BEFORE THE UNITED STATES
NUCLEAR REGULATORY COMMISSION

IN RE: THE MATTER)
)
OF)
)
DAVIS-BESSE)

~~REPORT OF PROCEEDINGS~~ PUBLIC MEETING
May 7, 2003
1:00 P.M.

REPORT OF PROCEEDINGS ~~had and testimony taken the hearing~~ of the above-entitled matter, ~~held before Ms. Christine Lipa~~, at the Nuclear Regulatory Commission, 801 Warrenville Road, Lisle, Illinois.

PRESENT ON BEHALF OF N.R.C.:

MS. CHRISTINE LIPA, ~~Hearing Officer~~ Branch Chief;
MR. MARTIN J. FARBER;
MR. RON GARDNER;
MR. DAVE HILLS;
MS. CINDY PEDERSON;
MR. JACK GROBE; and
MR. DAVE PASSEHL

PRESENT ON BEHALF OF DAVIS-BESSE:
MR. GARY LEIDICK;
MR. JIM POWERS;
MR. ROBERT SCHRAUDER;
MR. KENDALL BYRD;
MR. BOB COWARD;
MR. KEVIN SPENCER;
MR. STEVE FRANTZ; and
MR. PAT ~~MC CLUSKEY~~ MC CLOSKEY;
PRESENT AT HEADQUARTERS: NRC
MR. TONY MENDIOLA;
MR. JON HOPKINS;
BILL RULAND; and
MR. HO NEIH.
ALSO PRESENT:
MR. JOE DRAGO;
MR. DAN SALTER;
MR. BRIAN RENWICK;
MR. DENNIS DEMOSS; and
MR. TODD SCHNEIDER.
ALSO PRESENT AT HEADQUARTERS;
MR. DANIEL HORNER.

MS. LIPA: Good afternoon and welcome to First Energy and members of the public. I'm Christine Lipa, and I'm a branch chief here in Region III for the NRC, and I am responsible for the NRC inspection program at Davis-Besse. I'm a member of the Davis-Besse oversight panel, and we will go through the rest of the introductions over here on our side.

Next to me is Dave Passehl, he is a project engineer. And behind Dave is ~~Monty~~ Monte Phillips, he's also a project engineer ~~and~~ in DRP. Following down is Jack Grobe, he's senior manager here in Region III. He's also chairman of the Davis-Besse oversight panel.

Next to Jack is Cindy Pederson, she's the director of the division of reactor safety. Next to Cindy is Dave Hills, he's the chief of the mechanical engineering branch. Next to Dave is Rob Gardner, he's the chief of the electrical engineering branch. And next to Ron is Marty Farber, he's the lead inspector for the system health area.

We also have panel members video conferencing, and if you guys from headquarters want to go ahead and make introductions from that end, that would be appreciated.

MR. HOPKINS;   This is Jon Hopkins, NRR project manager.

MR. MENDIOLA: Tony Mendiola, NRR section chief.

MR. BLUM: Steve Blum, region coordinator in the executive director's office. I'm not part of the panel.

MR. HORNER: Dan Horner, McGraw-Hill Publications.

MR. NIEH: Ho Neih.

MS. LIPA: And then in here we have a transcriber, Ellen Piccony.

Do we have any representatives or public officials in the room?

(No response.)

MS. LIPA: I didn't see any. Okay, great. The purpose of today's meeting is to discuss First Energy's plans to address and resolve a number of engineering design issues, and this is a follow-up to our December 23rd meeting that we held in here on design issues.

We have actually been discussing several of the specific issues at our monthly public meetings, and we thought it would be best to have another meeting focusing just on this topic, so that we could get into some more detail. And some of these issues have already been reported in LERs and analyzed, and others are still being analyzed.

We have several special inspections that will review this area in detail, including the system health inspection the corrective action team in connection with the resident inspection.

Today's meeting is open to the public, and the public will have an opportunity before the end of the meeting to ask questions of the N.R.C. This is considered a Category I meeting in accordance with the N.R.C.'s policy on conducting public meetings.

Before the meeting is adjourned,

there will be opportunities for members of the public to ask questions and make comments. We are also having the meeting transcribed to maintain a record of the meeting. The transcription will be available on our Web page several weeks after today's meeting.

It's important that all speakers today use the microphones and be sensitive to the fact that we have people video conferencing with headquarters, and also people listening in from telephone lines on the bridge, and also so the transcriber can hear what everybody is saying.

