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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE ON SYSTEMATIC EVALUATION PROGRAM (SEP)

MILLSTONE UNIT 1 AND DRESDEN UNIT 2

Room 1046
1717 H Street, N.W.
Washington, D.C.

Tuesday, November 30, 1982

The Subcommittee on Systematic Evaluation Program met, pursuant to notice, at 8:35 a.m., Chester P. Siess, Chairman, presiding.

ACRS MEMBERS PRESENT:

CHESTER P. SIESS
JEREMIAH J. RAY
DAVID A. WARD
DADE W. MOELLER

ALSO PRESENT:

W. LIPINSKI
D. FITZSIMMONS
I. CATTON

DESIGNATED FEDERAL EMPLOYEE:

HERMAN ALDERMAN

P R O C E E D I N G S

MR. SIESS: We will come to order.

This is an open meeting of the Advisory Committee on Reactor Safeguards, Subcommittee on the Systematic Evaluation Program for the Millstone Unit 1 and Dresden Unit 2 plants.

I am Chester Siess, subcommittee chairman. We have two other ACRS members present today, on my left Mr. Ray and Mr. Ward, and we have three consultants to the subcommittee, Mr. Lipinski, Mr. Fitzsimmons, and Mr. Catton.

The purpose of this meeting is to continue our review of the Systematic Evaluation Program as it has been applied to the Millstone 1 and the Dresden 2 units.

The meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act and the Government in the Sunshine Act.

The Designated Federal Employee is Mr. Herman Alderman, sitting on my right.

The rules for participation in the meeting have been announced as part of the notice published in the Federal Register on November 15.

A transcript is being kept and it is important that each speaker first identify himself for the record, and then speak with sufficient clarity and volume so that he or she may be heard by the reporter. If there is a microphone, please use it.

We have received no written statements from members of the public or requests to make oral statements. Is there anyone here, some member of the public, who wants to make a statement? If so, they can let me know, let Mr. Alderman know.

Now, just to bring us up to date on our meeting on October 26-27. On October 26 we dealt with the Oyster Creek SEP, and the staff at the time it was presenting the Oyster Creek items gave us some rundown on the comparisons with the Millstone and Dresden items.

Then, on the 27th, we devoted more time to Millstone and Dresden. So, these are not new to us, although we have not reviewed either one in the depth we will have by the time we finish today.

The full ACRS review of Millstone and Dresden is scheduled for the first item of business on Thursday, December 9 - whatever date Thursday is - next week. I think it was scheduled to begin at 8:45.

It is our intention to consider the two plants pretty much in parallel - I am not quite sure whether the words "in parallel" are correct - but we will consider them together in a single meeting because they are quite similar plants physically, although the sites and some of the questions and problems are somewhat different.

One purpose of this meeting, of course, is to serve as a pilot meeting - I hate to use the word "dress rehearsal" but it is almost that - for the full committee meeting, to see just how we can handle these together to save both your time and the full committee's time; and of course to continue our review and get into somewhat more depth than we were able to on October 27th.

So, we have laid out an agenda that you have before you. We have asked the staff to emphasize the similarities and differences so that we can get those in mind. We will not spend too much time on things that we have already covered, for example, in connection with Oyster Creek.

Now, there are differences. The sites are different and many of the issues that come up in the SEP are site related. There are other differences in that the areas in which there is disagreement between the staff and the licensee regarding what should be done. Those differences may be different for Millstone and for Dresden, and we will want those clearly understood.

I think the staff will refer back to Oyster Creek in some cases where there are strong similarities. Although Oyster Creek is a little different plant, some of the issues are very similar to those we have considered for Oyster Creek. I would like to relate what is being done here to what was done at Oyster Creek.

The committee has written a letter on Oyster Creek and has taken somewhat a position on some of the items. The position was clearer, I think, on some items than on others. The committee would like to be reasonably consistent unless there is a good reason to change.

So, we are going to try a certain approach today and, if it works, we will try the same approach, suitably condensed, for the full committee meeting.

Now, that is not intended to inhibit anybody in their questions or things they want to pursue, but we do want to emphasize what is the same and what is different.

I think that because of many similarities with Oyster Creek and because of some the things we have heard at the previous meeting, we can go a little faster through the first two or three categories of items, the ones that are not applicable, the USI, TMI.

We may go a little faster on meeting current criteria are acceptable on another defined basis, perhaps by reference to Oyster Creek. If it is similar for the two plants, we can take the two together.

We have one new aspect in that for Millstone we have a plant specific PRA which we have not seen on any of the previous plants. On the previous plants, they have used a sort of analogous PRA based on some other plant and tried to handle the importance to safety and things on that basis..

But we do have a plant specific PRA for Millstone, which was one of the IREP plants. Again, although it is plant specific, it does not address the extreme external phenomena like hurricanes, tornadoes, earthquakes, which lead to a number of the issues.

But we should try to get a little feel for how much difference it makes, if any, having a plant specific PRA.

In our first report on the SEP, which was Pallisades, we said that it looked like having a plant specific PRA would be a great help in reaching decisions on these items.

As we have gone through the successive ones, I personally have had the feeling that it was not that much more of a help as I thought it was going to be, and as I looked at the Millstone I did not see any more topics addressed of the PRA, or not a significantly larger number.

MR. CATTON: But it made you feel that your intuition was correct.

MR. SIESS: No, I am not sure that the PRA helped that much more on Millstone than it did on anything else. But the staff might tell us what they think about that at an appropriate time.

We do have an item on the agenda to talk about the plant specific PRA, the Millstone IREP.

Did the members and consultants get a copy of Draft Volume I of the Millstone IREP? Did you get one, Jerry, Dave?

MR. RAY: Yes.

MR. WARD: Yes.

MR. SIESS: Did you guys get one?

MR. LIPINSKI: Yes.

MR. SIESS: Do you want the rest of it? You know that all that you got was Volume I. What was it called, a 200-page summary?

MR. CATTON: The Executive Summary was quite adequate.

MR. SIESS: That was what I thought, that is why I asked if you wanted all the fault trees, the vent trees, and the rest of it.

Are there any questions about the agenda? Does anybody have anything that they would like to point out that we should try to do particularly or not try to do?

MR. CATTON: I would really like to hear about this DC instrumentation. I may have missed it the last time.

MR. SIESS: You mean what is in the control room?

MR. CATTON: And why there is any question about whether you have it or don't have it.

MR. SIESS: OK, that is one that is partially open, I think, on Millstone; isn't it?

MR. CATTON: Yes.

MR. SIESS: They didn't agree to put everything in the control room we asked to.

MR. CATTON: And also it is missing from the Millstone report that was sent out. It was missing from the table but it is in the pack. Maybe I missed it.

MR. SIESS: Well, I found some discrepancies between a couple of tables in some of the reports. I also noticed that Millstone's report was organized a little bit differently than the Dresden report for some reason. But it was a minor thing.

MR. CATTON: One of the things I would like to hear a little bit about too is, apparently the activity in the primary system is higher than the GE.

MR. SIESS: That we went into pretty thoroughly on Oyster Creek. I believe at the full committee meeting on Oyster Creek and at the subcommittee meeting, I guess, where we covered the three plants.

The problem seemed to be that putting in the GE standard Tech Specs involved a great deal more than simply controlling iodine activity. It had eight pages of requirements, and that that was the major hangup for the licensee. They did not object to controlling iodine activity down to a gross iodine equivalent comparable to the GE standard Tech Specs, but they did not want all the other stuff.

