MEMBER BONACA: So the weld was still affected before --

MR. POWERS: That's correct.

MEMBER BONACA: -- they did their work.

MR. POWERS: That's correct.

MEMBER ROSEN: They had already cut it when it moved.

MEMBER BONACA: Okay. I just wanted to know. Okay.

CO-CHAIRMAN FORD: Mark, thank you very much for your -- who's next? Is it the -- well, how about let's invite Jim Powers?

MR. POWERS: This is Jim Powers.

I'd like Nat Cofie from Structural Integrity Associates to give a short presentation on what he's done in evaluating this cladding and also comparing it to the disc burst pressures and give us a quick look at that.

MR. COFIE: My name is Nathaniel Cofie. I work at Structural Integrity Associates.

We've been assisting Davis-Besse in trying to determine the margins, set the margins in the as-found wastage condition. What I'm here to present this afternoon is just a very brief summary of the analysis, the failure criteria that we use, and how we've been able to justify this failure criteria that we're using for analysis.

We use a three dimensional finite element analysis to build a model.

MEMBER WALLIS: Do we have a --

CO-CHAIRMAN FORD: Yes, it's coming around.

MR. COFIE: We use a 3-D model because this geometry is very, very complicated. We've tried to explore the possibility of using a 2-D model which would really make the analysis very, very quick and very ready-available. But the geometry of the wastage inside that really didn't lend itself to a 2-D axi-symmetric analysis.

We ran some preliminary 2-D analysis compared with the 3-D results, and they didn't agree very well. Because of that, we decided to use a three dimensional finite analysis, which includes the head, the affected nozzle and the adjacent nozzle, and all the features that would capture the stress and strain distribution as we subject the head to the pressure loading.

We modeled the entire head and the dummy nozzle and the adjacent nozzles. Of course, because of the large strains involved in this, we used incremental elastic plastic analysis.

We used a very conservative stress strength curve in the analysis. And the previous speaker mentioned 11 percent and 5.5 percent. I'd like to rephrase that a little bit. It's really not 11.15 percent per C, but the criteria that we used was basically based on the uniform elongation of the stress-ranked curve. So that is really the basis for the 11.15.

The criterion that we use in the analysis was that any column of elements in the finite element analysis, which exceed the uniform elongation, that formed the basis for our failure criteria. Then we said that we've achieved failure.

We believe this is very conservative because when a column of elements exceed 11.15 percent, or the uniform elongation, there's redistribution of stresses and strains to the adjacent elements. So using this as a failure criterion to begin we thought was very, very conservative.

MEMBER SHACK: Suppose you did the more simple minded thing. I mean the uniform elongation in a tensile test, really it's a maximum load in the tensile test. So if you do a maximum load in the sphere under pressure and you consider the thinning of the sphere, you come up with two-thirds of the uniform tensile stress and the equivalent stress.

Why not that kind of a simple minded argument, where you are basically doing the same argument, but the thing fails because it is necking faster than it's work hardening?

MR. COFIE: Yeah, you know you build it -- once you get your large deformation, you find out using stress as a criterion becomes very difficult. Because a very small increment in --

MEMBER SHACK: No, it's still a strain criteria.

MR. COFIE: You know, as I will show later, you find that, in fact, when these evaluations started, the general feeling was that if you run the analysis all the way to plastic instability, that probably would be very close to the actual failure. It depends on the --

MEMBER SHACK: That's the equivalent of what you're doing with that kind of an argument.

MR. COFIE: Exactly.

MEMBER SHACK: Except you're going to do it without making an approximation.

MR. COFIE: Exactly. In fact, later on, I think with the experiment that I --

MEMBER SHACK: But that isn't what you said you did here?

MR. COFIE: Well, I would -- next slide, please.

You find that for the average thickness clad of .297, I've predicted --

CO-CHAIRMAN SIEBER: Could you move closer to the mic, sir? I'm sorry. Could you move closer to the microphone so the reporter can hear you?

MR. COFIE: Yes. I've predicted that the pressure was 5600, which was greater than twice the normal operating pressure.

We also ran a case with minimum measured clad thickness of .24. We got 4600 which was also greater.

MEMBER SHACK: But that's for your uniform strain in an element or that's for your plastic instability?

MR. COFIE: No, that is for the uniform strain, elongation.

MEMBER SHACK: I see.

MR. COFIE: So even with this conservative failure criteria, we got failure pressures which were twice, greater than twice the normal operating pressure. Of course, if we had used the instability load as a criterion, that would have been even greater. I'll show you those.

But this criterion came under a little bit of question because it was slightly based on engineering judgement, engineering judgment, but I believe that based on the fact that once you reached the uniform elongation, there's free distribution of stresses and strain. I believe strongly that that was very conservative.

But now that -- to prove, that fortunately we got this burst test that were run by PVRC somewhere in the early '70s. And Pete took that results. Peter Riccardella took those results and did an analysis of those.

So we had the test results available to us. So we used that basically to test the failure criteria that we've used to see how reasonable it is and whether it is conservative enough application to this wastage problem that we dealt with.

Next slide, please.

This didn't come out very well, but this is basically the three dimensional finite element model that we use. It takes a very sophisticated finite element model.

We have the -- this is the wastage area

right here. That doesn't show very well on this slide. This is the nozzle associated with the wastage.

We modeled the four adjacent nozzles so that we catch the ligament effect. Initially we thought that we could get by without making this thing too complicated, but we wanted to get you all the details. You know, once you have some adjacent holes in the neighborhood of this area, we thought that could affect them. So we modeled adjacent models to catch the ligament effect.

This model has a total of about 6,000 elements. Through the cladding, we had six through wall elements. Because of that, the became a very humongous model which took days to run. We wanted to do it right, to make sure that we get results that we can rely upon, are very, very reliable.

Next slide, please.

This is a summary of the analysis results. The original footprint, which is 20.5 square inch with an average thickness clad, using the criterion based upon the uniform elongation, the predicted failure pressure was 5600.

For this case, we also went as far as to instability, and the instability pressure was greater than 8000. If I remember, it was 8,125. It was greater than 8000.

We also looked at a case with the minimum measured thickness of .24 and the original footprint. The predicted pressure based on the uniform elongation criteria was 4600.

For this case, we really didn't go to instability because this was failure criteria. Therefore, we just run a little bit greater than this pressure. We know that the instability pressure is 48 -- greater than 4800.

If I were a betting man and you asked me what would be the instability pressure, I would say probably it goes up to about 7,000.

We also did another analysis to look at what is the failure pressure if, indeed, we have a larger footprint, twice the area that was associated with the wastage. And in this case we've got a predicted failure pressure greater than 2750.

Once again, we stopped this just around about 3,000 because we had used a 2-D model to basically benchmark against a 3-D model, to predict when we'd get to about 2750. So we didn't run this under any pressure greater than 3,000 or so.

I believe that the instability pressure

for this one is also greater than 4,00 psi.

Next slide, please.

MEMBER BONACA: That's the question I had. Can you comment on the stuff used 5.5 percent strained?

MR. COFIE: Right.

MEMBER BONACA: Okay. It seems to be a key to the difference as one may see. Could you comment why you use 11 percent?

MR. COFIE: Like I said, 11.15 percent was basically the uniform elongation. The idea of using that as a failure criteria, that once you reach 11.5 percent, once you reach the uniform elongation, you start to get necking (phonetic). That is the first onset of instability, but that's not necessarily the failure pressure.

I understand the 5.5 percent was used by the staff's contractor because they were trying to account for the so-called tri-axiality factor associated with the fact that this is sort of uni-axial loading, but it's a bi-axial, tri-axial state loading.

Unfortunately, you don't apply the tri-axiality factor to the uniform elongation. I believe, probably, if that has been explored a little bit, they would have probably done something a little different. I think that is the difference between the two failure criteria that we used.

I brought this slide only to show that the uniform elongation associated with the stress-strain curve that we used is very conservative. There's a whole lot of reference in the literature, a lot of NUREGs and EPRI reports that have reported various elastic -- various stress-strain parameters for weld metal as well as base metal, stainless steel.

Here is the uniform elongation for the base metal. It is pretty large. Our range is about 45 percent. So make-up weldments, SAWs, the average for all the data that would have to got in this reference is about 25.7, 25.7 percent. Most of the data is greater than 20 percent with only two of them less than 20 percent.

This is the data for SMAW weldments, all of them greater than 20 percent, with the average of about 30.7 percent.

If you combine both populations, both weld populations, both SAW and SMAW, the average elongation is about 27.3 percent.

MEMBER SHACK: But, I thought Davis-Besse when they were last here told us those came from measurements by Framatome, the 11 percent.

MR. COFIE: No, that's not exactly correct. The 11 -- the stress-strain curve that was used was basically obtained in the lurch and one of these handbooks. At that time, that was conservative enough that we chose to use that one as the basis for these evaluations.

But, no, there was no measurement made on the Davis-Besse --

MEMBER SHACK: No, not on the Davis-Besse. A test on weld metal, on cladding?

MR. COFIE: Yes, it was based on the test on that, but just obtained from the literature. Okay?

MR. POWERS: This is Jim Powers from FENOC.

Steve Fyfitch was there at that meeting and indicated that it came from Oak Ridge data in the handbook for the specific 308 material stress-strain curve. So it was the best data we had specific to the weld material.

MR. COFIE: So, in any case, you look at all this data and compare it to the data that was used for the evaluation, and you find that we are really on the very conservative side of what is reported in the literature.

Next slide, please.

Okay. From this slide going -- I'm going to just describe, basically, the disc burst test that PVRC -- disk burst test which was performed in the early '70s which was basically used to determine the reasonableness and conservative -- the conservatisms involved in the failure criteria that we used.

CO-CHAIRMAN FORD: This is just essentially the test that Mark just --

MR. COFIE: Yeah. This is just the test that Mark had presented.

CO-CHAIRMAN FORD: Could you just highlight any differences in your approach versus that which he did? Just for sake of time just highlight any differences you may have in your approach and --

MR. COFIE: Just to save time, this is basically, you know, the three geometries that I we did.

Next slide, please.

These are basically the properties associated with the materials of the disc.

Next slide.

Well, this slide also did not show up very well. What we did was that we looked at various through wall elements, four, eight, 12, just to look at the effect of through wall elements on the analysis results.

Next slide, please.

Okay. We also -- the slide you just saw was the axi-symmetric model. This one is a three dimensional model very, very similar to the model that we used for Davis-Besse. We used the same element types so that we get one-to-one comparison.

Next slide, please.

Now, these results show the effect of through wall elements versus the predicted pressure or the predicted failure pressure. As you can see from six elements to -- six elements onwards, there is essentially no difference in the predicted failure pressure.

So any time you use through wall elements of six and above, basically, you get essentially the same results.

In doing Davis-Besse's model, we used six through wall elements to decline.

Next slide.

MEMBER WALLIS: Why do you have two curves here? Why are those two different?

MR. COFIE: Well, there are two different because if you remember there's -- I presented two models. One is a 3-D model and one is an axi-symmetric.

MEMBER WALLIS: It seems to me that all the points are for the axi-geometry or am I misreading the figure?

MR. COFIE: Well, there are -- in the PVRC test there were three different geometries.

MEMBER WALLIS: But why are some at 7,000 and some at 14,000?

MR. COFIE: There are three different geometries.

PARTICIPANT: Some of them were one inch thick and some of them were a quarter of an inch thick.

MEMBER WALLIS: Okay. Okay. Then that's why it's twice the pressure.

MR. COFIE: Exactly.

MEMBER WALLIS: Okay. I understand.

MR. COFIE: Next slide, please.

Well, here is the typical stress-strain associated with the disc analysis that we did. Remind you everything is essentially membrane. You know, at very high pressure this is almost like a balloon, very, very high membrane stress. Right at the edge here, we have some venting stresses here.

Next slide.

Okay. This is a summary of one of the analysis results. This is the total equivalence strain of -- when makes it strain, this is pressure for one of the analysis that we did for the disc burst test. We flooded both the top level and the bottom strains as a function of pressure. This is how the outage behaves.

Okay. This really is the point where right at the end of the evaluation or the end of the pressure increment is where we reached instability.

So the instability pressure associated with this particular test was about 14,000 psi compared to a test pressure, a test burst pressure, of 15,000. So even at instability, we've predicted that we are slightly below the burst pressure obtained in the test.

Now, based on the elongation, based on the uniform elongation criterion that we use for Davis-Besse, this is where we would have predicted failure. We would have predicted failure right around about 11,000 psi, which is, of course, significantly below the test burst pressure.

MEMBER SHACK: Maybe I'm reading something wrong here. As I read from the paper, it says all the center line failures occurred at approximately the same strain level, 35 percent.

MR. COFIE: Well, don't forget that when Pete did this analysis, when this analysis was done, it was done with only one through wall element. Really this analysis is a refinement of what was done in 1972.

MEMBER SHACK: Oh, so the 35 percent is not a measurement?

MR. COFIE: No.

MEMBER SHACK: It's an analysis?

MR. COFIE: It's an analysis.

MR. RICCARDELLA: Yeah, this is Pete Riccardella from Structural Integrity.

Yeah, you have to recognize that they did that analysis with the tools that existed back in 1972. So you really have to ignore some of the analytical predictions there. We've updated that analysis with today's tools. So that 35 percent represents sort of an old estimate.

MR. COFIE: Right. If you read the paper, I find that one through wall element was used. This had about twelve through wall elements. So this is a much more actual analysis that we've done.

So this tells you that the criteria now

we're using is very conservative compared to the test results.

Not only that. The instability pressure also predicted pressures which are significantly -- well, not significantly, but slightly below the test pressure.

So really one can argue that you could go to instability and that would be a very, very good criterion to use to predict the best pressure.

Next slide, please.

MEMBER SHACK: Unless it falls at an edge, right?

MR. COFIE: Well, even that fail at the edge, you know, also predicted the same thing.

Here's a summary of all the analysis that we did on the burst test. Here is the burst test results.

Where is instability? We find that instability is very, very close to the burst test results. This is -- this are the results based upon a uniform elongation, and you can see that is conservative compared to the burst test.

So of all the analysis that we did to find out in all cases, the criteria that we've used for Davis-Besse is very conservative.

This simple analysis that we've done has proved beyond any reasonable doubt because now we have got some work as data that the criteria that we've used is conservative.

So, anyway, in confusion, I would say that what we've done for Davis-Besse, you know, we've done a very conservative analysis. We've used very good finite element models, 3-D finite element model. Like Mark said, we've used a lot of through wall elements to the cladding. We've also, basically, tested the criteria against known burst test results to show that it is very conservative.

CO-CHAIRMAN FORD: Thank you very much indeed. We appreciate that.

MR. COFIE: Thank you.

CO-CHAIRMAN FORD: As I understand it, now we've got three presentations, one by FENOC and then one by you, Jim. And then one by you, Larry. They are all scheduled for one hour each.

If I could ask you to please look at your presentations and try to make them three quarters of an hour each, I'd appreciate that very much.

(Pause in proceedings.)

MR. POWERS: Okay. good afternoon. I'm Jim Powers. I'm the Engineering Director for First

Energy at the Davis-Besse plant.

This afternoon, we're going to do a brief update to the ACRS ON where we stand with the situation at Davis-Besse. I brought along with me a number of individuals.

You will recognize Mark McLaughlin as our Field Project Manager for work on the head.

Bob Schrauder is our Director of Life Cycle Management and is responsible for the replacement head project that's ongoing.

And Steve Loehlein is our root cause lead investigator. He'll give you an update on what's transpired in the root cause area.

CO-CHAIRMAN FORD: Thank you.

MR. POWERS: Okay. So with that, let me turn it right over to Mark, and he will give us a description of field activities.

MR. McLAUGHLIN: Okay. Good afternoon. I will definitely try to be brief.

The first slide -- the next, keep going -- okay. The one thing that I wanted to point out, you guys had seen this slide before. I just wanted to point out the access that we had to do our inspection, and this kind of leads into the root cause report that will be coming up.

These are what are commonly called mouse holes and those were five by seven and they were installed in this lower portion of the service structure.

Next slide, please.

You've seen this nozzle depiction many times. The only thing that I wanted to point out is that on a Babcock & Wilcox reactor head, this is a gasketed joint with no seal weld. When these leak, the path that the borated water takes to get down to the head would be twofold.

One, it could drip down onto the insulation, and there is an eighth of an inch gap between the nozzle outside diameter and the insulation, or a nozzle, an adjacent nozzle in this area could spray onto this, and we have observed both of those types of leakage, And then it flows down and through the gap.

Next slide, please.

I wanted to update you with two things on this slide. Nozzle number two, we originally reported that there are eight axial flaws. There are actually nine axial flaws with this. That also brings the total number to six through wall.

The other thing, if you notice nozzle

number 46 we say has no flaw indication. However, there was a shadow. What we've done since we were here last time is we've cut the nozzle up into the shadow region. We did a visual inspection, as well as a dye penetrant inspection. I guess the results are that we really don't see any reason why that shadow is there. There is no leak path present and there is no significant corrosion.

