY: And the -- the personnel that work for your laboratory, could you just -- just give us a breakdown of -- of the personnel involved in these tests?

THE WITNESS: In Patuxent River we have 78 materials engineers, scientists, and technicians. 90 percent of those have a BS degree or greater. We have 19 Ph.D.s within the division.

DR. KOLLY: Thank you. Now, the -- the testing we had done -- that you had performed for us was essentially twofold. One was the analysis -- the -- the testing and analysis of the -- a grease sample taken from the accident aircraft, and the second area

was on testing of the pure greases that are in question here today. Is that correct?

THE WITNESS: That is correct.

DR. KOLLY: With regard to the sample taken from the accident aircraft, which was taken from the bottom part of the jackscrew, outside the working area of the jackscrew, can you describe the -- the SEM tests that were performed, which in particular we could start with what laboratories were involved in this analysis -- in this test?

THE WITNESS: Our laboratories that did the -- did the SEM investigation were Cherry Point, North Carolina; Jacksonville, Florida; and Patuxent River.

DR. KOLLY: And what were the purpose -- what was the purpose of this test?

THE WITNESS: The purpose of the test was to determine whether there were any particles in the recovered aircraft grease, and if so, to determine their composition, size, and any other characteristics that might help in determining the mechanism of gimbal nut wear.

DR. KOLLY: And could you describe briefly the procedure that was used?

THE WITNESS: The grease was -- examined in a

scanning electronic microscope, otherwise known as an SEM, to verify the presence of particles and the distribution in the grease. Particles were also extracted from the grease using a solvent and -- centrifugation. Individual extracted particles were analyzed for composition using energy disbursive X-ray, spectrometry, and image to determine morphology. X-ray diffraction was used to identify large particles found clinging to the exterior of the sample.

DR. KOLLY: Mr. Moore, what were the findings of this test?

THE WITNESS: Metal particles were found distributed throughout the grease in sizes ranging from several millimeters in length down to sub-micrometer level. Their composition was consistent with C95500 aluminum bronze, the material of the gimbal nut. The general form of the particles was a flat flake. Some of the flakes were oxidized on one side as determined by EDS. No foreign material other than the aluminum bronze was found within the grease.

Clinging to the exterior of the grease sample were large particles that were determined by X-ray diffraction to be silicon dioxide, presumably sand contamination from the sea floor.

DR. KOLLY: There was also a -- an examination of this grease sample to -- to make a chemical identity of the greases that were present -- grease or greases that were present. What laboratories performed this work for you?

THE WITNESS: The laboratories at Patuxent River and our -- facility at Jacksonville.

DR. KOLLY: Could you describe how -- the test procedure that was used?

THE WITNESS: The test procedure, we take a sample and place it on a salt plate directly into the instrument or the sample is placed on a diamond compression cell and analyzed via the microscope attachment of a FTIR Fourier transformer infrared. We perform the test in an infrared laser. As it's passed through the sample some of this light is absorbed by the chemical bonds in the sample. The instrument provides a spectra indicating the absorption patterns, and this is used to identify the functional groups within the sample. The instrument also has the ability to compare the sample spectra to a digital library for identification.

DR. KOLLY: And are these results qualitative or quantitative?

THE WITNESS: The results are strictly qualitative.

DR. KOLLY: And what were the findings?

THE WITNESS: The aircraft sample was found to contain AeroShell 33, identified by similar absorption patterns to the virgin sample of AeroShell 33 of the hydrocarbon portion, the esther portion and the lithium thickener. However, the results also indicated the presence of absorption past -- patterns related to the clay thickener, indicating the presence of Mobil 28. Therefore, it is concluded that the sample was most probably AeroShell 33 contaminated with Mobil 28. However, relative concentrations of these greases cannot be determined using this technique.

DR. KOLLY: There was also another test that was performed, what we call the sea water immersion test. I wonder if you could explain that for us, please?

THE WITNESS: We placed a virgin sample in -- for two weeks in immersion in sea water representative of the Pacific Ocean, and we found that it exhibited only slight changes in color, no other adverse effects noted.

DR. KOLLY: The grease was submerged in -- in

sea water taken from the accident site, and was there any -- was there any physical changes to the -- to the grease, such as did the grease emulsify or -- or dissipate in any way?

THE WITNESS: No, it was not. It's just simply a slight color change. Otherwise, it was intact.

DR. KOLLY: I understand we performed that test back in -- in the early part of the summer and -- and that grease is still in -- still submerged in the sea water?

THE WITNESS: Yes, it is.

DR. KOLLY: And has the appearance changed in any way since then?

THE WITNESS: Not at all.

DR. KOLLY: Thank you. Mr. Chairman, this completes my questioning.

MR. HAMMERSCHMIDT: Thank you very much, Dr. Kolly.

Therefore, we now go to the parties to this public hearing for questions, and let's this time begin with Boeing and we'll work our way around the party tables counter-clockwise. Mr. Hinderberger?

MR. HINDERBERGER: Yeah. Thank you, Mr.

Chairman. We have no questions for the witness.

MR. HAMMERSCHMIDT: Very good. Any questions from Alaska Airlines?

CAPTAIN FINAN: No questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. Mr. Donner, any questions from the FAA?

MR. DONNER: No, sir. Thank you.

MR. HAMMERSCHMIDT: Very well. Captain Wolf, any questions from the Airline Pilots Association?

CAPTAIN WOLF: No, sir. No questions.

MR. HAMMERSCHMIDT: Thank you, sir. Mr. Patrick, any questions from the Aircraft Mechanics Fraternal Association?

MR. PATRICK: No, sir.

MR. HAMMERSCHMIDT: Thank you, sir. Going next to Board of Inquiry. Mr. Berman, any questions?

MR. BERMAN: I have no questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Apparently, no one else on the Board of Inquiry has any questions, so let me thank you very much, Mr. Moore, for attending this public hearing, participating in it, and sharing your expertise with us. You've been a most efficient witness, and that -- and you probably don't know how

much we appreciate that.

(Laughter)

MR. HAMMERSCHMIDT: You may stand down. Again, thank you very much.

(Whereupon, the witness was excused.)

MR. HAMMERSCHMIDT: Well, we're certainly picking up the pace from -- compared to the previous two days. Therefore, the next witness on the list is Mr. Wright McCartney. Is Mr. McCartney ready to come to the witness table? And he is proceeding through the room right now, so we'll give him plenty of time to take position and get comfortable and situated before we begin the questioning.

(Pause)

Whereupon,

NICHOLAS WRIGHT McCARTNEY, JR.

was called as a witness, and first having been duly affirmed, was examined and testified as follows:

Interview of Wright McCartney

MR. RODRIGUEZ: For the record, would you state your full name?

THE WITNESS: My full name -- excuse me. My full name is Nicholas Wright McCartney, Jr.

MR. RODRIGUEZ: And what is your occupation?

THE WITNESS: I'm the director of Reliability and Maintenance Programs for Alaska Airlines.

MR. RODRIGUEZ: And your business address?

THE WITNESS: It's Alaska Airlines, P.O. Box 68900, Seattle, Washington, 98168.

MR. RODRIGUEZ: And would you briefly describe your aviation background for us?

THE WITNESS: Certainly. I'm a 25-year veteran of the commercial airline industry, mostly concentrated in reliability and maintenance programs. I'm a graduate of the Georgia Institute of Technology with a degree in Industrial Engineering, and I did further graduate study at Memphis State University in Industrial Engineering and Business.

I'm a four-year veteran of the United States Air Force Reserve.

I've completed the FAA Academy's Aircraft Maintenance and Reliability Programs course and was a guest lecturer there on a number of occasions.

I started my professional career with Southern Airways as a methods engineer from 1975 to 1977. And then I was an industrial engineer with the Federal Express Corporation from 1977 to '78. Then I became an industrial engineer and later a senior

industrial engineer with Piedmont Airlines from 1979 to 1989. At the merger with U.S. Air I was promoted to the position of manager of reliability of the combined airlines. I stayed with U.S. Air approximately four years before joining Alaska in May -- excuse me, March of 1994. I was promoted to the position of director of Reliability and Maintenance Programs in the fall of 2000.

I'm a member of the 737 Industry Steering Committee, and I'm also a member -- or was the chairman of, excuse me, of the 737 700 Cargo, 737 900 working groups of that steering committee.

MR. RODRIGUEZ: Mr. McGill will question the witness.

MR. BERMAN: Excuse me before you begin, Mr. McGill. Sir, could you please state what your position was at Alaska Air prior to 2000?

THE WITNESS: I was the manager of the Reliability Department from 1994 until the fall of 2000.

MR. McGILL: Good afternoon, Mr. McCartney.

THE WITNESS: Good afternoon.

MR. McGILL: We've talked a lot here already on reliability, so why don't we just -- why don't you

just give us a very short explanation of what reliability is all about?

THE WITNESS: Certainly. A reliability program is an FAA-approved method to -- it's designed to collect what might be called relevant operating experience data and analyze that data to identify trends that might indicate reliability problems. After that analysis, you can apply the appropriate maintenance controls to bring about the reversal of those trends.

MR. McGILL: Who -- who actually developed Alaska's reliability?

THE WITNESS: I led the development effort of the FAA-approved reliability program in 1994, 1995, but prior to that Alaska had been collecting much of what might be called standard reliability data.

MR. McGILL: What -- when you collect this data, what kind of base do you use to -- to develop a program like this?

THE WITNESS: Well, the -- the standard reference is FAA Advisory Circular 120-17A. It gives a lot of guidelines for development of a reliability program. I also used the Airworthiness Inspector's Handbook, which is FAA Order 8300.10, and there are two

chapters, Chapter 38 and 66, that give guidance on how the FAA inspectors approve and surveil reliability programs. I also used my prior experience with U.S. Air in having to redevelop that program to combine the best of the three merged airlines.

MR. McGILL: Well, we're -- excuse me. Go ahead. I'm sorry.

THE WITNESS: Okay. I also sought some FAA guidance during the development of that program, both from the locals on a sometimes weekly and monthly basis as well as we took a draft of the program under a fictitious airline's name, sent it to the FAA Academy, and they used it as a class project for six to nine teams of inspectors to go over. We took all the recommendations from those classes and adopted the ones that were applicable.

MR. McGILL: Well, let's just take something right now that we're discussing on component reliability. Tell me about Alaska's component reliability program.

THE WITNESS: Well, we have, among other things, a -- a statistical component alerting program that tracks components at a rate per 1000 unit hours in service. And we have a number of reports that go along

with that particular tracking system. We also have some non-statistical methods, such as direct input from anybody in the M and E division about what appears to be troublesome components as well as we review every single pilot complaint every day.

MR. McGILL: Well, taking that, we have a jackscrew assembly that did fail. Why didn't it pick it up?

THE WITNESS: Well, it actually did. In February 3rd of 2000, of this year, we actually received an alert notice based on January data from that statistical alerting program that the jackscrew had indeed exceeded its alert value. Now, our records show, and we've made an exhaustive study of the records, that we had never at Alaska Airlines replaced a jackscrew before June of 1999. And when that happened, our computer entered this particular part into the statistical program and established an interim alert value for it.

We replaced a second jackscrew in November of 1999, and at that time the unscheduled removal rate was still below the alert value set for it.

The third jackscrew removal occurred in November of 1999 as well, albeit at a different

station. Unfortunately, that aircraft was in Phoenix and was out of service for an extended period of time, and so the replacement of the jackscrew did not occur until January of 2000. When that occurred, the computer transaction was complete and the tracking system updated to show that November removal.

Now, when you couple that event with the recalculation, if you will, of the alert value for the jackscrew that occurred in January, then we received an alert that came out the 3rd of February. So you have to -- you have to understand that all these statistical programs need actual operating experience data from which they can base their actual -- their -- their -- what might be considered realistic alert values, and we, unfortunately, were accumulating that data during 1999.

DR. ELLINGSTAD: Excuse me. Could you clarify what it is that triggers the alert specifically?

THE WITNESS: Sure. We measure component reliability in a rate per 1000 unit hours. It's a moving rate based on a three month moving average. And when we figure that rate we compare that to an established alert value which is based on historical

data. And when we have an exceedance in that area we first investigate to determine whether it's a bona fide exceedance or not or whether it might be just a -- a statistical spike.

MR. McGILL: Mr. McCartney, you said we know that we -- there were three issues and three jackscrew problems. You said one in June, one in November. Well, of course, the other one was in November also but it wasn't picked up until January. Why was that aircraft down so long in Phoenix?

THE WITNESS: It's my understanding it was in a 30-K heavy maintenance check, which takes approximately a month and a half to two months to complete.

MR. McGILL: Okay. And -- but when you first identified the -- a problem in November, would you have received any kind of a report or something at that -- to start tracking it at that point or do you have -- or do you wait until the check is actually completed, like in this case, until -- in January?

THE WITNESS: Well, the computer transaction is such that it looks for removal off but it also looks for removal on. So until they actually installed the new unit in January the computer had no way of knowing

that a unit had been removed.

MR. McGILL: Okay --

THE WITNESS: This type of component program is -- it's pretty much standard in the industry and it's FAA-approved, but unfortunately, it did not react in time to tip us off that there may have been a problem with the jackscrews.

MR. McGILL: Could a -- could there be another method or other methods that down the road could -- other than just component removal, could we have something of inspection -- could -- could a mechanic have done some sort of -- inspection? Did you have a means for that to come into -- in a reliability program?

THE WITNESS: Well, there is a -- a method that any person in the M and E division can send directly to the Reliability Control Board his concern over a particular issue, so if a mechanic were to find something that he -- he considered to be significant he could alert us right away without any chain of approval on it.

Now, I have to point out also that these jackscrew replacements we had in 1999, they in no way suggested the type of failure that occurred on this

aircraft or appears to have occurred because all three of these removals were for wear that was slightly above the published limit. And -- and secondly, I guess we're here talking about a failure that's never occurred on an MD-80 jackscrew before.

(Pause)

MR. McGILL: Prior to June of '99 when the first assembly was replaced and you started tracking, you said --

THE WITNESS: We started statistical tracking in June of '99. Prior to that the unit was tracked on a non-alert, non-statistical method in that we surveilled many parameters of the aircraft and we had never had excessive, say, pilot complaints or delays or cancellations based on any jackscrew causes.

MR. McGILL: Okay. Let's move into something else here. Let's talk about the continuous airworthiness maintenance program that you have.

THE WITNESS: Okay.

MR. McGILL: Could you just quickly give us a short how Alaska treats that requirement?

THE WITNESS: Well, certainly. Alaska has a continuous airworthiness maintenance program. It's built upon many of the recommendations of the

manufacturer as well as all the appropriate airworthiness directives that are in force and -- and a number of other guidance materials. Now, we -- we used the reliability program to essentially surveil that continuous analysis -- excuse me, the continuous airworthiness maintenance program. So we used that as -- as kind of a measuring stick and when we find areas that the reliability program identifies as -- as needing some attention we can apply the appropriate controls, whether it be a change in maintenance procedure or whether it be a -- a change of component or some -- some modification so that we can bring the maintenance -- we can bring that system back into compliance and then monitor how that works with the maintenance program.

MR. McGILL: Since we're talking about the maintenance program, let's take it just -- we heard testimony yesterday about MRBs and MSG-2s and 3s. Very quickly go through Alaska's maintenance program in those areas, please?

THE WITNESS: Sure. Sure. When Alaska starts out to build a maintenance program we use the manufacturer's planning documents and the MRB plus any other guidance material that may be available. But

when that -- before the manufacturer gives us the -- the documents they do convene, as the previous witness has stated, an industry steering committee made up of representatives of the airlines that are purchasing the aircraft, prospective customers, the airframe manufacturer, the engine manufacturer, any other primary or major subcontractors. And these committees meet over several months and they also -- supporting those committees are working groups made up of many types of engineers and disciplines within those companies. The working groups pass on their recommendations for the maintenance program for the aircraft to the industry steering committee who then discusses and approves or in some cases modifies those recommendations and passes that on to the FAA's MRB for their approval under the MRB system.

Then, when the MRB report is approved by the FAA, that serves as the basic framework for the manufacturer then to take that document and complete it with all the various I won't say tasks but things like panel opening numbers and standards for completing the jobs and so on and so forth which they then republish in the Douglas Products Division as the on-aircraft maintenance planning document.

The airline then takes that OAMP, which is actually a reflection of the MRB, to develop its unique maintenance program based on how it chooses to package the tasks and at which intervals. They -- they typically start out with the manufacturer's stated intervals as a new carrier or new operator with that aircraft.

Now also, the manufacturers will sell you a set of -- of what might be called general task cards from which you can pattern your maintenance program to.

MR. McGILL: Did -- we're at this stage where we have the task cards, have the OAMP, they're all under an MSG-2 guidance. Could you switch to MSG --

THE WITNESS: Well, as -- as --

MR. McGILL: -- safety --

THE WITNESS: -- as the previous witness said yesterday, the MSG process started out, really, as a result of the Boeing 747 certification process. And after the 747 was certified the techniques that were used were so successful that the Air Transport Association took those particular techniques and genericized them for any new aircraft and called it MSG-2. That document was released about 1970, as I recall. It was used for many years, including

certifications on the MD -- I guess it was the -- the DC-10 and the L-10-11, I guess, first.

And then after a number of years, it was felt that there was a better way to do things rather than using MSG-2 because MSG-2 might be called a bottom-up approach in that it looks at components as parts of systems and says, now, what can we do to maintain those components?

MSG-3 takes a different approach because it looks at the top-down but it -- it looks at it from the highest manageable level, whether that be a complete system or a full subsystem or on possibly the component level. And then it looks at the system and its functional failures and the effects of those failures. And it -- it determines what might be called effective tasks. There are many applicable tasks, but it selects the -- the most effective tasks to be performed on that subsystem or system, the MSI as it's called. Then those MSIs are collected and with all their tasks and republished as a part of an MSG-3 planning document.

When the MD-80 MSG-3 MRB and planning documents were published in early part of 1996 there was language indicating that if you were an established operator of the aircraft that you could use the MSG-3

limits to adjust your maintenance programs in concert with your regulatory authorities.

MR. McGILL: So that's kind of what Alaska's done. They're MSG-2 but they have picked up certain areas under MSG-3 guidance?

THE WITNESS: We've used it very sparingly but we have used it, yes, sir.

MR. McGILL: If, for instance, you and I were to start an airline tomorrow with MD-80s, can we go to MSG-2 or do we have to go to MSG-3?

THE WITNESS: I do believe that the -- the preference right now is to start with an MSG-3 program as a brand-new operator.

(Pause)

MR. McGILL: Can you just pick up some areas here and talk about -- let's talk about the escalation of maintenance intervals.

THE WITNESS: Surely.

MR. McGILL: Maybe just very quickly how that's done, what the process is that Alaska uses to do that?

THE WITNESS: Well, escalations in general fall into two categories. If you have a reliability program, such as we do, there's language usually

written into the program document that allows you a certain latitude to escalate checks or tasks or component overhaul times or those things. The limits are very well defined, and you have to do all of the analysis work that would go into that type of escalation prior to putting that escalation into force. And you also have to seek and obtain the removal of your Reliability Control Board.

Now, while that data is not provided in advance to the FAA, it is certainly open and made available to or for them to review whenever they wish. And they're certainly free to cause a recision of whatever you've done if they feel it's -- it's unwise or not in anybody's best interest.

MR. McGILL: Well, if you do do that -- make that type of change, does that require FAA approval?

THE WITNESS: Well, as I said, it's -- it's more of a tacit approval in that you -- you provide them the documentation you've made the change, and any supporting materials are open and -- and -- to their review or discussion at their convenience, really.

Now, the --

MR. McGILL: The --

THE WITNESS: -- tacit approval --

MR. McGILL: Maybe some -- can you give me a little better definition of "tacit approval"?

THE WITNESS: Well, I guess you might call that acceptance, some of the language I've heard prior to me. In other words, they accept the -- the action that we've taken.

MR. McGILL: Okay.

THE WITNESS: The other method which we have used probably more than not would be to present the entire data analysis package in advance to the FAA and gain their explicit approval by signature before we ever put the escalation into effect.

MR. McGILL: As I recall, in your last C check escalation, when it moved from 13 to 15 months, was that done in that manner?

THE WITNESS: Yes, sir, it was. We prepared a data package that looked back at five separate tail numbers that we selected as a stratified sample of the fleet. At that time I believe there were a little over 40 aircraft.

We select -- excuse me. We selected them for age differences from some of the older aircraft in the fleet all the way up to some of the newer aircraft and we reviewed the last two C check packages for each of

the airplanes, meaning that we -- we reviewed in detail all of the non-routine discrepancies that had been written against the aircraft during those C checks. We then collected all that information as well as whatever -- I forget the -- the total amount of the package because it was approximately half an inch thick to three-quarters of an inch thick -- and submitted that to the FAA. Approximately a month later they approved it and we put the escalation into force.

MR. McGILL: When you made the -- made the change to escalate the C check, was every task inside the C check? For instance, particularly end play check, which is a two C check interval task. Was that all considered? Every one of these maintenance tasks looked at individually?

THE WITNESS: No, sir. Not each task individually because you -- you're talking about hundreds and possibly thousands of tasks that occur on a routine basis. What we actually did was we looked at the findings from those tasks to determine if there was anything that would be detrimental that we could identify, and we did identify two areas we felt uncomfortable with and so we separated those two items from the C check and made them stand-alone items to be

performed at a lesser interval.

MR. McGILL: What -- what two items was that?

THE WITNESS: There were, I think, some problems with the BUTE doors. That's the bent-up trailing edge doors on the rear of the wings that had to do with, I think, some corrosion that was being found in the hinges because that's a -- that's a pretty -- pretty open environment. And I think we also had some -- some issue with some of the bearings and bushings of the -- the elevator hinges. So we separated those two out and made them separate time items to be lubricated in between C checks as well as on the C check itself.

MR. McGILL: I notice that your C checks are conducted on calendar time.

THE WITNESS: That's correct.

MR. McGILL: Could we talk -- if you go to the MRB, we -- we have both calendar and flight time. You have selected only to use one of those. Is there a particular reason for that?

THE WITNESS: The change from an hour to a calendar time occurred in 1988, and since I wasn't with the company at that time I can't speak to the -- the logic used in that -- in that change.

MR. HAMMERSCHMIDT: Mr. McGill? Let me interrupt your line of questioning here. I note it's -- it is 12:40 right now. We have gone about an hour and 40 minutes into this -- today's session, so it's about time to take a break. Let's take a -- no more than a 15-minute break, and we will be in recess until 12:55.

(Brief recess)

MR. HAMMERSCHMIDT: We are now back in session. Mr. Wright McCartney is still at the witness table, and we proceed with Mr. McGill's questions.

MR. McGILL: Mr. McCartney, --

(Pause)

MR. McGILL: -- the maintenance comparisons, I had made a chart tracking the MRBs and S -- you know, MR -- and MSG-2s and 3s. Do -- do we have any -- or as a person in Reliability, do you have any comparison with -- with your time intervals on maintenance as compared to other airlines, specifically C checks, lubrications, and end play checks?

THE WITNESS: Well, yes, sir. I believe that Exhibit -- I think it's 11(W) is a -- a small portion of a large document that the Boeing Company publishes, I'm not sure of the frequency, that lists all those

inspection intervals for the carriers of the model aircraft that they -- they manufacture.

MR. McGILL: I was talking -- do -- do you -- running a reliability, do you talk to other carriers in the same areas? Do you talk to the director of reliability for --

THE WITNESS: Oh, absolutely.

MR. McGILL: -- the air carrier and you check and see if you're in tune with what everybody else is doing?

THE WITNESS: I -- I'd have to say yes, we do. I mean the -- the Reliability community is rather small in the industry and most of us know each other quite well. And we're not hesitant to pick up the phone and call each other and ask each other questions of any types.

MR. McGILL: Since you do everything on a time interval -- calendar time interval, do you have some means of -- of cross checking or cross referencing that with actual flight time?

THE WITNESS: Well, I'd have to say that the alerting parameters built throughout the Reliability programs are based on rates per hundred landings or rates per thousand flight hours. So as those hours

vary up and down and landings vary up and down, they're still indexed towards the established values that we have.

MR. McGILL: But when you specifically say "in 1996 escalated the C check from 13 to 15 months," were you aware of the consequences on whatever the interval might have been with flight hours?

THE WITNESS: I don't think specifically we addressed the flight hours in the directive that we produced to do that because the C check is controlled as a function of calendar months.

MR. McGILL: Thank you very much, Mr. McCartney. Mr. Chairman, I have no further questions.

MR. HAMMERSCHMIDT: Thank you, Mr. McGill. Mr. Rodriguez for more questions.

MR. RODRIGUEZ: Yes, sir. I wanted to return to this discussion of the aircraft that was in Phoenix on a 30,000-hour check.

THE WITNESS: Yes, sir.

MR. RODRIGUEZ: I believe it's November 947. And you had mentioned there were -- with respect to the jackscrew there were two problems with the aircraft, as I understand it. One was a broken stop, is that correct?

THE WITNESS: 947, was that the aircraft that was in Phoenix in November?

MR. RODRIGUEZ: Yes, sir.

THE WITNESS: Okay. I -- I'm not --

MR. RODRIGUEZ: Well, let me get -- I want your impression, sir. What was the 30,000-hour check jackscrew problem in November?

THE WITNESS: As I understand it, it was a -- when they did the end play check it was in excess of the allowable limit.

MR. RODRIGUEZ: Okay. And the previous November one?

THE WITNESS: I believe all three of them in '99 were removed due to end play in excess of the allowable limit.

MR. RODRIGUEZ: Do you have any knowledge at all about the end play check on that particular jackscrew?

THE WITNESS: Not that particular jackscrew, no.

MR. RODRIGUEZ: Do you know, based on your knowledge of the witnesses we have scheduled from Alaska Airlines, who might know what that reading was?

THE WITNESS: No, sir. I can't at this time,

but we certainly can discuss it in the -- the group and determine who might. Happy to supply that to you at a later date.

MR. RODRIGUEZ: Thank you.

MR. HAMMERSCHMIDT: Thank you, Mr. Rodriguez. Are there any other questions from our Technical Panel?

(No response)

MR. HAMMERSCHMIDT: Very well.

MR. RODRIGUEZ: No, sir.

MR. HAMMERSCHMIDT: We now move to the parties to the hearing for questions. This time let's begin with Boeing and work around the party tables in a clockwise fashion. Mr. Hinderberger?

MR. HINDERBERGER: Thank you, Mr. Chairman. We have no questions for the witness.

MR. HAMMERSCHMIDT: Thank you. The Aircraft Mechanics Fraternal Association?

MR. PATRICK: Thank you, sir. In regards to Alaska's Reliability program, Exhibit 11(A), page 68.

(Pause)

THE WITNESS: Yes, sir.

MR. PATRICK: In 1998 Alaska Airlines replaced 25 primary trim motors. Do you consider that

to be above the alert value for the Reliability program?

THE WITNESS: I can't state specifically whether it actually alerted. I -- I can say that the primary trim motor on the MD-80 is, as it is throughout the industry, does have a high removal rate.

MR. PATRICK: Okay. Thank you. That's all the questions I have.

MR. HAMMERSCHMIDT: Thank you, Mr. Patrick. Airline Pilots Association?

CAPTAIN WOLF: Thank you, Mr. Chairman. Thank you, Mr. McCartney. Does the Reliability Analysis Program review or consider wear rates on a jackscrew system specifically?

THE WITNESS: No, it does not.

CAPTAIN WOLF: Okay. Based upon the findings so far, do you -- you feel or -- or would it be appropriate for industry should pay more attention to the wear rates now that -- that we -- we see we -- we have a potential problem that perhaps FAA or the manufacturer should come out and say the -- this might be something that would be good to do in light of what's -- what's happened?

THE WITNESS: My personal opinion is that

given the circumstances of which we're investigating that would probably be prudent.

CAPTAIN WOLF: Okay. Just one last question. Early in your testimony were talking about that February 3rd alert.

THE WITNESS: Yes, sir.

CAPTAIN WOLF: What -- what that alert -- would -- would it have identified an adverse wear rate or a potential wear rate?

THE WITNESS: Based on the information, I suspect it would have been a potential wear rate because the alert happened because of the two November jackscrew removals, both of which were above their normal wear limits. There was wide differences, as I recall, between the flight hours that each one of those had accumulated on the aircraft.

CAPTAIN WOLF: The alert levels that were based on history, what -- what would be the origin of the history? Would this be -- industry-wide or would it be internal within the company?

THE WITNESS: It would be the company's history.

CAPTAIN WOLF: All right, sir. Thank you very much. Thank you, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Wolf. The Federal Aviation Administration?

MR. DONNER: Thank you, sir. Just a couple of questions. Mr. McCartney, so I'm clear on this, what is the Alaska policy on the end play check schedule? How often do you do that?

THE WITNESS: We do that as a function of the 2 C.

MR. DONNER: Okay. And the lubrication of the jackscrew?

THE WITNESS: The jackscrew is lubricated at every C check, but it also receives a mid-C cycle lubrication somewhere in the realm of seven to eight months.

MR. DONNER: And how does that compare to the Boeing recommendations?

THE WITNESS: Well, in terms of the MSG-3 recommendations, our flight hours calculate out to approximately 2500 in between lubrications as opposed to the 3600-hour flight hour recommendations -- lubrication recommendations in the MSG-3 documents.

MR. DONNER: Okay. Thank you very much.

MR. HAMMERSCHMIDT: Thank you, Mr. Donner. Alaska Airlines?

CAPTAIN FINAN: No questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Finan.

Moving next to the Board of Inquiry for questions. Let's begin with Dr. Ellingstad.

DR. ELLINGSTAD: Thank you, Mr. Chairman. I'd like to ask a few questions about the -- the Reliability program. And specifically, you -- you talked about the database that drives this.

THE WITNESS: Yes, sir.

DR. ELLINGSTAD: With respect to the words. What are the entries in that database? This is component removals? Do you record any of the -- the detailed inspection data in that database? You -- you'd indicated that --

THE WITNESS: Well, the --

DR. ELLINGSTAD: -- end play check results, for example, are not there.

THE WITNESS: No, sir. I don't believe even that the standard task cards from Douglas ask for recording of the end play check itself. They just ask you to perform the check against a -- a specific standard. But component removals are only a part of the Reliability program.

DR. ELLINGSTAD: What I'm asking about

specifically is what -- what goes into the database that underpins your Reliability program?

THE WITNESS: In the area of component removals?

DR. ELLINGSTAD: Yes.

THE WITNESS: The removals themselves are tracked through the computer system, and when a removal occurs the -- the appropriate statistics relative to its time in service and days in service, things like that are computed based on its -- its installation date on the aircraft. More than that, when the unit is returned from a vendor it is -- the condition report, if you will, is put into the computer system so that an analyst who's reviewing that data will have all the information relative to the statistics about the unit as well as all of the technical data, the tear-down report if you will, that occurred at the vendor.

DR. ELLINGSTAD: With respect to jackscrews, for example, in your fleet --

THE WITNESS: Yes.

DR. ELLINGSTAD: -- what -- what data are contained in the database that would support the -- an assessment of -- of their removals or whatever? The -- the individual entries, are they only of -- of

failures?

THE WITNESS: No, sir. They're all removals. All removals of the jackscrew.

DR. ELLINGSTAD: But -- but only of removals? There's no data about healthy jackscrews in your database?

THE WITNESS: We can produce statistics that would show how long the jackscrews have been on the aircraft, yes. But I'm not sure what statistics you're looking for.

DR. ELLINGSTAD: Well, what I'm looking for is -- is tracking wear or any other characteristic of jackscrews and trying to understand the nature of the database that you're --

THE WITNESS: No, no, sir. There's no tracking of the individual wear rates of the individual jackscrews, no.

DR. ELLINGSTAD: Okay. You had also indicated that if there was a change in lubrication intervals, for example, that this would require a reliability evaluation among some other steps.

THE WITNESS: That's correct.

DR. ELLINGSTAD: Could you comment on the nature of that reliability evaluation? What -- what --

what data goes into the evaluation? What kinds of -- of analyses? Is -- is this a statistical assessment?

THE WITNESS: No, not necessarily. The -- if we were to make a change in lubrication interval, the analyst and -- and then ultimately myself responsible would review the data relatives to findings in the areas that could be lubricated. For instance, we would -- in the case of the flight control systems we'd be looking specifically in ATA Chapter 27 for discrepancies that had occurred relative to lubrication.

DR. ELLINGSTAD: Okay. And -- and again, what is the nature of your -- of your review? This is simply looking for -- for some -- some set of exception reports?

THE WITNESS: Essentially, yes. We look to see what our history has been in that particular area. In other words, if we're seeing a number of -- of write-ups, if you will, or component removals or -- or delays or cancellations that would be attributed to a lack of lubrication or possibly contaminated lubrication or what have you, then we -- we in the Reliability Department would raise our hand and say let's think about this again. Our Reliability program

is such that we have eight different and distinct areas of the company, the M and E division, that are required to agree in unanimity on any action relative to the maintenance program, such as an interval like that.

DR. ELLINGSTAD: Okay. Again, pursuing the -- the nature of the reliability evaluation, is that not statistical and not necessarily quantitative?

THE WITNESS: I think it's more qualitative, but we certainly can produce the statistics that would show from a -- a quantitative point of view the rate of discrepancy per thousand hours or -- or what have you.

DR. ELLINGSTAD: And -- but there is no requirement to produce those kinds of rates to support decisions --

THE WITNESS: No, it's not a requirement, sir.

DR. ELLINGSTAD: Okay. Thank you.

MR. HAMMERSCHMIDT: Thank you, Dr. Ellingstad. Going next -- next to Mr. Clark.

MR. CLARK: The -- you just mentioned that you may go in and look at an ATA 27 area, and can you explain that a little more? That ATA 27 doesn't --

THE WITNESS: Sure.

MR. CLARK: -- mean too much to me. And then

also, what is it you're actually looking at?