There were handouts available in the foyer, including the licensee's presentation, and verifying that the licensee's presentation is already on the N.R.C./Davis-Besse Web page this morning. We also have copies of our monthly newsletter in the foyer, or out on the table, and feedback forms that you can use to fill out and provide feedback on the content and format of the meeting.

We do plan to go for the business

portion of the meeting today until about 4:30, and then we will take a break and open up the microphone for members of the public in here and on the phone lines and at headquarters to ask questions of the N.R.C.

So that's all I have for opening remarks. I'd like to turn it over to you, Gary.

MR. LEIDICK: Good afternoon, my name is Gary Leidick, executive vice-president of First Energy Nuclear Operating Company. Let me just introduce the individuals from our side. To my immediate right is Bob Schrauder, director of nuclear support services. To his right is Jim Powers, director of nuclear engineering. To the far right is Kevin Spencer from our licensing organization.

To my immediate left is Ken Byrd, supervisor of analysis in the nuclear engineering department at Davis-Besse. And Bob Coward, who is with MPR.

We appreciate the opportunity to give you an update on our design issues for

Davis-Besse, and I think we can move right through the slides here, really, to Slide 4 if you would. I just want to give a background to set the stage for today's meeting. I think most of us are aware of this, but it's good to refresh ~~where~~ why we are here. We did develop the building block last summer for the Davis-Besse recovery, and in several of those building blocks, particularly the system health assurance, program compliance and containment health, a variety of questions came out of those reviews relevant to the design of the plant and design documentation for the plant.

In December we decided to perform additional reviews, including our safety function validation project. As Christine indicated, we presented the outline of that project in late December.

This has really involved an extensive effort in terms of calculation reviews, detailed design reviews, revalidating design inputs, and finally the safety function validation project. So really where we are today is to present results and conclusions of these reviews, and to discuss the few remaining issues that we do have as a result of those views and the resolution plans for those remaining issues.

In terms of our desired outcome, we believe we are in a position to demonstrate to the regulators and public that we have provided reasonable assurance that the systems at Davis-Besse can perform their safety and accident mitigation functions. And, again, that is our purpose here today is to walk through that process.

Finally, in terms of introduction, on Slide 6, this is just a reminder of our return to service plan buildings blocks that we did create last summer. And as I indicated earlier, many of these building blocks produce design questions, so we have taken that set of questions, if you will, in earnest and developed a program to address those questions and the extent of condition of the ramifications of those questions.

So what I'd like to do is turn the

program over to Bob Schrauder. He will talk about the design reviews, and Jim Powers will present the remaining issues that we have as a result of those reviews.

MR. SCHRAUDER: Thank you, Gary.

Over the several meetings in the past, we have described for you our process for going through and answering the questions and the design reviews that we would do. We outlined the three-prong approach for that, where each individual condition report question would be put through our corrective action program. We then had a couple of collective reviews.

We did the safety function validation project and the latent issues reviews, which were deeper-cut reviews of systems, and then we also did a set of topical area reviews, and we will touch on the results of each of those during the course of the discussion.

We periodically at the public meetings updated you on our progress and the types of findings that we were -- that came out of those specific reviews. Now, over the last several months we have expended significant resources to answer the questions that had been raised through those specific reviews. And today, as Gary said, we want to discuss with you where we're at with those reviews, what remains to be looked at and what they have, in the aggregate, shown us.

Now, I had not planned on going into a great amount of detail of how we resolved each individual question that was raised in those reviews. Now, we can and will take any specific questions that you might have, you know, on any specific question that was raised during the process. What we want to do is kind of, here is what we found, and here is what we have left to do to resolve these things. And, again, what that has led us to in our conclusions.

As you might recall, we discussed in the past we had found 1,200 of these questions centering around the design of the plant. We took a graph to see if they would have responded as expected. To a large extent those questions have now been answered, and but for the few remaining items that we are going to discuss with you today, we have confirmed the adequacy of the design basis and the support systems, and that they would have performed to meet their intended function.

That is not to say that we did not find errors along the way, in some cases incorrect assumptions in some of the design calculations. There were errors in some of them, but what we did find in nearly all the cases is that there was enough conservatism built into the calculation and/or enough robustness, if you will, in the equipment itself, that even with those errors, we were able to demonstrate the systems' capability to perform their independent functions.

The next slide shows, going -- I'm sorry, we were already on the slide I wanted. The design reviews, the purpose was to provide assurance that the safety functions of those systems which have a significant contribution to the core damage frequency and the larger early release frequency, and what we meant by significant was greater than 99 percent, would perform their safety and accident mitigation functions. And, again, those two detailed reviews that we did in that regard were a combination of the latent issues reviews and the safety function validation project.