At the full committee meeting the staff sort of said, I think they agreed that really what they wanted was to control the iodine. And the ACRS letter recommended that the radio-iodine levels be controlled to that level and did not mention anything else.

So, if that is the current position, some of the controversy may have gone away.

MR. CATTON: OK.

MR. SIESS: And in fact, at the full committee meeting the staff passed out a copy of the GE standard Tech Specs which, as I said, was about eight pages, and there was an awful lot more than just the iodine. But we will have that presented to us.

I got yesterday, or the day before, a staff letter to both Millstone and Dresden, dated November 10 - they are identical letters, signed by different people - relating to Topic 15-16, which is the failure small lines carrying primary coolant outside containment.

I am not sure what the implication of that was. But it is a re-analysis by the staff and at the appropriate time, I think, you will explain that to us. Will you?

MR. RUSSELL: Yes.

MR. SIESS: We will get into that, if you want. You will understand the position. It got a little complicated. I think that was on the second day the last time when you were at another meeting.

MR. CATTON: Yes.

MR. WARD: Chet, one comment on the primary coolant activity. I am not sure that it is just the iodine that is important. The 10 CFR 100 dose limit to which this ultimately goes back to, talks about iodine. But in that sense, iodine is sort of a surregate for all activity.

So, if we are looking at the Tech Spec there is some sort of a specification that is going to take care of iodine levels and not other activity levels, that is kind of a legalistic position.

MR. SIESS: I think you are absolutely right, and I had that thought in connection with the source term that had been pointed out, that iodine was a surrogate for some of the other things.

Now, the question is whether controlling iodine controls these others. I don't know, but the staff can address that. Are you prepared to address that?

MR. RUSSELL: We can address that.

MR. SIESS: All right. Of course, the staff - this is an interesting point - the staff has addressed this in terms of current criteria. Current criteria in Part 100 is based entirely on iodine. Reg Guide 1.3 and 1.4, I believe, stricly talks about iodine, doesn't it? It is only when we got into the core-melt accidents and looked at source term that we began to get this other argument.

So, here is a case of current criteria versus up-coming criteria, and it is a legalistic thing. But I don't think we want to get involved in the legalistic part. But staff understands your question and we will get into that.

Is there anything else that you want to flag particularly?

MR. CATTON: On isolatable leak, Michelson flagged the scram discharge system and I saw no mention of that in here. Has that been sort of put to bed?

MR. SIESS: We will have to ask the staff.

MR. CATTON: And it was also a break outside of the containment, and I saw no mention of this anywhere.

MR. SIESS: A break outside the containment is an item.

MR. CATTON: But the scram discharge system is not part of that.

MR. SIESS: I don't know. Did you hear the question, Fred?

MR. GRIMES: No, sir.

MR. SIESS: Scram discharge system breaks --

MR. CATTON: leading to an un-isolatable break outside containment. Was that addressed? That was one of Michelson's concerns a few months ago, and I don't know what the final disposition of it was.

MR. RUSSELL: It was addresed from the standpoint that we looked not at the large line but rather looked at the support and smaller lines leading to it as part of the seismic review that was done.

In fact, that issue was identified on these plants as a part of the walk-downs by the various consultants on the Senior Seismic Review Team. It was a common problem on all three plants.

That was associated with support mechanisms for all the small piping - one inch in diameter - which goes back then to the discharge header, the scram discharge volume.

MR. CATTON: Was not this concern more a combination of valves open when they should not be?

MR. RUSSELL: This concern was a break in the line which then because the one-inch lines discharge back, would not be isolated. You would have a continuous flow out through that line into the reactor building which could then flood equipment at the lower levels in the reactor building.

MR. CATTON: OK.

MR. RUSSELL: These are the lines, one-inch lines. They are outside the scope of the Class I rules. But we did go back and look at how they are supported. Specifically, there was some upgrading done and it became an issue which was handled rather promptly on Dresden, as I recall, and resulted in several meetings. There was immediate action taken on the part of the licensee to upgrade the support systems for the small lines.

These are supports, they look like pipe racks which 60 to 100 lines in each one. They had little clips on them and there was a concern about the way they were supported and what the potential was for breaks in those lines.

So, it was the same system and there was a break in line, but it was at a different point in the line. It was not the large six or eight-inch pipe which goes to the scram discharge volume but rather the small lines which feed it, and the potential of breaks in that line.

MR. CATTON: Wasn't he also concerned about the drain valve getting stuck open or something? I really don't recall. It was a valve was stuck open or something.

MR. RUSSELL: I don't recollect. I will look into it.

MR. CATTON: I would like to have that clarified.

MR. SIESS: Your name, please.

MR. RAUSCH: I am sorry. Tom Rausch, Commonwealth Edison.

About the same time as this Michelson concern the utilties were already working on the IE Bulletin, and I think it was 8017, I don't remember the number -- this scram discharge volume bulletin because of Brown's

Ferry where they had a partial failure of scram at Brown's Ferry.

That review encompassed things like scram discharge volumes, headers, adequacy of instrumentation; whether or not you should have redundant instrument volumes, redundant instrumentation, adequacy of the hydraulic system or scram discharge volumes, to ensure that you always have enough volume to handle the whole string.

MR. CATTON: Was a part of that a concern about maybe the valves getting stuck open?

MR. RAUSCH: That was part of the whole review.

MR. SIESS: Do I understand, then, that this was essentially covered under the IE Bulletin as a result of the Brown's Ferry and the AEOD study of it, which makes it a generic item; is that the point?

MR. RAUSCH: It is a generic SER. The Michelson issue was separate.

MR. RUSSELL: That is correct. We are talking about two separate issues now.

MR. CATTON: If that was covered, that is fine.

MR. SIESS: Yes, it was covered as a generic item. But what Russell was talking about was looking at pipe breaks outside of containment.

MR. LIPINSKI: Now Millstone, according to the report, had changed their discharge volume. But the details as to what was there and what the change consisted of is not specified.

But I do not recall any equivalent statement on Dresden and I would like to know what the comparison is between the two as they stand today.

MR. SIESS: OK. Now, first let me be sure that is a part of the SEP review, or was that a generic item, Bill?

MR. RUSSELL: No, that was done as a part of the IE Bulletin. We can get that information and respond to questions, but we don't have it right now.

MR. SIESS: We have to keep in mind that the SEP eliminates those things that are being handled generically for all plants on some other basis. If that is being handled generically, then I would simply say, let's worry about it separately. It is something that we would be looking at for the full-term license review on Millstone. But we would want to see how they stood on all the generic items, I think.

But I would just as soon not try to cover it here if it is a generic item.

Is there anything else anybody wants to get to?

MR. CATTON: I don't know how much time they are going to spend on this leak detection. I would like to hear some of the arguments about this one GPM and one hour, or two GPM in ten hours, or whatever.

MR. SIESS: We heard about an hour's worth of that on the 26th.

MR. CATTON: Maybe my reading the transcript would be enough.

MR. SIESS: No, I doubt it.

(Laughter.)

MR. SIESS: I heard about an hour's worth of it and I still don't understand it all. I will be the first to admit that what the ACRS said about it in its letter on Oyster Creek was not the most unambiguous thing we have ever written because it is a complex issue.

I think we all had some concern about using fracture mechanics to decide how much something was going to leak before it broke, and a few other things. I think we will hear some more about it today - I would like to, and I suspect the committee may have to, depending on the level of the issue.