THE WITNESS: Surely. The -- the Air Transport Association has divided the airplane, if you will, into a number of different areas. For instance, ATA 27 is considered the flight control system of the aircraft whereas ATA 21 is the air conditioning system and so on and so forth. When we would look at that type of information we have a very large bank of data that's stored in our computer systems that we can then retrieve relative to a number of different parameters and look through that, physically look through that. We also could look back through our -- and again, in terms of the nature of the data, the components we're talking about, essentially the removal data as well as all of the -- the shop findings, pilot complaint data and how they were resolved, and delays and cancellations and how those were resolved.

We conduct all of that data, look through there -- again, it's -- it's a -- it's a very subjective analysis, although there can be hard and fast rates computed.

MR. CLARK: You're looking at a computer screen with a list of information or print-outs?

THE WITNESS: It's usually a print-out.

MR. CLARK: And then you can thumb through that looking for consistencies as you're thumbing through a stack of data?

THE WITNESS: That's true. Additionally, we have the option if necessary to actually go to the Aircraft Records Department and go through what we might call the "dirty fingerprint" cards of all of the actions that have occurred on the aircraft that are represented in the computer system.

MR. CLARK: Okay. So if you're looking through the stack of data and you get an idea, that might give you a clue to go look at the hard records so you can see firsthand the available information?

THE WITNESS: Absolutely.

MR. CLARK: The -- we talked about lube intervals and expanding lube intervals --

THE WITNESS: Yes.

MR. CLARK: -- and checks and how those may expand as -- as you go through your MRB. But that's all -- but the expansion, from what I hear, is predicated on a good service history; things are working so we can go ahead and expand some more.

THE WITNESS: Yes, sir. In fact, there's language to that effect in the advisor circular. It's

121-22A. There's actually language in that circular that the MRB can include to tell you how to go about escalating those intervals.

MR. CLARK: Okay. And is there any language that would suggest that when you make a fundamental change to the way you're doing business that maybe perhaps you should collapse those inspection intervals back down or those lubrication intervals back down and see how it's working before you start expanding back out?

THE WITNESS: I'm not aware of any.

MR. CLARK: So -- so if you change grease, which may have a significant effect on a part or a piece -- we -- we stretched out on good operating practice and expanded those times out and now we can't -- there's no mechanism -- we changed a fundamental part of that, which is grease. There's no consideration in those plans to back down to -- to a more conservative area to see how that's working before we expand back out?

THE WITNESS: I would not normally think of it that way because a grease change of the magnitude we're talking about essentially has its own analysis.

MR. CLARK: Where -- where does that analysis

come from?

THE WITNESS: Typically, it would come from the Engineering Department.

(Pause)

MR. CLARK: And then from what -- I -- I heard you say earlier that part of this tracking analysis -- this tracking process that you do is -- really isn't set up to find that very rare catastrophic event that's -- that's sitting there lurking or pending?

THE WITNESS: Well, what I said earlier was that we've apparently never in the history of the industry -- I believe somebody quoted 95 million flight hours -- has there been a catastrophic failure of a jackscrew like occurred with this aircraft.

MR. CLARK: Right.

THE WITNESS: We're set up to catch all causes, whether we would find a bent jackscrew or whether it would be, let's say, any type of surface irregularity or -- or what have you. It really doesn't matter about the cause for removal. The removal itself is tracked and becomes part of the database.

MR. CLARK: But that -- but again, if there's nothing in 93 million hours that we're going to end up

at a catastrophic accident, that's really not the kind of thing that comes out in your database?

THE WITNESS: I don't see how we could predict it, no.

MR. CLARK: Yeah. All right. Thank you.

MR. HAMMERSCHMIDT: Thank you, Mr. Clark. Mr. Berman?

MR. BERMAN: Thank you, Mr. Chairman. Mr. McCartney, when you use what you and other witnesses have described as the top-down approach of MSG-3 how do you avoid missing some important information about a specific component, one that's not even identified at the -- especially important one, MSI or whatever?

THE WITNESS: Well, again, the engineers that are producing these documents are the -- they are the -- the -- the experts in their particular areas within the aircraft companies. And as an ISE member or even as a -- possibly a working group member you rely upon those particular individuals to tell you what is the highest manageable level of an MSI. As I believe one of the witnesses yesterday indicated, the horizontal stabilizer was selected itself as the highest manageable level. But it is entirely conceivable that it could have been driven down into

the -- one of the control systems, the electrical or possibly the -- even primary or secondary. That could have been the highest manageable level based on the MSG-3 analysis that Douglas performed.

MR. BERMAN: And we heard testimony yesterday but they did not get down to the level of the jackscrew -- you know, below the level of the stabilizer.

THE WITNESS: I'm familiar with that.

MR. BERMAN: How would they have identified any -- any particular special issues of the jackscrew in extending an inspection or lubrication interval if they don't look at that level?

THE WITNESS: Well, again, since we had the benefit of the operation of the aircraft, as -- as one of the witnesses indicated, they used a lot of service experience data that they gathered from the carriers and -- and used that in support of the what might be called empirical analysis of the aircraft. I was not present in those proceedings and I can't really speak to the -- the actual events.

MR. BERMAN: So you're not aware of exactly what data they -- the industry steering groups focus on when making recommendations?

THE WITNESS: Not for the MD-80, no.

MR. BERMAN: And which -- which groups do you attend?

THE WITNESS: I serve on the 737 ISC.

MR. BERMAN: Okay. Let me turn to Alaska Airlines' own maintenance programs. On what basis do you -- does Alaska Airlines deviate from Boeing's guidelines in terms of inspection intervals? I mean when Alaska Airlines is going to use a more permissive or a longer interval than Boeing recommends.

THE WITNESS: Well, the only -- the only information or the -- the only way we could deviate from that would be to demonstrate through our particular service history that if we were to increase an interval there appears to be no adverse effect that would happen. In other words, we can't use another carrier's experience, only our experience because of our unique operating environment and the way we use the aircraft.

MR. BERMAN: And how would you demonstrate that --

THE WITNESS: Typically, by assembling a data package of -- of inspection findings depending upon what you're trying to extend. For instance, if it were a component itself you would typically look at

component condition reports of the removed units. And we always ensure that the samples that we choose for that particular extension are within a minimum of 90 percent of the previous goal so that we feel like we're getting the most utilization we can out of it before we take the sample.

MR. BERMAN: Okay. And I think I understood you to say that you're not allowed to use other carriers' experience?

THE WITNESS: That's correct.

MR. BERMAN: That's what you just said. Wouldn't it be an advantage to use another carrier's experience if they're already at an escalated level to see how it's all been working out at their airline?

THE WITNESS: Well, certainly the data's anecdotal, but -- but it would and from time to time I know personally I have done that, calling other carriers and asking them what their intervals are relative to a certain check for a component or what have you.

MR. BERMAN: But you don't formally use data from other airlines --

THE WITNESS: No, sir.

MR. BERMAN: -- to see what their statistical

experience has been?

THE WITNESS: No, sir. The guidance material from the FAA allows us only to use our particular experience in doing something like that.

MR. BERMAN: Okay. Well, let me move on to a slightly different topic. Something came to mind for me in the -- in the pilot area where pilots for long history retired at age 60 and there have been many proposals and questions about whether that ought to be extended, a lot of analyses. And I think one of the most telling analyses that has kept that limit right where it is is that there's no statistical experience with -- with going beyond age 60 so how could we possibly extend if we don't have any experience to evaluate?

Now, a parallel with -- with maintenance and reliability programs, if you -- if you've never operated a component at a certain lubrication interval how could you extend to that interval? How could you expect to know how the lubrication or the material would behave at that level?

THE WITNESS: Well, I -- I -- number one, I'd have to -- to state I'm not an expert in pilot physiology so I don't know how comparable the two are.

But in terms of a lubrication interval that you've mentioned, again, we would look at historical data and if you're -- if you have a complete lack of -- of -- of complaint at the current level there is certainly an indication there that that level or that interval could be extended within certain reason. And -- and then once again, look at your data to make sure that you're now not starting to see problems.

MR. BERMAN: But you -- you're looking at data that isn't being operated at that point?

THE WITNESS: At that point, yes.

MR. BERMAN: So you're assuming that something -- when you extend out a lubrication interval that the -- the degradation of the lubrication will -- will be somewhat linear or gradual and not sudden?

THE WITNESS: I don't know that we assumed that it -- that it -- it is any -- well, I guess we would have to say I guess it probably is linear or curvilinear. But in this particular case, though, while it would be anecdotal I think we certainly could contact other carriers to determine what their intervals are if we were looking for what might be termed a comfort level. We also use the manufacturer's documents as guides. And the Reliability programs as

well as the local FAA typically will not allow a carrier to extend an interval on -- whether it be lubrication or component or -- or what have you, an exorbitant amount at any one time. That's been pretty much the historical industry practice for probably the last 50 years.

MR. BERMAN: Mm-hmm. So you're going by steps --

THE WITNESS: Yes, sir.

MR. BERMAN: -- to extend. As far as you're aware, has any carrier been operating with lubrication at end play check intervals that are as long as Alaska Airlines in terms of flight hours now that you're on a -- just a monthly basis?

THE WITNESS: I would have to know where those particular carriers have those checks in their system. However, Exhibit 11(W) gives me some indications that there are carriers that have end play checks in excess of what we have and lubrication intervals that may or may not be. Again, you'd have to know whether they were using MSG-2 or 3. So I can't really comment about that.

MR. BERMAN: Mm-hmm. And so, again, could you tell me the basis on which these intervals were --

were extended or escalated at Alaska Airlines?

THE WITNESS: I'm only familiar with the last escalation which was we used a -- a large sample -- in this case, better than 10 percent sample -- of the fleet and tracked those two aircraft back through their last two C check cycles to make sure that we picked up any -- any tasks which were unique to the C check -- excuse me, the two C check. And our maintenance program was built so that there are no unique 3 C or 4 C tasks. And then we reviewed all of the findings that came out of those checks to determine if there was anything that would be -- we as a Reliability Control Board would feel detrimental to that escalation.

MR. BERMAN: I think you mentioned that you investigate individual exceedances when they occur, such as -- I would guess that would mean a premature failure or removal of a component?

THE WITNESS: In terms of the components, yes, sir.

MR. BERMAN: How do you do that?

THE WITNESS: Well again, when we receive the -- the indication the component has exceeded its alert level, we then can go again to the computer system to draw out that data that caused that exceedance and then

we can look at that particular data for such things as common removal reasons, eventually comment -- common findings condition reports, common time and service. In other words, we're looking for a trend that's developed.

MR. BERMAN: And was that done with any of the premature jackscrew removals or the -- the jackscrew removals that caused the triggering of your function on February 3rd?

THE WITNESS: I can't say with any certainty because of the events of February. I was pretty much detached from my office and had other duty. But I can't say for certain that we studied the jackscrew removals.

MR. BERMAN: But there was no such review of the -- of the removals around the time of the occurrence such as --

THE WITNESS: No, sir.

MR. BERMAN: -- when the first one occurred?

THE WITNESS: No, sir. No, sir.

MR. BERMAN: It took to trigger some -- something with a trend?

THE WITNESS: That's correct.

MR. BERMAN: And do you have in your -- in

your procedures a comparison of the expected time between removal and the -- the time in service for an individual component when -- when it's coming out?

THE WITNESS: There's no formal procedures, no.

MR. BERMAN: So you can't trigger an exceedance based on a -- really, a premature removal? It had to be based on an end play measurement or some other inspection like that?

THE WITNESS: Well, as I said before, any premature removal, whether it would be an end play inspection or whether it would be a -- a surface irregularity or what have you of a jackscrew, the entire assembly -- would be removed. And it still counts as a removal whether it was an end play check or not. And so that type of information could ultimately trigger an alert that would have nothing to do with end play.

MR. BERMAN: Mm-hmm. Now, you say ultimately trigger an alert. Are the alerts always triggered by the changes in the mean time, the average time between replacement? In other words, --

THE WITNESS: No, we --

MR. BERMAN: -- moving average changes?

THE WITNESS: No, we actually use an unscheduled removal rate which is mathematic to related, but it's a rate per thousand hours of unit operation.

MR. BERMAN: So in order to triggle -- triggle. In order to trigger the -- the exceedance flag, that number has to change by some amount that you deem --

THE WITNESS: That's correct. That's correct. Well, actually, all it has to do is break the alert level we have set for it, which is, again, based on our historical average.

MR. BERMAN: So what would have been the alert levels for the parts we're talking about here?

THE WITNESS: The alert level that it was -- was exceeded. If my memory serves me correctly, it was .03 removals per thousand hours. It's an extremely small number.

MR. BERMAN: That was the alert --

THE WITNESS: Yes.

MR. BERMAN: Okay. When the airline switched to AeroShell 33 it was advised, I believe, that it was responsible for monitoring and evaluating the -- the service of the lubricant. Why wouldn't that fall into

the Reliability program?

THE WITNESS: Well, it would. I have to state that -- that I was not aware of that -- that telex that advised that special program until last summer during our investigation into the matters at hand. And I have to state, though, that the Reliability program was already monitoring all of those areas that would have been covered in that particular telex.

MR. BERMAN: Okay. I think I see what you mean by that.

THE WITNESS: Yeah.

MR. BERMAN: Through the components. What was the basis for the level -- the trigger level you just mentioned? I thought again of it, that .033.

THE WITNESS: It's based on the -- the -- in this particular case, the 1999 removal history, based on numbers versus flight hours.

MR. BERMAN: So you -- you chose the trigger level based on what had been happening in 1999?

THE WITNESS: Yes.

MR. BERMAN: And how much of a cushion is there between the existing level of activity and the -- and the trigger level? I mean how much does it have to

change in order to trigger you?

THE WITNESS: As soon as the existing activity level breaks that established alert value.

MR. BERMAN: Yeah, but how did you establish the alert value?

THE WITNESS: We used the 1999 historical data, which was the three removals. And so in other words, by using that data we were able to establish a mean performance --

MR. BERMAN: Yeah.

THE WITNESS: -- and then establish the alert value based on the mean.

MR. BERMAN: How much different?

THE WITNESS: It's the mean plus two standard deviations of it.

MR. BERMAN: Okay.

THE WITNESS: And then once that -- what it told us was is that the two removals in November were in excess of the mean plus two standard deviations.

MR. BERMAN: Okay. Thanks for going over that. No more questions.

MR. HAMMERSCHMIDT: Thank you, Mr. Berman. Are there any other questions by NTSB personnel of this witness?

MR. RODRIGUEZ: No, sir.

MR. HAMMERSCHMIDT: Very good. Mr. McCartney, we thank you for your participation in this public hearing and your cooperation with our investigation. You may stand down.

THE WITNESS: You're very welcome.

(Whereupon, the witness was excused.)

MR. HAMMERSCHMIDT: The next witness is Mr. Jim Davey. Would Mr. Davey please proceed towards the witness table?

(Pause)

MR. HAMMERSCHMIDT: Mr. Davey, we welcome you to our public hearing and we'll allow you the time to get well situated and comfortable in your place there.

(Pause)

Whereupon,

JAMES ALLEN DAVEY

was called as a witness, and first having been duly affirmed, was examined and testified as follows:

Interview of Jim Davey

MR. RODRIGUEZ: Please be seated, sir.

(Pause)

MR. RODRIGUEZ: And would you state your full name for us, please?

THE WITNESS: James Allen Davey.

MR. RODRIGUEZ: And your occupation?

THE WITNESS: I'm managing director of Engineering for Alaska Airlines.

MR. RODRIGUEZ: And what is your business address, sir?

THE WITNESS: Post Office Box 68900, Seattle, Washington, 98 -- pardon me. 98168.

MR. RODRIGUEZ: And would you brief -- briefly describe your aviation background for us?

THE WITNESS: Yes. I have a -- a Bachelors degree in Engineering. I've been involved in aviation for about 30 years. I have a graduate degree in Math and -- Math and Physics. I hold an airline transport pilot rating.

I worked for three years for Rockwell International as a structures engineer. I spent 13 years with Continental Airlines in various engineering assignments, the last five years of which I was director of Engineering.

I spent five years with Dover Hydraulics where I was vice president and general manager, a couple years with Lockheed Aircraft Corporation. I was vice president of maintenance.

I have been a designated engineering representative where I acted in behalf of the FAA. I've served on the Engineering Maintenance and Material Council here in Washington with the Airline Transport Association. I was chairman for a couple years.

Early on I spent three years in the military where I was a paratrooper and member of a special forces group commonly known as the Green Beret.

MR. RODRIGUEZ: Were you hired by Alaska Airlines into the position of assistant vice president for Engineering?

THE WITNESS: Yes. I had a title change but that's all that changed, so.

MR. RODRIGUEZ: And when was that, sir?

THE WITNESS: The title change?

MR. RODRIGUEZ: No. The hire.

THE WITNESS: When was I hired? 1993.

MR. RODRIGUEZ: All right, sir. Mr. McGill will do the questioning.

MR. McGILL: Good afternoon, Mr. Davey.

THE WITNESS: Mr. McGill.

MR. McGILL: I'd like to start off. We -- we ended one of our witnesses yesterday that worked for you with the maintenance program change request called

an ME01. I'll put it up shortly, but could you just generally go through that request again from -- and explain it to us, please?

THE WITNESS: You would like me to explain what an ME01 is?

MR. McGILL: Yes. And how you --

THE WITNESS: Okay.

MR. McGILL: -- how you tracked that process.

THE WITNESS: Okay. It's a maintenance and engineering form that can be used by anyone in our division to request a change. And if it's in my department it's requested usually by an engineer. The second step is that the engineer's supervisor or manager approves the change, and then the form goes to the appropriate member of the Maintenance Review Board, of which there are eight members. And for engineering at one time I was the member.

So the next step is it goes to the appropriate member of the Maintenance Review Board and then it gets reviewed to see that it's relevant. And then it's moved to the manager of Maintenance Programs and Technical Publications. And at that time the -- the approval level is determined on the form. The approval level meaning either the Maintenance Review

Board or the Reliability Control Board. And from that step, then it goes to the appropriate people for approval or disapproval.

After it's approved or if it's approved, it goes back to the Maintenance Programs area and the change is incorporated in the appropriate manuals or task cards. And I guess the last step is the person completing that change signs off the form.

MR. McGILL: Okay. Thank you. Dana, could we try again to get Exhibit 11(G)?

(Slide)

MR. McGILL: That's not quite as good as we'd like, but would you just quickly tell us what this request was, please, sir?

THE WITNESS: Yeah. I -- I can't see it but I'm fairly sure it's the request to change --

MR. McGILL: 11(G) is the --

MR. HAMMERSCHMIDT: Yes, Mr. Davey, we'll allow you to find that before we proceed.

THE WITNESS: I don't know that I have it here.

(Pause)

THE WITNESS: Okay. This is the ME01 that was authored -- originated by Ken Matsuzawa, an

engineer for Alaska Airlines in the Systems Group, that's requesting to revise task cards to use AeroShell 33 grease for flight controls, doors, and landing gear except wheel bearings on the MD-80. And it says, "Further, this grease will be -- will replace Mobil 28 grease noted in the maintenance manual."

MR. McGILL: And what can you tell us about this particular request, sir?

THE WITNESS: I can tell you that it was originated in an Engineering Department that reports to me. The supervisor John Hoover, whose signature is shown, signed -- it appears that he signed this document on July 23rd, 1997. I recall that this document was brought to me as the appropriate member of the -- the -- Maintenance Review Board with a packet of information. And I believe that I signed it on 7/25 of 1997.

MR. McGILL: Okay. You said a packet of information. Could you -- was that the justification? What was this packet? What do you recall from it, please?

THE WITNESS: I don't recall everything that was in the packet. I do recall a Boeing publication that described the attributes of the AeroShell 33.

MR. McGILL: When you signed off your name here in 7/25 from the -- from the position of director of Engineering, did you know if this would be a RAP Control Board action required or MRB required?

THE WITNESS: That --

MR. McGILL: Would --

THE WITNESS: Hmm?

MR. McGILL: Or could it have been routine? What did you know at this point since none of those were checked off?

THE WITNESS: Okay. Above the double line there, the first two steps with Ken Matsuzawa and John Hoover were completed. And then it came to me under the director of engineering slot. I was serving in that capacity for this change. And my job at that -- at that point was to review this to see if it's a -- an appropriate change, something which should move forward for approval. And so I signed it and sent it to Jay Maloney's group, who testified yesterday, and that's where it's determined whether it's a Reliability item or MRB item.

Looking at it after the fact, it appears to me that it -- it -- it should have some limited approval from the Reliability Control Board.

MR. McGILL: That would have been -- would it -- would that have been the only area or would maybe Quality Control also?

THE WITNESS: Well, when I say Reliability Control Board, that board has eight members. And basically, the members are listed on this form by position. The manager of Maintenance Programs is one. The manager of Reliability is the second. Engineering, Line Maintenance, and so forth down the line, including Quality Control. And that's the total of the Liability Board.

MR. McGILL: What did you know about the AeroShell 33 at this time?

THE WITNESS: At the time that I signed this form?

MR. McGILL: Yes.

THE WITNESS: I knew that the engineers had presented me with a packet of information based on their efforts. I recall that this one Boeing publication summarized pretty much the improvements that we could anticipate using this grease. I recall that I thought it was appropriate for us to be pursuing a product that was told to us to be an improved product, that it was compatible with the grease that we

wanted to replace, that it had improved corrosion protection properties. Its performance was -- was said to be better. It improved the life of the parts we were lubricating.

And it had some small safety advantage in that it was a general purpose grease that could replace several other greases. Therefore, it would lessen the opportunity for the mechanic to choose the wrong grease for an application.

MR. McGILL: Did you need any type of approval to make this change?

THE WITNESS: Yes. I -- we would need approval of the Reliability Control Board, for one. And we would need the approval of the manufacturer of the equipment that we were going to use the grease on.

MR. McGILL: At this point did you have the approval of the manufacturer?

THE WITNESS: No. We received -- we received information from the manufacturer I think it was in September. It's one of the exhibits.

MR. McGILL: That was Exhibit H. But how did -- how do you accept the term "no technical objection"? How is that defined from your perspective?

THE WITNESS: I don't know anywhere that it's

defined. But relative to this grease situation, the message that we received that said to me that the people that make the airplane and the people that developed the specification for this grease have no objection to us using the grease. They called it "no technical objection," and of course, we're interested in a technical objection.

And -- but they had no objection. They had been communicating with our Engineering people. And also in that message they said we would appreciate if you would tell us how it works out for you. So to me that's tantamount to approval.

MR. HAMMERSCHMIDT: Just a point of clarification. When Mr. McGill said Exhibit H, that's -- for those who are following along with the exhibits, that's 11(H).

MR. McGILL: Yeah. What did -- what --

MR. HAMMERSCHMIDT: You just abbreviated it to H.

MR. McGILL: Oh. 11(H), yes. Out of 11(A) document.

Back to this ME01, Mr. Davey. We're looking at this thing and we see several names scratched off, some not filled in. And then the bottom section of it

where it would say that the request change was accomplished was not signed off. It just looks like it's incomplete. Your thought on -- on this particular ME01?

THE WITNESS: Well, I agree that it's -- that the form's incomplete. It appears that our process was not followed. It made it through about four steps in the process and we can't find information that says the open signatures were signed as shown here. We -- we've done a lot of searching and it's unfortunate, but if you'll see up near the manager of Maintenance Programs and Tech Pubs, there's an "approved" box with some initials and that's Mr. -- Mr. Louis Woolfer who we believe implemented this change, and he's deceased.

MR. McGILL: In the letter that -- the "no technical objection" letter it looked like there were a couple of caveats in there where it was determined that it was your responsibility to determine the acceptability of the grease. How did Alaska perform that role?

THE WITNESS: Let's see. I'm not following what the "acceptability" language. Can you --

MR. McGILL: Well, it's the --

THE WITNESS: -- point me --

MR. McGILL: -- third -- third -- third paragraph of -- first sentence there.

THE WITNESS: Okay.

MR. McGILL: It's provided with -- you know, prior to the completion but it's intended for you to do -- and it continues on with a couple of -- I haven't really read it lately, but I was just wanting to know how you were going to monitor this change and how you did in fact monitor it?

THE WITNESS: Okay. You'll have to appreciate that I'm speaking to this after the fact because I hadn't seen this until part of your investigation. But on the monitoring part, as Mr. McCartney spoke to, our FAA-approved Reliability Program is what we use to monitor the performance of our fleet. And so that is the monitoring that was done relative to this grease.

MR. McGILL: Okay. It talked about getting the FAA approval or the principals. Do you know how that was accomplished?

THE WITNESS: Yes, I do. It's a requirement set up by our local principal maintenance inspector at the FAA that all changes to our maintenance program task cards are forwarded to them. And in this case, as

in every case, we give them an index each month of the cards that are changed. And included in the month that this change was made were the cards that changed the grease from Mobil 28 to AeroShell 33. So there's an index that talks about the number of the card, I believe, and it -- it has sort of the title and the nature of the change.

Then also, each of the individual instruction cards or task cards are given to them, and I understand that they review and file those. And as in the past, if they have any differences with us, they bring 'em up. We have a meeting every Tuesday and -- and they bring 'em up and we iron out our differences. And if we have to change the cards, we do. But if they don't bring up differences after a period of time we consider that we have received tacit approval of the FAA.

MR. McGILL: How did you do the performance -- or monitor the performance of the -- of the AeroShell lubrication?

THE WITNESS: The -- the reliability program monitors the components of the aircraft and systems.

MR. McGILL: So it's -- it's -- it's through this reliability of each one of the components then is how --

THE WITNESS: Yes, it is.
MR. McGILL: -- how you're going to track the performance --
THE WITNESS: That's true.
MR. McGILL: -- of this individual grease? Was there any other time period later that maybe you -- has any events ever come up since the -- this went into effect that you could talk about or know anything about of this grease?
THE WITNESS: I -- I'm not sure what you're searching for, but I know there's been a discussion of grease used in cold weather.
MR. McGILL: Yes, that's really what I was --
THE WITNESS: Okay.
MR. McGILL: -- brought up the other day about the cold weather.
THE WITNESS: Okay. We --
MR. McGILL: Up in Fairbanks.
THE WITNESS: We worked with our pilot group in that there was it seemed like two or three instances of MD-80 aircraft departing Fairbanks when the temperature was very low. And in that discussion in searching for reasons to why -- I think the -- the problem was that the aircraft didn't rotate on takeoff

as soon as it should have or it didn't respond as quickly as it should have. And so, in having some people looking into that, I am familiar with greases being one of two or three areas of investigation. And I -- I believe that's the one that we were in conference with the Boeing Company to -- and of course, as usual they were trying to help us get to the bottom of why this might happen.

So when you say other subjects -- concerning grease, that -- that's one that I can recall. I don't recall more.

MR. McGILL: Okay. Thank you, Mr. Davey. Mr. Chairman, I have no further questions.

MR. HAMMERSCHMIDT: Thank you, Mr. McGill. Are there other questions from our Technical Panel? Mr. Rodriguez?

MR. RODRIGUEZ: Yes, sir. I was just curious. What other greases did you anticipate using AeroShell 33 as a substitute for?

THE WITNESS: I don't know of any, but a better answer is I don't know.

MR. RODRIGUEZ: You had mentioned some earlier.

(Pause)

MR. RODRIGUEZ: Thank you, sir.

MR. HAMMERSCHMIDT: Thank you, Mr. Rodriguez. We go next to the parties to the public hearing for questions. And let's again begin with Boeing Commercial Airplane Group and proceed clockwise.

MR. HINDERBERGER: Thank you, Mr. Chairman. We have no questions for the witness.

MR. HAMMERSCHMIDT: Thank you. The Aircraft Mechanics Fraternal Association?

MR. PATRICK: Thank you. We have no questions for this witness.

MR. HAMMERSCHMIDT: Thank you, Mr. Patrick. The Airline Pilots Association?

CAPTAIN WOLF: Thank you, Mr. Chairman. We have no further questions.

MR. HAMMERSCHMIDT: Thank you, Captain Wolf. The Federal Aviation Administration?

MR. DONNER: No questions. Thank you, sir.

MR. HAMMERSCHMIDT: Thank you, Mr. Donner. Alaska Airlines?

CAPTAIN FINAN: No questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. We move to the Board of Inquiry. Let's begin with Mr. Berman.

MR. BERMAN: Hello, Mr. Davey.

THE WITNESS: Sir.

MR. BERMAN: Did your department process or begin to process an ME01 change to change the lubrication intervals after the Fairbanks events?

THE WITNESS: My recollection is that we moved towards reducing the intervals and actually reduced them. Now, whether we used an ME01 or another vehicle I don't know. But I -- I do recall -- I guess I -- interrupting the Reliability Control Board meeting after working with the pilots and encouraging them to approve reducing the interval for lubrication on the elevators of the MD-80s, elevator tab, as I recall, as a conservative move operating in the extreme cold temperatures.

MR. BERMAN: Do you remember what the lubrication interval was going to be reduced down to in -- as part of your suggestion?

THE WITNESS: I remember a number only because I saw it written down on a card not too long ago, just a hand draft. I think it was around 550 that was written on that card, but I'm not sure that's the interval that they settled on.

MR. BERMAN: But you think they did make a

change, you just said?

THE WITNESS: I think so.

MR. BERMAN: And would that have been documented?

THE WITNESS: Yes.

MR. BERMAN: If not on an ME01, on -- on what?

THE WITNESS: Oh, it could have been on some of the Reliability -- we call it a RAP document, a Reliability document that changes an interval to a lower interval.

MR. BERMAN: If it was ever going to be implemented it would have to get to a task card or -- or a scheduling process of the airline, right?

THE WITNESS: Right.

MR. BERMAN: And we -- we haven't seen any evidence of that. What do you -- what do you say to that?

THE WITNESS: Well, I haven't seen the evidence either, sir, but I do understand that that could be available.

MR. BERMAN: When you went to that meeting, was -- was there a general agreement to accomplish this change or was there disagreement? How'd that go?

THE WITNESS: Well, to be honest, I just kind of made my input clear and they continued to deliberate, and so I don't know what they discussed. I -- I then left the meeting.

MR. BERMAN: I understand. Thank you, sir. No more questions.

MR. HAMMERSCHMIDT: Thank you. Mr. Clark?

MR. CLARK: Thank you. You talked about the package that went with this ME01 form and that you saw it. You referenced the -- a Boeing document or a Boeing publication. What was that?

THE WITNESS: It's -- it's called "The Boeing Airliner."

MR. CLARK: That's the "Airliner" thing that's in the --

THE WITNESS: Yes. It's a -- it's a publication that -- it provides Boeing -- customers with supplemental technical information to promote continuous safety and efficiency, and it also says that it's information published is considered accurate and authoritative, and we rely on it to review improvements that the customer service people communicate to us.

MR. CLARK: Okay. And the -- what you just referenced is part of their -- that's what they assert

their magazine to be?

THE WITNESS: Yes, sir.

MR. CLARK: Okay. The -- also, how -- what -- what else was in that package? Do you remember or do you remember any other documents?

THE WITNESS: You know, it seems like it was some messages kind of on the same format as Exhibit 11(H).

MR. CLARK: Okay. Things like that?

THE WITNESS: Yes.

MR. CLARK: Now, if -- I under -- after the accident the FAA requested something -- it -- had the FAA -- had this information been sent to FAA during this time frame of '95 -- or '97, I mean?

THE WITNESS: Yes, I believe around December or -- December of '97 or January of '98 all the cards which had been changed in the index that described the changes had been sent to the FAA.

MR. CLARK: Okay. Now, that's -- what about supporting material? Do you normally send that?

THE WITNESS: Does -- the packet that came along with the ME01?

MR. CLARK: Yes.

THE WITNESS: No. That is maintained in our

files with the approved ME01. The packet of information.

MR. CLARK: Okay. And then you send the -- the cards or the other documentation over, and if they choose to look at that and they want to inquire about supporting material they contact you and they would either come over and look at it or you would provide them a copy?

THE WITNESS: Yes, we would.

MR. CLARK: Okay. And is that that same package of material that was sent to them after the accident -- shortly after the accident?

THE WITNESS: You know, I wasn't involved with what was sent after the accident. And I -- it's my recollection --

MR. CLARK: You don't know?

THE WITNESS: -- we -- we sent everything we could lay our hands on relative to this subject, so I don't know what was sent.

MR. CLARK: Okay. Do -- have we been provided the set of material that was in that packet?

THE WITNESS: That --

MR. CLARK: From the '97 time frame?

THE WITNESS: I have the -- materials that

was sent to the FAA for the justification of that change in March of 2000.

MR. CLARK: That's what we have?

THE WITNESS: Yes, sir.

MR. CLARK: Okay. And -- okay. And you don't know what -- we'll find out if that's the same package that went -- we'll ask ultimately.

(Pause)

MR. CLARK: This -- this ME01, you -- you made a note that it was -- there was an "LW" signature or initials on it?

THE WITNESS: Yes.

MR. CLARK: What -- what's the -- you said -- is that the -- if that gets on there that is the approval? This --

THE WITNESS: No. What I think that is is Mr. Woolfer was a maintenance program specialist for the MD-80 and he was the one that physically made the changes to the task cards. And he worked for Jay Maloney. And what I believe that signifies, that -- that Louis had looked in to see how many cards needed to be changed and -- and what related material needed to be changed and he's initialed that and that -- that's our conjecture, that that was his involvement.

That's his normal process and way of doing business.

MR. CLARK: Okay. When he initialed that, does that mean he was the one that made the changes or he was the one that researched how many changes had to be made? What -- what does the typical --

THE WITNESS: I don't know. He wouldn't be the one to approve it. That would be Mr. Maloney to approve it. And I think it's some communication within their Maintenance Programs and Technical Publications Department to say that the guy that's going to do the work has -- has reviewed this and see that and kind of anticipate what's coming.

MR. CLARK: On this document, what -- what is the piece that constitutes the -- in a typical environment that it is approved, it is approved, ready to be implemented? What is that --

THE WITNESS: Well, --

MR. CLARK: -- here?