The next slide, this shows which reviews were done under which category. And what really spawned the latent or the safety function validation project was we had initially scoped these five systems under the latent issue reviews, which did a very deep cut into the system, and, in fact, most of those systems had enough questions raised on them that we wound up conservatively declaring them inoperable at the time, so that raised the question of what does that mean for the rest of your systems.

We did find that the great -- the vast majority of the questions that were raised were centered around the calculational support of the design basis. And that's what then spawned the safety function validation project, which added -- in that process we identified those systems or those functions that contributed to 99 percent of the core damage frequency again, and then identified which systems contained those functions, and we came up with a list of 15 systems. Five of those systems we had already performed in the latent issue reviews, and then we did the additional ten systems under the safety function validation project.

I don't have it listed up here, but as we completed the safety function validation project, we also later added the station blackout diesel on this also, which is an -- it is an important system for us.

MS. LIPA: I have a question for you, Bob, before you go on. Initially you declared those systems inoperable, but have you concluded now that they were or were not, or are you going to get into it?

MR. SCHRAUDER: I'm going to get into it, but my sense is that if we had all the final answers on the latent issue reviews, we had answered the questions, got to the bottom of it. We may not have gone through the safety function validation project, that is the bottom line I'm going to get to, is that these systems will be found to have been inoperable, other than the coolant system, and as we know, that had pressure boundary leakage and that was tech spec inoperable. You are allowed zero pressure boundary leakage.

So the other systems, we had a couple of questions on some of the systems yet, but we have enough preliminary results in on those that calculations are not finalized and in our calculation base yet, but we believe that we will find that these -- four of these systems were operable, and that the in RCS some have performed the intended function but for the RCS boundary leakage.

MS. LIPA: Thank you.

MR. GROBE: Let me make sure I understand that. With respect to the emergency diesel generators didn't you have to add substantial cooling capacity for that room, and didn't that affect operability of the diesel generators?

MR. SCHRAUDER: Jack, you are correct, we had a question on the operability, and it was really the components in the diesel room itself, as a result of higher temperature, we are in the final stages of the analysis on that. We believe that the analysis, even at elevated temperature, is going to support operability. We were in -- we're getting a little ahead, but we are considering additional ventilation and margin into that room, but we have looked at the components in the room at the new elevated temperature, and the analysis is going to demonstrate that it was, in fact, operable.

MR. GROBE: Okay.

MR. SCHRAUDER: The next slide shows the set of systems that we are completed with and have demonstrated the safety functions have been confirmed on these systems. That is the main steam system, service water system, safety features actuation system, steam generators and the reactant coolant system. And obviously I want to make the caveat again, whereas I believe the reactant coolant system would have performed the system, it was tech spec inoperable as a result of pressure boundary leakage.

Then each of the remaining systems I'm going to go through one by one and identify where we're at with that system and what we expect to be the final answer on it.

The first one is the steam and feedwater rupture control system. This system we will conclude it was tech spec inoperable, and that is as an -- it is not to say it wouldn't have performed its function, but the technical specifications from a specific trip -- set of trip setpoint, one of them we found the reverse differential pressure, the tech spec itself is non-conservative relative to the design basis calculation and the supporting design basis.

With that issue we did go out and look at the actual field setpoints, and where did we actually put it and would it have been -- would it have met tech spec, even though tech spec is non-conservative to the design basis calculation.

What we found was that the setpoint, during the period that we looked back, according to regulations to look at that as operable, the setpoint in the field was actually conservative relative to the tech spec. However, as you know, we have what I will call a generic issue on instrument uncertainty where we hadn't applied in all cases instrument uncertainty properly. When we added instrument uncertainty on not as found setpoint, it did take the value above the technical specification.

Therefore, that system will be declared inoperable. We have administrative controls in place right now in accordance with Administrative Letter 98-10 wherein we revised the tech specs so we will, we believe, maybe taken with administrative controls the setpoint that is required to support the design basis, and we will submit a license amendment for that tech spec, and we will submit that as a licensee report.

We believe that this is based on the reviews that we have done, that this is an isolated occurrence. We had one other finding in the safety features actuation system that had a setpoint also that was non-conservative to the design basis, but as it turned out, our sets in the field were adequate for that and that was a very, very -- in the second decimal point difference from that setting, but it was -- nonetheless the tech spec setpoint was non-conservative relative to the supporting design basis calculation.

MR. GARDNER: Could I ask a question about that also? You use two criteria, you compared the setpoints, the design basis calculation and then you factor in the uncertainty?

MR. SCHRAUDER: Right.