But it is a complex thing. This has to do with the leak detection question.

MR. CATTON: Yes.

MR. SIESS: How good a leak detection system is and what is a good one, and what it is trying to do.

MR. CATTON: There was some comment on valves that could be locked out on small lines. It was recommended in the 1970 ACRS letter that this be looked into. Is the reason that it is still a problem because it was not looked into, or what?

MR. SIESS: No. I think the lock-out valve here is a different problem than the one we were concerned with then. The GDC has some references to containment isolation as to number of valves' location, control, and so forth. The staff is making some compromises here on administratively locking out valves.

Now, the 1970 letter which was inspired by Spence Bush - and some other people sympathized - was that locking out valves administratively was not all that sure a thing. There have at least been one or two instances - either before and I know one after - where a valve was locked shut, presumably, and it turned out it was locked open.

There is this general feeling about administrative controls that locking out valves was not all that great a deal. So, I think these are separate issues. But the question of whether or not locking a valve is a good idea or not, I guess, is still around. We can address that again. That is one, I am sure, we are going to give some attention to today.

MR. CATTON: OK. I have one question on

Dresden. In their summary table they are using some different words than they did in the earlier one. What does "later" mean?

MR. SIESS: I have the same question. They will explain that to us.

I noticed that there were an awful lot of "laters."

MR. CATTON: I know what my kids mean when they say that.

(Laughter.)

MR. SIESS: I know.

I think it means "not yet." But there is certain nomenclature we have to get straightened out. One is "no response."

Sometimes "later" means evaluations are going to be made, that was one category. Things that are not going to be settled, they have to make the studies, recommendations "later." Sometimes, I think, "later" means they have not gotten the response yet. It is somewhat ambiguous.

Anything else? I thought we would start off with the two plants, the licensee actually giving us a brief operating history, plant description. We did get that at the October 27 meeting but I am not sure everybody was there. I think it will only take a short time to get us back up to speed and refresh our memory.

So, if there is no objection, we will ask Dresden - Commonwealth - first to give us a brief rundown on Dresden, and then we will go to Millstone 1.

I assume this will be essentially what you did before.

MR. RAUSCH: It is almost identical. I have added a few things for your reference. The difference between what I am handing out now and what I had a few weeks ago is a few pages tacked on the end and identification of who provided this.

I do plan going through everything rather quickly. If you have any questions, just stop me. We do not have quite the force of people we did the last time when we tried to be very prepared for any kind of operating history questions you may have had. It did not seem to come up.

That is one question I had is, do you think that we should try to bring people with some sage wisdom or good memories for the full committee?

MR. SIESS: I hate to try to tell you whom to bring. But as I recall, in the previous reviews in the full committee there was not that much interest shown in the details of the operating history.

MR. RAUSCH: We should be able to address general questions, anyway.

Dresden 2 is a GE BWR-3, 2527 megawatt thermal, operating at a 830 megawatt gross. We use the Kankakee and Illinois Rivers for cooling mode. During the summer we can take river water directly, cool it through our cooling lake and put it back into the Kankakee River and the Illinois River. Otherwise, during the balance of the year, we use the cooling lake that was installed in 1971.

You can see there are only four years between our CP issuance and our initial critical. This slide, I think, I did not update. It is not quite the same that I handed out, is it?

There is not much else I want to point out. As far as chronology, we are still in the process of puting in some TMI mods and EOFs, becoming applicable right near the end of this year.

MR. SIESS: Units 2 and 3 are identical?

MR. RAUSCH: I will go through that.

MR. SIESS: Were they licensed together or did they come in sequentially?

MR. RAUSCH: They came about a year apart.

MR. SIESS: Was there a single PSR, PSAR for the two units?

MR. RAUSCH: I think there was a single SFAR.

The operating license for Dresden 3 was in January of '71 and Dresden 2 in December. I don't have it up here, but it was December '69.

MR. RAY: Excuse me, but No. 2 has a provisional license, and three --

MR. RAUSCH: That's right. That is one of the reasons we are here.

This is a simple overview of the site. You can see the arrangements of Units 1, 2 land 3. These are the reactor buildings. The Unit 1 reactor building, the turbine buildings are on line. We have added on over the years. The size of our technical staff and administrative staff has grown substantially. We have a separate administration building outside the site.

The cooling lake is down in this area to the south; this is north. The Kankakee River and the Illinois River confluence is right here.

I think I have pointed out the last time also that one of the issues is the diesel generator exhaust stacks location. You might want to recall, Unit 3 is right in this area of the turbine building. The exhaust stack is essentially half-way up on top of the roof.

There is a Unit 2-3 diesel generator in this general area, an exhaust stack, and Unit 2 over here.

One of the things we will be trying to show -

the staff is still in the process of formally submitting it - that would be essentially zero probability of a knock-out of two out of three of the diesel generator exhausts.

MR. SIESS: You have one diesel for each unit to swing?

MR. RAUSCH: Thtat's right. At the end of your handout this time I gave you a simple one-line fork AV diagram and a 250 volt DC diagram, and a 125 volt DC diagram.

Then we have some questions about shared systems. We can put those diagrams up later if it becomes necessary - specifically last time, this is the last handout - the last time we were trying to explain how our battery systems work. I am not going to try to explain this except to point out that again we have separate full capacity battery chargers for each unit, a single battery in each unit. Each battery is capable of full-load for Units 2 and 3 combined.

It is single failure proof. It is rather complicated, though. Like I say, if we need to --

MR. SIESS: We will keep it in mind.

MR. RAUSCH: Also in your handouts you will notice I am only going through a few more things, but you have a couple of simple descriptions of the simple diagrams of our containment, ECCS isolation condenser and flip-out cooling systems.

I would briefly point out that we are a typical BWR-3, 20 jet pump, two recirculation mode plant. The generators are set at full control. We have three electric-driven feedwater pumps.

Mark I containment with torus suppression pool and primary water source in the event of a design-basis accident.

Typical ECCS. Our high-pressure core injection is steam driven, in an emergency electric driven.

We have four 33-1/3 capacity LPCI pumps, 200 percent capacity core spray pumps, and our pressurization system with with four electric pumps in addition on the target rack combined safety relief valve.

MR. SIESS: Three stage or two stage?

MR. RAUSCH: You asked that the last time and Ron Reagan answered it. He is not here today. I think it is two-stage, I can't recall.

We have an isolation condenser which is a passive decay heat removal device. We can handle everything up to three percent power. So, about ten minutes into any isolation we can bring it right down to somewhere about 212 degrees.

We have a separate shutdown cooling system. A lot of newer plants, including some BWR-3s, do not have isolation condensers and shutdown cooling, they have a RICI system. We don't have that system.

In effect, we have more flexibility than some of the newer plants for shutting down the plant. This came in handy in fire protection.

This has the operating history numbers. They are somewhat different than what you have in the staff's yellow book, the NUREG. We are proud of a couple of availability years, 1980-1982. I think they are one of the leaders in the world in availability.

MR. SIESS: What do you have, an 18-month refueling cycle?

MR. RAUSCH: It is obvious you cannot tell what the refueling is. We run anywhere between 17 months and 22 months, the refueling cycles.

That is all I have planned formally. For the full committee I will elaborate a little bit more than I did now.