Let's skip this next one.

I guess the big thing that we've done since we were here last is we did perform the abrasive water jet cutting of the cavity. The cavity has been removed. What your seeing here is the water jet tool. This is a mock-up. We mocked-up -- performed two mock-up cuts prior to performing this cut on the head.

Next slide.

This is the actual cutout on the reactor pressure vessel head at Davis-Besse. You notice nozzle number 11 would have been in this location. We used nozzle number 11 as the entrance point so that we wouldn't do any damage to the weld material around nozzle number three to preserve it for experiments.

Next slide, please.

This is another view using a remote camera underneath the head of the cutout.

Next slide.

This is an actual view of the cavity that's been removed. It shows the lithium fixture and the as-removed was about a 17-inch diameter.

I just wanted to update you on the sample plans of what we have. Phase one was various boron samples that we had collected from the -- on top of our head. We do have a draft report from our contractor who's been analyzing those.

We've found what we expected. There's significant boron, iron, and lithium. There's also some traces of nickel and chromium which is probably from either the nozzle material or the weld material.

Phase two is currently in analysis. That is boron and material samples from the removal of nozzle number two. So that may give us some boron samples in the actual annulus region.

Phase three, we are currently working with the staff to determine what type of testing and experiments we want to do on the actual nozzle number three, the actual nozzle from number two, and the cavity.

Somebody was asking about dimensions earlier. All of these samples are down in Lynchburg, Virginia. We are arranging a trip down there within the next two weeks. Anyone who would like to go see the cavity, touch it, and measure it as much as they want, it is available.

PARTICIPANT: Keep the ALARA advised.

MR. POWERS: It is a much lower dose.

MR. McLAUGHLIN: Yeah, the dose is significantly lower now.

MR. POWERS: Yeah.

MR. McLAUGHLIN: This is a picture of looking in the cavity after it was removed. You can see in the under-hung portion, and I think you get an excellent view of the cavity itself as well as the exposed cladding.

The cladding looks brown because it still had the abrasive on it from the abrasive water jet cutting process.

Next slide.

What I wanted to show you here is -- the last time that we had talked to you there was some discussion about a detachment or corrosion between the cladding and the base metal around nozzle 11. What this is, this is the J-groove weld for nozzle 11 and you can see the opening where we entered to do the cut through nozzle 11.

I performed an inspection. The surface is too rough to do a dye penetrant test at this time. However, there is no evidence of cladding detachment or a corrosion in that region between the cladding and the base material.

That's all I have. Are there any questions as far as updates from the field activities?

(No response.)

MR. McLAUGHLIN: Hearing none, I'd like to turn it over to Bob Schrauder, who is going to discuss the replacement of the reactor pressure vessel head at Davis-Besse.

MR. SCHRAUDER: Good afternoon. While Jim and Mark were busy attempting to repair the reactor vessel head, I started out early on in the process looking for a potential replacement head for the vessel.

We looked at several options, one of which was to look at -- we do have a new head ordered for Davis-Besse that was scheduled to arrive at our plant during the first quarter of 2004. We looked at accelerating that schedule.

We also looked at potentially purchasing someone else's place in line, if you will, that had another head already ordered that would be compatible with the Davis-Besse vessel also. Those, the earliest one coming out there that we could find that was compatible was in the third or fourth quarter of 2003.

Both of those being manufactured, ours and the next one in the pipeline, if you will, were already on an accelerated schedule. So we were not going to be able to do much with the schedule of getting a new head in here much before 2004.

So I then began to look at what was already available in the industry. We found two heads that were compatible with Davis-Besse. Rancho Secho had a plant that had operated for a while and, as you know, has been shut down. And then at Midland, one of the two heads in that unit was still on site there.

We looked at those two options. We quickly zeroed in on the Midland head.

Next slide, please.

The Midland head -- both heads like I said would fit with some very minor adjustments. We thought Midland was the clear choice for two reasons. One, it was a lot closer to us. It's in the neighboring state right in Midland. We have to just bring it across the state line and bring it down to Davis-Besse.

It is readily available from the perspective of it's sitting in a commercial setting, if you will. It would be a commercial kind of construction job to go get it versus the Rancho Secho head which is, although not an operating nuclear plant, it is still a nuclear plant. That head, because it was used, was contaminated which complicated both any modifications we might need to make with it and significantly complicated the transportation needs for that.

CO-CHAIRMAN SIEBER: Well, the Rancho Secho head was still installed, right?

MR. SCHRAUDER: That's correct.

CO-CHAIRMAN SIEBER: So you would have had to cut a hole in their containment to get it out?

MR. SCHRAUDER: Well, actually the Rancho Secho head will fit through their equipment hatch.

CO-CHAIRMAN SIEBER: Oh, yeah?

MR. SCHRAUDER: The Midland head would not.

CO-CHAIRMAN SIEBER: Will it fit through yours?

MR. SCHRAUDER: No, it will not.

CO-CHAIRMAN SIEBER: All right. You can tell us about that later on.

MR. SCHRAUDER: Yes, that is in the presentation. We'll get to that.

PARTICIPANT: They're not going to fold the head.

CO-CHAIRMAN SIEBER: Cut the head in half and put it in the containment.

MR. SCHRAUDER: The other head at Midland is, by the way, cut in half. So that one was not usable.

(Laughter.)

MR. SCHRAUDER: This slide shows some of the similarities between the Midland head and the Davis-Besse head. They were both fabricated by Babcock & Wilcox in the same period of time to the same ASME boiler pressure code edition and addenda.

Now we have the records for the Midland head. We know that during construction that head was accepted for use by Consumers Power. It was signed off by an authorized nuclear inspector and identified as an acceptable ASME component.

It was, in fact, as all of the B&W plants were, it was hydroed before it was shipped to the site. It shows the hydro was there at 31.5 pounds. As you know, Consumers canceled the original plant back in the mid-1980s. Since that time, that head has been on the head stand inside the containment.

CO-CHAIRMAN SIEBER: You knew what heat

and nozzles came from?

MR. SCHRAUDER: Yes, sir. That's right around in the presentation and we'll get to that.

CO-CHAIRMAN SIEBER: Thank you.

Did you file a Part 21 related to the nozzles that were susceptible in your plant?

MR. POWERS: No, I don't think we've filed a Part 21 as of yet. But we've had discussions on that issue.

CO-CHAIRMAN SIEBER: I think that would be a good discussion to have amongst yourselves.

MR. SCHRAUDER: Because of their technical expertise and because of the fact that they had access to all of the records on this heat, we hired or we brought in with us a partner Framatome. Framatome actually purchased the head for us from Consumers. They purchased it as a basic component.

They'll verify its usability. They'll compile for us the code data package which they have the records for. They'll disposition any non-conformances on that head and then will sell it to us as a basic component for use at Davis-Besse.

CO-CHAIRMAN SIEBER: Is that an assembly or is it just the head? In other words are the control rod drive mechanisms already installed?

MR. SCHRAUDER: The control rod drive mechanisms have been removed and somebody else owns those.

CO-CHAIRMAN SIEBER: Okay. You're going to use your old ones?

MR. SCHRAUDER: That's correct.

CO-CHAIRMAN SIEBER: Thank you.

MR. SCHRAUDER: In the process of this, Framatome will also reconcile the design requirements of the Midland plant to the Davis-Besse plant. Those design requirements, again, are covered over the next couple of slides.

Of course, Framatome will do these activities under their quality assurance program, including responsibility for Part 21 reporting.

The next slide is simply a pictorial that you can relate to as we talk about some of the similarities and differences on this head.

This next slide shows that this head and the design is essentially identical to Davis-Besse. They were both 177 plants. The materials of construction you see there are virtually identical. Even the closure head flange there is really the same material, the same specs. for that material.

The design pressure and temperatures for both reactors was identical, 2500 pounds of pressure and 650 degrees.

MEMBER ROSEN: What does the dash 64 mean on the closure head flange?

MR. SCHRAUDER: Actually that's an A50864, and that's an ASTM material. They're the same material essentially. One is an ASTM code.

MR. POWERS: Go ahead, Steve.

MR. FYFITCH: To answer his question -- this is Steve Fyfitch, Framatome -- the 64 is the date, the year. So it's the 1964 edition of the ASTM code or the ASTM specs.. Excuse me.

MEMBER ROSEN: But the materials are the same is the answer I got.

MR. FYFITCH: That's correct.

MR. SCHRAUDER: The next slide that answers the question of do we know the heat materials on this head. In fact, we do. Sixty-eight of them are from the specified heat there, M7929. And one is from M6623.

What happened was in the manufacturing, the putting together of this head, there was one nozzle 7929 that had had a problem, and the other nozzle came from the canceled Bellafont (phonetic) unit. So that's why there is one nozzle that's the same.

Neither of those two heats of materials has any industry experience. We do know, though, that they look to fall right in the middle of the pack by way of yield strength for those heats. But there is no industry experience on them.

The control rod configuration and the alignment is the same on that head as it would be for Davis-Besse. So, geometrically, it's very nearly the same or physically, its characteristics are the same.

There are a few minor physical things that we have to do to the head. The picture that is shown here is the key-way. The key-way fits into the reactor vessel itself and it makes sure that the head is precisely aligned to the vessel for latching your control rods and your control rod interface.

There's two surfaces. You see that one and then the other one would be on the inside there. There's two surfaces for each of the four key-ways that you have to be concerned about getting your fit. Four of the eight surfaces needed to have some slight machining to precisely fit on our reactor vessel head; to the tune of about five mils., we had to machine on those.

Also the control rod drive flange itself that is on the nozzle that the control rod drive mechanism flanges to has an indexing pin on that, too. There's two locations that you can have your -- that that's indexed too. As you might figure, they used the opposite hole that Davis-Besse does.

So we have to take the plug out of their indexing pin in that location, put it in the other location, and then we'll have that set-up to index for our control rod drive mechanisms.

The next slide shows another physical difference on this head and ours. The Davis-Besse head has the O-ring which is the sealing ring for the head to vessel; is 0.5 inches on Davis-Besse. On the Midland one, it was 0.455.

CO-CHAIRMAN SIEBER: You have two O-rings?

MR. SCHRAUDER: Yes, sir.

So, those two O-rings -- we have done the analysis to show that it will effectively seal in the groove that we have on our vessel. Of course, we will be able to demonstrate that with the leak-off capability on that head. We will be able to tell if there's any leakage between those seals.

CO-CHAIRMAN SIEBER: But the clearance between the vessel flange and the head flange will be slightly smaller, correct?

MR. SCHRAUDER: Well, the crush is fine on it.

CO-CHAIRMAN SIEBER: Okay.

MR. SCHRAUDER: So the sealing surface that you need, both of those surfaces we show will have full contact and it won't be an issue.

So we're manufacturing the new O-rings to 0.455 that will fit inside the groove for the Midland head.

The next slide, again, is a pictorial that you can refer to for the next series of slides that I'll go over, which describe the nondestructive exams that we'll do on this head to verify that its stay in Midland, since they canceled that plant, has not had any deleterious effects to it.

We did three types of exams on this head or will do three types of exams. One is to supplement the ASME code data package. One is our pre-service IS exams, and then we did some additional nondestructive exams to verify that, again, there was no deleterious effects to the head from the period of time that it's been sitting in Midland.

This first page shows the examinations to supplement the ASME code data package. I should mention that with supplement, although we had a signed off code data form, we did not have the film of the radiographs for this head. We had indication and sign-off that they had a successful radiograph both on the dome to flange weld. This is a two-piece forging for this head. We didn't have that radiograph film and we didn't have the radiograph film of the nozzle, the flange to nozzle.

So we're re-radiographing both of those. In fact --

CO-CHAIRMAN SIEBER: You need to have that.

MR. SCHRAUDER: We have completed the radiograph on the large dome to flange weld. That radiograph did prove to be very sound.

We'll do a series of visual exams, just to verify there is no obvious problems on the seating surfaces and the grooves in this head.

And I discussed the radiographs that we'll do. And we'll also do a PT examination on the J-groove welds.

CO-CHAIRMAN SIEBER: And a visual on the inside cladding to make sure it's all there?

MR. SCHRAUDER: We're going to do some liquid penetrants on the surface of the and the repaired areas of the clad, of underneath.

CO-CHAIRMAN SIEBER: Okay.

MR. McLAUGHLIN: The cladding is all there.

CO-CHAIRMAN SIEBER: Okay.

MR. McLAUGHLIN: Yes.

(Laughter.)

CO-CHAIRMAN SIEBER: Well, sometimes it isn't, you know.

MR. McLAUGHLIN: Oh, really?

CO-CHAIRMAN SIEBER: Yes. Yes, sir.

MR. McLAUGHLIN: I was up Friday and inspected it. The cladding is all there in this head.

CO-CHAIRMAN SIEBER: PT is pretty hard to do on a welded surface that's not cleaned up, right? Dye penetrant?

MR. SCHRAUDER: The --

MR. McLAUGHLIN: It won't be a problem on this head. When I was in there, I'm not sure what process they used. They must do some grinding on it because the inside diameter of the head is very smooth.

CO-CHAIRMAN SIEBER: Oh, it is?

PARTICIPANT: The cladding?

MR. McLAUGHLIN: Yes, the cladding is smooth, as well as it was on the Davis-Besse head.

CO-CHAIRMAN SIEBER: Oh, okay. That's also not always the case.

MR. SCHRAUDER: The next slide shows the pre-service inspections that we'll do: magnetic particle exam with the flange to dome weld, an ultrasonic on that same weld, and an electric penetrant PT exam of the -- this has the peripheral CRDM nozzle to flange welds, the ones on the peripheral. That's what's required by code. Our intent is to do all of them that we can get to. We believe that we will be successful in getting to all of them. We will certainly, at least, meet the code requirements for that, and our expectation is to do PT on all of those.

The next page just shows the additional nondestructive exams we'll do, chemical smears to assure that it meets the proper class cleanliness. A baseline UT we will do on all of these nozzles so that if we do UTs in the future, we will have something to compare to. We'll know whether there was any indications in these nozzles early on.

CO-CHAIRMAN SIEBER: What kind of packaging was the head stored in?

MR. SCHRAUDER: It was not stored in any packaging.

CO-CHAIRMAN SIEBER: It was not covered?

MR. SCHRAUDER: No, it's not.

CO-CHAIRMAN SIEBER: It's in a building; is that correct?

MR. SCHRAUDER: The CRD nozzles did have some covering on them, but that was about all that was covered. It's in the containment building. That's correct.

CO-CHAIRMAN SIEBER: So you have to cut a whole in that one, too?

MR. SCHRAUDER: That's correct.

MR. McLAUGHLIN: That's correct.

MR. SCHRAUDER: And that's coming up next on how we're going to go about getting this.

I should mention -- I meant to mention this earlier -- our intent is to use this head, put it on now. We'll use it until such time as we replace our steam generators, which is currently expected to be 2010 or 2012, in that time frame.

So we are maintaining our place in line with our new head. We will get a new head and we will replace it again when we open the containment up again to replace steam generators.

CO-CHAIRMAN SIEBER: Now, why would you do that? For material change?

MR. SCHRAUDER: That's right. This head obviously has the same material on it, the same susceptibility.

CO-CHAIRMAN SIEBER: You moved the 690?

MR. McLAUGHLIN: Correct.

CO-CHAIRMAN SIEBER: Do you folks know a lot about 690 as far as the nozzle database?

MR. McLAUGHLIN: From what I understand, I don't believe there is a large nozzle database.

CO-CHAIRMAN SIEBER: Or any database, right?

MR. McLAUGHLIN: Well, there would be some in France.

CO-CHAIRMAN SIEBER: Okay.

MR. McLAUGHLIN: But they'd be young.

MEMBER ROSEN: What you want to do is take the head you take off, this one, and put it someplace and protect it.

CO-CHAIRMAN SIEBER: Well, I don't know. You have a whole --

MEMBER ROSEN: Just swap back and forth.

(Laughter.)

PARTICIPANT: Well, just don't take it out to the dump.

MR. SCHRAUDER: Well, as a matter of fact, our intention is to dispose of it shortly after we take it out of containment, if it is categorized as a Class A alpha waste.

MR. FYFITCH: Let me just add a point. John, I don't know where you are going with that question. This is Steve Fyfitch, again from Framatome.

The 690 has been in use now in steam generators for a number of years, and on France for the nozzles on the head, they've been replacing heads since the early '90s. So now they are almost nine or ten years in service.

By the time Davis-Besse replaces theirs in 2012 or 2010, it will be almost 20 years. So there will be a large database of experience by that point.

CO-CHAIRMAN SIEBER: Well, my only comment, I guess, is I started in this business in 1960, and the 1960, Alloy 600 was wonderful.

(Laughter.)

MEMBER ROSEN: If you do want to take my comment as a guide, I don't throw anything away. So come look at my garage.

(Laughter.)

CO-CHAIRMAN SIEBER: You can have the head.