THE WITNESS: It would be similar to the ME01 that we used to put the AeroShell 33 on all of the Boeing fleet about a year before this. It's the same process. It's an ME01 that --

MR. CLARK: Okay. Excuse me. That -- what I'm asking is -- is who -- who's -- who's the last guy

that has to sign this to make it an official document to be bundled and then the cards made and then sent to the FAA?

THE WITNESS: Okay. The last --

MR. CLARK: Who's the last signature that needs to be on this?

THE WITNESS: The last signature for approval is the last member of the eight-person board. The person to sign the very bottom that says I've incorporated this change and I'm sending it to the FAA would have been Mr. Woolfer.

MR. CLARK: And that would have been at the very bottom of the page?

THE WITNESS: Yes, sir.

MR. CLARK: So -- okay. So just the fact that any one of these individuals up here signed and initialed doesn't -- they all -- it all has to be there to make it official?

THE WITNESS: Yes, it does.

MR. CLARK: And -- and then in that -- but somewhere in this process those cards did get to the FAA and in -- in that bundle of cards and six-page computer print-out?

THE WITNESS: Yes.

MR. CLARK: And -- okay.

(Pause)

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

MR. HAMMERSCHMIDT: Thank you, Mr. Clark. Dr. Ellingstad?

DR. ELLINGSTAD: Just one question to follow up on what Mr. Clark is pursuing with respect to this ME01 in Exhibit 11(G). Your signature on that form, does that represent a substantive technical review and -- and your checkmark on "approved" means that you found this to be an appropriate change?

THE WITNESS: Well, what our process calls for and what I did was on the third step when it came to me I reviewed the packet of information and the request to determine if it was relevant, something that we should okay to do. And I signed it and dated it. The approval, I don't know if that's my check or not; I really couldn't say. But the approval process comes two steps later when it's -- usually these are discussed around a round table of -- of the eight members and that's when we indicate our approval or disapproval and have the opportunity to discuss it with --

DR. ELLINGSTAD: I understand that. What I'm asking you is does your signature here represent an engineering judgement. Are you signing off on it on -- on that basis or are you simply accounting for sufficient papers to have been assembled?

THE WITNESS: At the time I signed this, this constitutes that I had followed the manual and reviewed it. It does not constitute engineering approval.

DR. ELLINGSTAD: Or an -- does it -- that may have to do with your authority. What I'm asking is having -- having reviewed those materials have you exercised some judgement as to the appropriateness of -- of this decision? Is that what your signature represents?

THE WITNESS: Yes, it does.

DR. ELLINGSTAD: Thank you.

MR. HAMMERSCHMIDT: Thank you, Dr. Ellingstad. Are there any other questions for this witness?

(No response)

MR. HAMMERSCHMIDT: Okay. In that case, Mr. Davey, we thank you for your participation in this hearing and for your cooperation --

THE WITNESS: Thank you.

MR. HAMMERSCHMIDT: -- with this investigation. You may stand down.

THE WITNESS: Thank you, sir.

(Whereupon, the witness was excused.)

MR. HAMMERSCHMIDT: The time, according to our boardroom clock, is 2:08. We will take our one-hour lunch break. I would just note editorially that we have made great progress this morning in terms of where we stand in the hearing in terms of hopefully completing it by Saturday evening, but we will know better on that account later in the day and, of course, into tomorrow. So we stand in recess until 3:09.

(Whereupon, at 2:09 p.m., the hearing was adjourned for lunch, to reconvene at 3:09 p.m. the same day.)

A F T E R N O O N S E S S I O N

3:09 p.m.

MR. HAMMERSCHMIDT: Let's please take our seats, everyone. We'll come to order.

(Pause)

MR. HAMMERSCHMIDT: It's 3:09 in the afternoon and we are back in session on this third day of the NTSB's public hearing on the Alaska Airlines Flight 261 accident investigation.

The next witness on the witness list is Mr. Robert Falla. Is Mr. Falla here? Mr. Falla, please proceed to the witness table. Thank you, sir. We welcome you to this hearing, and let's see. Mr. Rodriguez is conspicuous by his absence.

(Pause)

MR. HAMMERSCHMIDT: I guess I could swear the witness in.

Whereupon,

ROBERT FRANCIS FALLA

was called as a witness, and first having been duly sworn, was examined and testified as follows:

Interview of Robert Falla

MR. HAMMERSCHMIDT: You may be seated. Please proceed -- Mr. McGill, please proceed with the

witness.

MR. McGILL: Thank you very much, sir. Mr. Falla, would you please state your full name and occupation, please?

THE WITNESS: It's Robert Francis Falla, and currently I'm unemployed, separated from Alaska Airlines. Last date of employment was 12/1 of 2000.

MR. McGILL: And would you very briefly describe your aviation background please, sir?

THE WITNESS: I received a Associates of Applied Science degree in Aviation Maintenance Technology in 1990 from Portland Community College. I received my Air Frame and Power Plant certificate in December of 1990. From that time I've been working in the aviation field in numerous capacities.

MR. McGILL: Could you also very quickly summarize your employment with Alaska Airlines, please?

THE WITNESS: I originally hired on with Alaska Airlines as a avionics line supervisor, and approximately two months after that I was promoted to the position of manager of Seattle Base Maintenance.

(Pause)

MR. McGILL: Have you -- have you ever been, excuse me, involved with any people under your control

or did you do lubrication of anything of MD-80 airplanes?

THE WITNESS: Approximately around '95 or '96 I worked for BF Goodrich Aerospace, which was formerly known as Trampco. Alaska Airlines had a maintenance contract with BF Goodrich at that time. I worked as a flight control lead working primarily the wings on the MD-80s as well as the tails of MD-80s, specializing in that area.

MR. McGILL: Let's go back to your position. You were the manager of the Oakland Base Maintenance, is that correct, sir?

THE WITNESS: No. I was -- of Seattle --

MR. McGILL: Seattle, I'm sorry. Of Seattle Office. And Seattle normally did Boeing 737 maintenance checks, is that correct?

THE WITNESS: That's correct. They performed heavy check aircraft maintenance and occasionally we would do some MD-80 aircraft but not in heavy check capacity, only in repairs.

MR. McGILL: Okay. In your capacity as manager in Seattle, did you attend any -- what type of meetings did you attend in your -- in that capacity?

THE WITNESS: Well, normally in my capacity

as a manager I would be on an advisory board, but on numerous occasions and in place of the director of Maintenance I filled in the position for the director of Base Maintenance at RAP MRB meetings.

MR. McGILL: Do you know that or can you remember on -- if any of these meetings involved the lubrication of MD-80 airplanes?

THE WITNESS: Yes, I do.

MR. McGILL: And could you briefly tell us what was discussed?

THE WITNESS: From what I can recall, it was very vivid for me because I was in a -- what I believed -- it was either MRB or RAP, I'm not sure which one it was, or possibly a Review Control Board. I'm not sure if it was that one either.

But I remember specifically because we've talked about the intervals on the MD-80s alone and reducing those intervals. And in that discussion I remember it vividly because there were another member there that was the manager of Line Maintenance was filling in absence of the director for Line Maintenance.

In regards to that discussion, the topic was specifically reducing those hours for the intervals. I

remember the ME01 going around the table and the discussions by Paul Miller, who filled in for Bob Hinman at that time, because part of the reductions also included that we were discussing the man-hours that were included in that. In general is that we were already at a level staffing that was asked to reduce our overtime hours or keep 'em within the five percent that marginally we have as a -- a cap.

MR. McGILL: Who -- excuse me one second, but who -- who set -- set the salary -- the overtime cap? Who -- does this come out of Maintenance area?

THE WITNESS: Well, yeah. The -- the actual five percent was just a value number that was specific. It was given to me and other managers in a staff meeting with Art Fitzpatrick in his meeting in his office after a staff meeting with Bill Weaver.

MR. McGILL: Okay. Continue on with discussion of what -- what was -- went on at the meeting, please.

THE WITNESS: Well, it was kind of vivid to me because Paul Miller made the comments that with the reduction in the cycle times it would require for him and his staff to increase. And at that time increasing in the staff wasn't one of the priorities at the

current time. I also remember him speaking very directly to that. He signed his name, I remember because then I do remember that the assistant vice president of Engineering, Jim Davey stopped in and was very explicit about making sure that we all knew that it -- this change was going to happen.

MR. McGILL: Do you remember about the time frame all of this happened? Was this before or after the -- the crash?

THE WITNESS: Well, what I can recall of it is I remember one time 'cause I -- I felt kind of proud that I was down in the back shop structures area and I -- the mechanics were talking about it. And I -- I happened to talk -- at the time I spoke out and said I'm -- I was proud of being part of a team or a company that was proactive instead of reactive. And so, from that assumption I understand that I wouldn't have made that comment unless that was before the accident at that time.

MR. McGILL: What problem was identified? Do you remember that?

THE WITNESS: Well, the general identification was during that meeting, from what I can recall, was they were talking specifically about

details on the MD-80 series aircraft and the lubrication of the tails.

MR. HAMMERSCHMIDT: Do you know if the ME01 was signed off completed?

THE WITNESS: Well, I remember the ME01 being passed around the table. Paul Miller was to my left, I was to the right. I was one of the last people to sign the document, the ME01. Paul Miller signed his name for Robert Hinman, the director Line Maintenance, and I signed my name for Art Fitzpatrick, director of Base Maintenance. I took the document at that time and I handed it over across the table to Lee Cantrell or -- who was the manager of Publications.

(Pause)

MR. McGILL: Following the crash, was there other meetings that you were in or other areas where you received any type of guidance involving lubrication for testing?

THE WITNESS: I was also asked -- sent, I should say, a memo and a print-out as a hard copy from Bill Weaver's office, the assistant -- our executive vice president of Maintenance and Engineering at the time requesting that I after -- after receiving this requesting that my department get a sample of the

lubricant to be sent out for testing for the jackscrews of the MD-80s. In that it stated that I needed approximately one pound or -- not one pound, but one gallon container. I notified one of my supervisors, and I believe that Mussah Azi, and gave him a copy of that memo and asked him if he would gather the data on that at the MSDS, Material Safety Data Sheet, along with the maintenance manual for the lubricants that they would use and then get a container so I could deliver that.

MR. McGILL: And what type of greases were we talking about at this time?

THE WITNESS: Well, at that time we only knew of -- we were only asked for one, and that's all we thought that there was at the present time. What Mussah had done was came back to my office, and he said, Robert --

MR. CLARK: Which one was that? Which grease?

THE WITNESS: Well, we weren't -- the only grease we knew of was the maintenance manual, and at that time it was Mobil 28.

MR. McGILL: Okay. Continue.

THE WITNESS: At that time Mussah came back

to me and says, Robert, we have a problem. There's two greases that we use here. Which one do we get? And I explained to him, well, I'm not sure, what -- what do you mean? He said, well, I got the maintenance manual. It says to use the Mobil 28, and I have a work card that says to use AeroShell 33.

Well, we were at my desk at that time when he was asking me what should we do, and I said, well, let's contact Oakland. So we made a phone call down to the Oakland facility and talked to one of the supervisors down in Oakland, and I don't recall the name of the supervisor. But we asked them what they were using at the time for their lubrication of the jackscrews, and I recall them saying that they used the Mobil 28 at the time.

Well, I was kind of confused at that point, and Mussah was, and I had a memo asking me, so I contacted Bill Weaver's office and asked what -- what would he like. And he asked for samples of both. I wasn't sure what the samples other than they were being sent out for testing.

I was under the assumption that they were going to be sent out with the knowledge of NTSB. When I found out they were -- through my discussion that

they were just being sent out for tests that Alaska Airlines was running on their own. I did gather both of the -- well, Mussah and I both at that time gathered the two lubricants, placed 'em into one-gallon, white containers with screw-on lids. We attached the MSDS forms to that to each one. We also attached a work card and a maintenance manual for each one, and we also marked on each container what the lubricant was that was in that container. I then took those containers and I delivered 'em to Mr. Weaver's office personally.

MR. McGILL: Was there any discussion after you gave it to Mr. Weaver?

THE WITNESS: No. There wasn't.

(Pause)

MR. McGILL: Where was -- what is the location physically of the grease that you -- where do you go to get grease in your company?

THE WITNESS: Well, the lubrication for the maintenance operation is kept in the base operation -- we have what we call the main hangar in the back where we have the tail dock stands. We have those in open containers sitting out on -- usually on palettes in five-gallon buckets as well as we have handguns that are individually placed in a cabinet, a fire cabinet or

metal cabinet with all those guns all enclosed in the same cabinet.

MR. McGILL: How does a mechanic know which one to get?

THE WITNESS: Well, I guess in the context of the job he's doing, whether it be the work card or the maintenance manual that he's using at the present time, he would find out what lubricant was required. He would then just go back to the cabinets or open areas and then grab one of the guns that had that lubricant in it.

MR. McGILL: So you're saying on the MD-80 there's one lubricant denoted in the maintenance manual and another lubricant denoted on the task card?

THE WITNESS: That's correct.

MR. McGILL: Do you know if this is also the case at -- at the facility in Oakland?

THE WITNESS: I do not. I -- I would presume that we use the same manuals, but I have not been to the Oakland facility.

MR. McGILL: I -- I was actually referring to the physical location of it sitting -- just sitting out in the hangar area. One might think it -- one could mistakenly take the wrong lubrication at some -- at

some time interval. I was just wondering where that was at physically.

THE WITNESS: Well, I can't speak for the Oakland facility or where the lubricants are kept there because I've never been in that facility.

MR. McGILL: Okay. That's fine.

(Pause)

MR. McGILL: Mr. Falla, I have no more questions at this time. Mr. Chairman?

MR. HAMMERSCHMIDT: Let's see. Are there any -- are there any other questions from the Technical Panel?

MR. RODRIGUEZ: No, sir.

MR. HAMMERSCHMIDT: Thank you, Mr. Rodriguez. Let's see. Moving to the parties to the hearing for questions. Again, let's begin with -- with Boeing Commercial Airplane Group and proceed clockwise around the parties.

MR. HINDERBERGER: Thank you, Mr. Chairman. We have no -- no questions for the witness.

MR. HAMMERSCHMIDT: Thank you, Mr. Hinderberger. The Aircraft -- the Fraternal Aircraft Mechanics Association?

MR. PATRICK: Mr. Chairman, I think in the

best interests and the purpose of this public hearing AMFA has no additional questions for Mr. Falla. Thank you.

MR. HAMMERSCHMIDT: All right. Thank you, Aircraft Mechanics Fraternal Association. Moving next to the Airline Pilots Association.

CAPTAIN WOLF: Thank you, Mr. Chairman. Good afternoon, Mr. Falla. Just have a few -- few questions here.

After you sat in on the MR -- MRB meetings for Mr. Fitzpatrick did you brief him on any of those discussions that took place during that meeting?

THE WITNESS: I believe I did not. He was in the Oakland facility at the time.

CAPTAIN WOLF: Okay. Thank you. In your position at all, and possibly communicating with other people, were you aware that there were three jackscrews replaced in 1999 and that possibly that the RAP had no tear-down reports for those components at all?

THE WITNESS: Yes, I was.

CAPTAIN WOLF: When the -- in discussions about changing from the Mobil to the AeroShell 33, were there any increases in -- in inspections of the jackscrew done to monitor the effects of the new grease

at all, just to kind of see what type of results that you might possibly have been getting pros or cons to it?

THE WITNESS: My responsibility wasn't in the area as towards the reliability so I did not deal with those aspects.

CAPTAIN WOLF: So I had a follow-up question, but I think you probably just answered it, was as the -- for the frequency of the inspections increased to monitor the effect of the decreased lubrication. It's kind of a different question. Let me read it to you totally. When the lube intervals were -- were increased, as we had talked earlier yesterday and today, was the frequency of inspections increased to monitor the effect of the decreased lubrication at all, that -- that you're aware of?

THE WITNESS: Not that I'm aware of. I couldn't answer that.

(Pause)

CAPTAIN WOLF: Who in your mind would be -- would be responsible for the escalations of the lube intervals from 500 hours in 1987 to moving up to approximately the 2500 -- 2550 hours in 1996?

THE WITNESS: I couldn't answer that because

I was not at the airline at that time.

CAPTAIN WOLF: Mm-hmm. And you wouldn't -- in any type of discussions over the last year or in your current -- when your position -- when -- when you were at the company as far as hearsay or anything to that effect? Speculation?

THE WITNESS: No, I -- I never heard anything as towards speculation other than the meetings that we had that were basically staff -- meetings with Mr. Weaver when I filled in for Art Fitzpatrick and -- and then, of course, the MRB and RAP Boards.

CAPTAIN WOLF: Okay. All right. Thank you very much. That's all I have, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Wolf. Going next to the Federal Aviation Administration.

MR. DONNER: Yes, sir. Just a couple of questions.

Hi, Mr. Falla. Forgive me for leaning around my attorney.

First question for you, sir, is what do the mechanics use when they go out to grease an airplane: the maintenance manual or the work cards?

THE WITNESS: Well, that depends on the task. If it's having to deal with a task card or a routine

card, it's outlined in the routine card in itself. If it has to be or it's generated off of a MIG 4 or a non-routine, then they would normally go to the maintenance manual and find that information there.

MR. DONNER: Okay. And in the case of lubricating the jackscrew, what would it be?

THE WITNESS: Well, again, if it was a specific task developed for lubricating or inspecting that jackscrew, they would have used the task card.

MR. DONNER: Okay. Would the mechanics then know if there was a difference in the grease specified between the task card and the maintenance manual?

THE WITNESS: Well, --

MR. DONNER: Would they have any way to know that if they were just routinely doing the job?

THE WITNESS: I do not believe so.

MR. DONNER: Can you describe for me the normal application of grease to the jackscrew as it would be accomplished on the ramp?

THE WITNESS: Well, I did not work on the ramp so I would not know how Alaska Airlines did that particular.

MR. DONNER: Do you have any knowledge of the lubrications done on the accident aircraft?

THE WITNESS: None.

MR. DONNER: Thank you very much.

MR. HAMMERSCHMIDT: Thank you, Mr. Donner. Going next and lastly to Alaska Airlines for any possible questions.

CAPTAIN FINAN: Thank you, Mr. Chairman. Just one question, Mr. Falla. Were you aware that following the accident the NTSB requested samples of Mobil 28 and AeroShell 33 grease in gallon containers from Alaska Airlines and that they were provided?

THE WITNESS: I was not.

CAPTAIN FINAN: Thank you, Mr. Falla. No further questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. Moving next to the Board of Inquiry for questions. Mr. Berman?

MR. BERMAN: Thank you, Mr. Chairman. Mr. Falla, were you aware of any connection between the lubrication interval issue that you described with an ME01 being worked on at a -- at a meeting and the Fairbanks events involving the problems with the rotating airplane?

THE WITNESS: I was not aware of those two circumstances.

MR. BERMAN: Was there any discussion at that meeting about the reason for the discussion you were having?

THE WITNESS: I do not recall the -- specific deal other than that I know that they said that due to the increased wear that the intervals needed to be reduced.

MR. BERMAN: Increased wear of any particular --

THE WITNESS: Just components in itself of the tail. The generalization was the tail.

MR. BERMAN: Uh huh. Was there any talk about a broken bearing in the tail of an airplane?

THE WITNESS: There was not. Not that I can recall.

MR. BERMAN: Any talk about dry tails coming into maintenance facilities or anything like that?

THE WITNESS: There was comments of dry bearings and what I remember was the lubricants of those dried bearings, you know, being insufficient.

MR. BERMAN: And that was from discussion at that meeting?

THE WITNESS: Yes.

MR. BERMAN: Yeah. What would the

lubrication interval have been moved to if -- if that meeting's efforts went through? And I'm not sure if they did, but what -- what was the lubrication interval you were adopting?

THE WITNESS: Well, at that time I -- I had a number that I kept focusing on but I'm not sure if that was it or not. I mean if I were to give you the number it wouldn't be --

MR. BERMAN: Okay. Thanks. We don't want you to speculate.

In your position in Base Maintenance, did you ever see a revised task card come through for -- for the lubrication?

THE WITNESS: For that specific task or that meeting?

MR. BERMAN: The results of that meeting, which I'm gathering was going to be a change to the lubrication interval of some parts of the tail. If you can be specific with what part of the tail, let me know, but.

THE WITNESS: Well, it -- it was the complete tail. The discussion was the complete tail. That included the elevators, the tabs, the -- the jackscrew assembly, the rudder. I had not seen or am aware of

that any changes occurred after that point. I do know that all the signatures were on the list on the ME01, though.

MR. BERMAN: Would you have received the revised task card through your office if that had been executed and implemented?

THE WITNESS: I believe that eventually it would have shown up but I would not have had knowledge of it at that time.

MR. BERMAN: Okay. So you wouldn't have noticed it or -- I mean is that the kind of thing you focused on in your job was the individual changes like that?

THE WITNESS: I do normally. I -- I -- I look after -- specific task, very detail-oriented. But in this case I was not available at the present time to look at documents or was I able to review any documents. I was on administrative leave so I was not aware.

MR. BERMAN: Oh. Oh, I see. So this was -- this -- you -- you've never pinned down for us when this meeting was, exactly. This was before the accident, right?

THE WITNESS: Well, my recollection was is I

made a statement that I went down to the operation or the structures back shop area and I --

MR. BERMAN: Oh, yeah. Right. You're correct. I'm sorry.

THE WITNESS: So I assumed that that date specifically. But if the document was available the date would clarify that.

MR. BERMAN: Yes, sir. Yes, sir. We're looking for it. How long after the accident was the sampling that we've discussed provided by you of the grease samples?

THE WITNESS: I remember the approximate time was around just after they found the jackscrew.

MR. BERMAN: Okay. Let's turn to something else that you mentioned about familiarity with three jackscrews that had been returned or -- or removed and replaced. What is -- what's your -- what's your knowledge of that? Tell me the whole story of that, please.

THE WITNESS: Well, again, I filled in for Art Fitzpatrick at different meeting levels. He wasn't present for one of Mr. Weaver's staff meetings, and I happened to fill in for him in this meeting. In the discussions of those meetings, particularly the

jackscrews of MD-80s were discussed. I remember Jim Davey at the beginning of the meeting speaking specifically about the differences between the end play and the free play, explaining to the rest of the directors and Weaver's subordinates about the differences in that.

We continued on with our discussion relevant to the MD-80s because at that time we knew the availability of the jackscrews weren't available for all the aircraft that we needed at the present time. And he explained -- Mr. Weaver -- that we had a variance from Boeing to purchase complete jackscrew assembly from the manufacturer.

We also went over the current failures of existing aircraft that were being tested at the present time, and I believe at that meeting we had a remainder of two or three aircraft left to test. Part of that -- in that discussion we were going over the failures of Alaska Airlines units compared to the failures of other airlines and was using that as a comparison. And I was given a hand-out sheet for that during that meeting.

MR. BERMAN: Okay. And just to clarify when we're talking about here, was this before or after the accident?

THE WITNESS: This was after the accident.

MR. BERMAN: I see. And the three jackscrews that you're talking about, were those the ones that were identified as part of the airworthiness directive?

THE WITNESS: Yes.

MR. BERMAN: Okay. Thank you very much. No more questions.

MR. HAMMERSCHMIDT: Mr. Clark?

MR. CLARK: From your -- what you said earlier, your -- the person that worked for you went out and came back and reported that there were two types of greases out there. Was that the first time you became aware of AeroShell 33?

THE WITNESS: It was while I was employed at Alaska Airlines.

MR. CLARK: At Alaska Airlines, yeah. And -- and -- and you did -- primarily your work in Base Maintenance was on the Boeing line of airplanes, the 737s?

THE WITNESS: The heavy checks were primarily of the 737s, but we did a numerous amount of repairs on the MD-80 aircraft as well.

MR. CLARK: Okay. But on those heavy repairs, the -- this BM 333 AeroShell 33 lube from your

experience there had not been incorporated on -- into the Boeing line of airplanes?

THE WITNESS: Can you rephrase that?

MR. CLARK: At -- are you -- are you aware if the AeroShell 33 grease had been incorporated into the Boeing -- to be used on the Boeing line of airplanes in -- in Seattle?

THE WITNESS: I'm not sure of that for Alaska Airlines. I -- I haven't looked at the documents for the grease in itself --

MR. CLARK: Okay. But it --

THE WITNESS: -- for those particular --

MR. CLARK: Okay. As what, director of Base Maintenance you would not necessarily know if that had been incorporated or not?

THE WITNESS: Well, I was the manager of Base Maintenance. But I did not watch over the functions -- the grease functions all that much other than a report of when we had troubles with other grease areas on the 37s in itself.

MR. CLARK: Okay. In -- you worked at Trampco or Trampco by a previous name, is that correct?

THE WITNESS: That's correct.

MR. CLARK: And worked in the air -- was it

-- was that on MD-80s in the area of the tail?

THE WITNESS: That was. It was actually on Alaska Airlines aircrafts at the BF Goodrich facility in Everett.

MR. CLARK: Okay. So in that function you -- did you do the end check measurements or did you do the lubrications on the -- on the jackscrew?

THE WITNESS: I have done the lubricants. I have not done the end play checks.

MR. CLARK: Okay. In -- with that experience or your experience at Alaska Airlines, had you ever received any kind of training regarding grease or any special training that dealt with lubrications or grease?

THE WITNESS: Well, in the industry mechanics and technicians take great pride in their positions. And for me, it was looking at all information and data that you could gather from the applicable maintenance manuals or information. I did know that you should purge the systems out. Not all people do know that. And those -- it sometimes is relatively pretty hard to find that or where it's located.

MR. CLARK: How would you have gone about purging a jackscrew assembly or the Acme nut assembly

if one day you went out there and the card had changed to a different type of grease? Or would you -- if you had the card, would you be compelled to do that or feel obligated to do that?

THE WITNESS: Well, I haven't done that on a MD-80 aircraft but I've done it similarly on a 737 aircraft. And to use the comparison or what I would have done in this case was I would have just used a rag and cleaned off the excess lubricant off of the jackscrew. I would have used the grease gun to purge the nut, or gimbal nut in this case, until the flow was that of the new lubricant. I would have exercised the jackscrew as well as then clean it a second time, then regrease it again, and then make sure everything was per the maintenance manual.

MR. CLARK: And you've done that in a similar procedure on Boeing airplanes?

THE WITNESS: I have.

MR. CLARK: What happen -- and you may not -- you may not know, but you were talking about this ME01 that talked about changing wear intervals. Do you know what happens to those particular documents or supporting material if it's decided to not implement that change?

THE WITNESS: I know at some times that it may have been approved or all the signatures gathered on the ME01s. There has been an instance at Alaska Airlines where that has happened and then that document was either lost or was shuffled in a pile in another place until brought up months and months later. That occurred to us once before.

MR. CLARK: Okay.

THE WITNESS: But I don't know where the end result is. I mean --

MR. CLARK: Okay. Is that a situation where it was approved and then just simply misplaced and never got into the system?

THE WITNESS: Well, I think probably it was more or less the way like Lee Cantrell explained to me at one time. There were questions even after the Board had made a decision to make a change. His group had questions of whether or not it was even feasible at that time.

MR. CLARK: Okay. But if it's decided among the company that you -- you don't know what happen -- what happened to that piece of paper? If somebody at some point decided we really don't want to do this, let's can it and get rid of it, you don't know that

process or procedure?

THE WITNESS: No, I don't know what happened to the paper.

MR. CLARK: All right. Thank you.

MR. HAMMERSCHMIDT: Thank you, Mr. Clark. I'd like to follow up on one of your answers to Mr. Clark's questions. When you do have a change in a lube task card such as changing to AeroShell 33, would or should any special instructions accompany that -- that change for the benefit of -- of every mechanic on the shop floor that would be subject to using that new, changed task card?

THE WITNESS: Typically, in the industry it would be known 'cause you have a lot of new employees coming in that would not know the difference. Also, it helps advise people that have been using one particular lube that there has been a change and that they don't go off of their memory.

MR. HAMMERSCHMIDT: So there normally would be some special explanation or special instructions?

THE WITNESS: Well, in the industry it would be that way. That was not the way it was set up at Alaska Airlines.

MR. HAMMERSCHMIDT: Okay. Thank you. Are

there any of the questions for this witness?

(No response)

MR. HAMMERSCHMIDT: Very good. Well, Mr. Falla, we thank you for your participation in this public hearing and for your cooperation with this Safety Board investigation. You've been an efficient witness today.

THE WITNESS: Thank you.

MR. HAMMERSCHMIDT: Thank you, sir. You may stand down.

(Whereupon, the witness was excused.)

MR. HAMMERSCHMIDT: We will now go to our next witness. It'll actually be a panel of two witnesses. Therefore, would Mr. Robert Hinman and Mr. Art Fitzpatrick please come forward to the witness table?

(Pause)

MR. RODRIGUEZ: If you gentlemen would move down so the Tech Panel can see you it'd be better.

(Pause)

MR. HAMMERSCHMIDT: Gentlemen, before you get settled let me welcome you both here to our public hearing and please take all the time you need to get situated and comfortable.

MR. RODRIGUEZ: Before you sit down, would you take the oath, please?

Whereupon,

ROBERT ALLEN HINMAN

was called as a witness, and having been duly sworn, was examined and testified as follows:

Whereupon,

ARTHUR ELLIS FITZPATRICK

was called as a witness, and having been duly sworn, was examined and testified as follows:

Interview of Robert Hinman and Art Fitzpatrick

MR. RODRIGUEZ: Please be seated.

(Pause)

MR. RODRIGUEZ: Mr. Hinman, first. Over here. Mr. Rodriguez.

MR. HINMAN: Yes, sir.

MR. RODRIGUEZ: Still talking to you over here.

MR. HINMAN: Thank you.

MR. RODRIGUEZ: Would you give us your full name, sir?

MR. HINMAN: It's Robert Allen Hinman.

MR. RODRIGUEZ: And your occupation?

MR. HINMAN: My occupation at the present time is a subject matter expert.

MR. RODRIGUEZ: And what is your business address?

MR. HINMAN: My business address at the present would be 1701 Westlake Avenue North in Seattle, Washington.

MR. RODRIGUEZ: And would you briefly state for us your aviation background?

MR. HINMAN: I started as an aircraft mechanic, United States Air Force 1963. Served four years, honorable discharge.

I went from there to McDonnell Douglas. I spent about eight months at McDonnell Douglas. Went to work for Continental Airlines. Served as a mechanic, a lead mechanic, supervisor, manager, director, and left Continental with 27 years. Came to Alaska.

MR. RODRIGUEZ: All right. And similarly, Mr. Fitzpatrick, would you give us your full name, please?

MR. FITZPATRICK: Yes, Arthur Ellis Fitzpatrick.

MR. RODRIGUEZ: We need -- there's a -- you

needn't share. There's I think three of 'em over there. Grab one of those others and -- if you push the red button down so that it's extended. There you go.

MR. FITZPATRICK: Yes. Arthur Ellis Fitzpatrick.

MR. RODRIGUEZ: And what is your business address, sir?

MR. FITZPATRICK: My business address is Alaska Airlines, Box 68900, Seattle, Washington.

MR. RODRIGUEZ: And what is your occupation?

MR. FITZPATRICK: I'm director of Base Maintenance, Seattle.

MR. RODRIGUEZ: And would you briefly describe your aviation background for us?

MR. FITZPATRICK: Yes, sir. I have 34 years in the aviation industry. I was S and A and P license, Air Frame Power Plant and a FCC Communications license.

After a three-year hitch in the United States Army, getting out in '66, I went to work for World Airways as an avionics mechanic. I spent 12 years with World Airways. Started off as -- as a avionics mechanic for six, avionics lead for two years, became a supervisor, and one year before I left as a manager of avionics.

After leaving Air Cal, I joined -- I'm sorry. I went to work for Air Cal in 1979 to 1988. I went to work for them also as a avionics supervisor and promoted to a manager to open up their shops and operated the line operation and the base operation for the Avionics Department. And the last two years I was manager of Line Maintenance.

After Air -- two years of that American Airlines purchased Air Cal so two years of it I was with American Airlines.

In 1988 I went to work for Alaska Airlines and currently 12 years. I opened up the -- Oakland operation hangar for the first year. We -- we renovated the hangar and hired mechanics, trained mechanics to get ready to do the C checks on the MD-80 fleet. First check was in January of 1999. And around April of '99 I was promoted to southwest regional maintenance manager. At that time I -- my office and base was in San Francisco. I was responsible for the Arizona stations, the Nevada stations, and all the Mexico stations, and San Francisco.

After three years I came back to the Oakland hangar to -- as manager to run the operation, the base manager. And in, see, 1996, July I came to Seattle as

the director of Line Maintenance. Director of Line Maintenance to '99 -- May -- June of '99 to present.

MR. RODRIGUEZ: To clear my understanding or the record, one, when was the first -- when was the first heavy check you did at the Oakland facility?

MR. FITZPATRICK: It was January the 3rd, 1990.

MR. RODRIGUEZ: All right. Thank you very much. Mr. McGill has some questions for you.

MR. McGILL: Good afternoon, gentlemen.

MR. HINMAN: Good afternoon.

MR. FITZPATRICK: Good afternoon.

MR. McGILL: Mr. Hinman, you no longer work with Alaska Airlines at this time, is that correct?

MR. HINMAN: That is correct.

MR. McGILL: When did -- when did that event take place?

MR. HINMAN: Officially I retired from Alaska Airlines on October 1st of this year.

MR. McGILL: At that time your position was director of Line Maintenance. In 1997 when 963 had the -- the last end play check, what was your position at that time?

MR. HINMAN: I was director of Base

Maintenance.

MR. McGILL: So at that time you would have been over the station at Oakland, is that correct?

MR. HINMAN: That -- that is correct, yes.

MR. McGILL: And Mr. Fitzpatrick, at -- at that time you were --

MR. FITZPATRICK: Director of Line Maintenance.

MR. McGILL: The Line Maintenance.

MR. FITZPATRICK: Yes.

MR. McGILL: So some -- somehow here ya'll swapped --

MR. FITZPATRICK: Yes, we did.

MR. McGILL: -- and changed jobs, is that correct?