MR. GARDNER: So your statement that it's an isolated occurrence, is that based on -- because I thought you said the uncertainty situation is a generic concern that is yet to be resolved?

MR. SCHRAUDER: We were looking at

uncertainty across the board.

MR. GARDNER: So the statement of isolated occurrence, that talks to the fact that all of the them appear to be conservative to the design basis calculation, but until you complete your uncertainty reviews, you cannot say that you don't have more instances like this, is that what you're saying, or have you been able to complete your generic issue and have been able to apply both considerations to the issue?

MR. POWERS: I believe we looked at tech spec value, Ron, relative to this statement. We do have a general ongoing assessment topical area and instrument uncertainty non tech spec value largely done with that, looking at margins that are available in the plant. And if we look at the set point tolerances, and in fact we had a team go through, and we looked at margins to accommodate that. That process is ongoing now, and as we finish that up, we will have the answer to the whole set. As we see it now, we will be successful in that effort.

MR. GARDNER: Okay.
MR. PASSEHL: My question was related to your second bullet, your actual field setpoint was conservative relative to design, but not uncertainty. So did -- the actual field setpoint was taken or was it above the operability limit accounting for design basis and instrument uncertainty? I was confused by that.
MR. SCHRAUDER: In this particular case when you added the uncertainty to the calculated value, the design basis took it over the tech spec limit, so it was inoperable. I want to be clear on this issue too, and the relative significance of it. The trip mechanism itself would have functioned, it would have functioned at a higher set point. That relates -- the function would have worked, it would have come into play probably in the one-second time frame, possibly as little as one second difference between when.
The system would have actually initiated versus where you would set your trip setpoint, the system would have worked, it would

have just come into play somewhat later, and we have not gone back and calculated when it would come into play and what would be the impact of that, but we have a high expectation that it would have very little, if any, safety consequence as a result of that.

MR. GROBE: Before you go on, one additional question: when do you expect to have that technical specification amendment request in to us?

MR. SCHRAUDER: We would expect to submit it before the end of the year, Jack. It is not currently on scheduled to be submitted prior to restart.

MR. GROBE: I have --

MR. SCHRAUDER: Administrative Letter 90-10 discusses the ability to utilize administrative controls, and it talks about a timing tech spec correction such that you're not depending on administrative control for an extended period of time.

MR. GROBE: I'm not sure before the end of the year gives me the right level of specificity on --

MR. SCHRAUDER: I talked to the licensing organization yesterday, Jack, and I did tell them to accelerate the preparation of that license amendment and get it in. I don't have the exact date for you yet, but we're going to start on it immediately and submit it.

MR. GROBE: Maybe Pat McCluskey would discuss that in his weekly call with NRR, when that will be submitted.

MR. SCHRAUDER: I believe that will actually wind up encompassing, too, the safety features actuation as well as the licensing control system.

The next system I will talk about is the auxiliary feedwater system. The auxiliary feedwater system looks like in the bottom line will support its intended function. We have two remaining issues to look at in there yet.

One has to do with pumps and piping. What we found is they may be subject to a lower temperature than previously had been analyzed for. That difference is about eight degrees. This actually came about as a -- this wasn't one of the issues identified in the latent issue review or safety function validation, but it came out as a result of looking at a temperature difference that was identified in that, and that had to do with an inlet nozzle to the steam generator for off-speed water. So we analyzed those for the temperature difference, and they are, in fact -- the tubes in the steam generators that handle that came out fine.

We have looked at temperatures in this range for piping systems. I do not expect any impact on the piping system from when we do the final analysis, and we have to look at the pump itself that came out, and that really is an issue on viscosity of oil in the pump. But with that little difference between the vendor recommended values and the eight degrees, we fully expect that this one is going to show positive margin, and the system for these purposes will be operable.

That currently is not flagged as a restart required item, in that there is no way to get to those temperatures right now, so the system is fine the way it is and the temperatures that we see, but we will be moving forward with that analysis to get it resolved in a timely fashion.

We may wind up with an operability determination on ~~off-speed~~ aux-feed water as we move forward, so we will have one or the other completed. We will either have the analysis done or we will have an operability determination in place that supports operation at the current temperature.

MR. HILLS: What temperatures are you talking about, are you talking about how hot it get outside?