MR. SCHRAUDER: Is it seventeen feet in diameter?

(Laughter.)

MEMBER ROSEN: My garage you're talking about? Just about might fit.

MR. SCHRAUDER: This shows and addresses the issue on the containments. Yes, we do have to cut both the Midland containment and the Davis-Besse containment structure.

The Midland containment is a pre-stressed containment so it has to be de-tensioned, and then we'll actually chip into that containment and open up a large, 20 foot by 20 foot hole approximately.

The Davis-Besse containment is a shield building, a concrete shield building with a free-standing pressure vessel and an annular region in between.

We are using Bechtel Power to assist us in the opening of both containments. They have done most of the containment openings and restorations in the United States.

We have a bullet on here that shows we will bring the head, the existing Davis-Besse head out, protected and the people around radiologically from that.

Temporarily, we hope right now -- I should get analysis back next week that will categorize what class waste it would be. And then it would be our intention at this time to dispose of it if it is categorized as a low level waste rather than create a temporary storage facility at Davis-Besse for it.

We will work with the NRC on that and make sure that the rest of the industry knows that's our intent in case there is any desire to do any more examination or testing on that head.

We are going to transfer our service structure from the Davis-Besse head to the Midland head. We are putting in the inspection, the inspection modification. That goes on the lower skirt, and that piece of the Midland head we will use, and before we ship it to Davis-Besse, it will have that modification performed on it to provide adequate inspection and cleaning of the head as necessary.

Of course, I have already said that we will re-use all of our control rod drive mechanisms on this head.

As we were repairing the head and we had to cut out a couple of nozzles, we had to reconfigure our core at Davis-Besse, specifically, the control rod locations to assure that it was acceptable. We will go back to the original core design with the new head. We will be submitting that core analysis to the NRC.

There are a couple of modifications that have been made over the years for serviceability and outage flexibility, the nozzle flange split. Split dot ring modification will be performed, and we will use the upgraded gasket design on the control rod drive mechanism flanges.

MEMBER LEITCH: Have you thought about foreign object damage when you're cutting a hole in the containment?

I guess you're planning to do this with the fuel still in the --

MR. SCHRAUDER: No, sir.

MEMBER LEITCH: You're going to de-fuel?

MR. SCHRAUDER: We will be full core off-load when we do the -- and I meant to say that. The cut at the Davis-Besse site will not be a classic cut and chipping. It will be a process that uses a very high pressure water lancing that essentially washes the concrete off of the rebar, and Bechtel has used this process in Spain several times.

There appears a much nicer cut on the containment and avoids having to chip back to get the rebar exposed. Then the rebar can be tagged, cut, and then restored right back into the original location so that it's already go the proper bend to it and you cad weld it back in and then restore your concrete.

So it's a much gentler process.

MEMBER LEITCH: But even so, are you going to deck over some areas to prevent foreign object outage or --

MR. SCHRAUDER: We do have a vessel cover for the Davis-Besse head. That will be in place when we take the fuel out of the reactor vessel. Yeah, we'll be very cognizant of foreign material.

They're spending a lot of time cleaning that containment up right now, too. So I'm sure that it will be left very clean when we're done with it.

MEMBER LEITCH: One issue that always concerns me when you have a major construction project like that going on. Its fire fighting capabilities, just I'm sure you're going to get into a lot of detailed planning, but I would just like to remind you to be sure that you haven't temporarily removed from service any of your fire fighting capability while you're doing that because when that kind of activity goes on, it just increases the potential for fire, and you want to be sure that, you know, all of your fire fighting stuff is up to speed.

CO-CHAIRMAN SIEBER: Operable.

MEMBER LEITCH: Operable, or if not, some other temporary provision has been made.

MR. SCHRAUDER: I agree.

The next slide, Slide 31, just shows some of the post installation inspections that we'll do to verify that we do have a good fit on this. We'll fill and vent the RCS, do a visual for gross leakage, and we'll bring the plant to normal operating temperature and pressure with reactor coolant pump heat.

Of course, we won't be able to get right up into the nozzle space at that time. So what we'll do is we'll bring it up to temperature and pressure. We'll cool back down, and then we'll go in and look for visible signs of leakage when it was at pressure.

We'll perform the control rod drop time testing in accordance with our tech specs to verify the control rods do, in fact, go in at the appropriate speed.

Once we put the head on and you latch the control rods, you're pretty well satisfied that you've got the proper alignment here, but we will, as required by tech specs, do a control rod drop test.

The next page we don't really need to go into. They are approvals that we would need from NRC staff, and the top two there were actually needed for our existing head also in their IS program.

MR. POWERS: Okay. If there's no further questions, we'll turn it over to Steve Loehlein to talk about the root cause updates.

CO-CHAIRMAN FORD: I just got a proposal here from Jack. Has everyone read the root cause report?

It may be -- and I don't want to put you out of business.

(Laughter.)

CO-CHAIRMAN SIEBER: That was a god report, Steve. It really was.

CO-CHAIRMAN FORD: It was a very pointed and honest report, I thought.

Maybe the best way to tackle this in the cause of time is does anyone have any questions having read the root cause report.

MEMBER APOSTOLAKIS: Well, maybe you can go to the inspector summary on Slide 52.

CO-CHAIRMAN FORD: Do you mind? Do you feel s as though you're being done out of --

MR. LOEHLEIN: I don't mind. We thought that perhaps that time line slide would have had some questions on it, but if people are familiar with that, having read it, whatever is of interest to it, that's why we're here.

CO-CHAIRMAN FORD: It was a very complete report, I thought, and I enjoyed reading it. I didn't enjoy it.

CO-CHAIRMAN SIEBER: I didn't enjoy reading it.

MR. LOEHLEIN: I didn't enjoy writing it all that much.

CO-CHAIRMAN SIEBER: But it was well done.

CO-CHAIRMAN FORD: Okay. Why don't you put the time line graph up just to jog any people's memory as to whether this question --

MR. LOEHLEIN: It's probably -- I don't know by number. It's the fourth slide in.

CO-CHAIRMAN FORD: It's this one here.

CO-CHAIRMAN SIEBER: We all have it separately.

CO-CHAIRMAN FORD: Why don't you walk through that one, and it might jog people's memory as to the questions, and then go to the conclusion?

MR. LOEHLEIN: It's a little bit hard to do here logistically. So, Mark, I'll ask you to go ahead and point.

this is a little bit of clarification on the way this is laid out. You start at the very top of this diagram. We have a set of blocks that indicate what we call industry and regulatory knowledge, milestones.

At about the 1995 time frame with the boric acid corrosion guide book, and I'll pass on through, up through the bulletins and generic letters, and so forth.

As you proceed down, the first thing you see is is a blue bar graph. The blue bar graph indicates the reactor coolant system and unidentified leak rate over time.

There is also the red dashed line that proceeds on a diagonal from left to right with three data points on it or the number of nozzles that were not visible in an as found state, those refueling outages.

As you continue on down this chart, you run into the yellow colored blocks that indicate the containment radiation monitor filters and the change in preventive maintenance frequencies brought about by clogging either to boric acid or to a combination of boric acid and iron oxide.

Below those blocks we have similar blocks reporting the frequency of containment air cooler cleanings, and beneath those, we have the two time lines. The first one is simply the chronological passing of years. Beneath that are the outages and plant cycles as they line up.

Then in the numerous blocks down below, there's actually three sets of data. As you read from left to right, the first set of blocks is the conditions for the control rod drive mechanism flanges.

The next set below it is the reactor pressure vessel flange itself on the outside perimeter, and then the bottom set of blocks is the reactor pressure vessel head.

So that's how this is laid out. Any particular questions on it?

CO-CHAIRMAN FORD: I've just got a generic question. I must admit I read it in anticipation of reading -- because of my interpretation what a root cause report is -- that it would tell me specifically what the mechanism was and thereby when things started, and that would give me some idea as to how generic this was and whether it was a leader of the fleet.

And of course, it didn't have that, but having heard the reports earlier on from NRP, I'm assuming that that onus is now being passed to the NRP; is that correct?

MR. LOEHLEIN: I think --

CO-CHAIRMAN FORD: They will take on the burden of determining whether this really is --

MR. LOEHLEIN: We probably each have a piece in that answer. So I'll speak first and say that clearly in the evidence we had available to us in the large cavity region at nozzle three, we could from the plant data and other physical evidence say pretty much what happened since about 1998.

But that only describes what happens at high corrosion rates once the conditions are right, boric acid and so forth.

And what we all know and what we need to study further is what happens prior to that, and we didn't have measured data that we could go to and say how long the steps took, and that's the kind of work I think Christine at EPRI is taking on.

MS. KING: Right. This is Christine King with EPRI.

We took that on, as Glenn said earlier, just a couple of weeks after the discovery of the wastage at Davis-Besse because of the idea of understanding how this progresses, and we will obviously continue to work on that.

CO-CHAIRMAN FORD: The thing that keeps coming to mind, everything from stress corrosion cracking of turbines to tracking of small pipes: big pipes will never crack, and sure enough they do crack.

In Japan, we will never crack a pipe in Japan. And they do.

And so whenever anyone says that this is a one off (phonetic) situation, my ears immediately start to prickle, and my hair starts to prickle.

But anyway, I'm really suspicious until we understand what the real root cause was and how it relates to geometry and chemistry, et cetera. And this is why I was urging you to as quickly as possible we'd better put this one to bed.

MR. LOEHLEIN: What I would comment on is in all this investigation, we did as a team with a technical experts and so forth, is that we were unable to uncover any new evidence to provide us with any kind of insight different from what is already known, and that is that cracks can lead to leaks, can lead to corrosion if it's not discovered.

CO-CHAIRMAN FORD: And one of the conjoint requirements to have.

MR. LOEHLEIN: Or detected.

MEMBER BONACA: I would like to -- we're talking about root cause, and so your conclusion is that inadequate inspections of the closure head was the problem. I think beyond that it seems to me that the fact that you cannot fix the flange leaking completely at any given outage, but you manage that issue by saying we will fix the most severely leaking and we'll leave the rest must -- everything from that point on, in fact, you concluded that, you know, presumed boric acid leakage was coming from the flange, and so you kept doing that.

And then you presume that the accumulation of boric acid crystals on the head was coming from the flange. Therefore, you kept managing the issue, and that prevented you from performing complete inspection.

So I'm saying that to me the lesson learned is that when you have an issue of that kind you do not manage it. You just simply fix the flange leakage so you don't have it anymore. Because otherwise it will have a cascading effect, and your people are going to still live with a limited amount of time to perform the fixing of those flanges, and that cascades in not having enough adequate inspections.

I mean it seems to me that is throughout the root cause. There is that threat that people wanted to do the right job, but they said, "Well, we've reached the time limit. We could only fix this many flanges. So we'll leave this flange for the next outage."

MR. POWERS: Right, and I would say that there's a number of things in the root cause that are beyond the technical root cause that we've discussed thus far, and we're still ongoing with the management root cause issues. We're taking actions at the site as a consequence of that.

MEMBER BONACA: Yeah, and I don't want to get inside that. I'm only -- when I look at that and it says inadequate inspections, I think more than that is what was the cause of that. I mean, in part it was because you really believed that the leakage was coming from somewhere where you thought you knew, and that led you to convincingly believe that you didn't need to inspect further because you knew where it was coming from.

MR. POWERS: Right, and there's elements of problem solving adequacy.

MEMBER BONACA: I agree.

MR. POWERS: How far we drill down, and so we've got a number of things on our list of things to do as part of our 0350 restart.

MEMBER BONACA: Yeah, because inadequate inspection could be interpreted as simply, you know, we didn't look enough or whatever, but really there was this issue fundamentally that we know where it's coming from. We don't have to look further, and therefore, we can manage it. We can keep, you know, from outage to outage, to push further fixing to the next outage.

And that seems like a threat that finally convinced a lot of your people at the working level that that was the solution, and they kept believing it.

CO-CHAIRMAN FORD: If there's no more questions on the root cause aspect, I thank you very much indeed, and thank you for coming.

I'd like to move on for the NRC.

Do you want a break? Okay. Ten minutes. We don't want any accidents. We'll recess until ten minutes past five.

(Whereupon, the foregoing matter went off the record at 4:59 p.m. and went back on the record at 5:11 p.m.)

CO-CHAIRMAN FORD: Okay. Thank you very

much, Jim. I appreciate your giving us the time.

MS. WESTON: This is a part of the NRC package, part of it.

MR. GROBE: Okay. We've got three more topics that the staff will present. I'll update you on what we've been doing with respect to regulatory oversight at the Davis-Besse plant.

Ed Hackett is going to be talking about independent lessons learned task force that's been chartered by Bill Travers, and Allen Hiser is going to talk a little bit about management by leakage detection.

I'm sure you're going to have no questions for myself and Ed and about 300 questions for Allen. Are you ready for the next slide, Allen?

Allen is going to flip slides for me.

Just a brief time line of major activities that have occurred. Of course, the pressure vessel had degradation on the 6th of March. The AIT inspection on March 12th, began on March 12th. We issued a confirmatory action letter on the 13th an established the oversight panel on April 29th.

The basis for chartering an 0350 panel for Davis-Besse were fourfold. First, the situation at Davis-Besse represented a significant, complex technical issue and also a complex regulatory issue.

The plant is in an extended shutdown and regulatory hold, in effect, and that's the confirmatory action letter.

The 0350 panel would enhance the agency's focus on clearly defining and communicating the plant specific issues that need to be resolved prior to restart, and we provide as a panel a focused and coordinated oversight.

The next slide is -- please stop me if you have any questions. I'm just going to zip through this -- goals of the panel are several. One of the goals is that the panel provides oversight and assessment of licensee performance. It's a broad and integrated focus on assessment, much more comprehensive than would be applied to a routinely operated plant.

We assure that the restart issues are identified and resolved, and what's critical here is a shared understanding between First Energy, the NRC, and the public on what those issues are needing resolution prior to restart.

We have the capability to coordinate across organizational boundaries within the agency, and of course, Region III, NRR Research, Public

Affairs, Congressional Affairs, ACRS. There's been many aspects of the agency that have been involved in the Davis-Besse issue.

Provide a single point of contact, a single focus for communicating with external stakeholders. We've had extensive interface with concerned citizens in the area, concerned groups across the country, federal, state, and local elected officials, and of course, the media.

So it's important to have a single focus and a cohesive message on what's going on at Davis-Besse.

MEMBER LEITCH: John, it's my understanding the 0350 panel goes on through, I guess full power operation.

MR. GROBE: Yeah, I'll get into that in a little bit more detail.

MEMBER LEITCH: But as far as identifying restart issues, other than the obvious replacing the head, is there some kind of a report or a point in time when those restart issues are clearly defined?

MR. GROBE: Yes.

MEMBER LEITCH: And what is that point in time?

MR. GROBE: There's two documents that

guide the activities of the 0350 panel. One is called process plan. That's been promulgated and issued publicly, and it covers more not plant specific per se, but process issues, including interfaces and communications and activities that need to be accomplished.

The second document is called a restart checklist, and that is the document where those specific issues that need resolution prior to restart will be clearly communicated. A checklist has not been issued yet primarily since the licensee, First Energy, has not completely defined the causal factors in some of the areas, and I'll get into that in a little bit more detail in a minute.

MEMBER ROSEN: What was the first document's name?

MR. GROBE: Process plan.

MEMBER ROSEN: And that is on the Web site?

MR. GROBE: Yes, it us.

CO-CHAIRMAN SIEBER: It's in the inspection manual chapter, 350.

MR. GROBE: Right. There's guidance in the manual chapter, and you interpret the guidance that's in the manual chapter as applied to the specific task. Each plant that might come into an 0350 might have different characteristics required.

MEMBER ROSEN: So if I go to the process plan, I'll see the actual milestone dates for Davis-Besse?

MR. GROBE: No, no. There are no dates.

CO-CHAIRMAN SIEBER: You'll see general format.

MEMBER ROSEN: That's what I was still interested in. Is that what you were asking about, Graham? What the dates were for when we would see --

MEMBER LEITCH: That's what I was asking about. I think I heard that the dates are not yet established.

CO-CHAIRMAN SIEBER: Right.

MR. GROBE: We won't establish --

CO-CHAIRMAN SIEBER: The issues aren't established.

MEMBER LEITCH: But the process plan is not specific to Davis-Besse. It's more or less a checklist of those things that one must consider --

MR. GROBE: Right.

MEMBER LEITCH: -- before moving to restart.

MR. GROBE: We will serve no wine before

its time.

(Laughter.)

MR. GROBE: You won't find dates in our documents. Like I said, we will develop a shared understanding of those issues that we expect to be resolved prior to restart.

When the licensee believes that each of those is ready for evaluation, we will provide inspections of those activities and then address any findings with the licensee.

So there won't be any dates in our restart plan, our process plan.

The panel provides continued oversight after plant restart. Our expectation is that the panel will continue to provide that oversight at Davis-Besse for at least one calendar quarter following restart.