MR. FITZPATRICK: That's -- that's correct, and that was June of '99.

MR. McGILL: Is there some reason that that event happened?

MR. FITZPATRICK: I believe it was best felt that my expertise over the years lies in base maintenance, overhauls, C check, heavy maintenance aircraft, and was -- there was an agreement that I would go back to base maintenance, run that operation.

Oakland and Seattle.

(Pause)

MR. McGILL: Dana, may we pull up Attachment 11?

(Pause)

MR. McGILL: I'm sorry.

(Pause)

MR. McGILL: 11(M) please.

(Pause)

MR. McGILL: And while she's doing that, this is a MIG 4 -- well, in fact, I'll -- why don't we have Mr. Hinman, since at this particular time you were director of Base Maintenance when this event occurred, would you mind taking us through this generally?

MR. HINMAN: Okay. Generally, whenever a heavy check is accomplished there are a number of non-routines generated over the course of the check when it's inducted, it's inspected. There are a -- a number of these generated. It could be 300, it could be a thousand.

This particular non-routine work card it appears was generated on 9/27 of '97, and looks like it was a non-routine written against Aircraft 963 for a horizontal stabilizer Acme screw and nut has exceeded -

- excuse me. Not exceeded. Has maximum allowable end play limit of 40 thousandths of an inch.

MR. McGILL: Okay. Do you remember this particular card?

MR. HINMAN: No, sir. The first time I saw this card was I think an attorney showed it to me about a week or two weeks ago.

MR. McGILL: So you have no remembrance of this particular airplane in the check during this particular time frame, is that correct?

MR. HINMAN: No, I wouldn't remember specifically that -- that the time, date, and place -- I wouldn't connect that with a particular tail number, no.

MR. McGILL: Mr. Fitzpatrick, are -- do you know anything about this particular card?

MR. FITZPATRICK: No, sir. This -- this card -- I was director of Line Maintenance at that time so I would have no knowledge of it.

CAPTAIN FINAN: Mr. Chairman? Mr. Chairman?

MR. HAMMERSCHMIDT: Captain Finan?

CAPTAIN FINAN: Yes, sir. I might offer to the Board that Mr. Fowler, who's a witness that will subsequently testify, could speak very well to this

card.

MR. HAMMERSCHMIDT: Thank you. So noted.

(Pause)

MR. McGILL: Are all -- are both -- Mr. Hinman, are you familiar with the check procedures normally for a -- an MD-80 airplane C check?

MR. HINMAN: The check that I'm -- in general?

MR. McGILL: Yes.

MR. HINMAN: Have a -- a knowledge of. In specific, no. But if I were to want specific information I would have to go to the task card or the maintenance manual, depending on the situation.

MR. McGILL: What about the -- specifically, the end play check?

MR. HINMAN: Again, you know, other than some discussions that have occurred recently relative to measurements such as the 40 thousandths, I wouldn't have any direct knowledge of that and I would have to review a task card to really respond to that question intelligently.

MR. McGILL: What about the tooling that is required to perform that check?

MR. HINMAN: I have a -- a general

understanding of the tooling that's required. The tooling, as I understand it, required for that task would be called out on the card.

MR. McGILL: Have you had any involvement with the manufacture, the purchasing of any of this tooling?

MR. HINMAN: Some very limited participation in that process, yes.

MR. McGILL: How limited? What -- what are we talking here?

MR. HINMAN: I had some knowledge that we were manufacturing some tools and that we were purchasing some tools at some point in time subsequent to the crash.

MR. McGILL: Mr. Fitzgerald -- Fitzpatrick, may I ask you the same questions please, sir, about the tooling on the end play check itself? Can you tell us anything -- what you might know about the tooling?

MR. FITZPATRICK: I'm familiar with the tools that are required to do the end play check: the dial indicator, the torsion bar to -- and the -- the fitting to -- on the horizontal stat to connect it down and use a torque wrench to torque it up to the -- the test. I've never done the test myself. I was -- have

observed it a couple of times.

MR. McGILL: Were you involved in any of the purchasing of tooling for this particular check?

MR. FITZPATRICK: Yes, I was. To -- to accomplish this check, yes. I -- I believe it was somewhere mid-February. I'm not quite sure of that, but before I went to Oakland Mr. Bill Weaver asked me to check the status of -- of our tooling and to -- to order if we need -- needed to do that. So at that time I went to Engineering to get the -- the part numbers and the proper tools that were used. I was not familiar with it prior to this, so the drawings were pulled out by the engineers and at that time I ordered six of each part required to do the job. And I believe several months later, almost five months later I -- I put in another request to order six more of each part required.

MR. McGILL: The specifications that you looked at, were they -- who -- whose specifications were they?

MR. FITZPATRICK: They were a Boeing drawing provided by our Engineering Department. And we went over -- over that together.

MR. McGILL: What is the procedure at Alaska

Airlines to manufacture in-house tooling?

MR. FITZPATRICK: Well, number one, you -- you're required to have a drawing that meets the specs from the manufacturer, and that's -- that's the main rule for everybody who manufactures a tool so you can manufacture it out of the material, make sure it's got the proper heat treatment that was -- is required and using the proper -- everything that's required, just like it's made from Boeing or the manufacturer.

MR. McGILL: This tooling we're talking about, is this the restraining fixture that is used in the end play check?

MR. FITZPATRICK: That is one of the tools I ordered, yes.

MR. McGILL: What were the other tools?

MR. FITZPATRICK: It's a bracket that fits on top of the bottom of the horizontal where that restraining bracket hooks to on that part, and the other part of the restraining bracket is a permanent fixture on the aircraft. So the two can be put together so you can tighten the torque wrench to proper tension.

MR. McGILL: Does that particular tool there also have a set of specifications with it?

MR. FITZPATRICK: I -- I believe a tool does, yes. And it -- with the drawings, yes. That's why I got the part number off the drawings, I believe.

MR. McGILL: Is that tool -- that particular attachment L that you're talking about, is that used on all MD-80 end play checks?

MR. FITZPATRICK: No, that's -- there's -- I believe there's three different type of brackets depending on which type of aircraft configuration you are going to mount it on. So there's -- there's three of those different type of brackets. One is a -- more of an L-shaped and then there's a T-shaped one and one that's got a -- like a seven kind of -- like an inverted seven.

MR. McGILL: The authority to produce tools like this, does this come from your area in Base Maintenance or is that into -- Engineering role that's in -- authority comes out of Engineering Department?

MR. FITZPATRICK: Engineering has to generate that. I mean we may talk to 'em and request it. They'll -- they'll get the drawings for us if we don't have 'em in-house. And -- and you go from there.

MR. McGILL: Were you familiar with the document that was -- let me try to find it here, but it

was issued by Boeing that --

(Pause)

MR. McGILL: Excuse me.

(Pause)

MR. McGILL: Attachment 11(F).

(Pause)

MR. McGILL: It was issued by Boeing on the 13th of April of 2000, and it was to -- to inform operators about the use of that particular restraining tool.

MR. FITZPATRICK: Yes, I have seen this. I believe this -- I believe this is the one I have seen.

MR. McGILL: Okay. At this time did -- was there any -- was there any check to verify that your tooling conformed to the standards that were set forth in this document?

MR. FITZPATRICK: The tooling that I ordered at the time?

MR. McGILL: Yes, sir.

MR. FITZPATRICK: I do not know that as I -- at that time I ordered the parts as requested and a few days later I went to -- I left for Oakland and I was -- the next four months I was in Oakland Maintenance, and I'm -- I never got back to it. It wasn't -- I just

ordered the parts.

(Pause)

MR. McGILL: Do you recall that I believe a set disclosure was given about August of 2000 involving some tooling from Alaska?

MR. FITZPATRICK: I heard that, yes.

MR. McGILL: From April to August, three months or so, was there any activity to verify the tooling per the document that was sent out in April by Boeing?

MR. FITZPATRICK: No, sir. I -- I ordered the parts from the drawing and I never -- I had no reason to go back. I mean I -- I think I seen this document earlier but I -- I never did go back personally. I seen the tools when they came in.

MR. McGILL: Mr. Hinman, do you -- do you recall during this same time frame from April when Boeing issued the letter to verify the proper tooling to August, did you -- in your area, did you get involved in any of this?

MR. HINMAN: I -- I do not recall seeing this particular telex or letter, no.

(Pause)

MR. McGILL: Mr. Hinman.

MR. HINMAN: Yes?

MR. McGILL: The -- the lubrication of the jackscrew from a line perspective, is there any -- ever been a -- any time where there was any concern in how that task was performed?

MR. HINMAN: Post-accident perhaps. There was a lot of activity in reviewing, you know, what we were doing with the jackscrew from a maintenance perspective in general, yes.

MR. McGILL: Have you ever had any difficulty -- you -- you normally do this on a layover at nighttime when -- when the -- this task is accomplished?

MR. HINMAN: If we're -- if we're talking about a -- a lubrication --

MR. McGILL: Yes.

MR. HINMAN: -- or in general any heavy maintenance from a line maintenance perspective would be handled at night unless it was something that occurred during the course of the day in the form of a discrepancy that would require a response from Line Maintenance. But in general, most of the work, the routine task cards, A checks, and other physical work on the aircraft was generally accomplished at night,

yes.

MR. McGILL: When the lubrication change was made to move from Mobil 28 to AeroShell 33, did you -- was there any instructions that you might have given your mechanics to perform that task?

MR. HINMAN: I don't recall any specific instructions that we would have given the mechanics. In general, the task card would describe the work that was to be accomplished on the aircraft and the mechanic is required to have that task card with him when he accomplishes maintenance on the aircraft, whether it be lubrication or any other work that's accomplished on the aircraft, required to have that present. So he would be following the instructions of the task card.

MR. McGILL: Mr. Fitzpatrick, may I ask you the same question, sir? Did you give any instructions or was there any special considerations made when that task card changed the -- lubrication type?

MR. FITZPATRICK: No, sir. I didn't, and -- and there's many task cards that get changed over a period of time but that the change is what you're going to do on the aircraft or -- or servicing and -- and we don't go out and give special instructions. If there's anything of significance, it -- it would be described,

you know, on the card, like to drain it all out and reservice or -- there just was no reason to do that.

(Pause)

MR. McGILL: Mr. Fitzpatrick, do you attend the internal meetings of the RAP Control Board and staff meetings like that?

MR. FITZPATRICK: Yes, sir. I -- I am a voting member of the MRB and the RAP Board, yes.

MR. McGILL: Mr. Hinman, do you also attend those same meetings?

MR. HINMAN: When I was with Alaska Airlines I did attend the MRB meeting, the RAP meeting, morning meetings, staff meetings, facility meetings, that --

MR. McGILL: I understand. I understand.

(Laughter)

MR. HINMAN: Yes, sir.

MR. McGILL: Was there any time where -- that you could recall that problems ever come up involving after AeroShell 33 was switched that there was any problems with -- with that lubricant?

MR. FITZPATRICK: I personally know of none.

MR. McGILL: How about you, Mr. Hinman?

MR. HINMAN: No, sir. I do not.

MR. McGILL: On the operations A6

specifications diagram, you two gentlemen co-shared the director of Engineering and Maintenance, is that correct?

MR. HINMAN: We -- we shared -- I believe the title at the time -- and I've just recently seen the A6.

MR. McGILL: Yes.

MR. HINMAN: As I understand it, when that was initiated the title was assistant vice president of Maintenance. I understand that that title may have changed, but yes, I believe that on the A6 we shared that --

MR. McGILL: Well, you -- you shared it for, maybe, two and a half years?

MR. FITZPATRICK: It was approximately 18 months. June of '98, I believe, to about April of this year. Somewhere around there.

MR. McGILL: Can you tell me just very quickly how you did that? I meant how you co-shared responsibility and -- and how that was performed between the two of you?

MR. HINMAN: Well, I don't believe substantially that our duties changed that much but we worked very close together in our efforts to make sure

that we provided the best maintenance possible for the airline.

MR. McGILL: Mr. Fitzpatrick, did -- did the FAA accept this type of --

MR. FITZPATRICK: To my knowledge --

MR. McGILL: -- co-sharing?

MR. FITZPATRICK: Sorry. To my knowledge, yes, sir, they did.

MR. McGILL: Did you have dialogue with the -- Mr. Fitzpatrick, different times? Obviously, for the, like you say, 18 months or so did -- did you have dialogue with the FAA?

MR. FITZPATRICK: Mostly when I was in Line Maintenance I attended a Tuesday meeting with the FAA that lasted from 9:30 to almost noon every Tuesday. That was never a subject. There was also other members there. It was just the -- it's -- it's just a way that we get to communicate with the FAA on a weekly basis on formal matters of how the airline's going and communication. But that was never a subject.

MR. McGILL: Mr. Hinman, did -- did -- did you have -- did the FAA talk to you?

MR. HINMAN: They didn't talk to me specifically. And as Mr. Fitzpatrick said, over the

course of time I was director of Line Maintenance. I met weekly with the FAA on Tuesdays when I was present and able to. And I -- I don't specifically recall that subject being brought to me individually.

MR. McGILL: Was there any method of apportioning the duties or -- between the two of you or how -- allocating responsibility? Was -- was anything defined along those lines?

MR. FITZPATRICK: We never -- yes. I was -- I would basically handle the -- any items on base maintenance and Mr. Hinman would also handle anything on line maintenance. We never had a conflict in anything or anything that we couldn't agree upon, and if the situation would arise we would always meet with Mr. Weaver on a daily basis. But nothing of that significance ever became an issue to do that. It was mostly in title.

(Pause)

MR. McGILL: Mr. Hinman, going back to 1997 when the last end play check was performed on Aircraft 963, do you remember if there was any -- would you remember if a jackscrew assembly had been ordered?

MR. HINMAN: To go that far back and to remember specifically whether a jackscrew had been

ordered, I don't know. Subsequent to that, following the crash and some of the meetings that I've had, I understand that possibly not, but to tell you definitively that I know that, I couldn't do that.

MR. CLARK: Excuse me. Would you normally have been involved or would you be aware that a jackscrew had been ordered?

MR. HINMAN: There were occasions where -- I mean we ordered, you know, hundreds of parts. And --

MR. McGILL: But -- but a $60- or $70,000-unit I would think is -- one would remember that.

MR. HINMAN: Well, we ordered a lot of units that were in excess of $60- or $70,000. I wouldn't say that that particular dollar amount for me has any significance. I mean main landing gear, aircraft rudders, --

MR. McGILL: Well, maybe not. But I was just trying to see if you could remember ordering or had any involvement.

MR. HINMAN: I do not recall, no.

MR. McGILL: Mr. Fitzpatrick, do you have any knowledge of ordering -- of any ordering of a jackscrew assembly for 963 in 1997?

MR. FITZPATRICK: No, sir. I would have no

reason to know that. Once again, I was in -- director of Line Maintenance at that time.

(Pause)

MR. McGILL: Gentlemen, thank you very much. I have no further questions.

MR. FITZPATRICK: Thank you.

MR. McGILL: Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Mr. McGill.

(Pause)

MR. HAMMERSCHMIDT: Are there further questions from the Technical Panel?

MR. RODRIGUEZ: Yes, there was. I was picking up a historical fact here. Sorry.

I would like to -- I would like to cover a couple points that are not clear in my mind. I believe, Mr. -- Mr. Fitzpatrick, you said that you had acquired the additional tools. Could you just chronicle for us the tooling for the end play check at Alaska Airlines as you're aware of it?

MR. FITZPATRICK: Yes, sir. There's a dial indicator. There's also --

MR. RODRIGUEZ: I didn't mean describe it. I meant --

MR. FITZPATRICK: Oh.

MR. RODRIGUEZ: -- at one time, as I understood it, you had one tool.

MR. FITZPATRICK: I don't know how many tools we had. I -- I just took it upon myself to pick a number because I didn't know where these tools were going. We had six-man stations in the system at that time and I was -- thought I was buying 'em for the system. So I -- I ordered six.

MR. RODRIGUEZ: Okay. Now you're speaking specifically of purchase?

MR. FITZPATRICK: Purchase from the vendor.

MR. RODRIGUEZ: Okay. Which would be Boeing?

MR. FITZPATRICK: I -- I don't -- I know that now but at that time I really didn't know that. I just used the part numbers, the nomenclature, and gave it to Purchasing.

MR. RODRIGUEZ: And -- and that's for the -- what I would call the attachment to the restraining fixture itself also, is that --

MR. FITZPATRICK: There was the upper attachment, yes, sir. And the tension bar.

MR. RODRIGUEZ: And I'm -- I'm not clear. There were some tools that were manufactured by Alaska. Are you familiar with that at all?

MR. FITZPATRICK: I have absolutely no knowledge of that, sir.

MR. RODRIGUEZ: Mr. Hinman, do you have any knowledge of tools being manufactured for use in the end play check at Alaska?

MR. HINMAN: I'm aware that some tools were manufactured, yes.

MR. RODRIGUEZ: Do you have any specific knowledge about the chronology of how many you may have had in 1997 and how you acquired additional tools?

MR. HINMAN: I don't have any knowledge of how many tools we had in inventory for end play checks in 1997. I have learned since that -- that some number that I believe was quoted as one. I don't know if that's accurate or not.

MR. RODRIGUEZ: What else might you have learned since or refreshed your memory with respect to the chronology of acquisition of those tools internally?

MR. HINMAN: Well, I know -- I know that we ordered tools. I know --

MR. RODRIGUEZ: From whom?

MR. HINMAN: I don't know who we ordered those tools from. Would have been our Purchasing

Department. They would have been given the tooling specifications, the number probably off of the drawing or the task card or the maintenance manual. And --

MR. RODRIGUEZ: So you have no knowledge of Alaska Airlines' Engineering Department manufacturing tools for use in end play checks?

MR. HINMAN: I know that we manufactured some tools and had some very limited knowledge of that. And relative to an issue about whether those were manufactured in accordance with whatever specifications they were, really until I was advised by counsel later in the year I had no knowledge that there was an issue with the tools not being manufactured to specification.

MR. RODRIGUEZ: And what about the attach -- the -- the attaching bracket, the additional fixture for the upper restraint, apparently?

MR. HINMAN: Well, I can respond to that generally but not specifically. I know that there are different attached brackets. That would be based on the affectivity spelled out in the manufacturer's illustrated parts catalogue.

MR. RODRIGUEZ: May I ask physically where a tool would be manufactured at Alaska Airlines? Where would the engineering facilities for the -- for the

creation of a tool be made? Is that in Seattle, Oakland, or where? Do you know, Mr. Hinman?

MR. HINMAN: I would say it would depend on -- well, I don't know specifically where the tool would be manufactured. It could be -- we had a machine shop facility in Oakland; we had one in Seattle. I guess it would depend on where we chose to manufacture the tool.

MR. RODRIGUEZ: If -- if the aircraft were being overhauled at Oakland, would it be likely to have the machine shop at Oakland manufacture any tools?

MR. HINMAN: I wouldn't necessarily say that. It may be manufactured at -- at either facility.

MR. RODRIGUEZ: Mr. Hinman, do you have any knowledge at all of the attachment bracket that is an additional part to the restraining tool being manufactured at Alaska Airlines using aluminum?

MR. HINMAN: Using aluminum?

MR. RODRIGUEZ: Yes, sir.

MR. HINMAN: I believe I recall that there were brackets made. I -- I don't specifically recall what the composition of those brackets were.

MR. RODRIGUEZ: You didn't -- you didn't order any that wound up coming back to you as aluminum, for instance?

MR. HINMAN: Well, they wouldn't have come back to me. They would have probably gone to the -- to the tool room.

MR. RODRIGUEZ: Okay.

MR. HINMAN: So --

MR. RODRIGUEZ: And Mr. Fitzpatrick, the same question for you, sir.

MR. FITZPATRICK: Yes, we did have an aircraft that had a aluminum type upper bracket installed on the aircraft that was a homemade bracket. In fact, that actually broke while doing the test on the ground.

MR. RODRIGUEZ: Was that made to Boeing specifications?

MR. FITZPATRICK: No, sir. It wasn't.

MR. RODRIGUEZ: Now, with respect to the -- the operation of the Oakland base, can you -- speaking in the '97 time frame -- Mr. Hinman, you were the manager of the Base Maintenance at that time, is that correct?

MR. HINMAN: I was director of Base. I had responsibility for both Seattle and -- and for Oakland.

MR. RODRIGUEZ: How many aircraft were processed through there on a weekly basis as a ballpark

figure?

MR. HINMAN: Under ordinary circumstances, unless there's some non-routine or special project going on, there would be one aircraft in heavy check at a time.

MR. RODRIGUEZ: Could you characterize for me the frequency of delays that you may have experienced in not meeting the schedule for those checks?

MR. HINMAN: I couldn't characterize it for you. I could -- I could tell you that there were times where we delayed an aircraft out of check. There were some occasions where we delivered aircraft early out of check. I don't know that I could characterize it -- I couldn't give you a number. I could say that reasonably there were times where -- that we did not deliver an aircraft as we forecast date and time.

MR. RODRIGUEZ: At -- were either of you in a responsible position at the time that the Oakland facility went from a five-day work week to seven days?

MR. FITZPATRICK: That would be me, sir.

MR. RODRIGUEZ: Mr. Fitzgerald -- Patrick, I'm sorry. I'll make you a Fitzgerald yet.

MR. FITZPATRICK: That's okay.

MR. RODRIGUEZ: You may call me Hernandez.

MR. FITZPATRICK: Thank you.

(Laughter)

MR. RODRIGUEZ: What time frame was that that you increased to a seven-day program?

MR. FITZPATRICK: I believe it was the first part of maybe January of 1996. We talked about in the previous year to go into a seven-day work week, so we hired more mechanics. I can't remember the number of mechanics that we hired to -- to go there into the seven-day work week.

MR. RODRIGUEZ: And what were the -- were all days fully staffed?

MR. FITZPATRICK: Say again, sir?

MR. RODRIGUEZ: Were all days fully staffed at that time when you went to seven days?

MR. FITZPATRICK: When we went to seven days, pretty well. Pretty well, yes. We -- we never, even today, in Seattle or Oakland -- we still keep the weekends on a lighter number of people than we do on a Monday, Tuesday, Wednesday, you might say. But pretty close to same.

MR. RODRIGUEZ: We've heard testimony through the investigation that I believe it's Purchasing was not open during the weekends. Is that correct?

MR. FITZPATRICK: In Oakland that -- that is true. There's Leslie Joakalyn, if I'm pronouncing it right. I've known her for many years. She works Monday through Friday. She's got a pager on. She's got a computer at home. I'm not sure about a cell, but everybody has her number. She's a very dedicated employee, and she can do the work of six people. But when I was in Oakland and I needed a part and it was the weekend, Leslie had no problem coming in to get -- procuring that part over the weekend.

(Pause)

MR. McGILL: Mr. Hinman, may I ask did you have a similar experience with the purchasing agent?

MR. HINMAN: Leslie -- I think Art aptly described Leslie and her enthusiasm for her job and her dedication, and that would reflect my experience with her in the purchasing process as well.

MR. RODRIGUEZ: So during the time that you were director of -- sorry. Director. Did I get that right?

MR. HINMAN: Director of Base.

MR. RODRIGUEZ: Director of Maintenance, Base Maintenance at Oakland, they actually increased to the seven-day program, is that --

MR. HINMAN: That is correct.
MR. RODRIGUEZ: Now, we've already discussed the MIG 4 card. May I ask what is a MIG 2?
MR. FITZPATRICK: A MIG 2 is the log book.
MR. RODRIGUEZ: The log book itself?
MR. FITZPATRICK: Yes, sir. MIG 2A.
MR. RODRIGUEZ: Mr. Hinman, would you refer to Exhibit 11(M)? That is the MIG 4 card for November 963 when it went -- with respect to the end play check.
MR. HINMAN: Okay. This is the one we looked at previously?
MR. RODRIGUEZ: Yes, sir.
MR. HINMAN: Okay. Yes.
MR. RODRIGUEZ: The entry indicates a end play limit of 40 thousandths inch. Do you see that?
MR. HINMAN: Yes, I do.
MR. RODRIGUEZ: The -- the corrective action was -- planned action, I guess, is to replace the nut and perform according to write-ups and that being scratched through. Why would -- why would somebody remeasure that? Isn't that a waste of manpower?
MR. HINMAN: I -- I wouldn't -- I wouldn't characterize it like that. It may have been relative to the way it was written, replace nut and perform the

EO. As I understand it, the construction of that jackscrew, the nut and the jackscrew itself are a matched set. And I -- and -- and -- and my response to you is I wasn't there. I -- I really had no personal knowledge of this particular action so what I'm saying is just, you know, my -- you know, just general understanding of what might have happened.

MR. RODRIGUEZ: Let me ask you how many people -- in this time frame, how many people would you be supervising?

MR. HINMAN: How many people would I be supervising?

MR. RODRIGUEZ: Yeah, under your control.

MR. HINMAN: Roughly 170 ballpark.

MR. RODRIGUEZ: As you scan this and look at the various names, do you know those folks?

MR. HINMAN: Well, I know some of them now, but as I indicated, you know, if you would have asked me this question two weeks ago or even a week ago I wouldn't have known those names. I have been told that "authorized by RB" would be Ross Beluhr, who is a supervisor.

MR. RODRIGUEZ: No, I -- I didn't want you to identify 'em. That's -- that's on the record. I just

was curious --

MR. HINMAN: Okay.

MR. RODRIGUEZ: -- if you knew them personally as professionally and to see them in the shops and what have you.

MR. HINMAN: I visited Oakland about anywhere from four to six weeks. I've always thought of the Oakland people as being thoroughly professional and a dedicated group of people that did outstanding work. I had somebody once tell me that if you could bottle what they had in Oakland you could sell it for a million dollars. We're very -- very enthusiastic, very dedicated and, in my opinion, a very professional group of people.

MR. RODRIGUEZ: In this time frame do you have any idea -- pardon me -- that you could generalize for me as to the number of aircraft -- MD-80s that would -- were being outsourced for processing of a C check?

MR. HINMAN: I wouldn't have a number off the top of my head. There were some aircraft that were outsourced.

MR. RODRIGUEZ: During this time frame, as you were increasing the -- the staffing and the number

of days you were open, did you make requests for manpower that were unanswered?

MR. HINMAN: I made a request for manpower in the form of an expense justification. And we hired supervisors, if I recall. Art would probably be better able to quote some numbers. He was on site when that happened. But we hired mechanics, we hired supervisors, and the staff requests that I made to ramp up to the seven-day operation were met so far as I can remember.

MR. RODRIGUEZ: Do you have any feel for whether the adequacy of the staffing was a function of desired overtime by the mechanics or by people who were able to fulfill their responsibilities in a regular shift work with rotation of the people involved? Do you understand the question?

MR. HINMAN: Not totally. The -- the effort to ramp up, as I recall, was a effort to capture some of those times where we weren't working the aircraft with the force that we could have done so with. For example, on a Saturday and Sunday some of that time we had a very small contingent of people. On graveyard, I think -- and this is a ballpark figure -- that we computed that we could capture about 35 to 40 percent

more time on the aircraft, hands-on time on the aircraft while it was in check. Did I answer your question?

MR. RODRIGUEZ: I think so. The -- if the planned action for November 963 as reflected in the Big Four was to replace the nut and perform the EO specified, would the -- would the mechanic who made that recommendation have the authority to -- to cause to be ordered that kind of a part, that expensive a part? Would he come to you at all? Would anybody else care?

MR. HINMAN: He -- he would have ordered the part. He had authority to order the part. Would he have come to me directly? No, he would not have. There was a process in which if the item was not in inventory it would have been ordered on a field requisition. And if that field requisition generally was during a weekday I would get the field requisition, I would sign it, and move it forward if it required higher signature authority.

MR. RODRIGUEZ: Did you stock jackscrews in Oakland in '97?

MR. HINMAN: Again, I -- I believe I responded to that question earlier, and I don't think

my answer has changed.

MR. RODRIGUEZ: I didn't hear it, sir. I'm sorry.

MR. HINMAN: Okay. Well, I'm sorry. I don't -- I don't recall whether we had a jackscrew in inventory in Oakland at that time. It was, you know, several years ago.

MR. RODRIGUEZ: Mr. Fitzpatrick, do you recall if at any time while you were at Oakland before the accident Alaska -- stocked a jackscrew in Oakland?

MR. FITZPATRICK: No, I wouldn't know that. You know, I wouldn't know it till it was -- somebody ordered one and they said they needed one. But no, I don't know that.

(Pause)

MR. RODRIGUEZ: Just so I'm clear in my mind, Mr. Fitzpatrick, you seem to be the only one who's familiar with the fact that there was an aluminum attach bracket for the end play tool. You don't know how many of those there were or where they came from?

MR. FITZPATRICK: I believe that particular one I'm -- I think the aircraft was 935, but I'm -- I'm not sure about that. They were doing a test at the Seattle hangar and that's where it was discovered and

broke, which did some damage which we had to get the RAMS team in to do some work.

MR. RODRIGUEZ: But you personally had nothing to do with the acquisition of that particular bracket?

MR. FITZPATRICK: No. It -- that particular bracket had been on the aircraft, I believe, for a while. It -- nobody put it on there. It was flying around with it on the aircraft.

MR. RODRIGUEZ: Beg your pardon? You -- it came from Boeing with that bracket on there?

MR. FITZPATRICK: No, I'm not saying that. No, I'm saying that that -- came in and it was on the aircraft when the -- when our mechanics did the check. We didn't add it to it to do the check. It's the upper one under the horizontal stabilizer.

MR. RODRIGUEZ: I see. That's all the questions I have, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Mr. Rodriguez. Are there any other questions from the Technical Panel at this juncture?

(No response)

MR. HAMMERSCHMIDT: Very good. This is a good opportunity for us to take our afternoon break.

We've gone almost exactly one and a half hours since the lunch break. Let's take a -- let's say a 15-minute break and return at about two minutes until 5 p.m.

But we are -- I would again acknowledge that we are making much better progress today than we did the previous two days, so we may be able to stay on our original game plan for a four-day hearing. But that -- let's -- let's keep it up.

(Brief recess)

MR. HAMMERSCHMIDT: Our two witnesses are at the witness table ready to answer more questions. And before we went into the last break we had concluded at least at this point with questions from our Technical Panel, and now we will proceed to questions from the parties to the public hearing.

Let's stay on this same track starting with Boeing first and working our way clockwise around the party tables. Mr. Hinderberger?

MR. HINDERBERGER: Since that's been good luck you want to keep -- keep going that way, right, Mr. Chairman?

MR. HAMMERSCHMIDT: That -- yes, sir.

MR. HINDERBERGER: Okay. Well, to keep the string alive Boeing has no questions for the witnesses.

MR. HAMMERSCHMIDT: Okay. Thank you. Going next to the Aircraft Mechanics Fraternal Association.

MR. PATRICK: Thank you, Mr. Chairman. We have no questions for these witnesses.

MR. HAMMERSCHMIDT: Thank you, Mr. Patrick. Going next to the Airline Pilots Association.

CAPTAIN WOLF: Thank you, Mr. Chairman. I do have some -- some questions here.

And try to keep in line some of the progress that Mr. -- Mr. Rodriguez had going previous on that. This is regarding some of the tooling. And what processes were in place to interface with the FAA, i.e. the PMI, to ensure that the tools met the specifications of the manufacturer? I guess I would -- I would direct that to Mr. Fitzpatrick first.

MR. FITZPATRICK: Yes, as I understand it, your question is how would we know that the tooling meets the specifications of the FAA?

CAPTAIN WOLF: Correct.

MR. FITZPATRICK: For the FAA?

CAPTAIN WOLF: Well, actually, and -- and interface with them, with the PMI. In other words, would -- would the PMI also be coming and questioning or -- or getting involved with you to make sure that --

that they're surveilling it properly?

MR. FITZPATRICK: Right. How the procedure normally works, that you can either buy a tool or manufacture a tool in-house or at an approved vendor that -- that can make the particular tool you need for -- to accommodate the task or the job that you are wanting to accomplish.

The drawings are requested by your engineering department. And by the way, some drawings you cannot get. They -- they will not give it to you. But there -- a lot of the tooling can be requested, the drawing made and manufactured as per spec. It is inspected and tested to make sure it meets the -- the standards, the strength, the dimensions, whatever it requires to -- to meet the specs as if the vendor is making it. Or you can go out and buy it from the vendor if the vendor has it. Either way, it's -- it's a common practice.

CAPTAIN WOLF: I understand that. The scope of my question was is what participation would the PMI have with yourselves in seeing that the -- that these were the -- that these were the proper tools to use or the proper -- made to the proper specifications that Boeing put out.

MR. FITZPATRICK: I think the only involvement they may have is a spot check of your tooling or facility where they come in and they would ask to see the drawings that you manufactured this from and did it meet that specific requirement.

CAPTAIN WOLF: Okay. Thank you. This is referring back to Exhibit 11(M). And Mr. Rodriguez and Mr. McGill went over the MIG 4 in quite some depth and detail there, but I had just a couple of basic questions on it. I was wondering if these -- these particular forms, these MIG forms, the MIG 4, if they're prioritized in any type of manner whatsoever? In other words, is there something -- some indication that would say one MIG 4 is -- is more important than another one or whether one has higher priority than another one?

MR. FITZPATRICK: Yes, sir. There -- there is. In a C check operation you could generate anywhere from 800 to 2000 MIGs, as we call 'em, non -- non-routine forms written up depending on the -- the depth of the inspection that is accomplished on the aircraft. And that's one of the supervisor's and lead's jobs is to prioritize so you can flow the work of your aircraft in a -- in a proper manner so you're not working the

aircraft in a helter-skelter type situation.

CAPTAIN WOLF: Right. How would that prioritization be -- be known to -- to -- to the mechanics or to -- to the maintenance personnel?

MR. FITZPATRICK: Well, the lead mechanic is also involved in that process. So it's -- but the unit -- the working crew understands, the maintenance control understands. There's also a mark if it needs engineering. There's also a mark of identification if it needs parts. There -- there's -- we have a -- a color-coding system you might say that is displayed in our production control room so it -- it identifies that red means something, yellow means something, green means --

CAPTAIN WOLF: Right.