MR. SCHRAUDER: 40 something degrees down. It's applied temperatures in the system, so if temperatures did go down to say 32 degrees, whereas the vendor's recommendation currently is at 40 degrees

MR. HILLS: So you are not expecting to see

that type of temperatures until like this winter
sometime?
MR. SCHRAUDER: That is correct. And then of course we have a very high expectation of showing operability there. But if you didn't, for instance, then we are dealing with obviously operability of the system that would pass operability as well, but really this one has a very, very low likelihood of coming out not acceptable.
MR. GROBE: Are you tracking how many systems you anticipate having in a degraded but operable status at restart?
MR. SCHRAUDER: Yes, and I don't have that specific answer for you today, but I have asked them, and we are starting to put that together. I want to make sure I understand every system that we will have an open operability determination on. I don't think there is going to be very many at all, Jack, one or two maybe.
MR. GROBE: As soon as you get that together, if you could get that to Christine, I'd

appreciate it.

MR. SCHRAUDER: We will do that.

MS. LIPA: And I had an extra question for you too, Bob.

MR. SCHRAUDER: An extra one?

MS. LIPA: You mentioned that you believe that there is a high likelihood that there will be -- the eight-degree difference is not going to have an impact to pass that. At what point does your process have a start the clock for the 60-day LER if you decide this was a ~~pass~~ past?

MR. SCHRAUDER: As soon as we would determine that it is a past operability issue, that it is, in fact, the clock would start.

MS. LIPA: And that is not planned before restart?

MR. SCHRAUDER: It's not planned for restart. It's not excluded from being done, but it's not a requirement for restart. We haven't flagged it as a requirement for restart.

MS. LIPA: Okay. Thank you.

MS. PEDERSON: Did the other temperature

bring you down to 32 degrees?

MR. SCHRAUDER: That's the lowest it could still be pumping water through the system.

MS. PEDERSON: Okay.

MR. SCHRAUDER: So that is -- that would be the lower bounds of it, I guess. Ken, do you have anything to add on that?

MR. BYRD: No. The only thing, it is 32 degrees, and it's originally 40 degrees, and that was based on the temperature of the storage that was originally the source for the auxiliary feedwater system. If you are pumping water from a lake, service water can get down to 32.

MR. SCHRAUDER: Any other questions?

The auxiliary feedwater system is another one that instrument uncertainty comes into play, and it's on the pump flow acceptance criteria, instrument uncertainty was not formally documented for that either. There is -- we have had prepared a calculation for that, and we have verified it has no impact, but it is not a done, done, done calculation in the system yet, so it's

-- the answer is the pumps are fine with uncertainty included in the calculation for most issues. Finalization is under way now.

MR. GROBE: It just begs a question. You found an issue with instrument uncertainty incorporated in setpoint on the system feedwater rupture control system and you found an instrument uncertainty here. But you concluded that it was an isolated occurrence?

MR. SCHRAUDER: For tech spec. It's not isolated on pumps, Jack. The instrument uncertainty is what I will call a generic issue and we are looking at the impact of instrument uncertainty on the calculations in the equipment across the board.

MR. POWERS: And that was a significant root cause CR that investigated that, and the team had to go through the process of looking at all the instruments and various levels of safety significance for setpoints. I think this is one -- in this particular one, Ken, where the surveillance instructed an allowance for instrument inaccuracy, the issue was we didn't have a specific calculation that backed up the percent, and that was taken in that procedure, it wasn't that it was overlooked entirely.

MR. SCHRAUDER: It's highly unlikely that you will find a concern with pump flow criteria relative to instrument uncertainty. There is -- if you put some uncertainty into the calculation where you call it instrument uncertainly for a flow criteria and put your acceptance didn't incorporate instrument uncertainty as a specific item in that, but -- and I will just tell you, you're not going to find a problem in the flow acceptance criteria because of not having incorporated instrument uncertainty. You would have to have really nailed it down to a very narrow band of acceptable flow to get there.

MR. GARDNER: You said there was an existing value for instrument uncertainty and you didn't have a calculation you could find to back it up. Now you have done a calculation at least it's in the final stages of review, did the numbers correlate?

MR. BYRD: The original value was slightly less than the calculated or recalculation, but it's acceptable where it is right now.

MR. GARDNER: But there is some difference between what was originally documented and what you are finding?

MR. BYRD: In this case there was a small difference.

MR. GARDNER: Then in no cases are you relying, I assume, and you can tell me if I'm incorrect, on calculation values that have no calculation because of this information?

MR. BYRD: We are going back on at least all pumps, which is actually calculating instrument uncertainty and putting that explicitly in the calculation

MR. GARDNER: Okay, thank you.

MR. GROBE: I understand instrument uncertainty for non-tech spec parameters. Is that being considered as a topical issue?