I would like to point out again that we have a fair number of simple diagrams of the basic systems that make us unique. If you wish to refer to that, they come in handy - although most of the issues do not have much to do with the systems any more than they have to do with sites and layouts of the plant.

MR. SIESS: Any questions, gentlemen?

If I glance through what he has there and later on you want to see it in connection with a particular item, you will have them available.

Thank you, Mr. Rausch.

Now, let's hear the same picture from Millstone so we have in our minds the relationships, similarities and the differences, of these two plants.

MR. ROMBERG: My name is Wayne Romberg, I am the operating supervisor on Millstone 1. Mike Bain is handling the slides for me, and I have Dick Kacich with me from Licensing.

This is pretty much the same show as we gave the last time. We are very similar to the Dresden unit. There are specific differences and I will go through them.

There is a handout that is being passed out now, so you can take a look at the reference material. We did not go into as much detail as Dresden, but I can say it is very similar.

We are a BWR-3 with Mark I containment, maybe a little earlier than the Dresden unit. It is a jet-pump plant with 20 jet pumps, two recirc. loops. We have an iso-condenser very similar to theirs that will take us close to cold shutdown but not quite.

It is a feedwater coolant injection for high pressure injection. We do not have the standard steam-driven high-pressure injection system that came in the later product lines.

The feedwater coolant injection system is powered from a gas turbine emergency power supply which makes us unique in the industry. Our other backup emergency power supply is a diesel generator which powers essentially the other string with that single stream of high-pressure injection, feedwater coolant injection.

The plant is unique in the fact that it is a hundred percent by-pass on the main terminal, and we also have the full load reject capability. We can take a full load reject from a hundred percent and continue operation of the plant, continue supplying electricity, and we have successfully used that a number of times.

As far as cooldown to cold shutdown, we use a shutdown coolant system similar to Dresden's, a little different again in the new plants.

We also have the ability and routinely use as a cooldown method cooling down to the main condenser and we can get right down to about 140 degrees, sealing steam to the main turbine. So, that probably makes us unique in that area, too.

Plant size, main watts thermals is 2,011, just a little smaller than Dresden, about 685 megawatts, electric.

Our cooling medium is Long Island Sound. We are based right on Long Island Sound, it is a multi-unit site. We share the site with our combustion engineering unit right next door. In fact, the buildings are for the most part common, and we have gotten as third unit going up on that site which is under construction. It will be a Westinghouse fresh-water unit.

MR. SIESS: What do you use the quarry for?

MR. ROMBERG: The quarry is used as part of our discharge.

MR. SIESS: It is next to the Sound?

MR. ROMBERG: Yes.

The next slide. A little on our operating history. We started construction in May of '66 and went to criticality in 1970, four years on line, later that same year, and commercial in December of that year. It went pretty well in those days.

We have applied for a full-term operating license in 1972 and do not have that yet. We hope to get that out of the activities we are engaged in now.

If you look at the refuelings. The first one took 189 days. As we kind of got in step and the plant got operating a little better, refuelings went down to a pretty good number, 30, 35 days, 36 days.

The seventh refueling went 197 days. We had some light cracking problems. It was a difficult one. We also did a lot of modification during that outage.

On that start-up we broke the turbine and went to another 57-day outage.

The current refueling outage just ended a few weeks ago, it was 69 days. It was scheduled for 70, so it went pretty well and the plant is currently operating at 100 percent power.

MR. SIESS: If you did nothing but refuel, how long would it take you?

MR. ROMBERG: If we did nothing but refuel we could probably do it in around 30 days.

MR. SIESS: And if you did refueling plus what I call routine maintenance?

MR. ROMBERG: OK, let's go back then. If I just refueled, I could probably do it in 20 days. Refueling plus a routine maintenance, the inspections that are required as part of our programs, the minimum you could get by is about 30 days, assuming no problems.

MR. SIESS: So, anything thta is longer than that, you were making modifications?

MR. ROMBERG: Modifications or we ran into some sort of problem. We looked for something and found it, which we have.

If you look at the unit's performance today, our capacity factor today, including all the outages, is 63.3 percent which is a little better than the industry average; availability is 71 percent.

If you look at the various years and you look at the various capacity factors, you see a general improvement. That is just before the TMI time frame and we did not have a lot of regulatory people look at a lot of different things that we are now looking at.

If you look at our last cycle, it went pretty well. That 79.5 reflects the actual capacity factor with a penalty of about 10, 11 percent, running without the 14-stage turbine blades. If we had had the blades in, it would have been closer to 90, 91 percent, in that range. So, the plant is operating well on cycle.

We got the turbine all back together, rebladed, and I anticipate the next cycle should be incomparable to the laste one.

MR. SIESS: Any questions? OK, thank you.

Now, staff. We have a handout, I believe. Chris, do you think you have a way of handling all this now?

MR. GRIMES: I hope so.

MR. SIESS: I think this is the last time we will be trying to do two together because in the next five I do not think there are any two alike; are there?

MR. GRIMES: I am trying to put this presentation together with a comparison of the common and unique aspects. That became a bit of a bookkeeping problem. So, if we accidentally miss an issue or get it put into the wrong bin, I apologize.

Also, in categorizing the issues in the context to their resolution, we have been having on-going discussions with both licensees about the staff's position in the draft report, and are trying to reflect in the presentation the most current status of some of the issues.

Consequently, in some cases we have some issues thrown into the further evaluation section or procedural backfit section with an indication that there is no response from the licensee. We anticipate that there is resolution and it is just working out the details. When we get to those, I will point them out.

Also, we just received yesterday consultants' comments on both Dresden and Millstone, and have not had an opportunity to get those distributed to you. We will do so later this week.

There were not any comments that would impact on the staff's positions as far as I could tell. Like I said, as soon as we can get this package put together we will get the consultants' comments distributed to the committee.

MR. SIESS: Chris, a couple of items before you start. Would it be reasonable to assume that the status of resolution will not change too much between now and next week?

MR. GRIMES: I would expect so. We boiled it down to only a few issues of substance that we will discuss with you today, and it is possible that between now and next week we might be able to resolve some of these issues with further discussions with the licensee.

For the most part, I think, the presentation has been organized so that the bulk of the issues are in their proper categories for the full committee meeting.

MR. RUSSELL: Dr. Siess, if I might add one comment to that.

MR. SIESS: Yes.

MR. RUSSELL: We do expect to receive written confirmation to some of the agreements which have been reached verbally, and some of the agreements which were presented in the previous subcommittee meeting were some of the items which we will be discussing today.

So, we requested those commitments from both licensees such that we have them prior to the full committee meeting, so that that information will in fact be reflected in the final version of the NUREG report when it goes to the Commission.

MR. SIESS: OK. Now, just as a matter of nomenclature, there is a difference between a "topic" and an "issue?"

MR. GRIMES: Yes, sir. I was going to get into that with this first slide.

MR. SIESS: Can you define that in terms of decimal points?

MR. GRIMES: Yes, sir.

MR. SIESS: OK.

MR. GRIMES: In the reports, "topics" are addressed under the major subheading 4.1 or 4.2. The "individual issues" then break down to the third character. An individual issue would be 4.1.1.

MR. SIESS: OK.

MR. GRIMES: In some cases, there were issues that were similar or could be grouped, in which case you will find them in sections labeled 4.1(1), for example, if they were comparable issues with different twists.

MR. SIESS: Now, in terms of your topic designation, that Roman Arabic-Alpha thing, II-3-B would be a topic, and II-3-B(1) would be an issue under that topic?