MR. FITZPATRICK: -- something.

CAPTAIN WOLF: On this particular -- particular MIG 4, and I know, Mr. McGill, as far as the exhibit that we are just able to see a black-and-white copy on the exhibit. But are there -- were there any particular colors on this -- this MIG 4 form itself that you're aware of?

MR. FITZPATRICK: I can't answer that. Once again, I have to revert back to that I was director of

Line Maintenance at that time and wasn't particularly involved in this particular check.

CAPTAIN WOLF: Mr. Hinman, would you --

MR. HINMAN: There -- there is a color. To recall specifically what the color is, and I've probably looked at, you know, a few of these over the time, I couldn't -- I couldn't recount. I believe they're very light green in color, but I -- vague recall that that might be the color.

CAPTAIN WOLF: Okay. So if perhaps there is a yellow color and orange color or a red or a green, then that obviously signified it had to be done sooner, possibly, than -- than some of the other MIG 4s?

MR. FITZPATRICK: It was --

CAPTAIN WOLF: -- higher priority?

MR. FITZPATRICK: It was priority.

CAPTAIN WOLF: And we don't know what that scheme, what that scale of prioritization is with the color markings?

MR. HINMAN: I don't recall that there was any kind of decremental priority relative to color of the MIG.

CAPTAIN WOLF: Okay.

MR. HINMAN: As I recall, they were all the

same color. There were many occasions that a lead mechanic who, if he felt that something was of significance, he would, as -- as Art said, there are blocks on the form, that he may take that to his supervisor and say, you know, I think this is something that we need to look at now because it's going to take a little more time or whatever the case may be. So there was generally ongoing dialogue, and I think everybody on the team pretty well understood when something was significant it was going to take a little more spend time to work the project or whatever the case.

CAPTAIN WOLF: Okay. All right. Mr. Fitzpatrick, on -- on this particular MIG 4 on the Exhibit 11(M), who -- who in particular asked to have the recheck here done on the end play?

MR. HINMAN: I -- I believe, and -- and I apologize --

MR. FITZPATRICK: That's okay.

MR. HINMAN: -- for jumping in here, but I -- I believe Mr. Fowler was going to respond to questions in specific relative to this document. I believe that was what we were advised.

CAPTAIN WOLF: Would you -- so in other

words, you don't know who -- who asked for the -- the recheck on it?

MR. HINMAN: I personally do not. As I indicated earlier, I -- I think the first time I saw this document was a week or maybe two at the outside.

CAPTAIN WOLF: Okay. If we needed to put a new jackscrew on the aircraft, and as we see here it's still within the limits of point -- of 40 thousandths there. Could either of you describe, I guess I would ask Mr. Hinman first, the various levels in the management and -- and the purchasing power that -- that they have. So in other words, if this item perhaps isn't in stock but has to be obtained outside of stock and the Purchasing Department, obviously, has their level of purchasing power and that obviously goes up the ladder. Can you give a very short description or -- or explanation of that at all? I'm just trying to get -- I'm just trying to get an idea of -- of the authority and the amount.

MR. HINMAN: My authority, at -- at least at this particular time that this MIG was generated was $900. I would -- when I received -- sometimes if it came from Oakland they would fax me a non-routine -- I'm sorry, a purchase order and I would sign that, and

if it required higher signature authority I would route it to the -- to the higher authority required. I wouldn't say that that always meant that the part wouldn't be ordered on a weekend, for example, if there wasn't someone with adequate signature authority. As I recall, someone would move forward with the purchase, acquire the signature later.

CAPTAIN WOLF: Okay. Mr. Fitzpatrick, the same -- same question.

MR. FITZPATRICK: And just about the same answer. It -- paperwork -- I at that time had also 900 and if the part was more I would move it up the line. And almost the part was being ordered anyway as -- as the process was taking place.

CAPTAIN WOLF: And Mr. Hinman, this question probably would be more appropriate for you, but just on the -- on that Exhibit 11(M) there again, it just said where it was rechecked and it was found to be in compliance. It says, "rechecked five times and same result." Is that normal to recheck it that often or would this -- I mean two times, three times or five is -- is there anything specified for that?

MR. HINMAN: Basically, what I have learned recently is that there is a requirement to check it

more than once in order to -- to get a consistent reading, yes.

CAPTAIN WOLF: Okay. Thank you. Just three last quick questions here. Mr. Fitzpatrick -- and this is concerning this -- some of the C checks. When a C check interval was increased from 12 to 13 months and then to 15 months, it was extended out, why was the flight time hourly requirement of MSG-2 dropped?

MR. FITZPATRICK: That's not really my area of expertise. Wright McCartney, I believe, was -- needs to be asked that question.

CAPTAIN WOLF: Mr. Hinman, would you have any --

MR. HINMAN: No, I would -- I would have to defer to Mr. McCartney.

CAPTAIN WOLF: Okay. Mr. Fitzpatrick, again, were the tear-down reports obtained for the three jackscrews that were replaced in 1999?

MR. FITZPATRICK: I do not know that. I was not involved in any of that.

CAPTAIN WOLF: Okay. Mr. Hinman?

MR. HINMAN: Same answer.

CAPTAIN WOLF: Okay.

(Pause)

CAPTAIN WOLF: And this would be for both of you, and Mr. Hinman first. Would you expect an operator to obtain and analyze tear-down reports for ratable parts as part of the basis for escalating an inspection interval?

MR. HINMAN: I don't know that I can answer that with any certainty. And again, I would -- I would defer to the Engineering group or the Reliability group.

CAPTAIN WOLF: Mr. Fitzpatrick?

MR. FITZPATRICK: I would have to answer the same way.

CAPTAIN WOLF: Okay. Thank you, gentlemen, both. That's all, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Wolf. Going next to the Federal Aviation Administration for questions.

MR. DONNER: Thank you, sir. Mr. Hinman, please. I'm over here.

MR. HINMAN: Oh.

(Laughter)

MR. HINMAN: Lost you in the crowd.

MR. DONNER: I'm hiding. Sir, were you apprised of the 40 thousandths measurement after it had

been taken -- immediately after it had been taken?

MR. HINMAN: No, sir.

MR. DONNER: Okay. And -- and did I hear you tell Captain Wolf that it has recently come to your knowledge that several measurements would be taken and then averaged to -- to achieve those measurements?

MR. HINMAN: Yeah, I -- I don't think that I -- you know, before -- recently have looked at the task card.

MR. DONNER: Since it was recent, can you tell us how many measurements would be taken normally?

MR. HINMAN: Without looking at the task card I couldn't quote a figure.

MR. DONNER: Okay. And -- and do you know how that average is achieved when -- after they're taken?

MR. HINMAN: No, sir. I do not.

MR. DONNER: Okay. For both of you, I guess, do you know how long it usually would take to receive a jackscrew once it had been ordered, either from the -- from Boeing or from your supplier?

MR. FITZPATRICK: No, I personally wouldn't know that.

MR. HINMAN: I -- I think it would depend on

the availability, shipping distance, a variety of things. I don't think there would be a set figure that anybody could quote relative to the time.

MR. DONNER: And I realize you haven't had much experience in ordering them or receiving them, so it would be a -- kind of an abstract figure. Thank you.

The -- the accident aircraft, when it was in the C check, can you say if it was ahead of, on, or behind schedule at the time this discrepancy was noted with the jackscrew?

MR. HINMAN: I don't recall.

MR. DONNER: And -- Mr. Fitzpatrick?

MR. FITZPATRICK: I would have no way of knowing that. Once again, I was director of Line Maintenance, so it would have just been routine to me and I wouldn't have been involved.

MR. DONNER: Who would know that?

MR. FITZPATRICK: The person that probably would know that would be the manager of the base at that time.

MR. DONNER: Okay. Finally, again going back to the tooling, does Alaska have a specific policy for making the decision between buying a factory tool from

Boeing or making your own?

(Pause)

MR. FITZPATRICK: Could you say that one more time, please?

MR. DONNER: Do you have a specific company policy when you're making the decision whether to buy a -- a tool from the factory, in this case from Boeing, or -- or manufacturing your own?

MR. FITZPATRICK: No, I don't think we have a policy. I -- I think it's -- it's one-on-one basis if the tool is required or needed. One, we can look at the availability of purchasing the tool. If it's several months down the road or six months down the road and we have the drawings and we can make the part in our machine shop in -- in two days or a day, whatever it takes, of course, we would elect to make the -- the part in-house if we have the proper documentation.

MR. DONNER: And -- and who would be responsible for making that decision?

MR. FITZPATRICK: Well, we coordinate all drawings through Engineering.

MR. DONNER: Thank you, sir.

MR. HAMMERSCHMIDT: Thank you, Mr. Donner.

Going next to Alaska Airlines for questions.

CAPTAIN FINAN: Thank you, Mr. Chairman. Mr. Hinman, you worked with Mr. Robert Falla while he was an employee at Alaska Airlines, did you not?

MR. HINMAN: Worked with him, sir. He was not on my staff; he didn't report to me. I knew he was a manager of -- of Base, so to -- to say that I worked with him, you know, as a member of Alaska Airlines, yes. Did he work for me? No.

CAPTAIN FINAN: Did you ever tell Mr. Falla that Mr. Weaver had overwritten or changed a previous decision to change the jackscrew on 963?

MR. HINMAN: No, sir. I did not.

CAPTAIN FINAN: Did you ever tell Mr. Falla that you told Mr. Bill Ayer of such a decision by Mr. Weaver?

MR. HINMAN: No, sir. I did not.

CAPTAIN FINAN: Did you ever tell Mr. Ayer of such a decision by Mr. Weaver?

MR. HINMAN: No, I did not tell Mr. Ayer.

CAPTAIN FINAN: Thank you very much. No further questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. Just for the record clarification, who is Mr. Bill

Ayer?

CAPTAIN FINAN: He's the president and chief operating officer of Alaska Airlines.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. Going next to the Board of Inquiry. Mr. Berman?

MR. BERMAN: Thank you, Mr. Chairman. Mr. Hinman, with respect to the -- the work card that shows the .040 measurement, had -- had you ever had any discussions about that with anybody prior to the accident? That issue?

MR. HINMAN: No. Not that I recall.

MR. BERMAN: Okay. Have you ever used a -- a measurement or an estimate of a wear rate in -- on a work card or in any decision you made to replace a component?

MR. HINMAN: I'm not aware of an estimate that would be used unless there was some specific thing on the task card that required an estimate be used. I -- I'm not aware of any task card that would have that requirement.

MR. BERMAN: Mr. Fitzpatrick, have you ever had an experience of that?

MR. FITZPATRICK: Well, the task cards pretty well tell you what you're looking for in a measurement

or where and how to do it in most cases.

MR. BERMAN: Okay. Mr. Hinman, have you ever had a phone conversation with Mr. Falla after the accident?

MR. HINMAN: Yes, I have.

MR. BERMAN: When was that conversation, please?

MR. HINMAN: It had to be sometime after August 14th of this year.

MR. BERMAN: How do you know that?

MR. HINMAN: Because I know that it was roughly two days after I left Alaska Airlines.

MR. BERMAN: What was the occasion for the conversation?

MR. HINMAN: I was -- I had understood that he knew someone in the legal profession and I was looking for someone to represent me. And so I called him and asked him who was representing him and would he share that information with me.

MR. BERMAN: How did you know that he -- he had that knowledge?

MR. HINMAN: One of our shop managers, Alan Flowers had indicated to me that he knew that Robert had an attorney.

MR. BERMAN: Is that the only phone conversation that you had with him?

MR. HINMAN: I had several phone conversations, and to ask me specifically how many, three, four, maybe five. Could have been more; could have been less. I do not specifically recall the number of conversations I had with him.

MR. BERMAN: Oh, really. But you -- when I asked you, you recalled one in particular?

MR. HINMAN: Well, certainly the first -- the first call. I -- I did make subsequent calls and -- and we talked more than once, yes.

MR. BERMAN: Okay. What did you discuss in those phone calls?

MR. HINMAN: We -- we discussed a variety of things.

(Pause)

MR. BERMAN: Such as?

MR. HINMAN: One of the things we discussed was his separation from the company, or at least at that point in time his being on administrative leave. We discussed that. We discussed some personal issues relative to the health of a member of his family. We discussed the attorney issue. He was very

complimentary of the attorney he was dealing with. In fact, at some point in time -- couldn't give you a day, time, and place -- he and I had the same attorney, the same individual representing the two of us.

MR. BERMAN: Anything else?

MR. HINMAN: There were other things that we discussed.

MR. BERMAN: Such as? Do you have anything else to tell me here?

(Pause)

MR. HINMAN: I believe that we discussed the conversation that I had -- or at least a event where I -- where I had entered Mr. Weaver's office and he had been discussing something with Mr. Leotine. And we talked about that.

MR. BERMAN: Mm-hmm. And did you know Mr. Leotine?

MR. HINMAN: I knew generally who he was.

MR. BERMAN: And what was the conversation that -- that you're talking about now with Mr. Weaver and Mr. Leotine?

MR. HINMAN: The conversation, basically, was that myself, Mr. Fitzpatrick, and another individual had came into Bill's office and he was having a

conversation with John. I don't specifically remember what the conversation was but that that had preceded the Oakland investigation and that I knew he was in communication with Mr. Leotine.

MR. BERMAN: And if you were -- if you were reviewing a situation of needing to order a part or an airplane being delayed in maintenance --

MR. HINMAN: Mm-hmm.

MR. BERMAN: -- and Mr. Leotine's name was on that as, you know, being potentially involved in a delay or something like that, would that catch your attention?

MR. HINMAN: No.

MR. BERMAN: Okay. Given that you already were alerted to situations of him?

MR. HINMAN: I'm sorry. Time frame?

MR. BERMAN: The time before the accident, back to 1997.

MR. HINMAN: I don't know that -- that anything at that time would have raised a question in my mind. No.

MR. BERMAN: Okay. During your phone conversations with Mr. Falla did you discuss Aircraft 963, the accident airplane? Of course, this is after

the accident.

MR. HINMAN: No, sir.

MR. BERMAN: You didn't discuss the accident?

MR. HINMAN: Not that I recall. No.

MR. BERMAN: Highly unusual, I would think.

MR. HINMAN: Well, the focus of our conversation really didn't revolve around the crash, no.

MR. BERMAN: All right.

MR. HAMMERSCHMIDT: Mr. Berman, we -- let's -- like the past hearings, let's just accept the answers as they are and -- and these witnesses are, of course, under oath to testify truthfully and we operated under those guidelines.

MR. BERMAN: All right. Thank you, Mr. Chairman. Let me turn to a slightly different issue. I'm going to need to refer to an exhibit that, unfortunately, you weren't prepared for, which I apologize for. And for both of you gentlemen, if you'd take a look at Exhibit 16(D) and 16(F). Ms. Dargan will provide it if you don't have it.

(Pause)

MS. DARGAN: B and F? D and F?

MR. BERMAN: Delta and Foxtrot.

(Pause)

MR. HAMMERSCHMIDT: Okay.

(Pause)

MR. BERMAN: These are -- these are service letters that -- service -- service letters from Boeing, the Seattle part of Boeing, issued in 1993 and 1997 respectively, both prior to the accident, referring to lubrication for the 700 7 -- the 7 series airplanes.

(Pause)

MR. BERMAN: If you could take a look at page 7 of 16(D)?

(Pause)

MR. BERMAN: And there's a similar page on 16(F) we may not need to look at, but they're both similar.

MR. HINMAN: I don't see a page number, but I see a title that says, "Copper and Aluminum Bronze Corrosion Testing."

MR. FITZPATRICK: Oh, what's -- I think there's a full one.

MR. BERMAN: I don't think that's the Boeing service letter. Sorry. It's -- let Ms. Dargan help you.

(Pause)

MR. FITZPATRICK: 16(B), page 7. We have that now.

MR. BERMAN: Okay. It's talking about possible incompatibility between clay-based and lithium-based greases. Wanted to ask both of you was anyone at Alaska Airlines aware of these service bulletins and who had responsibility for them?

(Pause)

MR. FITZPATRICK: I -- I don't know that. I personally was not involved with it or --

MR. HINMAN: I don't know who would issue or handle the service bulletins within the company, personally have knowledge of who would handle that.

MR. BERMAN: Okay. Thank you very much. No more questions, sir.

MR. HAMMERSCHMIDT: Okay. Thank you, Mr. Berman. Mr. Clark?

MR. CLARK: Thank you.

(Pause)

MR. CLARK: It's -- let's start off with the ME01 that was developed in 1997. I think it's 11(G). If we could get it up, but I can also just simply ask you several questions. But let's go ahead and -- I think it's 11(G). Is that it?

(Pause)

MR. CLARK: There we go. Okay. This particular document was -- are you -- are you -- are either one of you familiar with it, or both of you?

MR. FITZPATRICK: Yes.

MR. CLARK: Okay. Several things about this document. It -- it is the document that started the process to get AeroShell 33 in -- into your operation. And down at the bottom, Line Maintenance was to sign off on that. And is this the one where you had somebody standing in for you or were you there or --

MR. FITZPATRICK: What was the -- it was '97?

MR. CLARK: '97, right.

MR. FITZPATRICK: I can't say that. I don't know why my signature's not on it or somebody else's.

MR. CLARK: Okay. If that -- that's your time frame there, okay?

MR. FITZPATRICK: Yes, sir.

MR. CLARK: And do you think it's appropriate that you should have been there or signed off on this type of document? Or somebody standing in for you?

MR. FITZPATRICK: If -- if I need to review it and sign it to move it on, yes, it would have normally been hand-carried to me. It looks like this

particular one I would be the only one left to sign on it.

MR. CLARK: Well, there are several there.

MR. FITZPATRICK: Right.

MR. CLARK: Okay. But the -- the question is is that should you be involved in a decision like this involving a changeover of grease?

MR. FITZPATRICK: Not so much the changeover. My -- my part in -- in the board is representing my mechanics, when a change is made to review it and physically see if it's feasible for them to do it. If a -- if there's a time frame issue my part of it is to look at the mechanics of it, to look at the acceptability. I have to take the person that's responsible for that, be it an engineer or whatever. My part's physically seeing if the job can be accomplished when they want it accomplished.

MR. CLARK: So for any documentation that may or may not be attached, may not be that important to you? You just need to know if operationally if your mechanics can pull the job off?

MR. FITZPATRICK: That's basically correct.

MR. CLARK: Or be able to do whatever's on the task? And then that's the same for you when you

were in -- Mr. Hinman, when you were involved in the Line Operation side of the business?

MR. HINMAN: Well, would certainly have reviewed any -- any attachments or any data or anything that would have been part of the ME01. And I think Mr. Fitzpatrick accurately represents that we would have been looking at, you know, the impact of Line Maintenance operation.

MR. CLARK: Okay. And also, in your -- both of your functions as directors of Base Maintenance, should you have been involved in this type of decision-making for a changeover in grease?

MR. FITZPATRICK: The involvement of grease affects both operations, yes.

MR. CLARK: So the -- do you believe this is appropriate that this is lined out and that Base Maintenance would not have been a part of this decision-making process?

MR. HINMAN: I -- I don't know that we would have made the decision about whether to line it out or not. That -- that would have -- that would have come from Engineering or one of the other groups. In fact, not all ME01s would come before -- if you -- if you're thinking that perhaps this went through the MRB

process, it might not have went through a formal board, so.

MR. CLARK: But just the subject matter and how it is involved, shouldn't you have been involved as director of Base Maintenance?

MR. HINMAN: Have been involved in the MRB process and in reviewing ME01s, yes.

MR. CLARK: Yeah, I understand that. But what about this specific subject?

MR. HINMAN: As it relates to this particular document?

MR. CLARK: Yes, this -- this very document, changeover from Mobil 28 to AeroShell 33 should -- should Base Maintenance have been involved -- involved in that decision-making?

MR. HINMAN: I -- I can't say that that's -- that's correct.

MR. FITZPATRICK: If I can help, the thought process was probably believing that Line Maintenance normally does most of the lubrications on the RON aircraft. So it -- they were looking more at the Line Maintenance operation than the Base Maintenance operation.

MR. CLARK: Okay. There was a -- another

ME01 that was discussed earlier about the -- shortening the intervals of lubrication on the MD-80. The -- I mean the -- you're both familiar with that? Okay. And in -- in that case, is it my understanding that in -- the both of you had somebody standing in for you during that process?

MR. HINMAN: I -- I don't recall. I don't recall whether we did or not. I don't know, you know, day, time, and place.

MR. CLARK: Okay.

MR. HINMAN: It's accurate to say that if there was a scheduled MRB RAP Board meeting and I weren't there that I would have a representative there who I would have presented the -- the package to that have -- probably would have reviewed the information and those documents and then been debriefed after -- after the meeting.

MR. CLARK: And you?

MR. FITZPATRICK: And -- and that's also my case. I was particularly down in Oakland at that time frame for almost four months of the particular document you're talking about. And when we're on normal vacations or at other meetings we -- we put our managers in to have our signature authority to do that.

MR. CLARK: Did -- are you briefed ahead of time or do you brief them of what your intention is on each one of these?

MR. FITZPATRICK: What we have is a package that's prepared for us a few days prior to the MRB meeting. We review that package so we're prepared to go into the MRB meeting and talk about it. And as -- as those are the only copies that we have. And then when we get to the MRB meeting, if it's approved we basically -- it moves on and we don't talk about it again.

MR. CLARK: Okay. Now, what -- what happens if this is prepared several days in advance and you're in Oakland for four months? Do you ever see those?

MR. FITZPATRICK: Most likely not.

MR. CLARK: So whoever's standing in has that authority and uses their judgement and their experience to go ahead and sign off?

MR. FITZPATRICK: Yes, sir.

MR. CLARK: How far down the line can it go that you would delegate your authority?

MR. FITZPATRICK: Well, we -- we have canceled MRB meetings because we couldn't get the full quorum there of eight people, and so they would not

bring in, maybe, a supervisor for various reasons. That probably happened a couple of times over the years. But we try to keep with the managers and the directors.

MR. CLARK: Okay. Are these always approved in a meeting process like that or can they be passed around?

MR. FITZPATRICK: There has been times when there's been a hot issue we want to move on and they have to walk around to be signed.

MR. CLARK: Okay. What happens if --

MR. FITZPATRICK: That would be one individual one that happens to normally.

MR. CLARK: An individual ME01 at a single time? A single ME01 that gets walked around --

MR. FITZPATRICK: Right.

MR. CLARK: -- group? What happens if somebody on this entire list disapproves it, checks the "disapproved" block?

MR. FITZPATRICK: Stops in its tracks.

MR. CLARK: So it's --

MR. HINMAN: That's the end of it.

MR. CLARK: -- you --

MR. FITZPATRICK: -- his -- whatever his

issue is with the change or adding to his result.

MR. CLARK: Can somebody come in and override that?

MR. FITZPATRICK: No.

MR. CLARK: Not at all?

MR. FITZPATRICK: Not at all.

MR. CLARK: Can't go up the chain of command to --

MR. FITZPATRICK: It's never got that serious. We -- we sit there and we -- we find out what the issue is he has with it. We may have to hold it till the next meeting till there's some findings on it. And we'll look at it again and re-vote on it.

MR. CLARK: Okay. What happens if it's approved and everybody signs off. Does it have to be implemented? Can somebody -- it just never goes anywhere, gets lost?

MR. FITZPATRICK: There's a procedure that it follows, best I know. And then it becomes a work card or a change, whatever -- details.

MR. CLARK: Okay. What happens if it's all signed off and somebody decides that it should not be accomplished?

MR. FITZPATRICK: I would -- I would only be

speculating. I -- I -- I don't know.

MR. CLARK: You don't --

MR. FITZPATRICK: That's never happened.

MR. CLARK: -- you've never been involved in -- either one of you?

MR. HINMAN: No.

MR. CLARK: So if somebody higher up decides, no, we're not going to do this even though you've all signed off?

MR. HINMAN: I'm not aware of anyone ever -- once one of these has been signed off by the MRB or the RAP Board then saying, well, we're not going to do this.

(Pause)

MR. CLARK: Regarding the -- the -- that last check on -- on Ship #963, what was the tooling used on that airplane?

MR. HINMAN: I -- I can only make an assumption that it would have been the tooling that is spelled out on the task card that was in the tool room at the time.

MR. CLARK: And that tooling, that particular tooling, do you have any knowledge of its origin or where it came from or how it got into your system?

MR. HINMAN: I do not, no.

MR. CLARK: Are you aware of any -- of what's happened since to that tooling? Do you know any of the history since the accident?

MR. HINMAN: Well, I -- I've -- I've probably read, you know, a foot of documents, and since then I understand that the tool was acquired or at least seen in our inventory sometime in -- in 1984. But again, I don't know any direct knowledge.

MR. CLARK: In the process, apparently there were tools that got into the system and even tools that were subsequently ordered that weren't -- were not the specification. Is that your understanding, either one of you?

MR. HINMAN: I believe the -- I'm sorry.

MR. FITZPATRICK: No. I'm not aware of that scenario. I was having -- Robert may know more of that.

MR. CLARK: Do you?

MR. HINMAN: I became aware that there were some tools that might not possibly have been built to specifications through counsel at some point in time.

MR. CLARK: Okay.

MR. HINMAN: Couldn't give you a specific

date or time.

MR. CLARK: All right. Are either one of you aware of any corrective actions that Alaska Airlines has taken to prevent that from happening again? Would that involve your area?

MR. FITZPATRICK: Yes. In the past month, maybe two months now there's been an extensive check of all the tooling that we own in the system from any station to our Oakland to Seattle. We've sent people to inventory check and pull anything that cannot be identified by a drawing and that meets the manufacturer's specs. They have all been pulled out of the system and quarantined.

MR. CLARK: Okay. And if there were -- who does the specification checks? Is that in Engineering? Or do you -- do you get involved --

MR. FITZPATRICK: I believe right now there's a -- now, me personally, I have not got involved in it.

MR. CLARK: Were your people?

MR. FITZPATRICK: But I do have a manager that's involved in it.

MR. CLARK: Okay.

MR. FITZPATRICK: And a supervisor that's involved in it. And they are working with Engineering

with the drawings one -- one-by-one on the tooling.

(Pause)

MR. CLARK: You talked about an aluminum tool that was on one airplane that broke. Do you have any idea how that tool got into the system? It sounded like this is a tool that's attached to the airplane that remains permanently with an airplane?

MR. FITZPATRICK: Well, there's one at the top, which is underneath the horizontal stabilizer to attach to and that one's put on every time the check is accomplished, and that's the tool I'm talking about. They're the brackets I'm talking about.

MR. CLARK: And do you know how that tool got --

MR. FITZPATRICK: I have no idea.

MR. CLARK: Do you know if there's any action to find out how that tool --

MR. FITZPATRICK: I think there was an investigation that went back and looked at that, but I -- I was not privileged to that or involved in that.

MR. CLARK: Would you be involved in replacing that tool with a proper tool?

MR. FITZPATRICK: Yes. Like -- like I said earlier, I originally some -- I believe somewhere in

February I ordered six of those brackets. I ordered six of the torsion bars. And then several months later I ordered six more of each.

MR. CLARK: And were all those tools that came in built to specification?

MR. FITZPATRICK: I believe they came from the manufacturer.

(Pause)

MR. CLARK: On the maintenance card for 963 there was a discrepancy of -- or it was measured at 40 thousandths of an inch end play check and subsequently was measured at 33 thousandths five times, supposedly. What is -- is -- that's a 7 thousandths of an inch difference. Is that -- is that a big difference? Is that a -- in the scatter of things?

MR. FITZPATRICK: Well, yes, it's a -- it's a large range, and I believe that's probably why it was tested five more times, to verify that, you know, where it's at.

MR. CLARK: Okay. Do you have --

MR. FITZPATRICK: I think it was a good idea to do that.

MR. CLARK: Do either one of you have any idea how it was so badly mismeasured the first time?

MR. FITZPATRICK: Well, .0 -- .040 is -- is actually within the recommended limits, we all know. How -- what I heard and know that it was kind of an inexperienced mechanic inspector and that's why they wanted it rechecked again.

MR. CLARK: You also made that comment that at one time both of you and another individual were in the presence of Mr. Weaver talking about these conversations with Mr. Falla. You mentioned that there was another individual involved; who was that?

MR. HINMAN: That was Mr. McClendon.

MR. CLARK: How was that?

MR. HINMAN: Mr. Jim McClendon.

MR. CLARK: And you also referred to the service bulletin about -- that came from Boeing about grease -- or it was referred to you. Who should be aware of those types of service bulletins coming in and acting on those?

MR. FITZPATRICK: I believe it's -- we're not -- I believe it's Engineering should review all service bulletins that come in to the company.

MR. CLARK: And part of that is -- you wouldn't be involved because you really don't get into the technical aspect or the engineering aspect?

MR. FITZPATRICK: That's correct.

MR. CLARK: You're assuming somebody says that grease is good to go. You're just looking at the operational side?

MR. FITZPATRICK: Yes, sir.

MR. CLARK: Okay. Thank you.

MR. FITZPATRICK: Thank you.

MR. HAMMERSCHMIDT: Thank you, Mr. -- thank you, Mr. Clark. Going next for questions from Dr. Ellingstad.

DR. ELLINGSTAD: Thank you, Mr. Chairman. I'd like to focus a little bit, again, on the -- the end play measurement tooling. Mr. Fitzpatrick, you indicated the -- the six sets that you purchased were in February of -- it was this year?

MR. FITZPATRICK: Yes, sir. That's correct.

DR. ELLINGSTAD: Okay. Previous to that how frequently had you acquired --

MR. FITZPATRICK: Previous to that I have no -- no reason or did not order.

DR. ELLINGSTAD: Okay. The -- the -- the tooling that -- that you purchased, is this -- is this a certificated product? Is there --

MR. FITZPATRICK: I have seen the tooling

since I ordered it and have -- back in Oakland, but I believe they all came from Oakland -- I'm sorry. I believe they call came from Boeing. I believe. Our Purchasing Department purchased them.

DR. ELLINGSTAD: All right. Is there any process of -- of calibration of the -- of these -- of this equipment in -- in service or on receipt?

MR. FITZPATRICK: The -- on receipt the dial indicators get our calibration sticker on it and so does the tension bar.

DR. ELLINGSTAD: And what -- how does one get the calibration sticker?

MR. FITZPATRICK: It's --

DR. ELLINGSTAD: Whose responsibility is it to do that calibration and what does it signify?

MR. FITZPATRICK: Well, whenever new tooling is purchased, be it a O-meter or any kind of test equipment, pyostatic tester, they -- they come into Shipping and Receiving and they are identified as calibrated tools that have -- on a list that they have. And then they are routed to -- to get that certificate put on 'em.

DR. ELLINGSTAD: But whom is it within your organization that --

MR. FITZPATRICK: Well, we have a calibration --

DR. ELLINGSTAD: -- does the testing and certify --

MR. FITZPATRICK: We have a test and calibration shop in our avionics room. We do not do everything, so there's quite a bit of instruments and test equipment that gets sent to different manufacturers.

DR. ELLINGSTAD: But the end play tooling, is it provided with this calibration testing?

MR. FITZPATRICK: I don't know that -- when it comes from the manufacturer does it have that on it? I --

DR. ELLINGSTAD: Okay. So you --

MR. FITZPATRICK: I don't want --

DR. ELLINGSTAD: Mr. Hinman, are you aware of -- of -- of whether or not there is a calibration required and whether that's certified somehow or another?

MR. HINMAN: If I were to go back in time I probably wouldn't be aware specifically of that particular tooling, but --

DR. ELLINGSTAD: Have you become aware of

that since?

MR. HINMAN: Yes. There's -- there's -- there is a receiving inspection that would take place, and it's -- it's my understanding, you know, based on our whatever manual -- in specific, the general maintenance manual that would require. I believe the "go/no go" gauges are calibrated and require a test in calibration. I don't know if that would be done in-house or if that would be done out --

DR. ELLINGSTAD: Are -- are either of you aware of -- of whether the tooling that was used on 963 had been calibrated and had that certification on it?

MR. FITZPATRICK: I have no idea at that time.

DR. ELLINGSTAD: Okay. If I -- one -- one of the -- the issues that has also come up is the variability, apparently, with -- within the same tooling in measurements from, apparently, one operator to another or from within an operator from one occasion to another. That obviously suggests some kind of a training sort of an issue or -- or an operator reliability issue. Whose responsibility was it to train the mechanics who were applying this -- this measurement tool?

MR. FITZPATRICK: In most cases you follow the steps and routine cards. You're an A and P mechanic certified. You -- not every job requires a -- a stamped-on certification that you have tested and checked out on that particular job. Just not every job requires that.

DR. ELLINGSTAD: And this particular job does not require that?

MR. FITZPATRICK: No, sir.

DR. ELLINGSTAD: So did any -- any otherwise eligible mechanic, whether or not they've done this measurement before, would be expected to go and perform that end play measurement and the results that they would get would be used for this decision-making?

MR. FITZPATRICK: Well, in general, not just this item. If a man felt uncomfortable or wasn't sure performing a test, a lead or another mechanic or two of 'em would work -- work through it together.

DR. ELLINGSTAD: But the company doesn't --

MR. FITZPATRICK: -- some cases --

DR. ELLINGSTAD: -- provide a mechanism either to train the people on this particular task or to determine whether or not they have proficiency in performing the measurement, is that correct?

MR. HINMAN: Time frame? If we're talking about today?

DR. ELLINGSTAD: Well, let's -- let's talk about the -- at the -- at the occasion of this -- of this measurement on September 27th of 1997.

MR. HINMAN: I do not believe there would any -- be any specific training on that particular task.

DR. ELLINGSTAD: Okay. To date is there training?

MR. HINMAN: I think Mr. Fitzpatrick would have to respond to that.

DR. ELLINGSTAD: Please do.

MR. FITZPATRICK: I -- I think everybody's well aware of it, but I do not believe there's a -- it's put into their training records that they have been trained on -- on that particular check. It's the task card. You follow it step-by-step and it's -- it's well within the range of a certified A and P mechanic to accomplish that task on there.