MR. POWERS: It's not a topical issue, but it's in the corrective action program, it's a significant root cause CR, Jack, with corrective action to follow-up, and it's one of our issues in terms of my list of top issues, technical issues, it's cited on that list, so we have a plan laid out, we have a team put together that did the investigation of the root cause, presented it to the senior management team, and they are moving forward with an action plan.

In other words, it's a significant effort that we are applying to it.

MR. SCHRAUDER: And will have an extent of condition associated with it.

MR. GROBE: And there is -- does this include Mode 4 mode restraints?

MR. POWERS: They are looking -- that is right at a mode restraint that would be required associated with these instruments.

MR. MENDIOLA: This is Tony Mendiola. I'm curious, what setpoint methodology do you use, and do you use a difference methodology for tech spec versus non-spec? I may be summarizing a few of the things you have already stated, but --

MR. BYRD: I can't answer that question. I could -- I'd have to talk to our I & C people to get a --

MR. POWERS: I think we will follow up in detail on a weekly call.

MR. MENDIOLA: That would be fine. Thank you.

MR. SCHRAUDER: If there is no more questions, we can move on to the component cooling water system. The remaining items on the component cooling water system are going to Mode 4, we are going to do a flow test. What we have discovered is that we have never performed this comprehensive flow test to measure the actual flow into some of the small components to observe component cooling. I'm talking about instruments that pass -- that don't have any line flow instrumentation on them. But major paths for component cooling water, like the heat coolers and all the larger components have been measured and most have been flow tested, but we want to take

the component cooling water system and actually
measure the flow to each of the components that
it's required to serve.

We expect that to come out well,
based on the history of the plant. We have never
seen any -- any indication that they are not
getting sufficient flow. We, of course,
understand they have not been subjected to the max
design temperatures that you'd see, and that's why
we need to go out and do that flow test, but we
anticipate that that flow test will demonstrate
adequate flow to those.

MR. FARBER: You used the term comprehensive
flow test. Is that differentiating between -- or
what do you mean by that, is that something
different than a full flow test which would
analyze all the possible ~~pads~~ paths, including the minor
flows?

MR. SCHRAUDER: The minor flows are
specifically what we are going after, but it is a
full test flow.

MR. BYRD: I think to answer that, it

actually looks at safety features at Level 3. What we are doing is looking at flows under given conditions of the water as you did up at the higher levels of safety features actuation. You are isolating different part of the system so actually we are doing a full test, Marty.

MR. FARBER: All right.

MR. HILLS: Minor flow ~~pads~~ paths, what type of equipment, are you talking about being safety risk --

MR. BYRD Yes. Some of the kind of things we are talking about are high pressure injection, bearing cooler make-up, bearing cooler heat pump. The flows in these are rather small, they are anywhere from 6 to 12 gallons per minute, the flows in that kind of a range, so these are the kinds of flows which have an analytical perspective. We couldn't run any actual data to back up the analysis we're doing.

MR. HILLS: Thanks.

MS. PEDERSON: Did I hear you say the HPI pumps and bearing coolers are included in that?

MR. BYRD: The bearing coolers were included in that.

MS. PEDERSON: Is that going to be impacted by your changing of the HPI pumps, and how is that going to fit into your verification of flow?

MR. SCHRAUDER: If we change the HPI pumps, they will have different seals and seal coolant requirements that will have to be verified for those pumps. If we modify the existing pumps, we will obviously have to verify acceptable seal flow for that pump.

MS. PEDERSON: So is it correct to say that for this particular test you are describing prior to Mode 4, it's uncertain yet which pumps you will have, or are you expecting to have tested the existing pumps.

MR. SCHRAUDER: What we expect to do is the initial and OP test and Mode 4 with existing HPI pumps, so it will be the seals on the pumps prior to entering into Mode 4.

MS. PEDERSON: Thank you.

MR. PASSEHL: Just one more question. Did you verify the temperature ranges for component cooling water lower limit and upper limit? I guess you had a question on service water.

MR. BYRD: We actually looked quite a bit at that component cooling water. The major issue was the upper limits, since we are not taking water from the lake and we had several condition reports dealing with that, and we were able to respond to them and the ceiling on the component cooling water system.

MR. PASSEHL: Thank you.

MR. SCHRAUDER: The other issue on the component cooling water that does have the potential to impact system operability is on a set of air-operated valves. As you know, during the course of this we have also I will say base labeled our air-operated valves. At many of the plants are doing it, we did find the LER, certain valves that cannot have adequate margin for the system that they were in.

A couple of those specific ones are related to the component cooling water, and if we showed that they wouldn't fully open or fully close, depending on whether it's an isolating non-essential load or providing essential load, then that could render the system and potentially the supportive system, and that supported system in this case is the KD system, inoperable.