And finally, we create copious amounts of documentation. All of our internal meetings and external meetings are documented, and those are available on the Web site.

We're now going to be transcribing the meetings that occur in Ohio to make sure that people who can't make it to Ohio have access to the specific issues that are discussed.

The panel members include two senior managers, one from Region III, myself, and one from NRR; three supervisors, two from Region III and one from NRR: the NRR project manager; the senior resident inspector; and a risk analyst from my staff in Region III.

So as I said before, it's a very broad oversight. It brings together a variety of different skills from different parts of the agency.

The routine reactor oversight process, what's come to be known as the ROP, is suspended in the situation where you have a plant that goes under 0350. There's a number of reasons for that.

One is that the plant is in a configuration that the reactor oversight process was not written to address.

In addition to that, a variety of the operationally focused performance indicators will atrophy when the plant is shut down. So those PIs will not be providing insight into plant performance.

We talked about the process plan. The process plan will include coordination, communication activities, inspection and assessment activities, licensing activities, and a variety of things. It's about a ten-page document.

The restart checklist has not been issued yet, but that will contain all of the restart items.

We have been averaging about two internal meetings per week, and we had our first public meeting in early May. Our second public meeting at the site, in the vicinity of the site is next Wednesday, a week from today.

The licensee has submitted what they call a return to service plan. That was submitted on May 21st. That's also available on the Web site. There's what they call building blocks. Is that -- yeah, okay. I'm getting nods back there.

Six substantive building blocks that need to be completed to return to service effectively. Three of them are pretty straightforward. Three are a bit more complex.

The reactor head resolution is a fairly straightforward activity, much more straightforward now that the head is being replaced instead of repaired.

Containment extended condition, that includes extensive inspection of the reactor pressure boundary, as well as inspection of other equipment inside containment for damage or the effects of the environment that the equipment was subjected to.

The other one that is pretty straightforward is the last one, restart and post restart test plan. Those are fairly clearly understandable and definable activities.

The remaining three are a bit more complex in defining exactly what is necessary prior to restart, the scope and depth of those activities. The licensee has defined a system health plan where they're going to select risk significant systems and evaluate those at some level of depth to insure that they actually have what they thought they had as far as safety system health.

A program or a process review plan, where they're going to pick at least three programs, I believe: the boric acid management program, of course; the corrective action program; and the design change program, and possibly others that they're going to review at some level of detail.

And the next one is one that has not yet been fully developed yet, and that is the management and human performance excellence plan. There's been, I think, four different activities that have been undertaken to try to get their arms around exactly what went wrong from an organizational effectiveness perspective, a human performance perspective, management effectiveness.

That included a group chartered by INPO, which was senior executives from a number of plants that came in an evaluated what happened; a group chartered by Bob Saunders, the Chief Nuclear Officer, that included review of various activities; the root cause team, of course; and there was one other. It slips my mind at the moment.

But the licensee is now accumulating all of that data and is going to define what it believes are necessary activities prior to restart.

Not only is it difficult to understand the scope of what activities in these areas are necessary, but how to measure success is not an easily defined concept. So those are the areas where we're going to be having some dialogue in our public meetings at the site.

MEMBER APOSTOLAKIS: Do you have any guidance as to what a human performance excellence plan is?

MR. GROBE: No. The way I've approached these kinds of activities in the past is really four steps. First is insuring that we have confidence that the licensee's identification of causal factors is sufficient.

Second, to insure that the scope of what their activities that they're going to undertake -- they define these activities, and we make sure that the scope is sufficient to address the root causes, the causal factors.

We'll provide inspections of their implementation of that plan and then resolve any deficiencies, and there could be a substantial number of deficiencies that we identify that don't need to be resolved prior to restart that can be ongoing activities after restart.

But there is no specific guidance in that area. Clearly there's a number of performance, organizational effectiveness and performance issues that contributed to what happened at Davis-Besse. So we'll be making sure that they identify those to our satisfaction and that they have a plan to assess how they're improving in those areas.

There's three inspections that are ongoing right now: the AIT follow-up. The primary focus of that is taking the results of the AID inspection and putting them into a regulatory framework, what are violations, what aren't violations. There are some technical issues that have come out of the AIT that we'll be forwarding on to headquarters for evaluation.

The head replacement plan we've received from the licensee the process that they're going through and milestones, activities so that we can start scheduling our inspection activities, and the extent of condition inside containment inspection has been initiated.

Those are the activities that I wanted to cover with respect to what we're doing at Davis-Besse today. There were two issues that came up earlier in the day that I wanted to comment on.

One, Dr. Apostolakis, you raised an issue regarding the resident inspector knowledge of the head inspections. The resident's primary focus is on operational safety, day-to-day operational safety, and that encompasses operator performance, equipment operability, maintenance activities, testing activities. It's at least a full-time job for the two residents that are on site.

We're rather protective of distracting their focus off of operational safety. For PWR linguists, you're at risk of losing the bubble if you distract the residents from their operational safety focus.

Members from my staff, particularly several metallurgists, would be the ones who would be going out to the site and observing the head inspections that licensees have undertaken.

The challenge with that is that obviously they're traveling out of the regional office. So they can't be everywhere all the time. We have to depend, as Bill Bateman mentioned earlier, on the veracity of the statements made by the licensee, and we challenge those through phone calls and the residents participate in that, and they have some awareness of what the licensee has been doing.

But I wouldn't expect them to get into detailed evaluation of the head inspections because it would take them away from their principal responsibilities.

MEMBER APOSTOLAKIS: Let's see. I mean, the fact that the containment filters had to be replaced much more frequently than originally anticipated, isn't that something that somebody ought to notice?

MR. GROBE: As soon as that issue came up, I know we in Region III assessed that, and the containment air cooler cleaning and the red monitor filters, and the resident inspectors did that.

And of course, the information notice was issued. So the licensees were also sensitized to that. So we did follow up on those types of indicators and found no problems at the other sites in Region III.

MEMBER APOSTOLAKIS: No, I mean at Davis-Besse.

MR. GROBE: Oh, in retrospect?

MEMBER APOSTOLAKIS: Yeah.

MR. GROBE: There were two inspections in the fall of 2001, and the resident inspector had become aware of operational concerns with the -- this is actually a leakage detection system, the RAD monitors, and focused both on the operational performance of that system, as well as the source of the corrosion.

The licensee had committed at that time to do a comprehensive inspection. They did do some evaluation in containment of sources of leakage, but did not identify any and committed at that time to do a comprehensive assessment during the 2000 outage.

I misspoke. It was the fall of '99, and so they committed in the 2000 outage to do a comprehensive evaluation of what might have been leaking in containment. In fact, that's one of the issues that Ed Hackett's group is going to be looking at, is how we followed up on that organizationally;

the inspection program, how it addresses issues of that nature.

MEMBER APOSTOLAKIS: One last question.

MR. GROBE: Sure.

MEMBER APOSTOLAKIS: It's really a comment. When we were discussing with the staff the revised oversight process, this committee expressed concern about the safety conscious work environment cross-cutting issue, and the issue that we raised was, you know, how are you going to know that the safety conscious environment is, in fact, acceptable.

And the answer was: we're not going to do much about it because if it is not good, we're going to see it in the hardware. Things will start failing or, you know, doing things.

I wonder now as a result of this experience whether we still believe that that's the case, and do you?

MR. GROBE: Again, that's an issue. I had the distinct pleasure of spending four hours with the lessons learned task force yesterday, and that's an issue that they're going to be asking.

The results of our inspections and PIs and assessments over the last really decade or more of Davis-Besse performance has shown good performance.

We do inspect the effectiveness of their corrective action program, and that gets to a certain extent to this safety conscious work environment or safety focus of the folks at the facility, and those inspection results revealed the program was operating effectively.

MEMBER APOSTOLAKIS: So in retrospect then, we have to rethinking that.

MR. GROBE: That's correct. We have to look at what lessons we can learn, and that's why --

MEMBER APOSTOLAKIS: Now, I don't know if you want to make a comment on it, but I believe the problem is that this agency does not have the tools to do that. Now, you may not agree with me, but --

MR. HACKETT: I think I'd add the comment. I think Allen is going to get into this. One of the early themes, if you can call it a theme, in the lessons learned task force is let's look at management of these issues through leakage, basically through leakage management, and obviously in this case, you know, you've eroded margins to the point there is effectively no margin.

And that does go back to what tools are available to do better than that because in several instances now we've gotten to these points by people finding leakage, either NRC or in most cases licensee inspectors, and it's going to challenging the adequacy of that and then how do you do better.

You can do nondestructive examinations, but they're costly. They may not be entirely effective at going after exactly what you're looking for. So I think it does go to development of the tools, and I think that's going to be one of the things to come out of it.

MEMBER APOSTOLAKIS: Good.

MEMBER LEITCH: I know we don't want to go too far down that road, but that inspection of the corrective action program is not an ongoing inspection. It's module 4500, right, which is done every two years or something like that?

MR. GROBE: It's got a new number today, but, yes, it used to be 4500.

MEMBER LEITCH: Yeah, right, and so someone comes in from the region and looks, I guess, retrospectively at the effectiveness of the corrective action program.

MR. GROBE: The assessment of the corrective action program is in three phases today. The first part is a certain portion of each inspection procedure, each inspector every time they go out whether it's a health physics inspector, an engineer, resident inspector, a certain portion of their time during each inspection is focused on selecting certain activities retrospectively and making sure that those activities were properly resolved. So that's one part.

The second portion is that we just recently changed the periodicity of the major inspections from annually to once every two years. The reason for that was that freed up a number of resources.

It did two things. It gave us more time when we do it once every two years. We added about 25 percent to the duration of that inspection. So it gave us more time and more resources when we actually do go out to get more intrusive.

Secondly, it freed up a number of hours to select certain activities that are ongoing during that two-year time period between inspections and really drill down deeply. The more complex issues that come up, we can go out in a more real time basis and send an inspector out or the resident can do these kinds of inspections.

So it's in those three phases. We have a major team inspection every two years where it's a risk focused selection of quite a few deficiencies that have occurred over the last two years and evaluating how they resolved those; the real time situation between two years where we drill down and every inspector every time they go out samples.

MEMBER BONACA: But it seems to me, following up on this issue, oftentimes we see this concern with inspections, adequacy of inspections, and all of the ROPs focused on performance of safety systems, which are really managed and maintained on line outside of the outage.

And it seems to me that an area of concern would be to look at the outages specifically because there you see the constraints of activity, length of time given to activities that leads to inadequate corrective actions, inadequate inspection, and so on and so forth.

And that really is what is more likely to have a conflict between the need to restart and taking care of business completely. So I know you do have, in fact, your active inspections during outages, but is it -- I think still you have the resident inspector simply there just looking at what's going on, I mean.

Are there any lessons learned there? And should it be stepped up, the focus?

MR. GROBE: I bent the lessons learned task force here on a number of these issues yesterday. In today's environment, competitive environment, outages have been getting shorter and shorter, and outages are frequently less than 20 days now.

It becomes more and more difficult for us to inspect those kinds of activities that are only available during outages. So that's a challenge for us.

We try not to schedule complex inspections during outages because the entire work force of the facility is focused on the outage. So we try not to distract them from that focus.

So it's a challenge, and that's one of the issues that is before the lessons learned task force.

MEMBER BONACA: That's the major trend in the industry performance, has been the shifting towards shorter and shorter and shorter outages, moving out, for example, you know, all of the maintenance equipment, all line, when it's done without the pressure of the outages. So, therefore, you have much higher assurance that the work will be done properly.

And so it seems to me that there would have to be almost like a revisiting of the focus on that outage because that outage becomes critical, and the pressure in on the operators. I mean, I know I've spoken with some of them, and they have told me they feel the pressure from peers, who are really competing with them, and then from their management because if somebody else is doing it shorter and shorter time, why not us?

So, you know, I think certainly that's an area where I understand it's a challenge for you, but you know, one may conceive that you would want to have less focus at large on those activities which you know have been dedicated resources and time like staff under maintenance rule and more conceptive (phonetic) teams maybe, you know, just focusing on outages.

MR. GROBE: One of the things that we've observed as outages have gotten shorter, of course, as you mentioned, some activities have been taken out of outages and put on line, but one of the other things that we've observed is much more complex and effective scheduling and work management activity, which actually improves the quality of work.

There is that additional schedule pressure, and we're sensitive to that, but in fact, we've seen the outages are better managed, and that's one of the ways that the outage schedule has gotten compressed.

MEMBER BONACA: Well, no, I agree. I mean, they can do it. If they haven't done a very strong improvement affecting the way the outages are managed, then there are a lot of things.

However, time pressure is still time pressure. There are going to be some things which are a decision is going to be made that this is not important enough that we have to do it completely or this can be postponed, whatever. It has to be done because time is more limited.

MR. GROBE: And that's, quite frankly, one of the issues that is part of our follow-up activities at the AIT, is looking at those specific questions.

MEMBER ROSEN: I'd like to come away from the discussion of the outage for a minute and come back to your earlier remarks about operational focus, which I absolutely commend. I think that is the right thing for the inspectors to do, but I'm puzzled by that comment and the fact that what was going on at Davis-Besse for perhaps four years or maybe more was an event, an ongoing event, of the degradation of the head which sent a lot of signals, operational signals, the containment atmosphere, coolers, pressure drop, and the need for recurrent cleaning of that.

Just take that for an example.

MR. GROBE: Sure.

MEMBER ROSEN: There's clearly an operational event that your inspectors with their operational focus had to know about and had to draw a conclusion about.

MR. GROBE: In fact, I'm not sure that we had focused on the containment air cooler cleanings. I just don't think it rose to the level of cognizance on the residence staff, and Ed Hackett and the rest of the lessons learned task force team will be out interviewing all of the inspectors, but for my interaction with them, I don't believe that came to our attention.

MEMBER ROSEN: Well, clearly, in hindsight, which is always 20-20, one would say that that was maybe the preeminent signal to inspectors who have an operational focus that there was something amiss.

MR. GROBE: I think that's clearly one of the signals. The other one is the RAD monitors, which was probably more directly connected to what was going on. I believe it was July of '99 that they sent the sample filter out to be analyzed, and it came back that there were corrosion products that were produced in a steam environment.

That was a clear message that there was some leakage going on, primary coolant system leakage, and that did come to the attention of the inspectors through their routine inspections, and they did follow up on it, and it's documented in two reports.

It didn't get above the resident supervisor, and it didn't come to the cognizance of myself or the division reactor projects director.

We asked the right questions, but maybe didn't follow up the way we should have.

CO-CHAIRMAN FORD: I'd like to move on if I may.

MR. GROBE: Sure.

CO-CHAIRMAN FORD: Because this is not a topic that we covered in the letter.

MR. GROBE: There was one other if I could

CO-CHAIRMAN FORD: I'm sorry.

MR. GROBE: There was one other question that came up, and I just wanted to make sure despite Research's desire to be done with the finite element analysis.

That really is an important activity for two reasons, and I think they kind of came up, but I just wanted to make sure. One of the things that is part of the new program is a new definition of how we communicate significance to the public, and the results of that analysis and the following analysis, which will be the probablistic assessment. That will feed the probablistic assessment and are critical to us in our ability to communicate the significance of this event both internally and to the public.

The second though is we also use the results of that analysis to budget staff, and the more significant the finding, the more staff we put on a project.

And one of the things that I also bent the lessons learned task force's ear yesterday on was, you know, we've shifted to a, quote, risk informed framework. The significance determination process is actually risk driven in this arena. In other areas like health physics and emergency preparedness and security, it's risk informed.

But in the areas where we can do probablistic analysis, it's fairly well risk driven. You heard some analyses both from our Office of Research, as well as the licensee's staff, on burst pressure of the remaining cladding. It will be interesting to see how that's handled within the significance determination process and, when we're done with that, whether that truly reflects the significance of the performance deficiencies.

And that may be an opportunity to reexamine the way we do risk significance and whether there should be some other factors that are considered.

Taking notes, Ed?

MR. HACKETT: In fact, I am.

MR. GROBE: Good. Those were the other issues.

CO-CHAIRMAN SIEBER: So it's going to be green.

MR. GROBE: If you looked at it as a binary gate, you could come to that conclusion, but, in fact, there's probability distributions on all of those things. So even though the burst pressure might be some psi, that doesn't mean it wouldn't fail at a lower pressure.

CO-CHAIRMAN SIEBER: Right.

CO-CHAIRMAN FORD: Ed, thank you very much.

MR. HACKETT: I think like Jack said, Jack had already reached several conclusions for the task group yesterday.

MR. GROBE: If you need any help, just let me know.

MR. HACKETT: I think we're going to get all kinds of help.

I guess given everything that's been discussed here and the situation, it's not surprising that we're talking about a lessons learned task force. The agency has done these before. We don't have criteria for deciding exactly when they might be done.

The last one was done for the Indian Point Unit 2 tube rupture; this one for Davis-Besse reactor vessel head degradation.

I'm the assistant team leader. Art Howell from Region IV, he's the division director, division reactor projects in Region IV -- division reactor safety. I'm sorry.