DR. ELLINGSTAD: Irrespective of the fact that we'll -- we'll find the kinds of variations that are indicated on this card?

MR. FITZPATRICK: Yeah.

DR. ELLINGSTAD: Thank you. No more

questions.

MR. HAMMERSCHMIDT: Thank you, Dr. Ellingstad. Are there any other questions for these two witnesses from NTSB personnel?

(No response)

MR. HAMMERSCHMIDT: Very good. Gentlemen, because of the nature of your -- of the questioning of you this afternoon, is there anything you wish to add for the record or to clarify that might help us in our investigation? I give you that opportunity if there's some -- something you wish to share with us further.

MR. HINMAN: I guess the only thing that I would share with you is that a lot of these events and situations and conditions stretch out over some significant period of time. And to have an exact recall or recollection is a difficult proposition. I have tried as best I can to recall as best I can the conditions and the situations that prevailed, and that's -- that's about what I would share.

MR. FITZPATRICK: I leave it -- leave it at that.

MR. HAMMERSCHMIDT: Thank you, sir. Gentlemen, we -- we thank you for your participation in this public hearing and for your cooperation with our

important investigation.

MR. FITZPATRICK: Thank you.

MR. HAMMERSCHMIDT: You may stand down.

(Whereupon, the witnesses were excused.)

MR. HAMMERSCHMIDT: The next witness to be questioned is Mr. Bill Weaver. Welcome, Mr. Weaver.

(Pause)

Whereupon,

WILLIAM FRANKLIN WEAVER

was called as a witness, and first having been duly affirmed, was examined and testified as follows:

Interview of Bill Weaver

MR. RODRIGUEZ: Please be seated, sir.

(Pause)

MR. RODRIGUEZ: And would you give us your full name, please?

THE WITNESS: Name is William Franklin Weaver.

MR. RODRIGUEZ: And your occupation?

THE WITNESS: I am the vice president of Maintenance and Engineering for Alaska Airlines.

MR. RODRIGUEZ: And what is your current business address?

THE WITNESS: It is Box 98600 -- or 68900,

Seattle, Washington, 98168.

MR. RODRIGUEZ: And would you briefly relate for us your aviation background?

THE WITNESS: Yes. I started my aviation career back in 1976 where I attended Parks College of St. Louis University. Obtained my Federal Aviation Air Frame and Power Plant license at 1978. Worked as a mechanic and then continued my education till 1979 where I obtained a B.S. degree in Aeronautical Engineering.

At that point in time I went to work for American Airlines. Worked for American Airlines in 17 years, a little over 17 years. And in my capacity at American Airlines or during the 17 years I had a number of positions, both in the quality assurance, quality engineering, production management, both component -- avionics maintenance and aircraft support shops, wide-body aircraft heavy maintenance.

And upon leaving American Airlines in 1996 I was a managing director of wide body maintenance and component avionics maintenance.

In 1996 I went to work for Alaska Airlines. Assumed the responsibilities of the assistant vice president of Maintenance for Alaska. There I had the

responsibilities of the Maintenance operation, both high maintenance and base maintenance and also the maintenance control and tech services organization.

In May of -- May of 1998 I was promoted to vice president of Maintenance and Engineering, and those are the duties -- the duties I have today in -- in regards to maintenance and engineering.

MR. RODRIGUEZ: Thank you, sir. Mr. McGill will question the witness, Mr. Chairman.

MR. HAMMERSCHMIDT: Please proceed.

MR. McGILL: Good afternoon, Mr. Weaver.

THE WITNESS: Good afternoon.

MR. McGILL: Would you mind just very briefly going over -- at the time of the accident you were vice president of Maintenance and Engineering. Would you go through the areas that you were over at that particular time?

THE WITNESS: Yes. At the time of the accident, again, I had all of Maintenance and Engineering. That would entail both the Quality Control Maintenance M and E training function, director of Quality Control, and Maintenance and Engineering Training. I had Maintenance at that time, which included both Line Maintenance and Tech Services

Maintenance Control and Base Maintenance, -- M and E Planning. Had Engineering also -- managing director of Engineering. And we -- that's -- but -- director of Budgets and Contract Administration.

MR. McGILL: One of the areas we've been talking about was in the area of quality control and quality assurance. Could you kind of briefly go through those two areas that -- under quality control how inspection, assurance --

THE WITNESS: Yes.

MR. McGILL: -- and the training kind of fit in together? How do you -- how Alaska handled those positions.

THE WITNESS: Well, at the time of the accident what we had was a director that had quality control and maintenance training. His -- his duties were both directing the organization of inspection. When we talk about quality control we're synonymous with inspection, so the inspection task would be completed by the Quality Control organization.

The Quality Assurance organization is really the auditing part of the department. They're the ones that are essentially out there ensuring and auditing the airworthiness of the aircraft through our CAS

Program. And -- and then you would also have the M and E training function.

MR. McGILL: If -- under quality assurance, does this -- is this the area that would -- that would give assurance for the airplanes and their being in a airworthiness condition?

THE WITNESS: Well, assuring that aircraft are in airworthiness condition obviously is a collective effort, but the inspection organization really is the -- the entity which is out there inspecting and back-checking the different measurements, the different tasks that are done, the -- what we call required inspection items, inspection performance, those functions. They also do the receiving inspection function.

The Quality Assurance organization really is an -- an auditing group where they are continuously out there auditing the different facets of -- of the operation and, again, assuring that we are complying with our procedures, rules, and regulations, our policies.

MR. McGILL: Was there any auditing of lubrication from the time that the AeroShell 33 was changed to?

THE WITNESS: No, not to my knowledge. The -- the Quality Assurance organization, they have essentially an established regime. They -- they establish an auditing curriculum or -- or calendar, I might say. And -- and that is coordinated, essentially, a year ahead of time. And I don't know that there would have been any quality assurance auditing function on -- on the grease.

They do random audits as well, but again, just trying to answer your question.

MR. McGILL: When -- when you outsource a -- an aircraft for maintenance, how is the inspection and auditing of that aircraft performed?

THE WITNESS: When we outsource maintenance the inspection is done as the same as it would be done in-house. The -- the RII qualification that our own inspectors in-house have and the chief inspector who is -- who they all report to is essentially overseeing or -- or they have responsibility to him and they are trained and qualified in the same manner that our inspectors in-house are. They -- they receive a RII qualification.

MR. McGILL: Under you was a position that was vacant at the time of the accident that was called

the assistant vice president of Maintenance. And of course, that was shared by Mr. Hinman and Mr. Fitzpatrick.

THE WITNESS: Mm-hmm.

MR. McGILL: Did you make that selection?

THE WITNESS: Yes, I did. Did I -- did I make the selection in filling the vacancy or -- or make the determination that they would share responsibilities?

MR. McGILL: Well, both.

THE WITNESS: Okay. Well, I did both, so -- actually, when -- when I was promoted to the vice president of Maintenance and Engineering, obviously that vacated the position and I had been the director of Maintenance prior to that on the op spec. I sat down with both of them, both Art and Bob, and we discussed the responsibilities, discussed what it had meant to me, and we -- after talking about it they were acceptable to -- to share those responsibilities. We coordinated and -- and talked about how we would coordinate that affair.

And subsequent to that -- actually, we had another option, and the other option would have been that we could have made the manager of Maintenance

Control, Jim McClendon the director of Maintenance as well and had a one-person, but Jim is really located in the Flight Ops building and he is not as well known as the two directors that I just mentioned and their presence actually being on the shop floor or -- or in the maintenance environment, I -- I thought it would be best that they share the responsibilities of the director of Maintenance.

So once I had their concurrence and understanding that that's the direction we're going to go, I sat down with -- with our PMI. We talked about it. I explained the options to them at that time as well, and we agreed to just go forward with -- with them -- with the position vacant but a note down below on the A6 that the duties would be shared.

Immediately though, I mean we took off on -- initiated an executive search for the position. And in fact, we -- we were unsuccessful the first time. We were -- actually, we went through three executive searches to find the candidate. On our second executive search we were actually able to find a candidate but he wasn't able to relocate or willing to relocate so it took us to a third search.

And -- and during that time I might mention

too that I knew that two occasions that the PMI talked about it in terms of the position being vacant and -- and how we were handling the vacancy and in the discussions that we would have. So -- and no one intended for it to go two years. Certainly wasn't for lack of effort that that position was vacant for two years, but it did. We discussed it. And in my own mind, you know, I really don't believe that there was ever a time that having the duties shared between the two ever negated or degraded their responsibilities as the director of Maintenance.

We would meet every morning, I mean other than weekends, and sometimes even on a maintenance conference call on the weekends we would all talk. And whatever maintenance issue there was we would discuss and we would resolve whatever it was.

MR. McGILL: Let's kind of move into the area of -- it was -- been brought up a couple of times about the maintenance training to -- to a mechanic that would perform lubrication or a task such as a jackscrew end play check. Can -- can you briefly describe what training is performed at Alaska Airlines?

THE WITNESS: We have a number of types of training at Alaska Airlines. We have a Training

Department that provides both technical training, classroom type training. They provide assistance in on-the-job training, OJT. We also use vendor training in terms of training that we haven't developed but, say, a manufacturer has. We utilize that as well. Classroom training. CBT, we use the computer-based training as well.

Normally, we take a mechanic through -- the line maintenance mechanics usually go through the technical training where they're what we call exposed to the -- of course, most of our mechanics -- in fact, the majority of our mechanics hold A and P licenses. Very rare, actually, that we hire mechanics that don't have A and P licenses, but there's occasions. And there are certain skills that we'll do that for, such as avionics and -- and structures.

Assuming, though, and -- and just taking, for instance, a mechanic that has an A and P license, if he's going to work the line he's most likely going to go through the general familiarization -- as we call it, gen fam training -- for each fleet type that we have. And the same goes for the base maintenance gentle -- base maintenance mechanics.

And -- and as that relates to the base

maintenance mechanics because we do a substantial amount of maintenance ourselves. Say, in Seattle it's primarily, though, the Boeing fleet. We'll focus on the Boeing fleet training first, and so it's -- it's possible that you will have mechanics that have Boeing training in Seattle which normally work the Boeing fleet and MD-80 training for the heavy maintenance mechanics in Oakland.

In -- in -- I'll add, too, that -- that we do ad hoc training where at -- every year essentially the manager who's now director of Training will put together a training catalogue. And he'll sit down with all of the end users, basically, and they will develop what they believe is going to be the training requirements for the -- for the upcoming year.

MR. McGILL: Well, let's just take since the accident. Has any special training been given on -- on, specifically, the end play check itself?

THE WITNESS: Specifically training, a term that we would use in terms of qualifications, there is no specific training that we've developed that would make them qualified. What we have done, though, is we've gone to both the vendors that are performing this work as well as back in Oakland and we've had the

mechanics that are doing this end play check work with the engineers and go through the procedures and make sure that they understand it. And we've had a focus of trying to make sure that the same mechanics that have -- continue to do the same -- same end play measurement.

DR. ELLINGSTAD: Excuse me --

THE WITNESS: I mean through a --

DR. ELLINGSTAD: Would anyone other than an A and P-licensed mechanic perform an end play measurement?

THE WITNESS: I -- you know, I'd be assuming no, but I couldn't actually say that that's the case. You know, we've all learned a lot in terms of this end play measurement and the inspection, and there's been techniques, there's been changes in the procedures as a result and subsequent to the accident. So there has been tremendous amount of focus in terms of the procedures, techniques. And obviously, I've talked with the supervisors and -- and mechanics that have done it in the past and what I have learned subsequent to the accident is -- is that we're keeping the same people working, and that's customary, really, in the business where leads try to get the same mechanics in

the same jobs. It just makes things more efficient and effective.

So to absolutely say that we would have someone performing that inspection that doesn't have an A and P license, I don't think so but I wouldn't want to say that absolutely.

MR. McGILL: Mr. Weaver, we've -- we've heard some testimony about the tooling. Is there anything else that you might -- could shed along that line about the tools that was used by Alaska Airlines on the end play check?

(Pause)

THE WITNESS: I don't know what I would add that hasn't been already discussed.

MR. McGILL: We're still trying to determine actually who ordered the last set of tooling that was made in-house. As I recall, there was like seven of the tools that were made. I was -- I was just curious if you knew anything about those or could shed some light to some of those?

THE WITNESS: I don't think I can. I -- I believe that there's been an internal investigation on the matter. And as to -- and -- and I don't know what the outcome of that is. It's --

MR. McGILL: I -- I don't have any information about that. If you had -- if you have something like that I would like for it to -- I would like to -- to get a copy of it if you've concluded that.

THE WITNESS: Okay.

MR. McGILL: The last I heard -- was given was the -- Alaska had manufactured 11 restraining fixtures and then they had purchased seven from Boeing, and I was just trying to kind of keep track of how they got -- how they were manufactured, by whom, and under what authority.

THE WITNESS: Well, I think the -- the authority would have been our GMM and our in-house manufacturing policy. Just -- just a general comment that this year's been full of challenges and there's been a lot of things that have happened to us all this year, and -- and I think that -- I think is some of the reason why in all the activity that's happened I think that's some of the -- some of the reason why some folks may not be able to recall exactly when something took place or what took place.

I know in my own case this had really -- my recollection is is that I'd -- I'd gone down to Oxnard

and this had taken place while I was at Oxnard. And I -- when I came back it was my understanding that this tooling -- and it was all in -- again, in response to the AD inspections and -- and getting out in -- into the operation and having these inspections done as soon as we could. So I am not clear on who it is that requested them. I -- I could have requested the tooling in -- in the sense of we need to prepare and respond to an AD inspection, but I don't have a recollection of that.

(Pause)

MR. McGILL: Do you recollect in 1997 when 963 was in a heavy check, was there any discussion ever of trying to purchase a jackscrew assembly for that airplane?

THE WITNESS: No, I have no recollection of that.

MR. McGILL: I have no further questions, Mr. Weaver. Thank you very much. Mr. Chairman?

MR. HAMMERSCHMIDT: Thank you, Mr. McGill. Are there other questions from the Technical Panel?

MR. RODRIGUEZ: Yes, sir. I have a few.

MR. HAMMERSCHMIDT: Mr. Rodriguez.

(Pause)

MR. RODRIGUEZ: Mr. Weaver, in your capacity did you track in any systematic way the amount of overtime performed by staff?

THE WITNESS: Yes. We -- we track overtime. We track it by shop and by month and we talk about it on a monthly basis as we discuss our budget performance.

MR. RODRIGUEZ: Does the company have a policy with respect to the allowable amounts or the desired amounts?

THE WITNESS: I don't think we have a policy about what is allowable. We -- we -- we go into each year planning and -- and we anticipate just from a budgetary standpoint that -- that the budget will include five percent overtime. That's how we've -- budgetaried and -- and prepared our budgets in the past, but there is no policy in terms of you -- you can't go over a certain amount of overtime. What -- what that entails, though, is -- is that during our monthly meetings we'll sit down and talk about the overtime and where it's going and we'll discuss, like in the line maintenance environment, aircraft that are out of service, whether it was ground damage or whatever. And so we usually talk about it overtime.

MR. RODRIGUEZ: Well, may I approach it from a different angle? Do you know what a break-even point would be where mechanic staff is concerned?

THE WITNESS: No, no. A break-even point in terms --

MR. RODRIGUEZ: Where you would be better off to hire another mechanic rather than to pay some other mechanics overtime to perform duties.

THE WITNESS: Well, I would answer it by saying that overtime really is unplanned. And in terms of we prefer not to work any overtime and only work overtime as unplanned. But there are factors that -- that present themselves in the maintenance operation that cause us to -- if we're short-staffed or we've got a -- a particular non-routine that is a critical path of the airplane, then we'll work the overtime.

MR. RODRIGUEZ: Well, in 1997 what was the staffing with respect to the Oakland facility and overtime? Do you have any idea? You -- have you reviewed that since the accident?

THE WITNESS: No. I have not. In -- in regards to just 1997?

MR. RODRIGUEZ: Well, I'm looking specifically at September --

THE WITNESS: Yeah, to --
MR. RODRIGUEZ: -- '97.
THE WITNESS: I'm sure that in 1998 when we prepared the -- in the tail-end of 1997 when we were preparing the 1998 budget overtime would have been considered at that point in time in the manning and -- and staffing and all. But that's basically the only --
MR. RODRIGUEZ: All right --
THE WITNESS: -- done.
MR. RODRIGUEZ: Perhaps you could give me some perspective on this. In earlier -- during the investigation we were advised that there was a significant increase in the utilization of MD-80 fleet at Alaska Airlines.
THE WITNESS: Mm-hmm.
MR. RODRIGUEZ: Would you concur with that?
THE WITNESS: Yeah.
MR. RODRIGUEZ: Okay.
THE WITNESS: There's been an increase of utilization.
MR. RODRIGUEZ: The figures that we were given run in the range of July of '88 something like 6400 hours in a 26-month period, and then in July of '96, about the time you were coming on the scene, they

were up to 9955 hours between the -- the C checks -- or the end play checks. Does that sound like a reasonable amount of increase, based on your experience with the airline? Is that about what it was?

THE WITNESS: That's my understanding of what it was. Again, I think we -- our --

MR. RODRIGUEZ: With the nearly doubling of the -- of the utilization of the aircraft, how does that distill down to the number of mechanics or the number of aircraft passing through your overhaul facility?

THE WITNESS: Doesn't really have an effect.

MR. RODRIGUEZ: Is that because you go on the calendar month basis?

THE WITNESS: It's because we only work one aircraft at a time, and so as the aircraft come they go after they're finished. And --

MR. RODRIGUEZ: But with a -- with a calendar month as the predicate for an overhaul, they really -- under that system it really wouldn't matter how many hours you flew in the calendar period, would it?

THE WITNESS: That's what our maintenance program had in it, yes.

MR. RODRIGUEZ: Does that give you any

concern with respect to the length of -- or the utilization of those aircraft between the times that you're actually looking at them?

THE WITNESS: I -- I think, again, it would fall upon the -- the wholeness and -- and the Reliability Program itself. The Reliability Program would indicate to us if there were concerns or problem components, and -- and when we talk about utilization, yes, there was increased utilization, I think from -- 1993, again, is before I got to Alaska Airlines, but it -- it increased from '93, '95, '96. From '96 on it has increased modestly, not very much really.

And throughout all that time, though, we've -- we've added resources, you know, to the operation. We've increased the fleet size in that time frame that I just mentioned. I want to recall what -- is 35 percent and we've increased the Line and Base Maintenance by 36 and 34 percent, respectively. So again, we know that increasing utilization -- I mean we didn't invent the model with increasing utilization. And -- and when you do increase utilization on an aircraft there is maintenance and -- and there's planning that you have to do to support that. And -- and we've made those changes and --

MR. RODRIGUEZ: Are you -- are you also familiar with the, specifically, the positions in Seattle, like a base manager?

THE WITNESS: Yes.

MR. RODRIGUEZ: Do you track that? Do you know how many people have occupied that position, say, in the last five or six years?

THE WITNESS: Five or six years, no. The last four years I would think maybe two or three.

MR. RODRIGUEZ: Is that a high turnover?

THE WITNESS: No.

MR. RODRIGUEZ: Would you -- do you typically pump the two to three people through different positions of management in five-year periods?

THE WITNESS: I think that there's different positions and -- I mean to generalize like that, I -- I would typically say that there isn't that type of turnover throughout all of management or -- or mechanic ranks. So you know, depending upon the specific individual, there can be turnover.

MR. RODRIGUEZ: And to move from the general to the specific, do you -- in your opinion, do you have a high turnover rate at the base manager position in Seattle?

THE WITNESS: No.

(Pause)

MR. RODRIGUEZ: But would you --

THE WITNESS: To explain -- to explain that, though, I mean that's not to say that I wouldn't like it to stay -- have it just stay one.

MR. RODRIGUEZ: Are you familiar with that position specifically? Do you know why the turnover? Have you looked to see what the root cause might be that you're having a turnover like that?

THE WITNESS: No, again, because of the -- the directors working for me, in general they would apprise me of the issues and -- and situations involved -- involving those.

MR. RODRIGUEZ: So they handle -- never have spoken to you about it?

THE WITNESS: No, they -- they handled it and they spoke to me about it both.

MR. RODRIGUEZ: But not in terms of that being a problem?

THE WITNESS: I would say a problem in the sense that we wouldn't want it to be vacant.

MR. RODRIGUEZ: Well, let me ask you this way. Have you found that in the changeover from one --

one manager to another in that facility that you have solved the problem there that's generating this turnover that we've been discussing in manager positions?

THE WITNESS: The manager that's there now?

MR. RODRIGUEZ: Over the last several years --

THE WITNESS: Mm-hmm.

MR. RODRIGUEZ: -- in the position of manager at the Seattle Base Maintenance, have -- have you experienced an abnormal turnover?

CAPTAIN FINAN: Mr. Chairman?

MR. HAMMERSCHMIDT: Yes, Captain Finan?

CAPTAIN FINAN: Excuse me for interrupting, but that same question's been asked about four times of Mr. Weaver, and I would suggest that perhaps it could continue on a different topic or subject.

MR. HAMMERSCHMIDT: Well, I've noted the multiple times the question has been asked and I thought they were trying to reach a meeting of the minds and understanding here.

MR. RODRIGUEZ: It's the differing answers that is the problem. That's why I'm trying to get it clear.

MR. HAMMERSCHMIDT: So let's just give it --
THE WITNESS: Well, --
MR. HAMMERSCHMIDT: -- one more chance.
THE WITNESS: -- let me just answer this. One of the turnovers was created by a personal issue. One of the managers had a medical problem. So you know, I -- I don't really equate that into being a problem. He had a family --
MR. RODRIGUEZ: And the other -- the other changes?
THE WITNESS: The other changes would have been one particular individual, no. I mean were there problems -- I'm not sure if I understand your question now.
MR. HAMMERSCHMIDT: I think what Mr. Rodriguez is getting at, how would you categorize the other changes? Just in broad terms. Am I right on that, Rod?
MR. RODRIGUEZ: Yes, sir.
(Pause)
THE WITNESS: Normal. Normal transitions.
MR. HAMMERSCHMIDT: Okay.
MR. RODRIGUEZ: Is that a springboard for promotions up -- up the organization?

THE WITNESS: It -- it can be. I mean promotions based upon individual performance.

MR. RODRIGUEZ: Did you have -- excuse me. Did you have any special knowledge or insight on the special inspections that were conducted at the Seattle Base Maintenance recently?

THE WITNESS: Well, I was in -- involved in -- in part of the turnover and part -- part of the planning, yes.

MR. RODRIGUEZ: Would you have any comments on the results of the finding at that facility?

THE WITNESS: Well, the first -- the first comment I have is that after both the special inspection was done and the independent assessment team's safety inspection was done, they both determined that we ran a safe airline, a safe operation. For the -- for the special inspection, there were generally 56 findings that resulted from that, and only a few that I would agree that perhaps were -- that -- that we were contrary to the Federal Aviation regulation.

MR. RODRIGUEZ: You also mentioned an internal review of the manufacture of the tools when you were talking with Mr. McGill. Were you part of that internal review?

THE WITNESS: No. No, I was not.
MR. RODRIGUEZ: You were not? Who --
THE WITNESS: Which review are you -- are you referring to?
MR. RODRIGUEZ: I -- I understood you --
THE WITNESS: I -- I thought I was talking in general that we have in our GMM a section that handles the in-house manufacturing of tooling. And that's what I was referring to.
MR. RODRIGUEZ: I understood you to say that because there were some inappropriate tools being used in the end play check that Alaska Airlines had an internal review to determine how they got into the inventory, where they came from, that sort of thing. Is that true or not?
THE WITNESS: That is true.
MR. RODRIGUEZ: Did you take part in that?
THE WITNESS: No, I did not.
MR. RODRIGUEZ: Who might have represented your interest in that?
THE WITNESS: I believe that Jim Trimberger would have been the person involved in that.
MR. RODRIGUEZ: Did he report to you about the findings?

THE WITNESS: It was being handled by counsel, and so I -- I don't -- I don't recall the findings, actually.

MR. RODRIGUEZ: Is the review complete?

THE WITNESS: I believe the review is complete. And as a result of that, I -- we -- we canvassed our whole operation and have audited all the -- the tooling that we have.

MR. RODRIGUEZ: But -- but you don't know specifically who ordered the tools or anything of that nature?

THE WITNESS: No, I do not.

MR. RODRIGUEZ: Do you know who manufactured them?

THE WITNESS: No, I do not.

(Pause)

MR. RODRIGUEZ: That's all the questions I have, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Mr. Rodriguez. We will now go to the parties to the hearing for their questions, if they have some. Beginning once again with Boeing.

MR. HINDERBERGER: Thank you, Mr. Chairman. I -- we have no questions for this witness.

MR. HAMMERSCHMIDT: Thank you, Mr. Hinderberger. The Aircraft Mechanics Fraternal Association?

MR. PATRICK: Thank you, Mr. Chairman. Good evening, Mr. Weaver.

THE WITNESS: Hi, Dave.

MR. PATRICK: Just a couple quick questions here for verification. When an unlicensed mechanic is given a particular task, is that unlicensed mechanic then observed by a licensed A and P mechanic to assure that the job is completed properly?

THE WITNESS: Normally they're supervised by a properly certificated mechanic.

MR. PATRICK: Regarding outsourcing of maintenance, can you verify whether or not Alaska Airlines' vendors use licensed A and P mechanics to perform end play checks?

THE WITNESS: I -- I could not -- I could not -- I couldn't answer that affirmative as to whether or not it's only A and P mechanics doing it.

MR. PATRICK: Okay. Thank you. Just one other question. Does the Quality Assurance department audit ME0 -- ME1 -- ME01s? I'm sorry.

THE WITNESS: I don't have specific knowledge

as to whether or not they do. I know that there's a wide variety of things that they -- they do audit. They do audit policies and procedures as well as things in regards to shelf-life, so I -- I would want to refer to their checklist, actually, to -- to better answer that question.

MR. PATRICK: Okay. Thank you very much. That's all the questions I have, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Mr. Patrick. Moving next to the Airline Pilots Association.

CAPTAIN WOLF: Thank you, Mr. Chairman. Good evening, Mr. Weaver.

THE WITNESS: Good evening.

CAPTAIN WOLF: I just have a question concerning C check intervals. This went back to yesterday to Mr. McCartney's testimony and -- who is manager of Reliability. He told us that the escalations of the C check intervals in 1988 and 1996 were based on data from the Reliability Analysis Program and this -- and that this data was submitted to the FAA to support the escalations. However, he stated that there was no RAP data regarding jackscrew removals until 1999. So the question is is how was the escalation of the interval for the inspection of this

component justified or how was it that we ended up coming up with the new interval?

THE WITNESS: I -- I specifically would not be able to answer that. I think Wright is the person that would be more appropriate to answer that. I just in general terms know that there's sampling and sample fleet inspections and things like that that take place, but again, I think Wright is the authority on that and would be better suited to answer the question than I would be.

CAPTAIN WOLF: And that wouldn't necessarily be something that he would pass up the chain to yourself or to one of your directors?

THE WITNESS: The -- the idea of escalation or --

CAPTAIN WOLF: Just passing on the information that -- that -- that they went ahead and escalated the interval on the inspection there.

THE WITNESS: Well, I think that if -- if that was happening, definitely someone in my position would be apprised of it and -- and told.

CAPTAIN WOLF: Okay. Notice this has to do -- were you aware that the lube intervals and inspection intervals had -- had been extended at all?

That might be similar to this past question here, but were you aware of the lube intervals and the inspection intervals being extended at all?

THE WITNESS: No. No, I was not.

CAPTAIN WOLF: How about from the -- the grease being changed from the Mobil 28 to the AeroShell 33?

THE WITNESS: At the time, no.

CAPTAIN WOLF: This is kind of expanding a little bit on -- on Mr. Rodriguez's question, not specifically with overtime but it might -- might be something similar to that. If it looked like an aircraft might be delayed coming out of a check and with a particular item that might delay this check, would that be subject to, perhaps, a -- a conference call or an internal conference call to be discussed?

THE WITNESS: I think that there's a number of conferences that take place during the day in Maintenance and Engineering, specifically Maintenance, that the status of the aircraft are tracked at least every day and if not twice a day. And so if there were -- if there was an issue pertaining to an aircraft that could be driving the aircraft out -- late out of check as we'd say, I would expect that to be discussed.

And the goal there is to -- to -- to discuss it as soon as we can and not wait till the last minute, obviously, so we can plan and try to minimize the impact if there is one.

CAPTAIN WOLF: Were you advised that the replacement of the jackscrew on -- on Aircraft 963 might delay an on-time completion of the C check in 1997?

THE WITNESS: No, I have no recollection of that.

CAPTAIN WOLF: And Mr. Patrick had a question on the ME01, and this -- this might be similar or not. Is the same ME01 process in place today that was in effect at the time of the accident?

THE WITNESS: I'm not for sure if there's any substantive changes. And again, I am not really involved with the ME01 process, so. I'm not aware of any changes.

CAPTAIN WOLF: Thank you, Mr. Weaver. That's all the questions I have.

MR. HAMMERSCHMIDT: Thank you, Captain Wolf. Going next to the Federal Aviation Administration.

MR. DONNER: Thank you, sir. Mr. Weaver?

THE WITNESS: Yes.

MR. DONNER: Have Alaska's procedures for conducting the end play check changed since the accident?

THE WITNESS: I believe there -- there have been some changes called out in the AD, original AD, and follow-up information as well, yes.

MR. DONNER: Can you briefly describe what changes were made since the accident?

THE WITNESS: Not specifically, no. Just -- other than in -- in learning of the end play checks that there -- there are things to take into consideration and that there have been changes in the procedure subsequent to the accident. What they are specifically, though, I -- I really do not know.

MR. DONNER: Okay. How about between September of '97 when the last end play check was made on the accident aircraft? Were there any changes from that time until the time of the accident, do you know?

THE WITNESS: I don't -- I don't know, no.

MR. DONNER: What I'm getting at is the number of sample measurements that would be taken at -- how many times would a mechanic measure the end play before he's confident that he has an accurate reading?

THE WITNESS: I think that would be dependent

upon each and every mechanic that does the job. It's a matter of having competence in -- in going through the procedures and in their confidence and the repeatability of the measurement. And --

MR. DONNER: Well, if we're talking repeatability, then we would have to repeat it, so I'm wondering did -- would he take one measurement and be satisfied with that or would he take two or three or five? And you know, when they remeasured after the 40 thousandths and then they remeasured and found it was less than that, they measured it five times.

THE WITNESS: I've never done the inspection myself. And being a mechanic once upon a time, it would be really speculation for me to say what mechanics would do in terms of trying to get confidence and -- and a feeling that they have dependable repeatability in the -- in the measurement.

MR. DONNER: Okay. Thank you, sir.

MR. HAMMERSCHMIDT: Thank you, Mr. Donner. Going next to Alaska Airlines for questions.

CAPTAIN FINAN: Thank you, Mr. Chairman. mr. Weaver, while you were on site in Oxnard, did you give direction to have a gallon of AeroShell 33 and a gallon of Mobil 28 grease delivered to the NTSB?

THE WITNESS: Yes, I did.

CAPTAIN FINAN: Thank you, Mr. Weaver. No further questions.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. Going next to the Board of Inquiry for questions. Mr. Berman?

MR. BERMAN: Thank you, Mr. Chairman. Mr. Weaver, we had some discussion on the subject a little bit earlier in the hearing; I'm not sure if you were in the room. But what I'm wondering is how -- how squealing could be -- become approved in Alaska Airlines jackscrew maintenance program when it -- when Boeing testified it was -- would not have been appropriate?

THE WITNESS: How it would be approved in our maintenance program?

MR. BERMAN: Yes. Evidently, it's -- it's an approved -- a jackscrew can be maintained and serviced if it's -- a squealing sound is heard when it operates, and I've been wondering from Alaska how that -- how that might have been added to the maintenance program and how that could get approved?

THE WITNESS: How it would get approved is that Engineering would revise the maintenance manual

and/or the task card clarifying or quantifying the condition. I -- I don't know how that was done or why it was done, though.

MR. BERMAN: Could we please ask if Alaska Airlines would provide us with that information after the hearing? Thank you.

Also like to get the philosophy of -- of why the flight hour requirement at the MSG-2 got dropped from the C check interval. We've heard how and when but now I'd like to know why, if you could answer?

THE WITNESS: I was not here at the time. I began my employment with Alaska Airlines in 1996 and I think it was Wright that mentioned yesterday or someone mentioned yesterday that that -- that was done in 1988, so I -- I do not know why.

MR. BERMAN: Have you ever had a discussion about grease compatibility issues prior to the accident on any aircraft type operated by Alaska?

THE WITNESS: No.

MR. BERMAN: Thank you. And did you ever give Mr. Hinman any -- any advice about a jackscrew replacement on any airplane during 1997?

THE WITNESS: No. I have no recollection or I can't recall ever having any direction in that

regard.

MR. BERMAN: Okay. Thank you.

(Pause)

MR. CLARK: The -- we just had a discussion or you just commented about two gallons of lube that were to be provided to us. Is there only one set of two gallons of lube, one and only, is that the one? Or were there several -- could there be several?

THE WITNESS: I'm sure there's many, but again, --

MR. CLARK: That you were involved with?

THE WITNESS: No, just -- just -- just one instance where I was involved with.

MR. CLARK: All right. We also heard about this internal audit for tooling. What was the purpose of that audit?

THE WITNESS: Again, it was to go through our whole system and -- and determine that the tooling that we were using in conformance to the manufacturer's specifications.

MR. CLARK: And is there a report generated by that -- out of that audit?

THE WITNESS: I -- I believe there is, yes. I've not seen it. That would have gone to, I believe,

to Mickey Cohen, Senior VP of M and E.

MR. CLARK: Okay. Is -- is there a report of that audit available?

CAPTAIN FINAN: If there is we'll provide it, Mr. Clark.