I will tell you that we are completing those analyses also, and they also are not final calculations, but preliminary results on that shows that, even though the reanalysis will show there would have been adequate flow in these cases. So we are anticipating operability on that, but not we can't assure that. That is -- preliminary results of the AOV says there is lack of margin, and we are doing more detailed analysis of that now.

MR. HILLS: When do you expect to finish the analysis?

MR. SCHRAUDER: Prior to Mode 4

MR. POWERS: Should be within the next several weeks. We have the calculation performed by a subcontractor and it's in review now

MR. HILLS: Thanks.

MR. PASSEHL: Just another question. You talked about air operating valves, how about the air delivery systems, your compressor piping, your safety-related back-ups and all that, is that --

MR. POWERS: The operating valves, that is part of the scope we are looking at, the pneumatic pressures to the actuator itself, to the accumulating pressure times and building margin into the plan, longer emission times set for the important valves, large accumulators. There is a number of changes that we are making, and I will get into it in some detail later today, but we have that aspect as well.

MR. PASSEHL: Thank you.

MR. SCHRAUDER: The next system I will talk about is the decay heat removal/low pressure injection system. The remaining issues on this have to do with a net positive suction head and potential vortexing issues related to the system's role in boron precipitation control. The safety function validation showed this to be a potential problem with the tested heights of water required for the suction ~~pad~~ path versus the analyzed actual height that you could achieve.

In that, where we are at with that is we are performing system additional analyses and testing on that method of boron precipitation control. Those preliminary results on that also indicate that this function would have been able to perform. Nonetheless, in parallel with that we are designing and we are installing a modification which will add an additional method of boron precipitation control so we won't have to rely on this method. This is our secondary method, prior method being through the HPI pump. We will add a third method right now, which also includes the decay heat removal system. It will eliminate this concern as any concern will actually add more margin on the boron precipitation control.

From a license perspective on that we are still looking at it because this is identified in our licensing basis as our secondary method of boron precipitation control. There were concern exceptions associated with that, so we need to look at that perspective, and whether we need to change that licensing basis or whether we will be able to go with it.

This license approach is still valid even though we may subsequently change the approach. My sense is that we will probably change it prior to start-up to coincide with the new method being our secondary method.

MR. GROBE: This is a difficult issue to visualize and understand. Jim or Bob, could you take a few minutes and just explain exactly what boron precipitation is that you are going to modify such that you will have an alternate method to prevent boron precipitation.

MR. SCHRAUDER: I think Ken is the best --

MR. BYRD The issues we have had here with this is our back-up method of boron precipitation control. And the way the back-up method is currently designed to operate, we would take one of our low pressure injection pumps --

MR. GROBE: Why don't you back up and

explain what -- how boron precipitation occurs, what accident consequences result in it and what the outcome of boron precipitation is, what problems it causes you, and get into how you are solving it.

MR. BYRD The issue of ~~borrow~~ boron precipitation control involves loss of cooling accidents in specific locations, the location being the cooler, and in this particular -- in these particular locations we would not have injection of coolant through the core, and over a period of time, as a result of decay heat, we could have -- we would potentially have boron concentration in the core that would increase and we'd have precipitation in the core.

So our method of preventing this is to have a method of boron precipitation control which is initiated after a loss of cooling accident, and essentially the method has to be a method that allows such amount of recirculation to go through the core, and the -- currently the method we have for doing this, one of them involves a high pressure injection pump, and we would take a high pressure injection pump and we would inject it through our -- what we call our auxiliary spray line. That is our primary method, and that's through our high pressure injection pump.

Our alternate method is through our normal decay heat drop line, and then we are going to follow the suction of our low pressure injection pump and go back through the core, so essentially circulating through the core through our normal drop line and back into the normal injection.

The issues that we came up with or that was actually identified during the safety function validation project, there was really two issues. The first issue we identified was this issue, which is vortex, and the issue is when you are taking a suction from a low pressure injection pump and you are taking the suction from the drop line, you have to have sufficient level in the reactant coolant system. This is after you have

-- you have had a lot of coolant accidents. There was a concern that we may not have sufficient level in the reactor coolant in order to maintain our pump's net positive suction.

And the issue here was analytically we had determined if this would be acceptable. There was some question over a test result we had from the plant over our height of the level in the ~~reactant~~ reactor coolant system and our potential for net positive suction on the low pressure injection pumps. And we are currently analyzing that, and we believe that is resolvable. We believe actually there is probably an issue with the test results that we initially had. And currently we are in the process of analyzing that.