MR. GRIMES: No, sir. Those are individal topic numbers which were reviewed against a select set of acceptance criteria, and from those evolved issues.

MR. SIESS: So, anything that has a Roman numeral in front of it, no matter how many decimal points after, is a topic.

MR. GRIMES: That's correct.

MR. SIESS: We will never approve Phase 3, assuming there are other good reasons for approving it, until you have a system that makes sense.

(Laughter.)

MR. SIESS: Because this one does not. Jerry?

MR. RAY: There is another connotation in the word "issue" in terms of agreement or disagreement. Whether it is an item to be resolved or whether there is a basic disagreement between you and licensees is an intersting area.

MR. GRIMES: Yes. That connotation was not intended. We wented to differentiate between specific things to look at and topics. And rather than call them sub-topics or staff concerns, which has a different connotation, we elected to call them "individual issues."

MR. RAY: Thank you.

MR. SIESS: Let's see, in the containment isolation, containment isolation is one topic.

MR. GRIMES: Yes, sir.

MR. SIESS: But the various different categories under that are issues.

MR. GRIMES: Yes, sir.

MR. SIESS: Whether it is two valves or one, or where they are. Those are issues under that topic. OK, I thought I had it straight, I just want to be sure.

MR. GRIMES: Perhaps another way to put it would be, in issues are specific differences identified from the acceptance criteria during the topic review.

For Dresden and Millstone, the satistics of the review are reflected on the first slide. We started with a total of 137. After we deleted the generic topics and plant specific topics, we ended up with 88 topics to review on Dresden and 86 on Millstone.

During the topic reviews, 54 were found acceptable on Dresden, 48 were found acceptable on Millstone. We ended up reviewing 34 topics in the integrated assessment for Dresden and 38 for Millstone. You see from the numbers that the plant reviews were fairly similar.

As a result of the integrated assessment, in reviewing those topics we were looking at a total of 72 individual issues or individual differences for Dresden, and 87 individual issues for Millstone.

For the discussion of the integrated assessment today we will be discussing those issues, the differences that were identified and the staff's proposed action in the context of either no backfitting, hardweare backfitting, procedural backfitting, or further evaluation, which could potentially result in one of those.

MR. SIESS: Now, in the generic topics, were 19 of them the same and one extra for Millstone, or were there more differences?

MR. GRIMES: All right.

MR. SIESS: You are going to get to that?

MR. GRIMES: First, under the discussion of the topics and issues I will briefly go through the topics that were deleted and why they were deleted, and a comparison from plant to plant.

I will then go through a comparison of topics that were found acceptable because they meet current criteria or equivalent, and do the Dresden-Millstone comparison there.

Then I will go into the issues that were addressed by the integrated assessment and put them into the categories just identified.

MR. SIESS: Now, Chris, I want to introduce one thing that may be a little different than I had warned you about, and that is, the topics relating to extreme external phenomena, some of which we saw shunted off to another committee on a generic basis, the floating tornado missiles of the seismic, in some instances they are not -- let's see, they are either resolved or not on one plant and not on the other.

I may have some questions about those if they don't show up on the list. I just wanted to warn you.

MR. GRIMES: All right. they should show up.

MR. SIESS: I think they do, and I have made a list of them because I want to be sure the other committee is aware of it.

MR. GRIMES: All right.

In the generic topics that were deleted because they were TMI, USI and multi-plant actions, the list is generally the same for all the plants that we have reviewed thus far.

In the comparison on Dresden versus Millstone the list is identical with the exception of Topic V-4 on piping and safe-end integrity. It was deleted generically from Millstone. The review was originally deleted for Dresden and then re-opened because Dresden had furnished sensitized statements that had not been yet changed out.

So, we picked up a portion of the review that was not being dealt with generically. As you will see later, that issue was found acceptable during the topic review.

MR. SIESS: Did Millstone not have sensitive safe-ends, or have they been replaced?

MR. GRIMES: They have been replaced.

MR. SIESS: After the Nine-Mile Point incident.

MR. GRIMES: Before. This was an issue that was raised long before Nine Mile.

MR. SIESS: The early Nine-Mile Point, the first cracks occurred about ten years ago.

MR. GRIMES: Yes, sir. I was thinking of the more recent.

MR. SIESS: And Millstone changed over and Dresden has not.

MR. GRIMES: As far as I understand, that is the case, sir.

MR. SIESS: OK. That accounts for that difference.

MR. GRIMES: Now, with the topics that were deleted on a plant specific basis, which are the next two slides in your package, again they are identical with the exception of one issue, and that is dam integrity. It was deleted because it was not applicable to the Millstone site because they are an ocean site.

But it was reviewed for Dresden because it is a river site.

MR. SIESS: It is a low water question, not a high water question.

MR. GRIMES: It was a dam.

MR. SIESS: There is no dam upstream from Dresden except the Kankakee, and that is about a four-foot hill. I think your dam question addresses low water.

MR. GRIMES: I am not sure.

MR. RUSSELL: We addressed them both and we found in both cases that it was acceptable.

MR. SIESS: Yes. It was a navigation dam.

MR. GRIMES: That covers all the topics that were deleted for both reviews. Now I will go through the topics that met current criteria or were found acceptable on another defined basis.

The topics that either met criteria or were acceptable on another defined basis are first grouped to the common topics and then the ones that were found acceptable only for one plant are gruped together on the following basis, the asterisk topic numbers are ones that were found acceptable on another defined basis.

MR. SIESS: And those are all site related?

MR. GRIMES: Predominantly site related matters.

MR. SIESS: Exclusionary of water that they did not have control over?

MR. GRIMES: That's correct. Similar to the issue on tectonic province and the basis for another defined basis that was described in the Oyster Creek presentation.

On Topic VI-3 you will note that Millstone was equivalent, Dresden met current criteria. There are a number of cases - I think three or four - the list of common issues that were found acceptable, where one might have been acceptable on another defined basis.

I will skip to the plant specifics. On Dresden because dam integrity was not an issue for Millstone, it was not acceptable for Dresden and therefore it is unique to Dresden.

On settlement of foundation it was found acceptable for Dresden; it was an issue reviewed in the integrated assessment for Millstone.

Effects of high water level on structures was acceptable for Dresden and during the integrated assessment for Millstone. And it is fairly much the case, if you go back to the statistics you will see that

Dresden resolved more things prior to the integrated assessment, and that accounts for the bulk of the difference between the two lists.

VI-10.B on shared safety features, Millstone shares far less between Units 1 and 2 because of their dissimilarity than Dresden between Dresden 2 and 3 because of dissimilarity between those points. That was an issue that was addressed in the integrated assessment for Dresden.

That covers all of the topics.

MR. SIESS: Why is XV-3 an issue on one and not the other?

MR. GRIMES: XV-3 was found acceptable during the topic review on Dresden. Drew, correct me if I am wrong, but I believe that was an issue that was addressed in the integrated assessment on Millstone for which the staff concluded that no action was required.

MR. SIESS: I see you have on Dresden that it is acceptable, on Millstone it is not.

MR. GRIMES: That's correct.

MR. SIESS: All right.

MR. GRIMES: The difference was evaluated in the integrated assessment.

That covers all the topics that were either excluded from the process or were found acceptable during the topic reviews, and gets us into the integrated assessment.

As an introduction to the integrated assessment, I was going to start by going into the issues that were addressed by PRA. There is a slide in there that shows the ones that were addressed by PRA commonly between both plants.