MEMBER LEITCH: Who is learning the lessons here? In other words, is this an internal --

CO-CHAIRMAN SIEBER: If anybody?

MEMBER LEITCH: Is it the NRC going to look at Davis-Besse or look at the NRC's performance?

MR. HACKETT: I'll make several comments in that regard. I guess go ahead and put up the next slide here to get into some of that.

The primary focus, as you are indicating, is on the NRC and the NRC's internal processes. It's not limited to that though, however. It's also to look at recommended areas of improvement, both the NRC and the industry.

We also say reactor vessel head degradation. The scope and charter is actually broader than that. I think you can use --

MEMBER APOSTOLAKIS: I'm really confused. If it's broader, why doesn't it say that? Why do you have to say, "But really it is broader"?

It always confuses me.

MR. HACKETT: It was written before I got there.

(Laughter.)

MR. HACKETT: So I guess the charter --

MEMBER APOSTOLAKIS: Because that was my next question. Why limit yourself to reactor vessel --

MR. HACKETT: That's a good question. It was written this way. I think the charter is publicly available now on the NRC's Web site, and if you go below this basic mission statement, it does say that it is to consider other areas, you know, basically.

Especially in this case, looking at reactor coolant pressure boundary leakage in general, you know, would be more consistent with the charter.

MEMBER APOSTOLAKIS: I would not defense in depth the scope of the task force.

MR. HACKETT: That's a good point, too.

The other point I'll make, since we're literally just kicking this thing off this week, we are looking for public comment, soliciting public comments on the charter. I'll get into the charter here in a few minutes.

So far we have a charter that's been written. That was written before the team was even in place, and the charter is still open to suggestion, comment from the committee, from the public and others.

MEMBER APOSTOLAKIS: Let me understand something. If I go -- I haven't done it; I should do it -- if I go to the NRC Web site and look up reactor oversight process, Davis-Besse, am I going to see greens all over the place?

MR. GROBE: yes.

MR. HACKETT: I believe so.

CO-CHAIRMAN SIEBER: I told you.

MEMBER APOSTOLAKIS: Huh?

CO-CHAIRMAN SIEBER: I told you.

MR. HACKETT: Yes.

MEMBER APOSTOLAKIS: I believe you.

MEMBER LEITCH: For the last two assessment cycles.

MEMBER APOSTOLAKIS: Okay. So there must be some lessons learned.

MR. HACKETT: I think there will be some.

MEMBER APOSTOLAKIS: There will be some. Okay.

MR. HACKETT: Maybe a couple other things I'll mention up front here in terms of coordination and interfaces. There are other investigations going on that I'm sure the committee is aware of and others are aware of.

The Congress, Energy and Commerce Subcommittee, I believe, has an investigation ongoing. I believe they've been out to the site. They will likely be talking to the NRC, probably to the lessons learned task force, to Jack and 0350, and there are others.

There's Jack's 0350 panel, obviously. The Inspector General, internal to the NRC, is also looking at the NRC decision process leading up specifically to delaying the inspection at Davis-Besse.

So those are going on. Those are going on in parallel with this.

MEMBER APOSTOLAKIS: Would it be appropriate to add safety conscious work environment there?

MR. HACKETT: That is part of what we'll be looking into.

MEMBER APOSTOLAKIS: Of the oversight process, yes.

MR. HACKETT: So yes.

MR. GROBE: They asked me many questions yesterday about the corrective action program inspections and about inspection perform --

MEMBER APOSTOLAKIS: Who's "they"?

MR. GROBE: The task force.

MEMBER APOSTOLAKIS: Oh, these guys?

MR. GROBE: Yeah. They were brutal.

CO-CHAIRMAN SIEBER: Well, there's one thing about examining the corrective action program, and that's if the standards are low enough and there's not a questioning attitude. Then there's not much in the program, but everything that's in there probably gets corrected.

And so that's part of it, which the inspection maybe doesn't get to.

MEMBER APOSTOLAKIS: These guys will define questioning attitude every six months. He will come back and say that the definition is this, right?

MR. HACKETT: I wish we had six months.

MEMBER APOSTOLAKIS: We all talk about it, but we don't know what it is really.

CO-CHAIRMAN FORD: Well, the ACRS certainly has it.

(Laughter.)

CO-CHAIRMAN SIEBER: The question would be what's all of that red stuff coming out of that hole.

MEMBER APOSTOLAKIS: And the answer would be: don't worry about it.

(Laughter.)

CO-CHAIRMAN SIEBER: That's standard.

MR. HACKETT: We'll come to the schedule in a bit, and I'll wish I had six months, I'm sure. Actually it's mandated to be done in about three months, almost exactly three months from today. So it's an ambitious effort.

The charter elements are listed here as we have them right now. There's really these five pieces with an awful lot of the front end focus is going to be on the reactor oversight process, and I think Jack covered that more than adequately.

In addition to that, regulatory process issues at the NRC, including evaluation of the regulations, licensing review process, regulatory processes, such as the generic communications and the clarity thereof for regulatory process.

An element on research activities. We've heard from the Research Office today, and that's my home base. So there are obvious issues with not just the research. This isn't restricted to the NRC Research Office. This is research activities in general.

Should there have been some things that should have been being done that might have led us to be in a better place to identify this type of thing from a research perspective or to mitigate it more successfully?

So we'll be looking at that type of thing, including research performed external to the NRC.

International practices. I think it's pretty obvious that some of the foreign industry has looked at this issue very differently than the United States did. Most aggressively handled in France, and I think Allen has presented this many times to the committee.

With the initial discovery of Bouget in 1989, they embarked very quickly thereafter on a head replacement program, which, you know, we didn't do after discovery of some axial type indication in maybe like the '97 time frame, general letter 9701.

At any rate, it has been handled differently for some very different reasons, but the lessons learned task force will be looking into that, too.

The generic issue process, there have not been generic issues associated with boric acid corrosion or much involved with corrosion in general. That will be one of the topics.

Should there have been? Should there be now? Should this process somehow be better tuned to picking these kind of things up? Because that type of thing has not happened.

So at least those five elements are there. One of the things I'll mention right now is the EDO feels strongly about soliciting input on this charter. So I'd be glad to take input that anyone might have.

MEMBER APOSTOLAKIS: Yeah, are we going to see you before you publish your results?

MR. HACKETT: Well, I guess that's probably largely up to you guys. We're going to be plenty busy enough. So I guess I didn't come here, especially from Art's perspective, to be volunteering too many presentations over the three-month period.

I would think what I'll come to in some of the subsequent slides here is that we have a period where we're basically in a preparation phase right now. We've literally just assembled a team this week.

The review phase really starts at the end of June and should complete more like the end of July, and by then there will probably be -- there will be a developing story, obviously, along the way, but by then there would be something to tell, and we would be in the mode of trying to integrate it and writing the report at that point.

So that might be a point to talk some more about. It will be briefing. Obviously internally we report directly to the Deputy EDO, Bill Kane, and to the EDO, Bill Travers. They'll be receiving at least weekly briefs on the progress of the task force.

And if the committee would like to hear, you know, an update --

MEMBER APOSTOLAKIS: I think we need to discuss that in private.

MR. HACKETT: That's something we'll take as an action.

MEMBER ROSEN: We have a discussion of the schedule for this weekend.

MEMBER APOSTOLAKIS: No, but this is

something new.

MEMBER ROSEN: Right, but I think we can take this up.

MEMBER APOSTOLAKIS: Yeah, yeah.

MEMBER ROSEN: I'm saying on Saturday.

MEMBER APOSTOLAKIS: Sure.

MEMBER WALLIS: This second bullet, does that include looking at how we might view risk informed regulation as a result of what we've learned?

MR. HACKETT: I think that's fair. That one is fairly broad in terms of regulatory process. Certainly the NRC processes have been focused at performance based risk informing for a number of years now. So I think that's fair game under that element.

MEMBER WALLIS: This kind of event isn't in the PRA, I understand, or is it?

MR. HACKETT: I don't --

MEMBER WALLIS: There's no analysis of --

MR. HACKETT: This specific event I don't believe would have been anticipated to be in a PRA. I would think the -- I'll defer to Steve or others to answer that more definitively.

I think what is or what has been evaluated, I know, is the LOCA that would result from multiple rod ejection has been, and that was shown in terms of the LOCA situation to be bounded by the hot leg break.

MEMBER ROSEN: PRAs typically don't address passive components. The head of the vessel is a passive component. So it wouldn't show up as the component.

MEMBER WALLIS: Passive component about to become active.

MEMBER ROSEN: That's been fairly accurate.

MEMBER KRESS: LOCAs are all passive.

MR. LONG: This is Steve Long with NRR staff.

The PRAs typically address initiating events that would be failure as a passive component to pipe break or whatever. So there's a medium LOCA frequency. There's a small LOCA frequency, except for special initiators where you have postulated a mechanism and gone in and analyzed the failures that lead to that mechanism, such as an interface systems LOCA or something, you really just lump everything that might create a hole of this size into an initiating event frequency.

MEMBER APOSTOLAKIS: We had recommended when we reviewed Athena that the project look at the possibility of having an initiating event due to human actions during normal operations.

You know, so before you go to the PRA, you have to do all this. Athena has to take care of it, and then eventually, of course.

But you're right. Right now it doesn't have it, but these are -- I think the problem is broader. I think there has been reluctance to get into organizational issues, you know, for a number of reasons for the last several years, and these naturally involve organizational issues, I mean, however you want to --

MEMBER WALLIS: You can fall back on Defense in --

MEMBER APOSTOLAKIS: Well, that's what I'm going to do, the structuralist approach. What if you're wrong?

MR. HACKETT: I think you're --

MEMBER APOSTOLAKIS: Well, there has to be a way out of it, Steve. Either we have to understand it or we put Defense in Depth, right? That's what Defense in Depth does. It helps you when you don't understand.

CO-CHAIRMAN FORD: I'd like us to move on if we may.

MR. HACKETT: We're fortunate that the EDO has been kind to us, and I should say Mr. Collins also, in terms of putting this team together. Art Howell is a highly capable individual. He's leading the team from Region IV.

I was assigned as his assistant leader, and we have a very capable team here that's distributed among both the headquarters operation and the regions.

In addition, we're going to have --

MEMBER APOSTOLAKIS: Have come you have -- well, I don't recognize anyone there who's an expert at human performance. Shouldn't there be someone?

MR. HACKETT: You know, the team is literally so new. I have to say I believe that Ron Lloyd has some experience in that area, and possibly Tom Koshy (phonetic), although I could take that as an action and get back to you on it.

MEMBER APOSTOLAKIS: When we had the Athena presentations, there were usually four or five guys sitting where you are sitting now. Maybe one of them should be involved in this. It would help you draw some conclusions that perhaps otherwise you wouldn't draw.

MR. HACKETT: Yeah, we have the ability to draw pretty much from what we need on the NRC staff, you know, with the --

MEMBER APOSTOLAKIS: See, my concern is, again, that maybe we would focus on the technical part, the hard science part, when, in fact, the failures were not there.

MEMBER ROSEN: I think the management, George, of this lessons learned task force, Art, Hal, and Ed, have enough experience to understand the organizational and management factors to deal with the issues that I think you're referring to.

MR. HACKETT: I think, in fact, the focus is much more initially on the -- well, the charter elements, what we're calling charter elements A and B on the reactor oversight process issues and the regulatory process issues, I think, in fact, the focus is going to be largely there.

The other three elements are important, but if I had to weight these, I think the first two are the most important, and that's going to be the primary focus of the task group for sure.

Anyway, we're fortunate to have this. We're also fortunate to have been given the physically separate space on the 16th floor.

MR. GROBE: Just one other thing on the

structure of the folks that are on the committee that's important is that the committee is completely independent of anybody in Region III or anybody in NRR that was involved in these activities. So it's going to be a fresh look.

MR. HACKETT: In terms of how things are going to progress, I just briefly mentioned schedule previously. We're in this preparation phase right now which really extends to the end of June effectively. That's, you know, running from some mundane things like getting people set up in offices to actually starting to conduct some interviews with NRC staff and managers and, starting next week, discussions with plant personnel at the site and also with the region.

Jack mentioned earlier there's a trip out to the site vicinity next week that several of us will be going on. I'll mention some more about that in a minute.

The expectation from the EDO is that we're going to complete this activity in September of this year. That's the marching orders right now. Obviously things could be subject to change. If any new information comes to bear that would bear on the schedule, in particular, but that's where we're heading right now.

And then I'll just end with current status. I'm sorry. This is sort of where we are as of today. We just literally this morning completed two and a half days worth of team orientation briefings. The team, the nine folks that I had up there on the slide are physically here at NRC headquarters from the regions and from the headquarters functions.

And we're all assembled in one place on the 16th floor in One White Flint.

Team orientation briefings they said are completed. We are having -- Jack is having the 0350 panel meeting next week at the site vicinity. We are having what Art has been calling a public entrance in the site vicinity right after that. I believe it's late morning

MR. GROBE: It's actually before.

MR. HACKETT: Before?

MR. GROBE: Yeah.

MR. HACKETT: It's like ten o'clock in the morning, I believe.

MEMBER APOSTOLAKIS: So what is a public entrance?

MR. HACKETT: Basically it's really part of the communications plan for the task force, is to get out to the site vicinity and let people know that we're doing this and sort of what the expectations are going in to do that particularly in the site vicinity.

One that I didn't put on the slide is that we are working right now on also having a public meeting probably the week of June 17th where we'll be sort of rolling that charter, duplicating that same kind of meeting here at headquarters and soliciting input from anyone who's interested in providing some at that point.

Art, in particular, has been on this longer than the rest of the team. There have been a lot of interviews with key NRC managers who have been involved in this, and many more are going to be in progress.

And right now the team, in fact, just this afternoon is working on detailed review plans for the separate activities that we'll be doing. So that's where we are at the minute.

I'm especially glad to take any inputs on the charter or any thoughts the committee might have are welcome at any time.

CO-CHAIRMAN FORD: Thank you very much.

MR. HACKETT: Thanks.

MR. HISER: I guess what I'd like to do is take a tack that is maybe a little bit unusual for ACRS, a little bit of a philosophical twist to things.

(Laughter.)

MR. HISER: I know you guys don't like to do that.

CO-CHAIRMAN FORD: In the course of an hour.

MR. HISER: You guys don't like to do that. Very short; three slides.

We talked quite a bit earlier this morning about use of leakage detection. I just wanted to go over some ideas that we have. We don't have any real firm ideas at this point, in all honesty. We're still gathering information.

We do have maybe some ideas starting to gel in terms of the philosophy of how leak detection can fit in.

Clearly, first of all, before you determine what the appropriate inspection methods and frequencies, what the inspection program should be, you have to understand what it is you're trying to manage from the standpoint of where we were almost a year ago.

When we were discussing Bulletin 2001-01, the focus was really the safety concern of nozzle ejection. With the recent findings at Davis-Besse, that as we discussed early this morning has really raised the bar a little bit to where leakage may be the thing that we're really most concerned about.

And I guess the one thing that I want to impress upon the ACRS is it's not just the nozzle base material that's of concern. Cracking has occurred in the nozzle base material. It has occurred in the weld material. It has occurred at the interface of the weld and the base material. It has occurred at the interface of the butter (phonetic) and the vessel head. So pretty much all components of this structure are at issue here.

CO-CHAIRMAN SIEBER: And none of it is allowed by the code.

MR. HISER: None of it is allowed. That's exactly correct.

But also, how can we effectively manage each of those parts is really another key part to this. That's dependent on the state of the art, of the inspections, and tooling and the availability of those.

CO-CHAIRMAN SIEBER: It seems to me that if you're inspecting visually for leakage, then you've already passed the threshold in which you're in violation of the code, and it seems to me that if you have a susceptible plant, you ought to do volumetric and work for the 70 percent crack and fix it.

MEMBER APOSTOLAKIS: I think the leakage part is part of managing the accident and preventing it from becoming an accident, right?

CO-CHAIRMAN SIEBER: Well, part of it is compliance with the code.

MEMBER APOSTOLAKIS: Isn't that what it is?

CO-CHAIRMAN SIEBER: That's an NRC requirement. It's a state requirement, insurance company requirement.

MR. HISER: Well, I think it's a good lead into the next bullet.

MEMBER SHACK: Well, before you --

CO-CHAIRMAN FORD: Before you go, you skipped that one. Surely there should be, as Jack says, there's a code that says, "Thou shalt not have a crack."

CO-CHAIRMAN SIEBER: A deep crack.

CO-CHAIRMAN FORD: Well, I meant a deep crack.

MEMBER ROSEN: Peter, we have a member of the public who wants to make a comment.

MR. LASHLEY: This is Michael Lashley, South Texas.

And I didn't bring the code book with me, but that's probably not a perfectly accurate statement. The code allows evaluations and has certain acceptance criteria. Cracking has acceptance criteria throughout the code. It's not precluded, and in certain instances, specifically an example is buried pipe, it will clearly say you can live with that as long as it's within your operational boundaries.