MR. CLARK: Thank you. You also mentioned that -- somebody asked you about the -- a complete review of that audit and generally you're not familiar with that, is that correct?

THE WITNESS: That's correct.

MR. CLARK: And you also made a comment that a Mr. Trimberger may have been involved. He works for you?

THE WITNESS: That's -- that's correct, yes.

MR. CLARK: And he would have been involved in that audit?

THE WITNESS: Heavily so, yes.

MR. CLARK: And for whatever came out of that audit, he never reported to you what the findings were?

THE WITNESS: Not -- not specifically, no. At -- at that point --

MR. CLARK: In general?

THE WITNESS: Well, again, going from recall, the tooling audit that we recently did -- and again, I

believe that it's complete -- was done, really, by I think Alan Flowers, who is the manager of the support shops there in Seattle. And he then in turn reports to Art Fitzpatrick, who spoke earlier, who in turn then reports to Brian Hirshman, our staff vice president of Maintenance. I don't know if Jim was personally involved or -- or if it was just his inspectors that were involved in the inspection and conformity the inspection of the tooling that was -- was audited and reviewed.

MR. CLARK: Okay. But you're far enough out of the loop you really don't know the internal workings of all that?

THE WITNESS: Yes.

MR. CLARK: Okay. But you also mentioned, and I may have misheard it, that the information would have gone to counsel?

(Pause)

MR. CLARK: Did I miss --

THE WITNESS: No, that's what I said. And -- and that's what I'm recollecting.

MR. CLARK: So would that be your internal lawyers that work internally for you or outside counsel?

THE WITNESS: Both.
MR. CLARK: Both? Who requested that audit?
THE WITNESS: I'm not for sure, actually.
(Pause)
MR. CLARK: But it --
THE WITNESS: Again, --
MR. CLARK: Is it your --
THE WITNESS: -- all this happening as a result of the accident and the inspections that are taking place determining earlier, as we mentioned, that we may have had tooling that didn't meet the conformity or the manufacturer's conformity. I think that as a result of the NTSB investigation that's going on -- I believe that as a result of that, in response to that as well.
MR. CLARK: That it came from a request from us?
THE WITNESS: No, no. But in support or in coordination with -- with the investigation.
MR. CLARK: Okay. In your position as vice president of Maintenance and Engineering, basically it's Maintenance that uses the tool?
THE WITNESS: That's true.
MR. CLARK: Uses these tools?

THE WITNESS: That's true.

MR. CLARK: And it's Engineering that specifies them or defines them or provides the drawings or whatever to get them built?

THE WITNESS: That's true.

MR. CLARK: Okay.

THE WITNESS: And I want to just add a clarification too, and that is that I have been, since the accident and since returning from Oxnard, I have been really focusing on running the airline. That's been my primary focus. It's not that I'm out of the loop on the NTN -- NTSB investigation and the things that are going on, but my primary focus has really been running the airline. And so there are -- there are bits and pieces that, forgive me, that -- that just, again, I have to pull together and recall. And again, I've not been in the mainstream of the investigation itself.

MR. CLARK: Okay. And this tool audit you consider as being -- being in the mainstream of the investigation?

THE WITNESS: Yes.

(Pause)

MR. CLARK: Rod, were you aware that a tool

audit was ongoing or being conducted? You or Jeff or Frank? Were you aware that a tool audit had been conducted or is being conducted in response to this investigation?

MR. RODRIGUEZ: No, sir.

(Pause)

MR. CLARK: Have you reviewed any of the issues regarding the switch in grease from Mobil 28 to AeroShell 33?

THE WITNESS: Subsequent to the accident?

MR. CLARK: Yes.

THE WITNESS: I -- I've seen some documentation, yes.

MR. CLARK: Okay. This ME10 -- ME01 card that is -- that doesn't have all the signatures, those are all people that work for you, is that correct?

THE WITNESS: That's correct. At the time that that was made, though, I was --

MR. CLARK: You weren't there?

THE WITNESS: I wasn't there, no. I wasn't the vice president of Maintenance and Engineering.

MR. CLARK: Okay. But looking at that card now, do you believe your people were justified in making that change from Mobil 28 to AeroShell 33?

THE WITNESS: I believe that we reviewed the information, had what we believe was the technical data to support a change, and may not have followed procedure in terms of filling out the form and having all the signatures there, but -- but whether the -- all the signatures were on the form or not I believe that the decision still would have been made that we would have changed over the grease based upon the technical data that we had to base that decision on.

MR. CLARK: And that same technical data after the accident the FAA found insufficient to make that change. That's the same technical data?

THE WITNESS: That is a question and still remains a question as to whether or not the grease is -- is more effective, efficient, and -- and so we have changed the grease.

MR. CLARK: The --

THE WITNESS: So there's -- there's a big unknown with this grease.

MR. CLARK: Right now. But --

THE WITNESS: Right now.

MR. CLARK: -- at the time looking at that data it would not have bothered you to -- or let me -- your evaluation then is that you probably would have

made the change even if we'd have had all the signatures and all the paperwork --

THE WITNESS: Yes, I believe so.

(Pause)

MR. CLARK: Referring to the -- there was a ME01 apparently in process regarding MD-80s. Are you aware of any of that ongoing thing?

THE WITNESS: In regards to the Fairbanks --

MR. CLARK: Yes.

THE WITNESS: -- issue?

MR. CLARK: Yes.

THE WITNESS: Again, only till recently.

MR. CLARK: Okay. Do you ever see ME01 forms?

THE WITNESS: No, I do not. Both as the director of Maintenance or assistant vice president of Maintenance I wasn't involved in it. I didn't serve on the boards. And in my current capacity I don't either. So I -- I don't see 'em, but the -- the guys that are involved mainly and the guys that report to me, if there's issues or concerns obviously they -- they will discuss them with me. But quite frankly, they -- I really don't hear much about it.

MR. CLARK: Okay. If -- do you ever get

involved if they all sign off on an ME01 that's going to be very expensive to implement?

THE WITNESS: If it's going to be expensive to implement, they -- they would most likely have -- and we would have all most likely have talked about it. I -- I don't ever recall an instance where we've talked about an ME01, though, that's been expensive to implement.

MR. CLARK: Okay. Have you ever stepped in after one's been fully approved and said no, we're not going to do that?

THE WITNESS: No.

MR. CLARK: Put a stop to it?

THE WITNESS: No, I've never done that.

MR. CLARK: I would assume you have that authority to do that if you chose to do so?

THE WITNESS: Yes, I do.

MR. CLARK: Okay. Thank you.

THE WITNESS: You're welcome.

CAPTAIN FINAN: Mr. Chairman?

MR. HAMMERSCHMIDT: Captain Finan.

CAPTAIN FINAN: Just for clarification for Mr. Clark, the tool audit that you referred to was requested by our principal maintenance inspector.

MR. CLARK: Okay.

THE WITNESS: That's part of being out of the loop. Sorry.

MR. CLARK: Let me -- let me ask you. If the PMI made that request, who'd he make it to and who is in the loop on that?

THE WITNESS: The PMI made the request to our senior VP of M and E, Mickey Cohen.

MR. CLARK: Okay. So he'll be aware of that?

THE WITNESS: Yeah.

MR. CLARK: Thanks.

MR. HAMMERSCHMIDT: Thank you, Mr. Clark. Dr. Ellingstad, no questions?

(Pause)

MR. HAMMERSCHMIDT: Mr. Weaver, have you been here all of today listening to the other testimony?

THE WITNESS: Yes.

MR. HAMMERSCHMIDT: Okay. Your name was referenced a few times in terms of other people's testimony as I can recollect. Did -- did -- did you hear anything concerning those references that would -- that is inaccurate? In the previous testimony concerning you?

THE WITNESS: No. I --

(Pause)

THE WITNESS: Let me --

MR. HAMMERSCHMIDT: I know I'm --

THE WITNESS: It's -- it's late in the day and I'm going to sit here and think about that for a second.

MR. HAMMERSCHMIDT: Please do. I'm catching you a bit off guard with that question, but I just -- just for quality assurance purposes I was trying to get a better reading on that.

(Pause)

CAPTAIN FINAN: Mr. Chairman?

MR. HAMMERSCHMIDT: Yes, Captain Finan?

CAPTAIN FINAN: If I might, Mr. Weaver's name was mentioned in several different -- at several different times in different contexts, and I'm not sure how he's going to organize this to -- to answer that question.

MR. HAMMERSCHMIDT: All right.

CAPTAIN FINAN: -- fact, he didn't hear everything that was said or -- or if he's not sure where that's directed.

MR. HAMMERSCHMIDT: All right. I just thought -- thought in case there would have been

possibly something said that -- in reference to him that he would wish to take issue with I would give him that opportunity. If something jumped up while other people were referencing him.

CAPTAIN FINAN: Okay.

MR. HAMMERSCHMIDT: I just wanted to give him the opportunity to clarify the record. But I realize that it might not be a comprehensive search in his memory.

CAPTAIN FINAN: I'm just afraid if he missed anything and he didn't then take exception to it now, it would stand as though he agreed with it.

MR. HAMMERSCHMIDT: I understand.

CAPTAIN FINAN: I'm not so sure that's a fair thing to do --

MR. HAMMERSCHMIDT: Okay.

CAPTAIN FINAN: -- to Mr. Weaver.

MR. HAMMERSCHMIDT: Right. I understand. Like I say, I was just trying to give him the opportunity to -- to set the record straight if he so wished. If there was anything specifically that he took issue with.

THE WITNESS: I'm trying to recall, and -- and at this point in time I -- I -- I'm only about

halfway through the day in my recollection, so. Yeah. I -- I'd feel a lot more comfortable knowing what it was and in the context of every statement, so --

MR. HAMMERSCHMIDT: Fair enough. Okay. Mr. Weaver, we thank you for your participation in this public hearing and for your assistance with our investigation. You may stand down.

(Whereupon, the witness was excused.)

MR. HAMMERSCHMIDT: At this point it is 6:55 p.m. Eastern Standard Time according to the NTSB boardroom clock, and we will take a 15-minute break and return with the next witness, Mr. John Fowler. Therefore, we are in recess until 7:10.

(Brief recess)

MR. HAMMERSCHMIDT: Mr. Fowler, we welcome you to this public hearing. And before we begin with your testimony, Mr. Rodriguez, can you give us a projection as to where we stand in terms of how much longer we expect this hearing to take or to last?

MR. RODRIGUEZ: I keep telling everyone I'm not in charge of this operation. Everybody keeps asking me. But I'll do my best.

It was my estimation, based on the information that I've gotten, that when we finish Mr.

Fowler Mr. Cohen has been scratched as a witness and will not appear, and that leaves five FAA witnesses which Mr. Brenner, the principal questioner has informed me may take in the order of four hours or so from his questioning. So if everyone else cooperates we should be able to finish that in a reasonable one day of activity, which I was skeptical of initially.

But that's about where we are, sir. I think if we finish Mr. Fowler today that we can finish the FAA witnesses on Saturday and wrap up the hearing.

MR. HAMMERSCHMIDT: Okay.

MR. RODRIGUEZ: No promises.

MR. HAMMERSCHMIDT: Understood. That -- that's -- that's good for our overall awareness of what we should plan on, I think, in terms of, again, hotel reservations and airline flights and that type of thing. Of course, this morning or -- and last night the prediction was that we would need pretty much all of Monday. At least, that's what the staff was considering. But we have had a very good pace today in terms of the questions and the answers and the progress of the witness list, so -- so we're appreciative for that for all who are involved in that process.

And we will -- without further ado, we will

proceed with the questioning of Mr. John Fowler.

MR. RODRIGUEZ: Mr. Fowler, will you be sworn?

Whereupon,

JOHN ROBERT FOWLER

was called as a witness, and first having been duly affirmed, was examined and testified as follows:

Interview of John Fowler

MR. RODRIGUEZ: Please be seated, sir. And would you state your full name for us?

THE WITNESS: John Robert Fowler.

MR. RODRIGUEZ: And what is your current occupation?

THE WITNESS: My occupation at the time of the accident was executive vice president, Technical Operations and System Control for Alaska Airlines. I announced my retirement in July, began engaging -- disengaging from the company in September, and I'll be retiring at the end of the year.

MR. RODRIGUEZ: And would you briefly relate your aviation background for us?

THE WITNESS: I've worked in this industry for 33 years, beginning at Panamerican World Airways where I was there for 24 years, beginning as a front-

line mechanic, holding various positions in maintenance, and then various maintenance management positions over that period of time. And when I left Panamerican World Airways in 1991 I was vice president of maintenance and engineering.

In 1991 I came to Alaska Airlines, and I've been here for nine years. During that period I've held the positions of vice president, Maintenance and Engineering; senior vice president, Technical Operations; and executive vice president, Technical Operations and System Control.

I hold an FAA Air Frame and Power Plant Mechanic's certificate. I hold an FAA commercial pilot's license with an instrument rating. And I have a Master's in Business Administration degree from Pepperdine University.

MR. RODRIGUEZ: Thank you, sir. Mr. McGill will question the witness, Mr. Chairman.

MR. McGILL: Good evening, Mr. Fowler.

THE WITNESS: Mr. McGill.

MR. McGILL: I would like to briefly cover Alaska's Safety Department. And include, please, the director of Safety that is required on the op spec.

THE WITNESS: I presume you're talking about

the time -- at the time of the accident?

MR. McGILL: Yes, sir. At the time of the accident.

THE WITNESS: Perhaps the best place to start would be on the -- on the front line, and I'll talk about Maintenance and Engineering. The first line of defense, if you will, in our safety programs at Alaska Airlines are -- is the relationship with the mechanics and supervisors and their managers. And it's certainly Alaska Airlines' preference that any safety concerns or safety issues be addressed as immediately as possible and resolved at the lowest level as -- as possible, if appropriate.

In addition to that, all the supervisors in Maintenance and Engineering are required to hold monthly crew safety meetings with their employees where they communicate, share, and discuss information, share safety concerns, and then feed back information. And it may be at a later time if they need to get information, but nonetheless, follow up with feedback on the information and take action or initiate action as necessary.

In 1996 also in Maintenance and Engineering we created a Maintenance and Engineering safety

committee, fashioned, if you will, after the safety committee that Flight Operations has had for some time that also meets quarterly with the Airline Pilots Association at Alaska Airlines. That committee had representatives on it from all areas of maintenance. It had front-line employees -- still has front-line employees from Line Maintenance, Base Maintenance, and Inspection. It also includes the respective directors from each area: the Quality Assurance Department, the director of Quality Control, and it's chaired by the vice president of Maintenance and Engineering.

In that forum they review internal audits on a quarterly basis, okay, with those in attendance, including the front-line employees, okay, discuss where there may be indications of opportunities for improvement or some information on why trends may be shifting or whatever. And also, there are other -- any other safety issues that need to be discussed are -- are brought forth at that time.

Finally, before I get to the more centralized portion of the safety programs at Alaska Airlines, is my personal commitment that I've given to employees at numerous employee meetings that I've had where I've told them that if they have an issue, safety or not --

it doesn't have to be safety -- but safety or not that I would like them to work through their first-line supervisors, managers in an attempt to resolve it. Okay. But if they have difficulty they don't need to run it up the chain of command to every single person between that -- between them and me. They can come and knock right on my door.

In the Flight Operations Department there's a -- a Flight Safety Office, the director of Flight Safety and Operations. They receive inputs from the -- from the pilots as well as -- both verbal as well as written inputs. And they also were responsible for developing and implementing the Flight Operations Quality Assurance Program at -- at Alaska Airlines.

We also had -- have -- had at the time of the accident an Employee Health and Safety Department which resided under the -- under the responsibility of the Employee Services Department.

We -- we had an Internal Evaluation Board, and the Internal Evaluation Board that we had was a --a compilation of experts, if you will, from each of the operating divisions, experts in regulatory compliance as well as safety for each of the divisions. That would include Maintenance and Engineering; Flight

Operations; Customer Service, which would include Ramp Operations, Freight, Security, HAZMAT, as well as the -- the In-Flight group.

The -- the chairperson of the Internal Evaluation Board, okay, is our director of Safety, and I'll speak more about that later.

The primary charge of the director of Safety is to keep the highest levels of management in the company fully aware of all safety concerns in all operational divisions.

The group would meet once a month and review internal audits with all the divisions, share information, look for trends. They would do cross divisional audits at least once a year where one division's internal audits group would go in -- audit another division's group.

They would discuss and work on any safety concerns that were brought to their attention that hadn't been resolved in some other form. They -- I would meet monthly with the chairman of the Internal Evaluation Board. And I would meet with the full Internal Evaluation Board frequently.

The Internal Evaluation Board members would also meet with their respective division officers on a

quarterly basis and ensure that they were aware of the internal audits in those respective divisions as well as any safety concerns that they believed needed to be addressed or were not being addressed properly.

The Internal Evaluation Board will also meet annually with all -- all of the operational division officers, including the presence of the president, COO, and chairman of the -- of the company.

The Internal Evaluation Board was fashioned after an advisory circular on the same subject. And it's been the -- that's the -- that has -- was the centralized portion of our safety program at the time of the accident.

As I mentioned before, the Internal Evaluation Board chair was designated as our director of Safety. The director of Safety at the time of the accident was Mr. James Trimberger. Mr. James Trimberger had collateral duties in the Maintenance and Engineering division as director of Quality Control and Training.

At the time that we designated a director of Safety at Alaska Airlines, the Internal Evaluation Board and all of the programs that I already discussed were already in effect. And when the -- the rule which

became final in 1995 and effective in 1997, we deemed it most appropriate since we've really had a lot of confidence in the -- in what we had developed for a safety program. We believed it appropriate to designate that individual as the director of Safety as well.

MR. McGILL: Did the FAA ever try to get that position where it was a singular position, only the director of Safety and not some other -- other positions like Mr. Trimberger had?

THE WITNESS: The director of Safety, as I mentioned, was placed on our op spec. Certainly, no later than March of '97 when the final rule became effective. And it remained that way until I would say third to fourth quarter of 1999, at which time the FAA did come and speak with me indicating that they had an issue, okay, with whether or not Mr. Trimberger actually, okay, should be the director of Safety given his collateral duties. I would suspect that the reason why they approached me in mid to late 1999 is because, as I understand it, that's when the -- the handbook bulletin, okay, was -- was -- with much more detailed information on the qualifications, responsibilities, and so on of the director of Safety was published.

They -- they meet -- met with us. We naturally put forth our position. The -- the principal inspectors that I met with, as I recall, was the principal maintenance inspector and the principal operations inspector at that time. They put forth what their feelings were. I asked whether or not we could just put our position in writing, just to make sure that it had been properly articulated and everything to give them an opportunity to review it, which they allowed. Ultimately, I received a letter back from the -- I believe it was the supervisor of the office, Mr. Phil Hoy who indicated that they had considered our case, okay, but in their view our -- our director of Safety position and his other responsibilities didn't meet what they believed the regulation said.

We did not agree with that; however, we set out immediately to recruit a -- an individual who would be director of Safety as his sole responsibility.

MR. McGILL: Tomorrow we'll be hearing some more testimony from the FAA, but right now could you -- would you be in a position to tell us about the FAA's proposal to conduct a SAT or a System Audit Team audit of Alaska Airlines?

THE WITNESS: I could just tell you what I

know about it and what my involvement was.

MR. McGILL: Okay. That would be fine, sir.

THE WITNESS: On or about March 6th I received a phone call from Mr. Bob Hill. I'm not exactly sure of his title. I believe he was manager of the Certificate Management section at that time. And he was wanting to put together a time that we could meet and discuss a SAT.

I asked him if he could tell me what a SAT was because I had never heard that nomenclature before. He briefly explained to me that it was a Systems Assessment Team, I think is what he said. Okay. Which was a process under ATOS, okay, which -- which was used under ATOS for ATOS carriers in situations where they believed that they needed to do a safety assessment in one or more areas in a particular airline.

He mentioned at that time that he wanted to come over and speak with us about -- speak with Alaska Airlines about whether or not, okay, we would participate in -- in such an audit, and he further explained that the findings for that audit, okay, would be handled as if they were self-disclosures.

I don't recall anything else from that particular phone call as far as exchange go except that

I -- I immediately accepted and agreed that Alaska Airlines -- on behalf of Alaska Airlines that Alaska Airlines would participate in any audit or inspection that the FAA deemed necessary. And then we set a time, okay, that we could meet on that. And as I recall, the time that we would meet on that was -- it was very shortly after that. It may have been the same day, may have been the next day. But again, it was -- it was on or about the -- the 6th of March.

Mr. -- Mr. Hill came over to the office. As I recall, Phil Hoy was there. There may have been others, but I don't remember. We -- we again reviewed what -- what Mr. Hill had said on the phone the day before. He had brought a document with him which he had prepared that outlined some objectives, some processes to be followed, some team members and some inspection areas and so on for the -- for the inspection, which we discussed.

I raised the question again about how the self-disclosures would work because I wasn't exactly sure what the structure would be since the team that was being proposed was a joint team. Some of the members were Alaska Airlines. Some of the members were the FAA. And it was unclear to me exactly how self-

disclosure worked in that type of arrangement. So we talked about that a little bit more.

Mr. Hill explained -- and it was actually in his -- in the handout that he provided, he explained that this was a process that had been used before. While there wasn't a lot of experience on it, it had been used. I believe the two airlines were Southwest and Northwest. They can be referenced in one of the -- one of the exhibits.

And we talked about team members. We talked about the -- the subjects or the objectives, if you will, of the investigation. And I believe what we did is we agreed to meet again, okay, sometime afterwards. There was some recommendations that we made relative to the objectives of the -- of the inspection as well as some other pieces of the document that were provided.

And again, this issue on how a SAT worked. I asked 'em whether or not there was any paperwork that was available, whether -- or something that were used at the other airlines that he named that could help guide us and help us understand the process or anything else that perhaps he could provide that helped us just make sure that we understood how this whole thing

worked.

We set a date to get back together. I don't recall what the date was, but it was on a fast track, so I'd say that it probably wasn't more than a week away.

We got back together. At this point I -- I'm not sure whether it was -- we got back together personally or by conference call. We got back together. He had -- I had received -- again, don't remember whether I received it because he came to a meeting in my office or whether or not it was sent over, but I did receive an excerpt from some FAA publication -- I'm not sure what it was. I also believe it's one of the exhibits -- that outlined a SAT. And it talked about -- talked about the process, talked about how it was used, talked about receiving carrier input on -- on -- on various issues. There was nothing available from the other carriers that he was able to provide.

So at that second communication I asked him whether or not he thought it would be appropriate for us to try to craft some kind of agreement that would conceptualize what we had talked about. And primarily because I had never done a SAT before and we were

entering into some ground that I wasn't -- I wanted to make sure we understood what we -- we had agreed upon.

And however it transpired, okay, we took the charge. Alaska Airlines took the charge of crafting -- beginning to craft that document.

We had another meeting scheduled for March 16th. As I recall, it was moved around a couple times but it ultimately ended up, as I recall, coinciding with a weekly meeting that we had with the FAA. We had a weekly meeting. This is not the same weekly meeting that was referenced earlier by Mr. Hinman and Mr. Fitzpatrick. That was a meeting that would occur with just the PMI on purely maintenance and engineering issues.

This meeting is one that we began shortly after the accident and just to make sure that the FAA was kept informed with everything that we were doing at the time.

Since that was a regularly scheduled meeting, we -- we decided that would be a good time for our next update and to just drive down the path we were going and see what we had agreed upon. That was -- should be the last -- that -- that ended up being the last meeting of the -- that was scheduled to talk about the

SAT, and ultimately the SAT never took place.

MR. McGILL: The draft agreement that was drawn up that's on page 22 of 11(X), that was then initiated by -- by Alaska Airlines?

THE WITNESS: That's -- I believe so. Page 20 --

MR. McGILL: 22 of --

THE WITNESS: Okay. Got it.

MR. McGILL: -- Exhibit 11(X).

THE WITNESS: Right.

(Pause)

MR. McGILL: And why was this not done? What -- what kind of event would -- change this?

THE WITNESS: Well, relative to the -- the page of the document that you're referring, that draft agreement, I reviewed that draft agreement once during the -- the whole process of that. And I reviewed it at request of counsel who we asked to put some words together. And just to make sure that it accurately represented what I believed we had agreed to in the discussions, and I agreed to that. And then from that point on I never saw it again, and I really don't know what the exchange was between counsel and the FAA or where this was in the process between Alaska Airlines

and the FAA.

MR. McGILL: So you were under the impression that in your earlier meetings with the FAA this was basically what ya'll had agreed to to allow Alaska to have some sort of -- of -- in the inspection itself some sort of protection?

THE WITNESS: Yes.

(Pause)

MR. McGILL: Dana, can you pull up Exhibit 11(M)?

(Slide)

MR. McGILL: Mr. Fowler, we've -- we've jumped around on this MIG 4 a little bit from several perspectives, but your coordinator said that maybe you could help explain a little more about it and maybe clear up some of the areas that we were looking at in this document.

THE WITNESS: Well, I'll -- I'll do my best. I'd like to preface my comments by saying that I actually have absolutely no first-hand knowledge of this document. I was not aware of it in -- in September of 1997, and I only became aware of it in the course of this investigation. So -- and my understanding about what I'm about to tell you is based

solely on my review, okay, and my briefing on the -- on the information and documents that have already been submitted by Alaska Airlines to the NTSB as well as any general knowledge I may have on this particular -- on this particular form.

So I'll do my best, but I'd like you to understand that I don't have first-hand knowledge. I'm -- I'm trying to represent the best I can submissions that we've made.

MR. McGILL: Okay. That's fine, sir.

THE WITNESS: What this -- what this document is when it's blank is it's called a MIG 4. Some of the mechanics refer to it just as a MIG. And what it is is it's one of the forms that would be used in maintenance to document non-routine work. That would be work that was not captured someplace else. It was -- be work that wouldn't be -- generated by a -- a logbook item or a task card or an EO or something like that. Any -- it's one of the forms used to document other work.

The -- the top half of the form is mostly filled out by an inspector. At least, the discrepancy is filled out by an inspector. And you'll see in the center portion of the form there's a planned action, and then in the lower portion of the form it provides

what the corrective action is for the -- for the work that was written up in the -- in the top.

This particular one, the work required that was written up, it says, "horizontal stabilizer, Acme screw and nut has maximum allowable end play limit," and parenthetically it's 40 thousandths of an inch.

The -- the planned action -- and again, that was entered by an inspector.

The planned action is usually entered by a lead mechanic. And in this case, the initial planned action was written as "replace nut and perform EO 8-55-10-01."

I'd like to jump down to the box that says "authorized by," and "authorized by" is a supervisor. And what the supervisor is -- is doing is he reviews the card. He fills in a number of boxes at the top. He'll fill in the priority box that you'll see up there on the top line. He'll fill in "number of men," "skill," man -- "estimated man hours." And then he'll -- he'll sign it or initial it and pass it along for subsequent action.

In this case the planned action was altered. The planned action was crossed out and it was initialed by the individual that crossed it out, which

is per our GMM procedure. And the planned action was rewritten. It said, "reevaluate test per work card 24627000," which was the same work card that showed reference at the top where it says "generating item," which is the work card that generated this -- this MIG 4.

At the bottom you'll see that the corrective action was "rechecked Acme screw and nut end play per work card. Found end play to be within limits, 33 thousandths per Step 11 and one thousandth per Step 12. Rechecked five times with the same result." It's signed off by a mechanic and an inspector, a different mechanic and a different inspector than did the original test.

And it's -- it was reviewed by and signed off by -- it was reviewed by a lead, and the signature where it says "reviewed by" is generally affirming that the paperwork has been completed. He may or may not have been actually present during the corrective action being taken.

MR. McGILL: Looking at this, is that -- you said in your maintenance manual procedures that a lead could scratch through another lead's planned action, is that correct?

THE WITNESS: No, that's not what I said. What I said that whenever anyone crosses something out and alters an entry the procedure for doing that is to cross it out with one line and then initial and date it.

MR. McGILL: Okay. Then I will ask, is that proper to do that after that planned action has been authorized by a supervisor?

THE WITNESS: It's not improper. I wouldn't call it -- from what I've been told -- again, I don't have any first-hand knowledge of this. From what I've been told from the basis of our research and -- and speaking to various folks in the -- in the work place, it's not a frequent occurrence, okay, but it does happen on occasion.

MR. McGILL: Since the task card itself that originated this MIG was already completed and that was how the 40 thousandths was determined, would not another -- another task card or perhaps even another MIG 4 been generated?

THE WITNESS: If I understand -- if I understand, what you're asking is whether or not he should have -- the proper vehicle was to use a MIG 4 or whether the proper vehicle was to issue another task

card. And it's my understanding that the proper vehicle to address additional work done is to use the MIG 4.

(Pause)

MR. McGILL: On the original -- and I know you don't have it there, but the -- on the original card there's some colorations, one in "priority" section which is actually an orange, and there's a yellow code in the -- in the area. Could you explain what those two color codes would mean?

THE WITNESS: The part of the procedure for the -- the handling of a MIG 4 says that in response to how it's prioritized the priority box would be marked one through four. And there are colors associated with the priorities. And the color for priority one is orange. Is that what you said? That --

MR. McGILL: Yes.

THE WITNESS: Okay. So this was prioritized as a priority one. It was color-coded as orange, and that would have designated to folks that are familiar with the colors -- I'm not, okay -- it's priority as well as what box it would be put in for processing and so on.

The -- in the upper left-hand corner where it

says "zone area," if that's color-coded yellow, okay, it indicates that parts research may be required.

MR. McGILL: The -- the dates when the -- when this was generated, it shows 9/27/97. And the corrective action for the recheck was done three days later on the 30th of September.

(Pause)

THE WITNESS: That's correct.

MR. McGILL: Can you perhaps know anything why that would take three years -- three days to accomplish that?

THE WITNESS: Actually, the planned action was entered, we believe from -- from piecing things together in the investigation, okay, on the -- the day shift on Saturday. The 27 September was a Saturday. Day shift is between 6 and 10:30 p.m. So that planned action would have been entered sometime between 6 and 10:30 p.m. And the corrective action was accomplished on the night shift on the 30th, which is actually the night of the 29th. So the night shift of the 30th runs from 10 p.m. on the 29th until 6:30 a.m. on the 30th. So the planned action was done sometime within that two or two-and-a-half day time frame.

And no, I do not know why there was a

difference between -- why there was that amount of time between those -- those two actions.

MR. McGILL: Could you elaborate on why we were unable to locate a shift turnover log during that same period?

THE WITNESS: I'm sorry. That's not one of the things that I was briefed on, so I can't answer that question.

(Pause)

MR. McGILL: And who -- who briefed you on this card, Mr. Fowler?

THE WITNESS: Counsel did.

MR. McGILL: Do you know if a jackscrew assembly was in stock during this time in September of 1997?

THE WITNESS: There was no jackscrew assembly in stock at Alaska Airlines at that time.

MR. McGILL: Do you know if one is available?

THE WITNESS: I don't know.

MR. McGILL: Do you know if one was ordered by Alaska Airlines?

THE WITNESS: Based on reviewing the documents, it does not appear so. The reason why I say that is that since it was not a stock item if it were

ordered there would have been a field requisition process. There's a field requisition log associated with each heavy check, and in reviewing the field requisition log for the C check on 963 in September of 1997, there is no entry of logging a field req for the order of a jackscrew. So we did not believe so.

(Pause)

MR. McGILL: Mr. Fowler, we -- we've had several testimonies about an aircraft or maybe two airplanes that had pitch difficulties in Fairbanks. Would you have any knowledge that you could share with us about those airplanes?

THE WITNESS: I believe I could speak to it generally and maybe tie some of the pieces together 'cause I know there have been parts of testimony from various preceding witnesses. I don't know that I know all the detail, but I'll give it my best shot.

MR. McGILL: Thank you.

THE WITNESS: As I recall, the initiating incident occurred in -- out of Fairbanks and into Anchorage February -- early February 1999. As I recall, the -- the pilot report was that -- I wasn't sure of the exact words. It was either that it -- it -- it was slow to rotate or it didn't respond as he

expected to control -- control column input on takeoff.

Nonetheless, that was ridden up into -- into Anchorage. And when the airplane got to Anchorage we obviously stopped the airplane to -- to do a lot of investigation. I think it was also at that time that we notified the NTSB. And they had -- unfortunately, they already off-loaded the airplane so I don't believe that a -- a validation of the weight and balance of the airplane was possible.

So we got Engineering involved and Tech Services involved and started identifying those checks that we could do to the airplane to ensure ourselves that the serviceability of the system because when the airplane arrived at Anchorage nothing could be duplicated. The system operated normally.

Ultimately, the checks that were prescribed by either Tech Services or Engineering, I don't recall precisely which one, okay, were accomplished and nothing was found. I don't recall whether precautionary work was done, but essentially we didn't have an answer.

The airplane was dispatched and the item never repeated on that airplane. However, it caught the attention of the Flight Safety Department in Flight

Operations and was immediately brought to the attention of Maintenance and Engineering as well as the Internal Evaluation Board, which is how I found out about it.

The Internal Evaluation Board carried it on their agenda even though the -- the -- the proper coordination was occurring between Flight Operations and Engineering to see whether or not they could identify what the cause of this was.

The -- the gathering of data and the analysis and -- and trying to arrive at a solution, quite frankly, I think drug on way too long. But nonetheless, it was as exhaustive as could be. Spoke with other airlines, spoke with the manufacturer. They bantied around different theories. The first theory was that it may be lubrication because they had spoken with I think it was SAS and they had recommended -- they had said they had -- they had a lower lubrication interval.

There was a lot of discussion, as I understand it, none of which I was involved with, with the Boeing Company in -- in partnering with them and getting them involved with the investigation as well.

I believe that the -- the outcome on the grease was that there was not consensus that

lubrication could have caused the problem. As a matter of fact, the report that I think I read indicated that the -- the grease that we had on the airplane actually was less viscous at that low temperature than the Mobil 28 would have been.