In the Dresden case, there was not a plant specific PRA, they were ranked either low, medium or high in the same fashion that they have been in past plants that have been presented to the committee.

On the Millstone case because there was a plant sp[illegible] PRA, there is a ratio of old risk to new risk. New risk established by explicit comparison before and after the difference and so, the summary here identifies the ranking low, medium, or high for Dresden or the ratio for Millstone.

In the case of Topic III-5.B it would have been evaluated had information been available to the risk assessment group. That information was not available, so they did not complete their evaluation of that issue.

MR. SIESS: That is interesting that on the plant that we have a plant specific PRA for we do not have as much information as we did for one that we do not.

MR. GRIMES: I do not know what specific information was lacking to perform that evaluation.

MR. SIESS: Now Chris, if I assume that .98 or higher would be a low importance, which would seem to be a reasonable assumption, I look at Item III-10.A which is a 996 on Millstone, but it was medium for Dresden.

Was that due to a difference in the plant or just a difference in the way it was assessed?

MR. GRIMES: I would like Mr. Spulak to respond.

MR. SIESS: Or a different group doing the PRA.

MR. RUSSELL: I might suggest we can hold these questions until Mr. Thadani and the other members of the staff on Liability and Risk Assessment arrive. They are proposing to address what the differences were bestween the two.

MR. SIESS: OK.

MR. RUSSELL: And come back to that question.

MR. SIESS: We will keep that one in mind.

On the next page I find battery testing which was high on Dresden, and on Millstone it says it was beyond the scope.

So, it is interesting that a plant specific PRA says it is beyond the scope for the non-plant specific one. I look at VIII-3.B, which is .987 on Millstone and a high. There have to be some differences in the way they were evaluated. That would be intersting.

MR. GRIMES: There were differences. If you note, in the text description of VIII-3.A the basic rationale between the two was the same. In one case they established a ranking for it, in another case they could not quantitatively describe it; so they addressed it as being beyond the scopoe.

But they put the same qualitative arguments in.

MR. SIESS: We will talk about it a little later.

MR. GRIMES: Now, for specific issues that were addressed by PRA in Dresden and not in Millstone, this is principally due to differences in the issues raised between the two plants.

MR. SIESS: Now, shut-down procedures are listed on both plants.

MR. GRIMES: But they were evaluated in different contexts.

MR. SIESS: OK, I-5.10, I-5.11.

MR. GRIMES: Yes. They were evaluated for different differences.

MR. SIESS: So, the five items you have there for Dresden but not Millstone do not appear for Millstone simply because they did not end up as issues for Millstone.

MR. GRIMES: They wre not exactly the same in the context of the issues evaluated.

Now, in the case of XV-16 there was a difference identified during the topic review on Dresden. We will get into this later when we discuss the issue of primary coolant activity.

But, as I mentioned at the Oyst-c Creek meeting because of the differernces identified in the topic evaluations as we received them, we went back and had them re-evaluated. It was then raised later in the integrated assessment as an issue for Millstone and therefore it was not evaluated in the PRA.

MR. SIESS: But the PRA is always going to rate those low compared to core melt.

MR. GRIMES: That is correct.

MR. SIESS: There is no question about that.

MR. GRIMES: That's correct.

On the specific issues that were evaluated specifically for Millstone, again it is a matter of difference between the two, the issues raised on the two plants.

MR. SIESS: Now, if you were using a low, medium, high category in your thinking, where would you put .84?

MR. GRIMES: I would expect that to be in the high category.

MR. SIESS: You make that high without knowing how much that contributed to the core-melt probability? If it only contributed five percent, you would give a ratio of 84, would you still call it high?

MR. GRIMES: That is a ratio of old risk and new risk, and I would have to look at it --

MR. SIESS: That is total old risk and new risk.

MR. GRIMES: It is new risk over old risk. It is a reduction in risk.

MR. SIESS: The overall risk.

MR. GRIMES: Yes, sir.

MR. SIESS: Not just the risk from this particular one.

MR. GRIMES: Yes, sir. We are going to get into this specific issue because they evaluated a modification that did not evolve from th staff review. They anticipated a backfitting requirement that did not result. So, the number is somewhat misleading.

MR. SIESS: Now, just again a very general question. Did you find the PRA evaluations more helpful for Millstone than for Dresden, or more reliable? You would give them more weight because of the plant specifics in your integrated assessment?

MR. GRIMES: The way that they were applied because of the timing of the receipt of the input, as opposed to where we had received it in the integrated assessment, we used them in about the same fashion that we had in previous cases.

We did not have an opportunity to go into the quantification and we looked at the results in about the same fashion that we would if they were ranked low, medium and high. We looked more at the rationale that was presented by the risk assessment than we did the numerical values.

MR. SIESS: Well, you heard my comment earlier that in our first report on Pallisades we thought that plant specific PRA would be very helpful, and the integrated assessment. Would you agree with that statement now?

MR. GRIMES: Not from the standpoint of the review for Millstone because we have not had the Millstone IREP study long enough to go into it in a lot of depth. So, I am not sure that statement would be true had we had the results from the IREP study at the beginning of the integrated assessment process.

MR. SIESS: I don't think you really meant what you said because if I believe what you said, you might change your mind after you have a chance to read the whole Millstone IREP about some of your assessment; is that true?

MR. GRIMES: I am not sure that the positions would change dramatically, but the basis for the positions and some of the twists on the positions might differ.

MR. SIESS: But as an aid to judgment you feel that you got on these particular cases, you got about as much out of the Dresden analogous PRA as you did out of the Millstone IREP.

MR. GRIMES: Fairly comparable.

MR. RAY: Chris, I am having trouble interpreting this ratio, new to old ratio. From what you said a moment ago I gather that it is a determination of whether or not - by the new assessment - whether or not there has been a reduction, so that unity would mean that there is no change.

MR. GRIMES: That's correct.

MR. RAY: Yet, in response to Dr. Siess' question a moment ago on how to interpret .84, you said that would be high risk. But it says to me, insofar as the information here is concerned, that there is a reduction.

You would only know that it was high because you knew that the original was high.

MR. GRIMES: What I was referring to is, when we look at low, medium and high, we are looking at: What does the difference contribute to risk? And if the new risk ends up being 84 percent of the old risk, then my intuition would tell me that the difference contributes significantly to risk.

MR. SIESS: See, what they did, Jerry, was look at where it deviates from current criteria, evaluate the risk as it stands now; evaluate the risk if it were fixed.

This says that if it were fixed it would be reduced 16 percent, the total risk. And his judgment is that since this particular item is not the only contributor, the change in this item must have been significant.

MR. RAY: But how do I know that what is left in terms of measure of risk in the absolute sense is a high risk in the original?

MR. SIESS: This is only a change.

MR. RAY: So, what you are saying is, it is a small change. And if the original was a serious risk, then it still is. Is that what you are saying?

MR. RUSSELL: Let me clarify. We use the terminology low, medium, and high to assess the impact of the propsed change upon risk, without any relative sense, without looking at what the absolute number is.

MR. RAY: I see.

MR. RUSSELL: If the change resulted in a large change, either in availability of the system, if the system was important to risk we would rate that as high under the old scheme, more a reliability evaluation. How do we change the availability of a particular system and was it important.

In the new scheme we did the equivalent of a sensitivity study on core melt probability, for example. We looked at it with and without the SEP fix. If implementing the SEP fix rersulted in more than a ten-percent change in core melt probability, we consider that to be in the category of high or something that should be done.