So it's known in the code that cracking is not a totally tabu thing. You do have to do other measures and have other compensatory actions.

CO-CHAIRMAN SIEBER: But the reactor coolant system pressure boundary is an exception to that.

MR. LASHLEY: Well, that's the tech spec issue. The tech spec will say.

CO-CHAIRMAN SIEBER: It's a code issue.

MEMBER BONACA: We do not wait until you have leakage in the tubes. I mean, you go in and inspect, and you're looking at certain criteria. Now, you may have leakage, but by the time you restart the plant you're not supposed to have any leakage in the tube.

MEMBER SHACK: But here they don't allow operation with through wall cracks, which is analogous to the steam generator case. I mean, you don't allow operation with known through wall cracks.

MEMBER BONACA: But you're waiting for leakage to detect. What I mean is in the tubes you go in, inspect, you do sampling, but you inspect and plug if your through wall is beyond certain criteria.

MR. GROBE: I think there are two issues on the table. One is having a leak, a through wall crack. You're clearly not permitted to operate with a through wall crack.

But it's not uncommon to have very shallow cracks identified during IS activities and have those be analyzed that it's safe to operate for another outage, another cycle, and oftentimes that's exercised, and the licensee prepares for whatever repair or replacement activities they'll do.

CO-CHAIRMAN FORD: But, Jack, surely it is up to a certain point.

MR. GROBE: That's right. That's right.

CO-CHAIRMAN FORD: You can't wait until there's a through wall crack.

MR. GROBE: Absolutely.

CO-CHAIRMAN FORD: The code doesn't allow that.

So that comes back to Jack's point. Should there not be a third sub-bullet on the second bullet? There's a limit to the amount of cracking, non-through wall, that you can have.

MR. HISER: Yeah, I think that's correct. The purpose of these bullets was really to look to the point of, you know, leakage and deposits. What is allowed within the tech specs and the ASME code, and how does this fit? How does use of visual examinations fit within this context?

MEMBER WALLIS: Right, yes.

CO-CHAIRMAN SIEBER: Well, the way you wrote that tells me that you should look at the code, and it tells me how far you can go, what you have to do in your tech spec.

MR. RICCARDELLA: Peter Riccardella from Structural Integrity Associates.

You know, we're not talking about operating with known leakage here. If we find the leakage, we fix it. We're talking about operating with some non-zero probability of a leak, and the code doesn't prohibit that, and we do that in the primary coolant system all over the place.

We operate with some non-zero probability of having a crack or of having a leak, and you know, that's the issue that I think we have to have addressed. What is the acceptable probability that we could live with, not that we operate with leaks?

MEMBER BONACA: But you do IS in the vessel, right?

CO-CHAIRMAN SIEBER: And piping and everyplace else.

MEMBER BONACA: In piping, in volumetric inspections, and so on and so forth, and here we're talking until now we just do visual. So with visual it means we're waiting until we see leakage to determine that we're going to now repair it.

CO-CHAIRMAN SIEBER: Are you going to leak? That's right.

MR. RICCARDELLA: But you know, IS of small bore piping we do visual, and you know, we accept the fact that, for example, socket welds and small bore piping, we have a finite probability of leakage that occurs from time to time.

CO-CHAIRMAN SIEBER: That's right.

MR. RICCARDELLA: In the primary coolant system.

MR. HISER: Yeah. I think the one context that the staff would come at this from is the expectation previously was that these components wouldn't fail. You wouldn't get leakage, and so maybe leakage was an appropriate method to manage for that unlikely event.

Now, given the incidences that have been identified, you know, we need to take another look at it. That's all we're trying to do here, is just to lay out some of the basis for this.

CO-CHAIRMAN SIEBER: Maybe I can add additional confusion. I already wrote my comments, and I --

(Laughter.)

CO-CHAIRMAN SIEBER: -- and I'm just waiting for you to say them.

MEMBER ROSEN: Well, Jack, do you want some more input first? We've got another --

CO-CHAIRMAN SIEBER: Well, let me finish. I have the floor right now. Okay?

It seems to me that the susceptibility ranking curves, if they're done right, could be a process where you decide what kind of inspection and examination you need to do.

For example, a plant where the probability of actually having cracks is pretty low. Maybe visual is good enough. On the other hand, if you're in the hard runner list, you know, the most susceptible plant list, maybe volumetric is a better deal, particularly if you can calculate, which I think that we're all trying to do, how fast these cracks will grow, and that's basically what you do with steam generator examinations.

You're trying to predict can I run another cycle without losing a tube, and I think there's some value in thinking about that kind of an approach.

I would be happier if one of two things. One of them is that the database that was used to come up with the susceptibility ranking also included information about heats or, on the other hand, I think that whoever has a leak that appears to come from a susceptible heat of material, write a Part 21 so that everybody knows that here's additional susceptibility, and they can do something about it.

So that would be my thought process as to how I would deal with these issues you've put up here, for what it's worth, and if I get ten other people to agree with me, we can do it right.

(Laughter.)

MR. LASHLEY: Let me make one other comment. We talked about code and we talked about regulation. I'm going to read Criterion 14 out of the general design criteria, which is for the reactor coolant pressure boundary.

"It is the reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage of rapidly propagating failure and of gross rupture."

The code follows that same structural integrity process. It doesn't preclude crackage or through wall leakage outright.

MEMBER APOSTOLAKIS: So don't you think though that having a through wall crack and leakage is inconsistent with the requirement of an extremely low probability?

MR. LASHLEY: If you accepted it and just gross leakage --

CO-CHAIRMAN SIEBER: Step to the microphone and identify yourself, please.

MR. LASHLEY: Your point is well taken if you lived with it and didn't fix it or didn't do an evaluation to show it's not a structural integrity issue.

MEMBER APOSTOLAKIS: Oh, yeah, sure. We're not talking about shooting anybody. I mean fixing it. I think we --

CO-CHAIRMAN SIEBER: And when you talk in general terms --

MEMBER APOSTOLAKIS: Can we go to the last bullet? I'm dying to see what they have to say.

(Laughter.)

MEMBER BONACA: You guys keep talking.

CO-CHAIRMAN SIEBER: Let me say one other thing. EDC-14 really is looking at the reactor coolant system pressure boundary as a whole where there are some flange gasketed joints, mechanical joints like spores (phonetic) and safety valves and things like that, some of which leak, and so you just can't have an absolute prohibition against leakage because some things just leak. Seals leak; inner system leaks occur.

MEMBER BONACA: But remember those flange leaking in my judgment, they were a measured contribution to this event because there were a fixed --

CO-CHAIRMAN SIEBER: Well, it masked the problem.

MEMBER BONACA: They masked the whole issue, and they -- so, you know, one could even say the codes are not perfect.

CO-CHAIRMAN SIEBER: Well, I think there's a difference between leakage at some mechanical joint and leakage because of a defective wall.

MR. HISER: Ongoing degradation does tend to cause problems.

CO-CHAIRMAN SIEBER: And go on.

MR. HISER: Right. Now, within the overall context of safety of these components we have robust designs to minimize failures. We have quality fabrication practices and inspections to insure that we have quality components.

The role of leak detection may be at a minimum Defense in Depth. If one had inspection requirements that were more intensive, say, NDE, something like that, there still may be a role for leak detection just in case something happens different from what we expected, more rapidly than was expected. But it could be used as a Defense in Depth approach to management.

MEMBER APOSTOLAKIS: So Defense in Depth now means that I have a redundant or diverse barrier to something, right?

MEMBER KRESS: Not necessarily.

MEMBER APOSTOLAKIS: No? The Commission says it's the use of multiple barriers? That's what the Commission said.

CO-CHAIRMAN SIEBER: You could use alternate techniques, too.

MEMBER BONACA: Alternate techniques or back-ups or trains, for example.

MR. HISER: Say again.

MEMBER BONACA: Redundant trains, for example, would provide you further Defense in Depth. I mean it doesn't have to be necessarily a passive barrier. That's only for the barrier portion

MR. GROBE: And there are three barriers. There's the fuel, primary pressure boundary, and containment.

MEMBER APOSTOLAKIS: So anything that reduces the probability is Defense in Depth measurable?

MEMBER BONACA: Well, I mean, it measures -- it's a broad definition.

CO-CHAIRMAN SIEBER: Sure. That's philosophical, but it sounds okay.

MEMBER APOSTOLAKIS: Well, the Commission said the use of multiple barriers, and that's what it is.

MEMBER BONACA: No, in the protection of those barriers.

MEMBER KRESS: They didn't mention the barriers in the white table paper at all. They said multiple -- I forget the words, but it wasn't barriers.

MEMBER APOSTOLAKIS: Measures?

MEMBER KRESS: Multiple measures to address incidents.

MEMBER APOSTOLAKIS: So this is a Defense in Depth measure against which event? What are we talking about here? Defense in Depth against what?

MR. HISER: LOCA.

MEMBER APOSTOLAKIS: LOCA?

MR. HISER: Nozzle ejection, a redundant way of identifying the degradation that could be ongoing.

MEMBER APOSTOLAKIS: I'm sure it is, yeah. That's what it is, yeah.

MR. HISER: Now, the industry will present their proposed inspection plan following this.

MEMBER ROSEN: Some time after midnight.

MR. HISER: Sometime today. We started ten hours ago. So we'll push it along here.

We did have a meeting with them about two weeks ago where they presented this to us. Just to pull out some of the characteristics of this plan, one is it does not consider explicitly the vessel head degradation experience at Davis-Besse.

The technical basis is still in progress. There is no report that's available at the present time. For moderate susceptibility plants within the plan there can be a reliance on bare metal visual examinations.

The report explicitly is limited to Alloy 600 heads with 82-182 weld metal, and again, explicitly assumed a robust generic letter 8805 program that is effectively implemented. And clearly, with the recent experience we've had those are some pretty good assumptions.

I think some of the comments that the staff presented at that meeting and that we will be transmitting to the MRP first is that the relevant visual conditions that require follow-up examination do require better definition. Right now it just describes relevant conditions.

Clearly, inspection methods and frequencies that they propose for the various populations of plants requires a robust technical basis, and that's still something that's being worked on.

The discussion of NDE, we thought that the capability and recent experience with inspection methods and the developments that are ongoing, we thought that should be provided somewhere in the inspection plan. The technology has improved significantly over the last year, and hopefully that progress will continue.

As I mentioned before, right now our examinations of the J-groove welds and some of the interfaces with the nozzle and with the vessel head are not real detectable using the current ultrasonic methods. So that's something that requires some work.

Another thing that isn't clear within the plan is how it's benchmarked. Clearly we know when leakage was identified at plants. We know when circumferential cracks have been identified, but it's not obvious that the thing is benchmarked to when the leakage first occurred, when the first through wall cracking occurred, but it appears to be based on discovery of the conditions as opposed to benchmarking to the onset of the unacceptable conditions.

There have been some questions on the appropriateness of the application of Reg. Guide 1.174 within the plan.

And finally, there is a provision in there to delay scope expansion to the next refueling outage, and that's something we think requires significant technical basis.

MEMBER APOSTOLAKIS: We're going to talk about this application of 1174 at some point? I don't understand. Why is it relevant here?

MEMBER SHACK: One times ten to the minus three probable failure, conditional probability --

MEMBER APOSTOLAKIS: Are we changing anything on the licensing basis? And we're seeing whether it is risk significant? Is that what we're doing?

MEMBER SHACK: It says, yeah.

MEMBER APOSTOLAKIS: We're changing the licensing basis?

MEMBER SHACK: Well, no. We use that to evaluate changes in risk in a more global sense.

MEMBER APOSTOLAKIS: Well, presumably as a result of the inspection of plant, the change is negative.

MEMBER SHACK: Right.

MR. HACKETT: Well, no, the inspection plant admits some possibility of an increase in risk. Otherwise you'd inspect more frequently.

MEMBER APOSTOLAKIS: Increase from what? From the previous state? See, I don't understand the definition. Is there a change here that is permanent that is increasing risk?

MR. MATHEWS: I would say that they're evaluating the increase in risk from this phenomenon that we didn't know about when we originally assessed the risk from the plant, and this is a change because now, oh, well, we could have the rod ejection here that we didn't evaluate when we looked at the whole thing to start with. What is the impact of that, and what is the change in risk to the public?

And what we're trying to evaluate is what is that change, and ten to the minus six is a ballpark number that we were trying to say, you know, it would be okay if I came in and did something to my plant and said, well, that's less than a ten to the minus six change in the risk if I do this.

MEMBER APOSTOLAKIS: Are you doing a regulatory analysis now?

MR. MATHEWS: Me?

MEMBER APOSTOLAKIS: Whether it's worth backfitting. Is that what you're doing?

PARTICIPANTS: No.

MEMBER APOSTOLAKIS: So Regulatory Guide 1174 can be used to evaluate the impact of previously unknown phenomena?

MEMBER BONACA: As a change, assume it is a change with respect to what was known.

MEMBER ROSEN: No, I think the question that the staff is asking is is this an appropriate application of Reg. Guide 1.174. We haven't even heard what the application is. The representative from the industry hasn't been given a chance to tell us yet.

MR. HISER: And hopefully he will describe that; is that right, Mike?

MR. LASHLEY: I'll give it my best shot.

((Laughter.)

CO-CHAIRMAN FORD: Could I understand the timing of this? Obviously the industry have come to you with a proposal. You're looking at it. What is the timing on the resolution of these various issues?

MR. HISER: If I can get to the last slide and --

(Laughter.)

MR. HISER: -- you still have that question when I'm done, then I have failed.

We do have ongoing activities, and we have some areas of concern in general. First of all, relative to Davis-Besse, the degradation mechanisms and rates as described in the root cause analysis report don't have a lot of physical evidence from Davis-Besse.

What we're looking to do is for them to back that up with work on the cavity at Lynchburg and also hopefully some laboratory demonstrations that will give us some confidence and reduce the uncertainty of the mechanisms and the rates of those mechanisms.

CO-CHAIRMAN FORD: When you say "mechanisms," you don't mean mechanisms the way I understand mechanisms. You understand the degradation process by which things happen, but you don't know the mechanism and you can't predict it. You don't know whether it's a generic issue or whether it's a one off issue.

MR. HISER: Right.

CO-CHAIRMAN FORD: And if it's a generic issue, when is the next one going to be? You know it's not a major thing out there right now based on what's come out of Bulletin 202, whatever the number is, 01, but you sure as heck don't know what the situation would be in, say, a year's time.

MR. HISER: Right, and that's what we want to do is have the comfort of being able to predict how things will occur.

CO-CHAIRMAN FORD: And that's what these guys are going to do urgently.

MR. HISER: Well, hopefully in order to reduce uncertainty we need these things to occur. You know, otherwise the inspections are going to have to assume worse case kind of conditions.

CO-CHAIRMAN FORD: Right.

MR. HISER: In order to back off of that, you know, with the necessary conservative assumptions we need to have a greater understanding.

CO-CHAIRMAN FORD: Right.

MR. HISER: As we discussed, the industry proposal does need a sufficient technical basis, and I think that will come over time. The staff is considering a generic communication with Bulletin 2001-01 and 2002-01. We provided sort of a one cycle approach to inspections, and that was sufficient. It gave us the data that we needed to be able to go forward.

We're still not able to go forward. We're still not in a position to lay out any long-term criteria. So this is a generic communication that will probably be a bridge from the first two bulletins to what I would call the more permanent requirements that would go in the ASME code or in 10 CFR, Part 50.

We are working with the staff to develop a technical basis for these longer term inspection requirements. We don't have that ready now. I mean, that's going to take time. I think within our action plan that's targeted for later this year. That may be overly optimistic at this point.

And to put another idea on the table, I think that we believe that the Davis-Besse experience has raised the bar, that the level or the type of cracking that is I don't say acceptable, but that you really have to guard against has changed from circumferential cracking a year ago to now even axial through wall cracking. That's really the emphasis that we have at this point, is trying to preclude through wall axial cracking.

CO-CHAIRMAN FORD: But to come back to my question, when are all of these issues going to be resolved?

MR. HISER: Hopefully around the end of the year or some sort of time frame like that is what we have worked out with the industry.

CO-CHAIRMAN FORD: This is very important. I mean if you're starting to just do away with volumetrics and won't go through any of these kind of studied process of when you use volumetric versus visual and you just go to visual because it's an easy thing to do, it's major, major assumptions.

MR. HISER: I would expect that as I stated the generic communication will have conservative assumptions. Until we have a firm understanding of things, such as Davis-Besse, we will not take potentially non-conservative assumptions.

CO-CHAIRMAN FORD: Okay.

MR. HISER: From the standpoint of visual detection and visual inspections, I think things will be different than what was laid out in Bulletin 2001-01 significantly.

CO-CHAIRMAN FORD: We will hear about that before it becomes a done deal?

MR. BATEMAN: I'm not sure about that. I think we're moving pretty quickly with trying to get some generic correspondence out.