The -- then they -- they -- the analysis or the investigation, if you will, into trying to explain that -- that event went into looking at the stall augmentation system, which is a series of -- I don't want to speak like I know it because I'm not an expert on that system, but it's a series of actuators and debooster valves and so on and so on. And there was theory that if one stuck, you know, it could have caused the problem and so on.

By the way, as I recall, flight data recorder information also confirmed that elevator unstick came at a -- a much higher speed than it should have, so it's -- it was not -- it turned out that it wouldn't have been weight and balance anyway. The elevator didn't unstick.

So in exhausting that and doing tear-down on those parts and all those parts were replaced, it was still inconclusive. I think at this point we were now late in the year, and I attended an IEB meeting late in

the year. I guess it was sometime fourth quarter. I, quite frankly, was a little impatient that it had gone this far and we didn't have an answer and hadn't done anything yet. So I -- I instructed the Maintenance and Engineering division to lower the interval on the grease -- on the lubrication.

I did that not because we had anybody that agreed it was the lubrication but because this was an event that I thought, we need to do something. And we didn't have any other answers and it seemed like the most prudent thing to do. So that's where it went -- that's -- I believe 'cause I backed out of it at that point.

And as I recall, I also made that mention to the Airline Pilots Association when the issue was brought up at the December 16th, 1999, quarterly Flight Safety Committee. I committed to them that the interval was being lowered on the lubrication.

So I believe that that's -- those are the events that led up, generally, to the proposal to the -- whichever it was, the MRB or the RAP Control Board, to lower the interval on the lubrication of the tail.

The -- that -- that proposal was to lower the

-- the lubrication on the tail, not the jackscrew. It only had to do with the rudder and the elevators. The jackscrew was never an issue. And it's my understanding -- again, I haven't been engaged with the company for a number of months, but it's my understanding that that change did in fact take place because if we look at our program now -- and I haven't done anything more than that so I haven't tracked it. If we look at our program now, the interval for lubricating the tail is 550 hours. And as you know, the airworthiness directives that came out after the accident relative to jackscrews did not address lubrication of the rest of the tail.

So -- so clearly, since it was -- it's now been changed, it was changed as a result of an action other than the airworthiness directive. I hope that that helps.

MR. McGILL: Yes. Thank you. Since you're kind of wrapping up things, I'll have one more question here. Can you shed any light to the different issues that we've been discussing about the tool audit that was performed at Alaska Airlines?

THE WITNESS: I -- I've listened -- I -- I -- I think I can add something. I'm not sure if I can

answer all the questions.

I've heard prior testimony of the -- a few prior witnesses that -- about tool audits. And as I was listening to the testimony, it was my observation that I think that there was confusion in some of the testimony, okay, with respect to which audit they were talking about. If we could just confine ourselves to the audit that had to do with -- or the investigation or research, whatever you want to call it. If we would just confine ourselves to the -- the audit, if you will, or the investigation that was being performed to identify, okay, why, okay, we had tools -- restraint tools in -- in -- in Alaska Airlines, okay, that did not conform exactly to the drawing. I'm not sure it was ever determined that they didn't conform relative to equivalent form-fit function, but I know that Engineering had a concern that they didn't conform to the drawings.

That particular investigation, okay, was really essentially initiated by me. And I believe that I mentioned that in my August interview with the NTSB 'cause I was asked the same question during that interview.

And I think -- I believe at that time I also

provided that I had initiated an audit, okay, to identify -- I think the question asked of me at that interview was, you know, well, you know, why'd you have these tools in the system and I frankly admitted that I had the same questions and launched off on an audit. And I was asked where that audit was at that time, and I said that the audit was being conducted by counsel and I had no other information past that point. And again, I disengaged from the company pretty quickly after that so I can't tell you at this point what the outcome of that audit was or what was found or anything else.

Relative to the other audit which was mentioned, I know very little about that but I believe that that other audit, okay, may have been the one that was requested by the PMI that had to do -- that was stated or alleged to be requested by the PMI, okay, that had to do with auditing Alaska's entire tool inventory to make sure that there were no other tools that were at issue of non-conformance.

MR. McGILL: Thank you, Mr. Fowler. I have no further questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Mr. McGill. Mr. Rodriguez, do you have a few questions?

MR. RODRIGUEZ: Just a few, sir, yes. Mr. Fowler, with respect to the tool issue that we were just discussing, if there was a conflict between the maintenance side and engineering side as to reproduction of tools, say without a drawing, how would that be resolved in your company?

THE WITNESS: You know, Dick -- Mr. Rodriguez, I would have to look at the -- I'd have to look at the GMM and see what it said. But a drawing's a drawing, and it's either approved or it's not.

MR. RODRIGUEZ: Well, I -- I'm -- the question was if there was no drawing. Just here is a sample, make some more. And Engineering says no. How would that get resolved?

THE WITNESS: I'd have to check the GMM. I think it's important to see what the GMM procedure says before I'd actually give you an answer to that.

MR. RODRIGUEZ: All right, sir. In the '97 time frame you had the title of, at the end, System Control, which I guess is the interface between the aircraft in Maintenance and coming out into Flight Operations. Were there any problems with the flow of the aircraft from Maintenance into -- back into the line operation?

THE WITNESS: Maybe we could -- I think that's two questions, and maybe I could address the -- address it as two questions, if you don't mind?

MR. RODRIGUEZ: Sir.

THE WITNESS: Let me first -- let me first address your understanding of System Control. I didn't have responsibility for System Control, if you will, until after I was promoted to executive vice president in 1998, okay. And what System Control was, it really wasn't -- it didn't have anything to do with airplanes per se. It didn't have anything to do with airplanes coming out of Maintenance and going into the system.

What System Control was was Alaska Airlines' implementation of a formal system operations control center. Okay. Some airlines call it SOC; some airlines call it operations control center. Alaska Airlines always had the required operational control -- control constituents in their Operations vis-a-vis the dispatchers. And there was always coordination, if you will, between the dispatchers, Maintenance and Engineering, okay, a duty director, and so on.

What we set out to do was to expand that and to provide representatives in there for Customer Service and, where appropriate, people from Storage

Department on AOG parts and things like that generally to provide a -- a better model of communication and coordination between operating divisions to operate as effectively and efficiently as possible. So that's what System Control referred to.

Relative to the flow of aircraft, and I believe what you asked was were there difficulties with aircraft coming out of Maintenance at that time, and I'm not exactly sure --

MR. RODRIGUEZ: On schedule, yes, sir.

THE WITNESS: Well, I don't remember specifically. Okay. I don't remember specifically whether there were problems coming out of Base Maintenance or Line Maintenance early or late at that time. I would have to refer to a performance chart.

MR. RODRIGUEZ: That was what I would characterize as an expanding era for Alaska Airlines, was it not?

THE WITNESS: Actually, I think I would characterize the '90s as an expanding era for Alaska Airlines.

MR. RODRIGUEZ: And to your recollection, you had no specific major problems with how you were keeping up with the expansion, is that your testimony?

THE WITNESS: That's my testimony.

(Pause)

MR. RODRIGUEZ: I -- I've been puzzled by the MIG 4 and the -- the replacement -- the planned action which says "replace nut with a 40 thousandths end play." From your maintenance experience, do you see any reason to replace a -- a part that is within tolerance?

THE WITNESS: I do not.

MR. RODRIGUEZ: Is there a reason why they would duplicate the work when it already has passed?

THE WITNESS: I wasn't there. I didn't do this so I can't answer it, but I think you're asking for my opinion.

MR. RODRIGUEZ: Yes, sir.

THE WITNESS: When the -- when the item was generated, okay, you certainly couldn't tell from this MIG, okay, what the intention was, okay. But we do know that in the testimony of the inspector that wrote the MIG. When he was asked why he wrote it he stated that he didn't really remember and he believes he just wanted a second opinion. Now, clearly, the 40 thousandths is a "pass." And as -- as we heard from testimony that occurred on -- on Wednesday, it's not

only a "pass" but it still has 10 times the strength it needs to perform its function. So it would have been extremely appropriate for somebody to sign the item off saying, okay, that it's within limits, no further actin is required. That would have been 100 percent appropriate.

So I believe that reevaluating it was a much more prudent action and that's why they did it. Again, I'm just giving you my opinion. I wasn't there.

MR. RODRIGUEZ: In -- in -- based on your experience and background, would it indicate to you a need for training or education or making mechanics aware of what the tolerances were or anything of that nature? This is almost a $60,000 part, approximately, that we are dealing with here.

THE WITNESS: Well, the -- the price of the part is kind of a not-issue here because mechanics order whatever parts they need for the airplane. But -- I forgot your question.

MR. RODRIGUEZ: Well, the question was would that -- would this, based on your experience, suggest a need to ensure that mechanics are aware what tolerances are -- are applied to various parts? I mean this clearly is not following the -- the procedures in your

manual. I don't mean the procedures; the limitations in your manual.

THE WITNESS: I think I have two answers to that. Okay. The -- the -- the limits are -- are stated in the task card, so there's not a question about what the limits are. However, you know, we never have a problem with a mechanic or an inspector asking for a second opinion.

MR. RODRIGUEZ: All right. Sir, I have no further questions.

MR. HAMMERSCHMIDT: Thank you, Mr. Rodriguez. Are there other questions from the Technical Panel at this point?

(No response)

MR. HAMMERSCHMIDT: Then we will go to the parties to this hearing for questions, and we will again begin with Boeing.

MR. HINDERBERGER: Thank you, Mr. Chairman. We have no questions for this witness. Thank you.

MR. HAMMERSCHMIDT: Thank you, Mr. Hinderberger. The Aircraft Mechanics Fraternal Association?

MR. PATRICK: No questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Mr. Patrick.

Going next to the Airline Pilots Association?

CAPTAIN WOLF: Thank you, Mr. Chairman. Good evening, Mr. Fowler. How you doing?

THE WITNESS: Mr. Wolf.

CAPTAIN WOLF: Just a few questions. Over the past 10 years, what was the rate of staffing or staff increases and to what departments was the staffing increased the most during our expansion era?

THE WITNESS: I couldn't begin to tell you that without looking at data. But I can tell you in a more global look, and I've looked at it from 1993 to 1999. The reason why I chose that time frame is because Alaska Airlines' growth took hold mostly in 1993 and then on through '96 where the -- where it began to flatten but still nominal growth after that.

So in the period 1993 to 1999 -- and the only numbers that I've researched in preparation for this -- this -- this testimony, okay, is that overall in Maintenance and Engineering the -- the mechanics' ranks, mechanics and -- Line Maintenance mechanics and Base Maintenance mechanics, those ranks increased by about 35 percent.

CAPTAIN WOLF: Were any recommendations made to -- recently to Alaska Airlines while you were at --

in -- actively still working with the company? The increase in the number of -- other management personnel or inspectors? I know you said the number of mechanics were increased, but higher up the level.

THE WITNESS: What period of time are you speaking about?

CAPTAIN WOLF: The same period that -- during our -- our expansive growth in the '90s but also possibly referring to what the Enders Report had to say, what the FAA Action Report had to say.

THE WITNESS: If we separate pre-accident and post-accident, the answer is yes in both -- both occasions. Certainly, before the accident over the years that I've been here there have also been steady additions to staff which -- I mean management as well as inspectors and stock clerks and -- and so forth.

After the accident, after the independent safety assessment that was done by Enders Associates as well as the FAA inspection, yes, we did add even additional staff.

CAPTAIN WOLF: You made mention earlier to the -- to the quarterly safety meetings that -- that take place within the company. Did you have any means at all to evaluate the effectiveness of these quarterly

safety meetings? No -- a type of a measure to -- of progress that perhaps took place as a result of 'em?

THE WITNESS: Well, it was certainly an opportunity to review what the internal audit activity and data was in all of the operating divisions. And past that, to identify what the benefit would have been, I think that that would be an exercise that would require going back over the minutes of the Internal Evaluation Board and seeing what items had been closed -- actioned and closed over that period. And I would make a presumption that had it not been for the Internal Evaluation Board, there's a possibility they might not have been actioned as -- as efficiently because there was nobody that would take up that charge.

CAPTAIN WOLF: Okay. Again, while you were still actively involved with the company, what type of grease was being used on the -- on the jackscrews at the -- at the company after the accident or just -- subsequently prior to that?

THE WITNESS: If you're asking me what my knowledge was at the time of the accident, I couldn't tell you.

CAPTAIN WOLF: So you don't know whether any

of our aircraft still have AeroShell 33 on the jackscrews or --

THE WITNESS: Well, --

CAPTAIN WOLF: -- Mobil 28?

THE WITNESS: -- I'm clarifying what my knowledge was at the time of the accident. At the time of the accident, okay, I had no knowledge of what kind of grease was where, color, name, or anything else. If you're asking me what my understanding is, is the status of the fleet right now, is that your question?

CAPTAIN WOLF: Yes.

THE WITNESS: My understanding of the status of the fleet right now is that the MD-80 has been modified or converted back, if you will, to all Mobil 28 in all areas where -- where formerly applied and that the Boeing airplanes are still using AeroShell, which was the cut-over that was made earlier in '96 or something like that.

You asked about jackscrews. Okay. I don't know what the jackscrew grease is on the Boeing airplanes. The jackscrew grease currently spec'd on the MD-80s for Alaska Airlines is Mobil 28.

CAPTAIN WOLF: Right. And so obviously, the -- if there was AeroShell 33 on -- on the jackscrews

there on the MD-80s and they were properly purged or whatever according to whatever procedures that were made available from Boeing?

THE WITNESS: I have not reviewed those procedures and I haven't reviewed the task card so I can't answer that with certainty.

CAPTAIN WOLF: Okay. All right. Thank you. No further questions.

MR. HAMMERSCHMIDT: Thank you, Captain Wolf. Going next to the Federal Aviation Administration.

MR. DONNER: Thank you, sir. Just a few, Mr. Fowler. Going back to the MIG, you stated that counsel briefed you on the contents of that work card, is that correct?

THE WITNESS: Well, counsel briefed me on the -- the information contained in the documents that were submitted to the NTSB, okay, which was the results of their investigation or research into the -- into the subject. Which, I mean, related to the work card, yes.

MR. DONNER: And -- okay. When you stated you had no first-hand knowledge of the information contained on the work card, and I -- I take it that counsel didn't have first-hand knowledge either of -- of these items?

THE WITNESS: What period of time are you speaking about, sir?

MR. DONNER: I'm talking about the work card we're talking about on replacing the jackscrew.

THE WITNESS: I understand that, but are you talking about what knowledge I had or what knowledge counsel had pre-accident or post-accident?

MR. DONNER: Post-accident.

THE WITNESS: Post-accident I don't know how they could have first-hand knowledge. I mean --

MR. DONNER: Well, let's go pre-accident then. At -- at the time it was filled out and shortly thereafter did you have first-hand knowledge of it?

THE WITNESS: I had no knowledge of this item whatsoever, okay, until after the accident.

MR. DONNER: Do you know where counsel got their information from again? I'm sorry.

THE WITNESS: I -- I believe from the interviews of witnesses along with the NTSB, okay, as well as going over various documents within Alaska Airlines which had been submitted to the NTSB.

MR. DONNER: Okay. Are you familiar with the end play check procedures in -- in any degree of detail?

THE WITNESS: Not really. I've never done it. I've only -- I've only read the work card. I can try to answer a question but I wouldn't be on personal knowledge.

MR. DONNER: Okay. My question would be then from the time that the work card was filled out till the time of the accident, were there any changes in the procedure for -- in measuring end play?

THE WITNESS: I don't know the answer to that.

MR. DONNER: Okay.

THE WITNESS: If you're talking up until the time of the accident, I don't know the answer to that.

MR. DONNER: How about after the accident? Were any changes made?

THE WITNESS: I -- I understand that there were several changes made to the procedure used for the end play check on the jackscrew of the MD-80.

MR. DONNER: Are you familiar with them? Do you know what they were?

THE WITNESS: I don't -- without referring to a document I don't know that I could accurately describe all of them. I can describe the ones that I'm aware of. I don't know that that would be a complete

list.

MR. DONNER: Okay. We'll be very happy with a partial list of what you're aware of.

THE WITNESS: I understand that during a lot of the investigation, the work that was done with the Systems working group and the NTSB in conjunction with Alaska Airlines and perhaps other airlines, that there was a discovery that when the restraint fixture -- when the torque was applied to the restraint fixture that the jackscrew may move and therefore alter the reading.

So it was added to the procedure to -- I'm not sure of a detailed portion of how the mechanic determines if the jackscrew moved, but it was added to the procedure that it may be necessary to restrain the jackscrew. So that was added to the procedure, and I -- as I recall, testimony on Monday indicated that -- that same thing. Okay. And they also indicated that in their -- in their data, if the jackscrew did move it would result in a higher reading rather than a lower reading. So that was one of the changes that was made to the procedure.

The other change that I know was made to the procedure was to perform a pretest inspection of the restraint tool itself. I don't know exactly what that

was comprised of, but I understand that was added.

I also understand that there was a change in the -- in the way the torque was applied, and that actually was two changes, as I recall. One change was that the original instruction said to apply 250 to 300 inch-pounds of torque to the fixture. And I believe that that was changed in a later post-accident procedure to apply 300 inch-pounds of torque.

And the last change that I recall, and I don't know if this is an exhaustive list or not, the last change that I recall was the original procedure called for applying torque in one direction and then just relaxing that tension on the restraint fixture to let the stabilizer go back to stabilizer, leading edge nose up. The revised procedure applied torque in one direction and actually applied torque also in the opposite direction to -- I assume to make sure that the assembly had gone to its complete limit up against the other side of the threads. Those are the only changes that I recall in the procedure.

MR. DONNER: Okay. Then you don't recall, I guess, if there were a specified number of measurements to be taken?

THE WITNESS: I don't believe that's changed.

The original procedure has always been, and I -- I can refer to the document here. The original procedure always called for several measurements to be taken.

MR. McGILL: 11(L).

THE WITNESS: I'm sorry?

MR. McGILL: 11(L).

THE WITNESS: 11(L). The 11(L), page number 2, if you look at step number 10, it says, "repeat steps 8 and 9," which are the test itself which I described, "several times to ensure consistent results." I -- it's my understanding that that was always part of the procedure, okay. I don't know that's changed, but I know that the requirement to repeat the test several times to ensure consistent readings within one thousandths of an inch was part of the procedure that was in effect at the time of the accident and in fact in September of 1997.

MR. DONNER: Okay. I have that and I see it, and it does say several times but it doesn't specify how many. And it wasn't -- it also doesn't say if an average was taken then or if there was a tolerance on the -- the highs and lows that were taken if they were out of what one would expect to be normal limits of readings. Do you know anything about that?

THE WITNESS: The only thing I know about that is from having spoken with mechanics in Oakland who have done the test and asking them the question, okay, what readings do you take? Do you take readings and do you average them? And the answer that I received from all of the mechanics that I spoke to is no, they don't average the readings. What they do is they do what the work card said, and that is to continue the test until they get readings that are within one thousandth of each other.

MR. DONNER: Okay.

THE WITNESS: That's not an average. That's the -- there's no more than one thousandth of an inch difference and they use the higher reading.

MR. DONNER: Okay. Thank you. That answers that. Was there any particular training or OJT for your mechanics on taking those readings?

THE WITNESS: Not that I'm aware of.

MR. DONNER: Okay.

THE WITNESS: Are you talking -- you're talking pre-accident or post-accident?

MR. DONNER: Well, I'll talk both pre- and post.

THE WITNESS: Pre-accident, not that I'm

aware of.

MR. DONNER: Mm-hmm.

THE WITNESS: Post-accident what we did because of -- you know, after the accident and all the information that was rolling in was beginning to -- beginning to make us wonder how many other variables there may be in this test because of the changes in procedure that we'd already seen as well as other things that we had learned.

So we sent -- we sent folks down to Phoenix. This was in August when we did the -- the test in -- in August. We sent folks down to Phoenix to oversee the tests down there. Earlier we had sent individuals down to Phoenix to train some mechanics down there. We had already decided to schedule all of the end play checks, if you will, in Oakland, okay, where it would be pretty much the same crew that was doing the check over and over again. And we did the tests in August because of the question about the tools. We also did some of them in Seattle.

So in order to assure the accuracy of those tests we sent one of our structural engineers over there who had been working close to the investigation and was very familiar with the procedure.

MR. DONNER: Going back to the mechanics that conducted the -- the test, the 040 test, did you read, by any chance, the transcript of their interviews with the NTSB?

THE WITNESS: I did not read the entire transcript, no, sir.

MR. DONNER: Thank you, sir. Thank you.

MR. HAMMERSCHMIDT: Thank you, Mr. Donner. And going, finally, to Alaska Airlines for questions.

CAPTAIN FINAN: No questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Captain Finan. Now proceeding to the Board of Inquiry for questions. Mr. Berman?

MR. BERMAN: Thank you, Mr. Chairman. Mr. Fowler, you described in some detail the various programs that Alaska Airlines has of safety, continuing airworthiness, surveillance, reliability, internal evaluation. Recently the FAA conducted a nationwide survey of nine of the 10 largest airlines to evaluate those very programs. Did they evaluate Alaska Airlines in those respects post-accident?

THE WITNESS: Well, as you know that Alaska Airlines, the FAA conducted a national safety inspection at Alaska Airlines beginning in early April.

I don't know what the criteria was used at the other nine major carriers that were recently inspected by the FAA so I -- I can't say whether it was similar or dissimilar.

MR. BERMAN: But they did evaluate those programs as part of a national program --

THE WITNESS: And I'm sorry. Which programs were they, sir?

MR. BERMAN: IEP, safety, CAS, reliability.

THE WITNESS: I don't recall specifically.

MR. BERMAN: Okay. Thanks. I was just wondering the results if they did.

Now, with respect to the --

THE WITNESS: I believe the results of the national safety inspection have -- have been shared with the Board.

MR. BERMAN: Yes, I know they are. Yeah. And those, I understood, were related to them following airplanes through C checks and such, but I wondered if there was additional. With respect to the task card -- I'm sorry, the -- the MIG 4 that had the .040 reading and the .033, in your testimony a couple minutes ago about how it's called out to recheck the figure, are you implying that that was not done when the .040

reading was obtained?

THE WITNESS: No, sir, I'm not.

MR. BERMAN: So do you have any explanation for how that could arise with a -- if they had repeated that test and gotten 040 to then obtain a much different figure.

THE WITNESS: Given the litany of changes that I've just gone over and how the procedure has changed, I would offer that one of them may have been a variable. I really don't know. I didn't do the test.

MR. BERMAN: Okay. Thank you. No further questions.

MR. HAMMERSCHMIDT: Thank you, Mr. Berman. Mr. Clark, any questions?

MR. CLARK: You -- I understand you made a comment that -- talking about the Fairbanks MD-80s, that the lube intervals only applied to the elevators. And is that correct?

THE WITNESS: I -- what I was referring to, I don't remember exactly what I said. What I was referring to is that the only lube intervals that were changed as a result of the action we took in response to the incident of the Fairbanks airplane were the tail, not including the jackscrew.

MR. CLARK: Okay.

THE WITNESS: They were always -- they were always tracked on -- on, I believe an hour -- no, a monthly limit, I think it was. But they were always tracked. It's just that those were the only intervals that were changed in response to hour work.

MR. CLARK: Okay. Now, is that in the same area that we were talking -- there was a earlier discussion about the meeting on an ME01 that dealt with that -- the lube intervals on -- on the MD-80s?

THE WITNESS: I --

MR. CLARK: Are we talking about the same issue here?

THE WITNESS: Well, I wasn't at that meeting, but if -- if you piece the -- the chronology together, I believe --

MR. CLARK: Probably the same meeting. And for an ME01 to be going through in -- a minute ago you said you ordered that the intervals be reduced?

THE WITNESS: That's correct.

MR. CLARK: How was that -- how was that implemented? Does that go through this ME01 process?

THE WITNESS: I didn't track it after that, sir. I don't know.

MR. CLARK: Who did you order to do that?

THE WITNESS: As I recall, I asked -- it was -- it was in one of the Internal Evaluation Board meetings that we were having. And as I recall, I -- I told Jim Trimberger to take the message back to M and E and say we need to change the intervals.

MR. CLARK: Would that have been the thing that prompted this ME01 meeting?

THE WITNESS: I -- I can only speculate.

MR. CLARK: Okay. And -- and do you know if the change was implemented on the elevators only?

THE WITNESS: The change was implemented. I don't want to say --

MR. CLARK: Or not --

THE WITNESS: -- on the elevators only. The tail lube -- the tail lube --

MR. CLARK: Exclusive --

THE WITNESS: -- interval of the MD-80 was changed.

MR. CLARK: It was exclusive of the jackscrew?

THE WITNESS: Well, I'm not sure but the change may have not coincided with one another, but they were not initiated by the same action.

MR. CLARK: I lost you there. What -- what does that --

THE WITNESS: Okay. The -- as you recall, the airworthiness directive that was issued post-accident?

MR. CLARK: Right.

THE WITNESS: Okay. Required a change in the lubrication interval for the jackscrew. Okay. So that's the action that changed the lubrication interval for the jackscrew. It was this other issue and the action that was taken as a results of it that changed the lubrication interval for the tail. They may have coincided closely in the calendar time that they were implemented, but they were independent actions.

MR. CLARK: Right. And this stems out of a February '99 event?

THE WITNESS: That's correct.

MR. CLARK: Okay. And a year later the -- the lube changes were getting implemented -- or you gave the order to implement the changes because of the Fairbanks event?

THE WITNESS: As I -- as I believe I mentioned in my testimony, there was a lot of work being done, a lot of questions being asked with no

answers. And that drug on for a very, very long period of time. I'm sure that we could probably reconstruct everything that was happening during that period, but it was toward the end of 1999 when it appeared as though everything had been exhausted and nothing had been identified and I deemed that it was appropriate that we should do something.

MR. CLARK: Okay. I just want to make sure I was -- we were talking one and the same all the way through.

The -- you also mentioned that you ordered the -- a tool conforming audit, and then there was a second audit that was requested by the PMI of -- of a more general tools nature?

THE WITNESS: I don't have personal knowledge of the more -- the broader tool audit that was done of -- that -- that it's alleged that the PMI was involved with.

MR. CLARK: Okay.

THE WITNESS: Okay. I do have knowledge of the tool audit that we initiated immediately after the August activity that we had in going back and rechecking airplanes that had been checked with the tools that Engineering had a concern with.

MR. CLARK: Okay. And in that audit you said that you were the one that requested that be implemented?

THE WITNESS: I -- I initially requested that audit, and it was -- it was taken over by our general counsel's office.

MR. CLARK: What -- what was the purpose for you requesting that audit?

THE WITNESS: Well, because at the time I happened to be the officer in charge of a number of divisions, including Maintenance and Engineering. As I recall, Mr. Weaver was out of town with a -- with a family medical emergency. Our staff vice president of Maintenance was out of town because his wife was delivering their first-born, and I was -- I was sitting in at that time. And having just gone through the exercise of rechecking I forget the number of airplanes, some 17-whatever airplanes that we believed may have been checked with one of those tools, that was our first order of business was to get the airplanes checked and ensure their -- their airworthiness.

The second order of business is how did this happen.

MR. CLARK: It's a safety issue.

THE WITNESS: Which is the reason why I -- I requested that audit.

MR. CLARK: From a safety perspective?

THE WITNESS: Yes, sir.

MR. CLARK: Okay. Then how does it end up in the counsel's hands to conduct an audit? It seems odd that they're going to be conducting a safety audit for your organization.

THE WITNESS: Well, the -- shortly after the accident our chairman charged the general counsel, okay, with ensuring a totally independent and objective investigation with anything that we needed to do internally and with cooperation of the NTSB. And I think that -- I mean I think I'd sound naive if I didn't admit that with everything that was going on at the time, I mean there was certainly some question, okay, with what was happening in the Maintenance Department. And I don't think that it was inappropriate for them to want to make -- to ensure objectivity and make sure that there wasn't an allegation later on down the road that, you know, we were investigating ourselves and perhaps trying to, you know, not do such a good investigation. So that -- that was the reason.

MR. CLARK: Mr. Rodriguez, were you aware that these audits were going on? I think you've already said you were not.

MR. RODRIGUEZ: Mr. Fowler's testimony was that he told us in August at the interviews in Seattle. I was certainly there. I don't recall it.

MR. CLARK: Okay.

(Pause)

MR. CLARK: With those audits going on, from previous testimony it seems that Mr. Weaver was not involved in that at all. Does that seem reasonable to you?

THE WITNESS: Well, yes, it does because, as I've just testified, Mr. Weaver was out of time during the period this -- that this whole issue occurred. It occurred all -- over an -- over a period of two or three days. And by the time he had come back into town the -- the investigation, if you will, into everything that surround this -- this tool had already been transferred.

MR. CLARK: Okay. Thank you.

MR. HAMMERSCHMIDT: Thank you, Mr. Clark. Dr. Ellingstad?

DR. ELLINGSTAD: I'd just like to follow up

with a couple questions in relation to some of the things Mr. Donner was asking. You -- you basically implied that there has been some involvement with -- with training and end play checks subsequent to the accident?

THE WITNESS: That's correct.

DR. ELLINGSTAD: And specifically, has that come out of your office? How -- what kind of a formal training in that respect has been instituted?

THE WITNESS: I -- there -- there has not been formal training that I'm aware of, sir. It's been on-the-job training. There is not a formal training course that was developed. It was training mechanics on the job doing the job being overseen and -- and ensure they know how to do it by a supervisor or -- or a lead.

DR. ELLINGSTAD: And has this been -- has this been applicable to all of the mechanics that would perform these checks?

THE WITNESS: My understanding is that in Oakland today the same mechanics by and large are doing the check. If you're asking me whether or not I can tell you that there's assurance that mechanics that are doing the check are all those that have received this

on-the-job training, I can't tell you that.

DR. ELLINGSTAD: Okay. But the -- there was a specific action taken to -- to ensure that -- that the procedures were gone over with respect to this OJT?

THE WITNESS: Yes, there were. And the individual that was charged with that was a gentleman by the name of Dan Ho who is part of the metallurgy team for the NTSB in this investigation and he's a supervisor that works in the Oakland maintenance hangar.

DR. ELLINGSTAD: And why wouldn't Mr. Hinman and Mr. Fitzpatrick have been aware of this?

THE WITNESS: I -- I can't answer that question, sir.

DR. ELLINGSTAD: Okay. Thank you.

MR. HAMMERSCHMIDT: Thank you, Dr. Ellingstad. Are there other questions from the NTSB for this witness? Mr. Berman?

MR. BERMAN: Thank you, Mr. Chairman. I just had one or two questions to clarify something that you just said to Mr. Clark. Did I understand that you're -- are you quite certain that both lubrication interval changes for the tail surfaces excluding the jackscrew and the jackscrew, did those changes occur after the

accident?

THE WITNESS: That's my understanding.

MR. BERMAN: Did you order it after the accident?

THE WITNESS: Oh, no. No, it was -- it was before the accident.

MR. BERMAN: Okay. Could --

THE WITNESS: It was -- as I previously testified, this occurred third or fourth quarter in 1999. I think probably fourth quarter.

MR. BERMAN: Right. But you'd said there was a long period of analysis before your order to do it --

THE WITNESS: That's correct.

MR. BERMAN: -- was issued?

THE WITNESS: That's correct.

MR. BERMAN: But you did order it before the accident?

THE WITNESS: That's correct.

MR. BERMAN: Okay. Super. And when such a change would be made to cut a lubrication interval way down, would all the airplanes that were right now -- right at that time above that interval, past that interval, would they be called in to Maintenance very quickly to have the lubrication done?

THE WITNESS: I can't tell you how it was done in this particular instance, but what I can tell you is that whenever there's an interval change and the interval change is in a decreasing direction of time there's a phase-in program that's developed with Engineering and Maintenance Planning that's agreed to on how to get it phased into the system as quickly as possible.

MR. BERMAN: Okay. Thanks very much. No further questions, Mr. Chairman.

MR. HAMMERSCHMIDT: Thank you, Mr. Berman. Mr. Fowler, you've been a very articulate witness and we have appreciated your responsiveness to -- to these several questions. Is there anything you would like to add to clarify our record on the facts and circumstances of this accident? Earlier -- earlier you mentioned that you wanted to clarify something that had been testified to I think by Mr. Hinman and -- and Fitzpatrick, but is there any -- are there any further clarifications you wish to make?

THE WITNESS: Not that I have at this time, sir.

MR. HAMMERSCHMIDT: Okay. In that case we thank you very much for your participation in this

public hearing and your cooperation with our investigation. You may stand down.

THE WITNESS: Thank you, sir.

(Whereupon, the witness was excused.)

MR. HAMMERSCHMIDT: Well, Mr. Fowler will be our last witness for today's session.

We have made very good progress in terms of working through the witness list today, greater progress than we anticipated when we began this morning, and I wish to thank all those involved in that overall process for their cooperation and their willingness to help us expedite this hearing to make it a little bit more efficient perhaps than it was the first couple of days. But public hearings such as this oftentimes are like that: they start off a little bit on the slow side and then they pick up the speed as we move along. And -- and so sometimes it's just the natural course of a hearing.

But I do wish to thank everyone for their awareness of -- of trying to conclude this hearing by the end of the fourth day, which will be tomorrow. Tomorrow is Saturday, and we plan to begin a -- once again at 11 a.m. So I would just alert everyone based on what Mr. Rodriguez has estimated, and we don't hold

him to that, based on information provided by Dr. Malcolm Brenner, our Human Factors specialist on the Technical Panel that it looks as though we will more than likely complete the five witnesses tomorrow and we can adjourn the hearing by tomorrow evening or by tomorrow sometime. At least by tomorrow evening. At least that is our -- our goal, and we will work towards that. And please make your travel plans accordingly.

Tomorrow we have five witnesses. They are all from the FAA, Federal Aviation Administration. And we look forward to hearing what they have to tell us.

If there's no other questions, we will stand in adjournment until 11 a.m. on Saturday.

(Whereupon, at 8:33 p.m., on December 15, 2000, the hearing was adjourned, to reconvene at 11:00 a.m., on December 16, 2000.)