We also had a second issue which was identified as a result of looking into the first issue. We had observed that our drop line actually rises to a higher level, and so we had a question of whether or not we would have a flashing in that particular part of the drop line.

That was actually a somewhat

greater concern that we had, as opposed to the vortexing issue, and that issue we actually have -- although we have not formally completed reviewing the test results and calculations, we believe that is resolved. We had calculations performed, and we also had an actual experiment performed to validate the results of the calculations, and based on that it appears that the height elevation difference we developed will not be a problem, so that issue has been resolved.

We still have to formally accept the calc and conclude that. So essentially these two issues, there still is an OEM issue of vortexes. From what we have heard, preliminary results are that issue will also be able to be resolved, that will make our current back-up method, which is the back-up method you are referring to, we will be able, I believe, to show as acceptable, and I feel very confident that we will be able to show that.

As a result of the concerns that we had, though, with these two issues, we had initiated looking at other methods we could use for boron precipitation control, and as a result of that, we did initiate this modification to come up with another back-up method. And actually, once we got into there, there are some advantages to this other method, which is the reason that Bob had mentioned we might actually go ahead and make this our primary method.

The advantage is, No. 1, it completely eliminates this issue of vortexes that we were talking about. You're not taking a suction from the reactor cooling system. The other back-up method we'd be looking at continues to operate from the pump, would continue to operate from the discharge. We have a drain valve on the discharge of the pump. The stream from the cooler would take that back to the boron line existing connection, so we'd be able to run from the discharge pump back to the drop line, essentially running in a reverse direction from the drop line.

The advantage is that we have a

non-vortex issue. We'd also eliminate the single failure. Now we have a single failure exemption method. We could eliminate that because the loss of a ~~training~~ train of a diesel would not affect its operation.

So there are some advantages, which is one of the reasons we are continuing to pursue this method. That pretty much summarizes where we are at right now.

MR. SCHRAUDER: I'm not sure I'd call that a summary.

MR. BYRD: I'm sorry.

MR. SCHRAUDER: I can tell you that was a lot more detail than I could have given you on that one. I'm glad we have Ken here with us.

The next issue still remaining is the ~~delay~~ decay heat removal/low pressure injection system. On the pump there is a cyclone separator for that purpose, and the reliability of that cyclone separator is called into question, and we are continuing to evaluate that and the impact on the seal of the decay heat removal and low pressure injection pumps. And then we will perform flow test demonstrating system margin. That is scheduled prior to restart, and again this is an issue that the last measurement that was taken on the system I believe was in the 1998 time frame, and it showed margin, but it showed decreasing margin at that time.

And when coupled again with instrument uncertainty now put into the calculation, we have to verify that we do, in fact, have acceptable margin on the capability of the system, so that will be demonstrated prior to restart.

And then I had mentioned the air-operated value potential impact on the system also.

MR. GROBE: The sump degree in the question on the seals is that you anticipate that that is going to be a challenge for you, and would it result in a modification to the pump?

MR. POWERS: We are currently looking at a modification, because it's relatively straight

forward, and we can practically have a replacement
available in two weeks, so it's on its way, so
rather than going through an analysis, we will
simply replace it, Jack. That's the current plan.
MR. SCHRAUDER: The next system is the
emergency diesel generators. As you recall, we
had a voltage and frequency drop on those during
the first load step. We have had transient
analysis performed on that for the impact of that
frequency ~~valve~~ value. We knew that we had a voltage
and frequency drop on that, what we didn't have
was a transient analysis that demonstrated it was
acceptable.
We performed that transient
analysis, we have had that performed for us by
MPR, and we are in the final stages of owner
acceptance of that calculation and demonstrate
that that voltage frequency is not a problem for
us.
MR. PASSEHL: What was the magnitude and
duration of the drops?
MR. POWERS: Let me take a stab at that.

The drops in voltage, I think the -- initially the threshold we were looking at was approximately 75 percent control and limitation. We dropped somewhat below that, and I don't know that I can give you specific numbers on it right now. Again, that is something I couldn't give you specific numbers on, but I would say we are below 75 percent, and the cycle timing in our use for several cycles, in fact, it's longer than that, although we have gone through and looked at equipment and its functionality to assure that we know where we stand, there is two concerns. One was voltage drop, and particularly the initial step loading on the diesel generator, the other was frequency drop. And both of those cases what we have done is we did a safety feature actuation test at the site.

We are running the diesel generator and electrical system through the -- what would be the emergency sequencing of loading, and then we took the data on the performance both in voltage and frequency dips, although they dipped below