If it was between one and ten-percent, it would be the equivalent of about the medium category, and less than one percent would be in the low category.

So, it is just a difference in how we did the tool because we had the models to exercise for Millstone and we did not have the models to exercise on Dresden or on Oyster Creek.

MR. SIESS: But absent the safety goal you made no judgment as to what is an acceptable risk.

MR. RUSSELL: That is correct. We only looked at it on a relative basis. What is the relative change? Does it make sense to do this thing we are evaluating?

MR. RAY: Well, now, for Dresden we should interpret the term low, medium, or high the same way we do the quantitative measures at Millstone?

MR. SIESS: He said low would be 99, medium would be 90 to 100.

Yes, David?

MR. WARD: Bill, you said that the risk, for example, is expressed as probability of core melt. Do you really mean for example, or wasn't that the only expression?

MR. RUSSELL: They were both done, and I believe what we have presented in the data in the viewgraph is the change in core melt probability. We also had in the appendix the change in risk which related then to containment failure, melts and release categories.

So, both were done. I believe that the .84 was a 16-percent change in core melt probability and it is about a ten-percent change in risk.

MR. SIESS: There is a table in Appendix D for Millstone - Table EX-1 - which gave a decreased in core melt frequency, a decrease in exposure, and then new risk over old risk. And the last column, you said, was based on man-rem exposure?

MR. THADANI: Mr. Siess, I believe that was on core melt.

My name is Ashok Thadani, NRC staff.

MR. SIESS: It would have helped in that table for somebody to have --

MR. THADANI: It represents risk, and we do intend to give you a presentation on that material in a few minutes.

MR. SIESS: In that table new risk over old risk is --

MR. THADANI: Based on man-rem.

MR. SIESS: Based on man-rem.

MR. THADANI: Yes.

MR. SIESS: It is really risk, not reliability.

MR. THADANI: It is risk.

MR. SIESS: I just wondered. I make the distinction in my mind between a risk assessment and reliability assessment.

MR. THADANI: I do, too.

MR. RUSSELL: Before we go on, there is one other unique aspect that I would like to bring to the committee's attention with respect to how the integrated assessment process was conducted on Dresden and Millstone 1.

We had a meeting with owners about a year ago now, talking about ways we could speed up the program. One of the proposals was to provide to each of the owners after the topic reviews were complete the list of all the differences on their plants, and allow those owners to do their own integrated assessment and provide those results to the staff.

The first licensee to do that was Millstone, so that the staff in performing the review had the benefit not only of discussions with the licensee throughout the review process but a point-by-point proposed action resolution by the licensee for each of the issues.

MR. SIESS: Bill, is what you are referring to the difference summaries you sent out?

MR. RUSSELL: That's correct. What we did is, we went through all the topic evaluations and culled out all the differences, and packaged those in a letter to the licensees and requested that they review them.

In the Millstone case, they reviewed them internally and came up with proposed actions and submitted what I call an integrated assessment input, the licensee's views over various actions.

In other cases the process was very similar to that which was done on Pallisades and Ginna, and Oyster Creek; that is, it was a joint staff-licensee effort with the staff taking and proposing action and in some cases. getting individual letters from licensees on issues.

But in the Millstone case that information came in much earlier. In fact, we gave them 90 days and I was pleased to see that the job could be done in 90 days.

MR. SIESS: You sent a different summary to Dresden but you did not get a response back; did you?

MR. RUSSELL: We did not get a response back in writing on each issue yet. We are getting them back individually.

You recall that in Dresden's case they are considering making the modifications for four units, not just one. So, they are routing it through their station engineering for both Dresden 2 and 3 and Quad City 1 and 2, the thought being, if it is significant enough to do for one they are doing it for all four.

So, that has somewhat slowed down the process as far as getting formal licensee response.

MR. SIESS: I noticed when I read NUREG-0824 that some of the pages were verbatim from Millstone's integrated assessment.

MR. RUSSELL: That's correct. In those instances where the licensee made a proposal and the staff review determined that that action adequately resolved the issue and we agreed with the action, we adopted the licensee's proposal.

I felt that programatically that was a very good test, the licensee's ability to review his own plant for a large number of issues and make recommendations as to how he would address those in an integrated fashion.

MR. SIESS: That soundsd a lot more like the ACRS ten-year review than the SEV.

MR. RUSSELL: But that aspect is unique to Millstone. In some instances the licensee has proposed actions where for instance the PRA identified the issue as being of low-risk significance, but there may be other reasons beside risk that the action is being taken.

In other instances, the staff took an action which was not consistent from a backfitting basis with the PRA, but we felt for other reasons that the action should be taken.

But this uniqueness for Millstone 1 is one that I am going to be very interested in the committee's comments on because, as you are aware, we are briefing the Commission on the rersults of these first five reviews on December 15 at 10 o'clock in the morning.

So, I am hopeful to have a committee letter on these two units with your views on how we have done thus far on the first five, in order to present those views to the Commission.

In fact, we delayed the Commission meeting in order to obtain the ACRS views prior to talking to the Commission on these units.

MR. SIESS: You will have five letters. I don't think you are going to get a letter on the first.

MR. RUSSELL: No, that is correct, just five.

MR. SIESS: And I think as far as we are concerned, the differences in the way you handled it are not too significant to us if the applicant made an integrated assessment and you reviewed it and you accepted it. It affects your workload, but it is still your judgment that it was acceptable. Conceivably, he could have come up with a different solution that what you would have imposed, but not necessarily.

MR. RUSSELL: It is more of a philosophical difference, at least to me. That is, I believe that that is a job that should be done first by the utility, and that they should in fact look at the issues on their plant, integrate them, and make their recommendations to the staff, rather than the other way around with the staff making the recommendations to the licensee.

MR. SIESS: Well, the original proposal in the SEP was that the staff was going to do it all, and that did not work.

What you have ended up with for Millstone is that the staff identifies the differences with current criteria, asks the licensee to come up with an integrated assessment. I think as we talked about in the last meeting, an integrated fix - the fix was more integrated than thes assessment.

MR. RUSSELL: That's correct, with the exception that the topic reviews - and I would guess close to half of all the reviews - were done by the licensees first and submitted to the staff.

So that in the process of going through and identifying the differences from the completed evaluations to come up with a different summary was a procedural step. The information was available and the initial reviews were done in the large majority of cases by the licensees.

MR. SIESS: That is what you ended up with.

MR. RUSSELL: That's correct. That is rather significantly different from the way we started out.

MR. SIESS: OK.

MR. RUSSELL: It points out that the job, at least in my mind, can effectively be done by the licensees if they are given the appropriate guidance as to what are the issues.

MR. SIESS: Well, did not that develop after you did the lead review?

MR. RUSSELL: That's correct.

MR. SIESS: And you did one plant and they did the others following your pattern.

MR. RUSSELL: That's correct.

MR. SIESS: OK, where are we, Chris?

MR. GRIMES: I have just presented the topics that were addressed by the PRA for Dresden and Millstone that were common and were unique to each plant.

Now, I would like to turn over the podium to Mr. Thadani to describe the difference between evaluation techniques that were used and the advantages and disadvantages of the plant specific PRAs.

MR. SIESS: All right, we will do that before the break. We got ahead of our schedule all of a sudden. Go ahead.