I think you can take some comfort from the fact that you're going to hear what the industry's proposal is, but I think our proposal at this point in draft stage is it's going to be more rigorous than what you're going to hear from industry. I think as Allen said, I think it will be a bridge. It will probably be more conservative than what we may ultimately end up with, but we have to do something.

We can't wait until we're through with all of this, Dr. Ford.

I mean, if we're talking about rule making, if we're talking about getting something in the ASME code, that al takes time.

CO-CHAIRMAN FORD: But let's see what the industry have got to say.

MR. BATEMAN: Yeah, I think that's the best bet.

MEMBER APOSTOLAKIS: This is the last presentation. This must be an important issue. Are you guys going to do this quickly?

MS. KING: We'll do this as quickly as you would like.

(Pause in proceedings.)

MS. KING: The slides for this are the las part of our original packet. And in the interest of time, we won't be covering every individual slide that you have.

MS. WESTON: Starting at slide number 102 for the MRP part of the presentation, yes.

MEMBER APOSTOLAKIS: One, oh, two.

MS. WESTON: The numbers are right beside ACRS 6502 and then there's a number.

MEMBER APOSTOLAKIS: Or it's four pages

from the end. Go to the end and count four pages back.

MS. KING: Okay. Peter, one thing I wanted to comment on is we have been meeting with the staff fairly frequently, and we plan on continuing that frequency of meeting with them on a technical level as we develop our research to get comments, and to incorporate that in so that we don't just shop up with the final answer.

CO-CHAIRMAN FORD: Michael.

MR. LASHLEY: My name is Michael Lashley. I'm from South Texas Project.

And the first slide that we have here basically just says, yes, we met with the NRC staff. We heard their comments, and we're actively dispositioning those comments.

One other aspect of this just to give you real briefly where I'm coming from, I also have the action within code space to bring these rules forward and try to write some rules in Section 11. So myself, and I know a member of the NRC staff, Wally Norris, is on that team. So we are trying to work together.

So we are trying to actively work it to a permanent solution.

Let me digress off of these slides real

quick and show you one other slide that maybe bridges the gap to what we were talking about, and you saw it in Pete Riccardella's, but we have another line drawn in here that may not be obviously, but it does speak to the Reg. Guide 174.

This slide kind of does that and also one other one. From this one, you saw everything on this slide except this one purple curve right here. That curve represents a one percent probability of leakage.

So you see there is a big grouping of plants in that far left-hand corner with low head temperatures that are under one percent.

MEMBER WALLIS: One percent per year?

MR. LASHLEY: Probability of having that first leaker.

MEMBER APOSTOLAKIS: But can you explain the figure first?

MR. LASHLEY: This is the one that Pete discussed. Was that yesterday? Earlier this afternoon, and this has on the left-hand side the cumulative effective full power years. The red chain link that has over it the -- which color? I'm not sure. That's kind of green. The upper one is one times ten to the minus third, which approximately equals the 75 percent probability of leakage.

The moderate dividing line is the one times ten to the minus fourth or 20 percent probability of leakage. So that's how we've categorized or just used that reg. guide as a dividing line.

And then we divine an inspection program. Our attempt was to keep us under the ten to the minus six change, to come up with an inspection program.

Now, recognize that one of the punch lines at the very end is we still have inspection activities for this grouping in the lower left-hand corner that's under one percent. That's at least to go after the unknown, which does speak to defense in depth and speaks to some other issues that were brought up.

So I just wanted to show that. We'll come back to it if there's other question because this kind of tells a lot of the story.

CO-CHAIRMAN FORD: So this essentially is you will be addressing the thing that Jack brought up about the low susceptibility plants do visuals.

MR. LASHLEY: Yes. So we still have those elements in here. Now, at certain times Al brought up wastage, and it's really the time line for wastage is a different issue, and that's what wasn't explicitly addressed in our program, in our plan.

We had assumed right off the bat that generic letter 8805, it's in effect. It is a good rule. You go read it, and it tells you exactly what to do. If you implement it, and you all talked about this earlier; if it's implemented, there will be no questions, but there's a desire to package this together so that there's no ambiguity and you can see some of -- we have the ability to bring lessons learned, bring pictures, bring training, bring a lot of things to bear in one central document. So we're taking that feedback.

And the purpose, I mean, as we say, we assume the generic letter 8805, but we also came up with a graduated approach for early detection, to start with low risk, require something, require it repetitively, and then, you know, raise the bar continuously as we move to higher and higher levels of risk.

We also believe they're very conservative for just structural integrity or the safety issue of a rod ejection or a nozzle ejection.

This is where we start skipping a few because those have already been gone through, but we took the technical bases. We say that the staff did not have the papers. They were presented, and Pete presented basically the elements of it again today.

There was another technical paper that was presented by Glenn White today that's a part of this bases, and Steve Hunt has another one.

One that we really haven't gone through is EPRI's visual guideline also, but we bring together all of this probablistic fracture analysis, and we did sensitivity studies to bound them to try to come up with correct inspections and correct frequencies for the different ones to bring that to bear, and we --

MEMBER APOSTOLAKIS: Can you explain something to me? I'm missing something here. Maybe it's me. This is a standard technical approach, you know, in an inspection using PFM, Monte Carlo, and so on.

Then I go and I read the letter that transmits the AIT report. The first thing they say is the boric acid corrosion control program at the site included both cleaning and inspection requirements, but was not effectively implemented to protect leakage and prevent a significant corrosion of the reactor vessel head over a period of years.

And I'm sitting here trying to figure out how is this program addressing this problem.

MR. LASHLEY: And staff brought that point up, but what you can see from that other figure, that one again --

MEMBER APOSTOLAKIS: Yeah.

MR. LASHLEY: -- a lot of plants have done -- well, the other 68 plants have done inspections and generally said wastage isn't an issue at my plant.

MEMBER APOSTOLAKIS: Yeah, but if there is one plant --

MR. LASHLEY: Oh, I understand.

MEMBER APOSTOLAKIS: -- where this will not be implemented, as these guys are saying, was not effectively implemented, then the whole thing again fails. So is this --

MS. KING: Well, there are industry activities that have been undertaken to evaluate the implementation of generic letter 8805. We have scheduled a -- EPRI has undertaken a conference to bring together the people that do the boric acid walk-downs in the plant to talk about best practices, and INPO will be participating in that conference as well.

MEMBER APOSTOLAKIS: Shouldn't that be an integral part of this inspection thing?

MS. KING: Well, as was stated in the purpose of this plan, and as the comment we received from the staff, when we initially wrote this plan, we were depending upon an effective implementation of the 8805 program.

As Michael stated, the words are good. It's a good rule, but we do understand that we need to potentially -- we are working to look at the implementation and best practices of an 8805 program.

MR. LASHLEY: And just to tag onto that, with boric acid, EPRI's guideline for how to do this was revised just as of November 2001. So we're going to bring all of these things back to bear at a workshop this summer, and we're going to take the feedback we receive from the staff, and those actions are underway.

I'm the chairman of an ad hoc team under this group to try to do that, and we're still working through that, and our time line is real tight. We would like to bring something back through our committees by the end of next week.

MEMBER BONACA: You showed us a curve before, and you show a bunch of plants below that purple line.

MR. LASHLEY: Right.

MEMBER BONACA: The lower purple line, and you said for those visual inspections are justified, something of that type. What about the other plants?

What are you proposing to do for the more successful plants?

MR. LASHLEY: It is the last page of your handout. There's a flow chart, and we're going to get there.

MEMBER BONACA: We are going to get there. Okay. So then we will just --

MR. LASHLEY: And like I said, we weren't going to go through all of our different slides, but we'll just start doing it.

Modern susceptibility we already mentioned there was a 20 percent curve and ten to the minus fourth or ten to the minus seventh cumulatively.

High susceptibility was using that for ten to the minus third or 75th percentile, and that's what we meant by the Reg. Guide 174, keeping the probability under or the change of probability under a cumulative ten to the minus sixth, which by reg. guide standards, if you do that and a few other things, that is a risk informed or meets the basis for a risk informed --

MEMBER APOSTOLAKIS: I have another question. My problem is what is the change. This is a new, novel application of 1174.

MR. LASHLEY: Yes, and we're just using it to guide us. We had used probability of leakage, and we wanted to use -- we also didn't want to be outside of, I guess, in bad air space and risk. If I knew, you know, a rod ejection was ten to the minus three, I should take --

MEMBER BONACA: Well, the change is similar to what has been done with 5059 for the plants. When you discover a new condition, okay, and you want to leave with it and you want to management it and solve it immediately, then you have to value it under 5059 because you're changing your design basis.

MEMBER APOSTOLAKIS: But that has nothing to do with 1174.

MEMBER BONACA: Well, 1174 is in a certain way akin in that it's a risk informed approach to the same thing.

MEMBER APOSTOLAKIS: Right.

MEMBER BONACA: You have an event. You could do things. One, you go in and just absolutely replace the head and make a case that you have put back the plant in the condition in which it was originally and you don't have to worry about it for a period of time. Therefore, you don't have to do any risk evaluation. Nothing has changed.

The other one is you want to live with it.

You want to be part of this pack. There is an increase in some risk factors there, and therefore, you are going to justify it under 1174.

So the change is not a true change, but a change came upon you.

MEMBER ROSEN: That is the battleship in the desert phenomenon. We don't know how the battleship got there, but now that it's there, can we live with it?

MEMBER APOSTOLAKIS: Right.

MEMBER ROSEN: And so what you do is do an analysis of what are the consequences of that.

MEMBER KRESS: What you have is a probability of the change. If you go in and actually find out that your probability was wrong and your detection process showed a leak, you'd do something else.

MEMBER ROSEN: Yes.

MEMBER KRESS: You would fix that.

MEMBER ROSEN: Yes.

MEMBER KRESS: So all this is is a way to deal with the probability that you might have approached that one time at ten to the minus sixth.

MR. LASHLEY: Right, and you'll see how once you're into the inspection program, the results drive you then.

MEMBER KRESS: Yeah.

MR. LASHLEY: And if you're in high once, you can't get out of it. You're stuck.

MEMBER KRESS: You're there. That's right.

MR. LASHLEY: Until you replace the head.

MEMBER KRESS: Yeah, you're there. That's right.

MR. LASHLEY: So we'll go into it that way, and we did look at the J-groove weld and put together -- because that was a concern, and it was brought up, just the crack growth rate and things of that nature. So we looked at it from almost the worst case to see if we needed to do something extra from what we were thinking, and we looked at it from a worst case.

And so we used these two conditions of a circumferential crack or lack of fusion, something that would free release that whole thing. For nozzle ejection we still knew that it still could provide leakage or provide the environment, and those were the comments Al said.

So we're still looking at the environment that it creates and the leakage and the wastage.

We've got to put that aside, but we did look at these two conditions and saw that's not going to create anything worse than the circumferential crack at the nozzle.

You'd have a circumferential crack around the J-groove itself. It physically can't fit through the hole.

Pretty much the same thing for lack of fusion. You would have to go all the way to still that structural margin of 300 degrees to really free release it. So we felt we were bounded by the circumferential analysis, the deterministic analysis that Pete's done.

So let's go into the plan. There are several slides that --

MEMBER BONACA: but you're still focusing only on the probability of rod ejection, right?

MR. LASHLEY: That was what when we looked at --

MEMBER BONACA: I know, but now there is a new issue, which is --

MR. LASHLEY: Wastage,

MEMBER BONACA: -- one of wastage, yeah.

MR. LASHLEY: And the issue with J-groove, it will just bring it to the surface sooner, but if a visual technique is -- we would propose a visual technique can see it, can see the evidence, and if it's done at just the appropriate frequency, you still won't have the wastage issue.

MEMBER BONACA: But if I remember, at Davis-Besse they had one nozzle, nozzle number three, where they had large wastage.

There was another nozzle, number two, I believe, where there was very minute wastage along the CNDM. Would you see that?

MR. LASHLEY: My supposition would be yes. I think you heard the 900 pounds didn't get there overnight, and I know you saw pictures dating back further that saw the red rust.

MEMBER BONACA: No, I understand that. I'm saying there were two areas of wastage. One was a very large one, which may be the main source of the red. Then there was a very thin one that I don't think a visual inspection would be visible.

MR. LASHLEY: No, we have the visual exam guideline which takes all of the other events, the Oconees and everything. It has nice pictures and videos in there. This is one of our reference documents to implement, to use.

And you've heard that term "popcorn." You can still have the minute, you know, one cubic inch, the very small levels that that condition would easily bring out. That one I think you'd still see a flow.

MEMBER KRESS: Your concern that the one leak masks the other one and --

MEMBER BONACA: Yeah, because at some point --

MEMBER KRESS: Yeah, but I don't think they would ever tolerate that kind of leak in this system, and this is going to be so low that if you get individual nozzles leaking, you'd know it because they're not going to have this kind of massive leaks.

MEMBER BONACA: No, no, I understand. I'm saying in the second nozzle where there was an incipient erosion taking place, but it was very minor. It was just very close to the --

MEMBER KRESS: Yeah.

MEMBER BONACA: I'm just questioning --

MEMBER KRESS: Yeah, but that would be a leak that you could fix.

MEMBER BONACA: -- whether it is visible at that point. Yeah, but I'm saying that would it be so visible.

MR. LOEHLEIN: Maybe I should comment on that.

MS. KING: Okay.

MR. LOEHLEIN: This is Steve Loehlein again.

Nozzle two does have a cavity region that maximum depth was about three-eighths of an inch. It did extend to the surface, was visible at the surface, and through comparison to other test data that's been available from the EPRI testing and so forth, it's pretty conclusive that there would be significant formations of boric acid in the region of a nozzle that looked like that, and there would be some rust colored deposits as well because there is active corrosion products being expelled with the boric acid at that point.

So nozzle two is actually quite far along in terms of being able to be visible from boric acid.

MEMBER BONACA: I understand, but I'm not talking only about nozzle two. I'm talking about another hypothetical nozzle where corrosion is going only from the beginning of it to one third or one fifth of what we see in nozzle two.

Do you see what I'm trying to say? I mean, there is an incipient corrosion taking place, and I'm just asking if, you know, the only criterion should be their concern with nozzle ejection or also with incipient -- the beginning of erosion and corrosion that would cause some coloration, but not necessarily allow the popcorn effect.

MS. KING: I think that comment goes directly back to the work that we've undertaken, and we're still going on, and you saw the initial presentation from Glenn White.

Our initial read on that situation is that you would have visible deposits on top of the head prior to reaching nozzle two type wastage, and definitely prior to reaching the cavity formation at nozzle three.

But the definite time line on that, we still have some work to do.

MR. MATHEWS: We've had 30-some nozzles that have leaked that we know of, and every one of them has shown boric acid on top of the head, even the ones that have had no wastage at all. And so what we're saying is that if you do start to get wastage, you're going to start expelling stuff to the top of the head.

And it takes a period of time, and that's what we haven't quantified yet to go from the initial leakage to getting the high flow rates that's going to generate significant wastage.

But it's going to be visible, and if you do a visual inspection at a frequent enough basis, you'll catch it before then.

CO-CHAIRMAN FORD: But that's not what happened at Bouget.

CO-CHAIRMAN SIEBER: Or Davis-Besse.

MR. MATHEWS: Well, I'll be honest with you, Peter. I don't know what happened at Bouget. They weren't looking on top of their heads under their insulation.

CO-CHAIRMAN FORD: N, as I understand it at Bouget, they detected by hearing during a -- well, they detected it during a hydrostatic test. There was no boric acid on top of that particular --

MR. MATHEWS: Well, that's what's not totally obvious to me, that there was no boric acid, because they had not looked under their insulation, as I understand it.

CO-CHAIRMAN FORD: Well, I'm only reporting what was written in the paper.

MR. MATHEWS: Okay. Well, I've been trying to chase that issue down. Did they look? And I'm not sure they did.

MS. KING: I'd like to make a further comment to what Larry was talking about with the experience to date. We'll take the Bouget comment under consideration. I mean, we need to get some more information.

CO-CHAIRMAN FORD: The reason why I'm bringing it up is, you know, this is a topic that comes up, you know, in cocktail conversation time and time again, and I keep hearing it, although we don't have any cocktails today.

Unfortunately this ugly fact destroys a beautiful hypothesis. If it really is true --

MR. HUNT: Steve Hung from Dominion Engineering.

At Bouget, the crack, the length of the crack above the top of the J-groove weld was two millimeters, which was less than a tenth of an inch. It was, you know, a 13th of the length of the cracks that you had at Davis-Besse. It may have been long enough for you to get water to create the circ. crack, the small circ. crack that was reported, but following the model that Glenn described, probably not large enough to create the volume of leakage necessary to create the wastage.

MEMBER BONACA: In any event, I don't want to pursue it any further. I just want to say that, you know, first of all, we thought that this nozzle would never fail. Then, lo and behold, some of them began to crack.

And then we believed that they would never have circumferential cracks, and lo and behold, we found circumferential cracks.

And then we believe that we had full control of it, and lo and behold, now we have a hole like this up there. So I'm not an easy believer anymore. I mean, I have to be a little skeptical about all of these promises.

MEMBER APOSTOLAKIS: This is my problem.

MS. KING: I guess I would like to comment along the lines of the experience to date and the repairs that have been done. Typically the repair that has been done is the Framatome what we've termed relocation of the pressure boundary, where they go in and take out the bottom portion of that nozzle.

And in that repair process, you have the opportunity to inspect the bore, and so far no one has identified wastage below that cut point, and you also do dye penetrant testing to validate that you have a good place to weld.

So we do have 34 data points in the industry where we have had boric acid on the top of the head and no known wastage behind the nozzle.

MEMBER BONACA: I understand. On the other hand, I mean, at Davis-Besse they found the hole by pure accident because there was simply the boring and --

MEMBER APOSTOLAKIS: Well, that's my problem. I see here traditional technical solutions to a problem that wasn't there.

MR. LASHLEY: So here's what we're going to propose --

(Laughter.)

MR. LASHLEY: -- to try to go after that.

CO-CHAIRMAN FORD: Are you going to go through these?

MR. LASHLEY: The flow chart. I'm going to go through the flow chart because that wraps up everything on one page.

CO-CHAIRMAN FORD: Good. That's the last one.

MR. LASHLEY: It's the last page.

MS. KING: It's the last page of your handout.

CO-CHAIRMAN FORD: Now, what's in those boxes essentially is what's written down on these low susceptibility, 100 percent reproducing --

MS. KING: Yes.

CO-CHAIRMAN FORD: The message that's in these here is important, but you're reproducing it on this.

MR. LASHLEY: Yes.

MS. KING: Right. That is the text from the inspection plan, and this is the --

CO-CHAIRMAN FORD: Jolly good.

MR. LASHLEY: It's probably easier to look at that.

And so you come into the plan, and let's take the low susceptibility, which we define as less than ten effective degradation years. What we know is you look at that big grouping on the lower right-hand side. They're all virtually into their second tenure interval already, and we also have the rack-up of the 0201. Virtually every plant has done or is doing an inspection.

So we know we have this snapshot of that at least at baseline, and we're going to require an additional inspection. It could be a bare metal visual or a nonvisual, indeed, volumetric, once per ten years, and we say do that starting in your third interval.

And our concern is, if you remember, there's such a large gap that these plants may never cross over to moderate. If they're 560 degree head, you don't cross over until life extension, your 52 years of operation.

So we're still requiring that group that's less than that one percent probability of leakage to do something and to do it on a ten-year frequency moving forward.

CO-CHAIRMAN FORD: So the ten years comes from some kind of judgment. It's not based on some criterion of some sort?

MR. LASHLEY: It had a lot of engineering judgment, and that's probably where Al was speaking to. Like wastage in and of itself, we have evidence that we could have found Besse six years ago, and so there is where the disconnect that we're still working on the staff on because you don't expect the surprise down there, but we --

CO-CHAIRMAN FORD: It's not based on some sort of analysis where you say in order to reduce the risk by a certain amount if we need to inspect at a certain interval?

MR. LASHLEY: We did do the analysis, but if you remember Pete's curve at the inspections, it would stay on the flat line. It would just keep bubbling up and never come off any risk, but we knew that, but we're still going to say you still have to do something for the unknown because we don't know what we don't know.

But the ten-year --

MEMBER ROSEN: Modeling uncertainty or modeling completeness.

MEMBER WALLIS: The ten years is based on your assessment of what you might not know.

MEMBER ROSEN: We require Defense in Depth. We require testing even for plants that would not otherwise require it.

CO-CHAIRMAN SIEBER: Yeah, but this is pretty modest for a low susceptibility plant, which is not unreasonable in my opinion. It's only ten percent.

MEMBER ROSEN: This is exactly what you were espousing, is the graded approach to the thing.

CO-CHAIRMAN SIEBER: Yeah. I just worry about the high susceptibility plant.

MEMBER ROSEN: We'll get to that.

CO-CHAIRMAN SIEBER: The faster we get there, the happier I'll be.

(Laughter.)

MR. LASHLEY: And I'd say don't forget that at least when we first proposed that, we still knew everybody does a boric acid walk-down every year or -- excuse me -- every outage, and we still assumed it was more robust. So we're going to take that. We have that comment.

Moderate susceptibility is at ten to 18 effective degradation years, and we required once every two, not to exceed five years, and this one was an engineered number to be less than the six that we knew about for Davis-Besse or that we suspected.

You're going to do a bare metal visual or you're going to do a non-visual once every four effective degradation years, not to exceed ten. And this is where we use Pete's model and his susceptibility -- not susceptibility. I lost the word.

PARTICIPANT: Effective inspections.

MR. LASHLEY: Yeah.

MEMBER KRESS: Some of those plants in that modern region are down near the bottom line.

MR. LASHLEY: Correct.

MEMBER KRESS: Some of them are up near the top, the one times ten to the minus six line.

MR. LASHLEY: Correct.

CO-CHAIRMAN SIEBER: Right.

MEMBER KRESS: Now, are you going to treat those two plants differently or they get the same treatment? Because they're in the moderate region, both of them.

CO-CHAIRMAN SIEBER: You're profiling now.

(Laughter.)

MEMBER KRESS: I am profiling, yeah. I mean, it would make some sense to treat those two plants differently, how close they are to that line.

MR. LASHLEY: Right. We talked about that when we received that specific comment from the staff. I mean, there's the example of this week you're moderate. You start back up from your outage, and by gosh, next week you're high.

MEMBER KRESS: You're across the line.

MR. LASHLEY: You're across the line. So we have evidence.

If you look at the periodicity of the exams, and most of those plants are higher in temperature, the periodicity is two EDY versus every outage. So most of those plants, if you are greater than 600 degrees, two EDY is only one cycle, is one 18-month cycle.

So we thought about it, and that's why we're using EDY and not years.

MEMBER KRESS: Yeah, okay. That would

help.

MEMBER ROSEN: Why are you switching from EDY to EFPY? I don't understand that.

MS. KING: Well, that was to put an upper cap on those plants that accumulate EDY very slowly, and so they couldn't go -

MR. LASHLEY: Do you want to go back to the figure?

MS. KING: Which one?

MR. LASHLEY: Heats.

MS. KING: Oh, Lord. There we go.

MR. LASHLEY: All right. Remember he had a whole series of blue lines, but EDY goes like this. So to do one EDY it might take that long. I mean, it may take five effective full power years if you're way over here at 560 degrees. Remember all of these swooping -- those are EDY, the curve.

So when we used -- that's degradation years normalized to 600 degrees, but if we keep it at, sorry, you can't go past so many effective full power years, that was our attempt to go after the wastage.

MEMBER ROSEN: Regardless of the --

MR. LASHLEY: Regardless of it, it maxed out.

MEMBER BONACA: And, of course, it assumes susceptibilities, only temperature dependent.

MR. LASHLEY: It's using the simplified model, yes.

MEMBER BONACA: So we're hanging a lot of things on this assumption. Again, I'm a little bit --

MEMBER KRESS: Well, you might argue that one times ten to the minus six kind of takes care of that uncertainty to some extent.

MEMBER BONACA: Maybe.

MEMBER KRESS: Because that's a pretty low number.

MR. LASHLEY: And you can see from this 560 degree plant to go from moderate to high, there's still some 40-something years, effective full power years, but that's only eight effective degradation years.

MEMBER KRESS: Now, the ones I was concerned with were these down here on the high temperature end, say the red ones.

MR. LASHLEY: We'll get -- well, it's not on the flow chart. Let me jump in. Any time you find a leak and it says it in the plan, you are redefined --

MEMBER KRESS: Yeah, but I'm looking at the blue ones that are that close, too. It seems to me like some of them, a couple of those blue ones are pretty close to that line.

MR. LASHLEY: Being blue like that means they've inspected. They're less than probably two EDY away.

We say when you come into this plan, you're going to do this inspection. You're going to start off doing it, hit the ground running. So that's what it was geared for.

And we knew all of these will be moderate imminently.

MEMBER KRESS: Well, they're going to get there. I mean, that's the thing about time being your --

MR. LASHLEY: Right, and our graduated approach is to use that effective degradation years as the frequency, but cap it in real years so that you can't get too far off track without coming back.

MEMBER BONACA: You have a number of red triangles there that are below the separation between moderate and high risk. But you consider them high risk, right? Because they already have --

MR. LASHLEY: They will be considered high risk.

MS. KING: They will be considered high

risk, but also those data points are one year old. We need to update our data points.

MEMBER BONACA: So that would go --

MS. KING: It's based on the 228 effective full power years at that count. It would be expected to be recalculated, and I guess I'd like to point out that those plants, well, spring '02 and the later Xes have inspections planned associated with their Bulletin 01-01 responses.

CO-CHAIRMAN FORD: Could I suggest maybe we start to wrap up?

MR. LASHLEY: Okay. Any questions? No.

CO-CHAIRMAN FORD: I think we're al getting a bit punch drunk here.

MR. LASHLEY: High susceptibility has the bare metal visual every outage, and it also has no matter what -- you're going to do a non-visual. You're going to do NDE within the first four EDYs to get --

CO-CHAIRMAN SIEBER: Volumetric.

MR. LASHLEY: You're going to do it, period, and that's just to go after the unknown.

What this also has in it if you go down below -- can you scan down? -- if you ever find the leaker, you're going underneath. This is standard code stuff now. You can characterize the flaw and find the extent of condition.

We do allow in this plan one cycle to complete the 100 percent look of every nozzle under the head. So this was for that plant that found a leaker early. You still have to go look at those, but we still felt like if you were moderate, you still had time. If you didn't show anything above, you still had time. You didn't have the wastage issue. You didn't have the safety issue. We could accept a cycle before you come back in and do 100 percent volumetric of everything.

So once you're a leaker, once you're high risk, you're doing that volumetric you're after, and you're going to do 100 percent within one cycle.

So then we would know the entire extent of condition and fix what we find. We're using the reference flaw characteristic that directs Strosnider, and it has virtually intersecting or circ. cracks you've got to fix, and that was the 75 percent through wall to the next inspection you have to fix.

That was short and sweet.

CO-CHAIRMAN FORD: Thank you very much, indeed. I appreciate it.

MEMBER APOSTOLAKIS: Is there a written

document where all of these things are explained?

CO-CHAIRMAN FORD: The work on the probability, French mechanics, I don't think you were here for. The explanation for the curves --

MEMBER APOSTOLAKIS: Yeah.

CO-CHAIRMAN FORD: It's in the package though.

MEMBER APOSTOLAKIS: Is there a series of EPRI reports, or there will be?

MS. WESTON: There is a write-up on the inspection plan in your notebook, yes, under page 117, handwritten. It's already in the notebook.

CO-CHAIRMAN SIEBER: Would this end up in Section 11?

MR. LASHLEY: Like I said, I have the action to bring it to Section 11, but we also have a meeting this summer to try to write -- we've already presented it twice. We hope we can bring something to start voting on this September, and all of the intertwining, acceptance criteria and the other things that this would go after.

CO-CHAIRMAN SIEBER: Otherwise it would have to go in tech specs in order to make people do it.

MR. LASHLEY: Our desire in codes and

fervent attempt is to get ahead of this and do something because there's a recognized inconsistency. This is a vulnerability that we didn't have any good inspection criteria for, none. I mean really none.

CO-CHAIRMAN SIEBER: Well, I have to think about it. This isn't really too far away from what I was thinking anyway.

MEMBER APOSTOLAKIS: What did you say? Too far away?

CO-CHAIRMAN FORD: It wasn't too far away from what he was thinking already.

CO-CHAIRMAN SIEBER: But in order to really be efficient and practical from a regulatory standpoint, Section 11 is the way to go, but that takes a long time.

MR. LASHLEY: I mean, we're well on a fast track. The Section 11 chairman, subcommittee --

MS. KING: I understand what you're saying, and, you know, we have direction from the PMMP steering committee to work fast and furious on the inspection plan. They've reviewed it once and as Michael indicated, they would like to see us address the staff's comments and come back out, get the technical basis pulled together by the end of next week, and that's what we're working to do.

CO-CHAIRMAN SIEBER: Well, the staff has a couple of people on the Section 11 committee anyway.

MEMBER ROSEN: What takes time about getting the code changed is when you're trying to get their attention with an issue, which they don't think is generic or interesting. In this case, you don't have that problem.

MR. LASHLEY: This is a special task group that reports directly to subcommittee Section 11. It doesn't go through working groups and such. It goes right to the main -- to this --

CO-CHAIRMAN FORD: Bill, could I ask you? You've heard some of the concerns from the group primarily because this is the first time you've been hit with it. Were there any concerns that you heard raised which you are not already considering in the list Allen put up on the board?

Do you understand the question?

MR. BATEMAN: I think I do, and I don't think there's any concerns we've heard today form you folks that we haven't -- that aren't similar to our concerns.

Can I just briefly --

CO-CHAIRMAN FORD: Yes, please.

MR. BATEMAN: -- give a few remarks here?

I think what we accomplished today is we've given the committee an update on the status of the two bulletins. You've got an update on the status of Davis-Besse from the licensee, an update on the 0350 panel and the lessons learned task force and other industry activities.

I think progress-wise since the last meeting, Davis-Besse has elected to drop the repair options and go with the replacement head.

You had asked for data. I think industry has supplied an abundant amount of data, and I think it's good data, a good basis for it.

I think we have from the results of the Bulletin 2002-01 inspection, which was the bulletin with respect to the Davis-Besse head degradation, I think we have gained assurance since we last met with you that at least at this point in time we do not have another Davis-Besse out there. We do have some time to take the action that I think industry has proposed here with respect to inspections and frequencies.

I think where we're at right now is, as I said earlier, we're contemplating some generic correspondence as a bridging document between now and when we reach a final conclusion, and I think it will be close, but not identical to what industry has proposed. I think it will be more conservative with respect to frequencies and maybe inspection methods.

But I can't speak any more on that because it's in a draft form right now, and we ave not finalized our position.

CO-CHAIRMAN FORD: Well, I would like to personally thank everybody who provided data. I know it was a pain in the butt. It really is to do this, but if you all recognize, the members around this table are not all experts in all subjects, and so we ask a lot of questions, and letters that come from us are from all of us, not just one person.

So it is invaluable that we can hear the complexity of the issues that you're all addressing.

Normally at this point we go around the table very quickly so that each of the members can say a couple of remarks about what they can advise and what to condense into two hours tomorrow, and you can pass if you don't want to say anything.

PARTICIPANT: I pass.

MEMBER APOSTOLAKIS: I pass.

MEMBER RANSOM: I pass.

MEMBER KRESS: Pass.

CO-CHAIRMAN FORD: Boy, this is easy.

MEMBER KRESS: It's seven o'clock.

(Laughter.)

CO-CHAIRMAN SIEBER: Well, I guess everything that I would say now I've already said.

MEMBER APOSTOLAKIS: Even if we make recommendations, they don't have time to do anything about it. It's seven o'clock. They're on in the morning.

CO-CHAIRMAN SIEBER: Just tell them what to say.

MEMBER BONACA: They should go through the same material in two hours.

(Laughter.)

MEMBER APOSTOLAKIS: Maybe they should leave time for Dr. Powers.

CO-CHAIRMAN FORD: Well, let me ask the people who are presenting tomorrow, Larry and Jim, please. Can you cope tomorrow?

MR. MATHEWS: I took our 118 slides from all of ours. I got it down to about --

CO-CHAIRMAN FORD: Four?

MR. MATHEWS: -- 40.

MS. KING: Forty.

MR. MATHEWS: But I was intending since everybody here is going to be there tomorrow, and Dana I think is the only one who is not here that will be there --

CO-CHAIRMAN FORD: That's correct.

MR. MATHEWS: -- tomorrow, that I was going to go through them pretty fast. If somebody could keep their hand over Dana's mouth, we could -- you know, I'll go through them real fast.

I know, I know.

MEMBER ROSEN: Well, you've got half of the confusion and difficulty here, and the other half is --

CO-CHAIRMAN SIEBER: What about the rest of us, you and me?

CO-CHAIRMAN FORD: Okay. One last piece of business before we bang the gavel. Bill has asked for a letter from the meeting tomorrow. Do I hear a suggestion that we discuss it over dinner tonight?

MEMBER KRESS: Yeah -- no.

CO-CHAIRMAN FORD: No?

MEMBER KRESS: Not all of us are going to dinner.

CO-CHAIRMAN FORD: Okay. So is it all right if I write the draft and you can all butcher it tomorrow?

MEMBER KRESS: Yeah.

MEMBER ROSEN: And can we discuss it the

remainder of the week through Saturday night or however long it takes?

CO-CHAIRMAN FORD: Right you are.

I thank everybody, the presenters especially. Thank you very much indeed.

(Whereupon, at 7:08 p.m., the joint subcommittee meeting was adjourned.)