MR. THADANI: I am Ashok Thadani, NRR. With me today I have Bob Spulak from Sandia National Labs and

Paul Amico from Science Applications, Inc.. They supported us in these risk assessments. We also have Ken Murphy from Research if you wish to get into some of the details.

The focus of our discussion today will generally be in terms of our assessment of the SEP topics, the qualitative assessment of Dresden and Oyster Creek, and the quantitative assessment that we performed for Millstone 1.

MR. SIESS: In regard to Millstone 1, keep in mind that we have been through for three plants the qualitative assessment. I think we have that material well in mind. We are really interested in the differences between that and Millstone.

MR. THADANI: That is exactly the focus of the discussion today, is very briefly describe to you what was done, and the earlier studies in terms of highs, mediums, and lows and what we have done on Millstone 1, and give you some examples of perhaps different conclusions we have come to because we had a plant specific PRA in this case.

MR. SIESS: Very good.

MR. THADANI: Incidentally, I do want to make a comment in passing that the Millstone 1 study has been sent to the licensee. The licensee, in fact, has already taken some actions while the study was in progress. The licensee in fact participated in the conduct of the IREP study.

So, in my opinion the licensee is quite familiar with the IREP study and has taken some action. Any other actions that would be considered in terms of what we have learned from the IREP study which was treated outside this program, unless you have some questions in terms of what we are doing, I can go on to Bob Spulak.

MR. SIESS: How many IREP studies on which plants?

MR. THADANI: The IREP studies, the first one was Crystal River; the next four studies - not all of which are complete yet - are ANO-1, Browns Ferry, Millstone 1, and Calvert Cliffs. The Calvert Cliffs study is not yet complete.

The Millstone 1 study, I understand, is in the process of being printed out. We do have a draft and I believe you have a copy of the draft. Essentially, that is all that is available to us and the fault trees were available to us on the computer but not in a document.

MR. SIESS: Volume 1 was very helpful because it did indicate what the licensee had done or was planning to do as a result of it. I think it was a very good paper.

MR. THADANI: Yes, it did provide some interesting insights, I think.

OK, we would start with Bob Spulak. He will give the discussion of what was done by our contractors and then, if you wish, we can get into some specific issues and our current use on these specific issues in terms of what one gets by real benefits.

MR. SPULAK: I am Robert Spulak from Sandia National Laboratories, and I am going to discuss briefly the qualitative methodology that was used for Dresden 2 and Oyster Creek, and also as the quantitative methodology that we used for Millstone 1 to evaluate the SEP issues.

Since you have already heard discussions of the qualitative methodology and read the NUREG on Millstone 1, I will not dwell on the methodologies but I will try to discuss the differences in methodologies and why some of the results for some of the issues which were similar to Dresden 2 and Millstone 1 appeared not to be quite consistent.

As I said, for Oyster Creek and Dresden 2 we performed a qualitative analysis and we assessed in a qualitative way how resolution of each issue that we examined would impact the dominant core melt sequences.

For Millstone 1, we did a sensitivety study on the Millstone 1 IREP PRA to deduce the actual changes in core melt frequency exposure end risk to the resolution of these issues.

The qualitative assessment of the Oyster Creek and Dresden 2 issues were, since they were qualitative, they had a couple of inherent conservatisms. I will get into that in a little bit.

MR. SIESS: Now, your qualitative assessments did draw on the Millstone IREP for these plants; am I right?

MR. SPULAK: Yes. The Millstone 1 PRA was used for the base case for all three studies. Because Oyster Creek and Dresden 2 are similar to Millstone 1, we went and looked at the IREP Millstone 1 fault trees and actually made changes and corrections or changes to these fault trees to represent what the fault trees would look lke if the fault trees were constructed for the other plants.

We did not attempt to actually solve these fault trees or to quantify them where you use changes in numbers because that would have entailed performing a PRA on those plants. Essentially, that would have meant a great deal of work.

What we did do is, we used these modified fault trees to qualitatively assess the impact of resolution of the issues on the tops of the fault trees and therefore on the dominant sequences which were identified in the Millstone IREP PRA.

In the qualitative assessments for Oyster Creek and Dresden 2 we had a ranking of high, medium and low importance to risk. And these were the criteria which were used.

A high issue was an issue which we assessed in a qualitative way from an examination of these modified fault trees. We assessed that resolution of the issue would dominate the value of a fault tree or event which appeared in a dominant event sequence for the plant.

This is where one of the inherent conservatisms comes in because we said, if a fault tree enters into a dominant event sequence, then that is an important event, that is an important fault tree. And if the issue dominates the value of that fault tree, it has a high importance.

And the reason this is conservative is because there are systems such as support systems - and the example I will discuss in a minute is DC power - which do, these systems do enter into the dominant accident sequences. But the dominant cuts for those accident sequences may not contain failures of those specific support systems or those parts of the support systems which the issue affects.

An issue is considered medium if we qualitatively assess that resolution of the issue woud have some effect on the top event of one of thse fault trees or events which would appear in a dominant accident sequence. But the effect was not enough that it could dominate the value of the system fault tree.

This is another inherent conservatism because if we looked at the resolution of the issue and said, "Oh, yes, here it appears in the fault tree, it appears like it might appear in some of the top cuts to the fault tree, but it certainly is not going to dominate the top of the fault tree," we say that, "Yes, that is of medium importance."

It turns out, though, that the actual effect on the top of the fault tree may be negligible, so this is a second inherent conservatism in the qualitative methodology.

An issue is considered of low importance if we can look at the resolution of the issue and look at the system fault tree for the plant, and we could say that there is no way that resolution of the issue could affect the top of the fault tree, that either the resolution of the issue did not make any change at all to the quantification or the structure of the fault tree or that we could determine tht the top of the fault tree was totally dominted by other sorts of failures and that the rersolution of the issue would not affect it.

So, this aspect is not conservative If we ranked an issue low, then it is low.

There were some questions earlier about how come some of the issues appeared as medium, high in the Dresden 2 assessment and they did not appear to have much effect on core melt frequency or risk in the Millstone assessment.

There are a couple of points here. One is that the issue -- of course, I have the terminology wrong, this should really say "topic" here. The topic or issue is not necessarily exactly the same at the plants. The topics are the same but the issues are different.

So, the actual issues analyzed by the PRA assessment named these different from plant to plant, slightly different. These four topics or issues I chose as examples because they are almost the same, they are more or less the same for all three of these plants, Dresden 2, Oyster Creek and Millstone 1.

I chose two issues here which are consistent across the three plants, and two issues on which the PRA result appeared to be inconsistent across the plants.

I am going to discuss these four issues in some detail so that we can understand how the methodology affected the results in these caes.

For the first issue listed here, loose parts, III-8.A, the concern is that a loose parts protection system should be installed to detect loose parts in the reactor coolant system.

The risk significance of this is that loose parts can cause transient events damage within the primary system and be initiating events for accidents.

In the qualitative aassessments actually this issue was treated about the same for all three assessments because we considered it in the transient, in the initiating event part of the analysis for the PRA. And we looked at historical data on loose parts and deduced that it would not affect the transient frequency for accident sequences as initiating events.

So, for the Dresden 2 and Oyster Creek studies, we rate this as low. We said, "Well, transients are important events in dominant accident sequences, but the loose parts cannot affect the transient frequencies."

In the Millstone 1 we just went one step further and said, "Well, the actual change in the numbers is going to be zero." So, there is not really any difference in our analysis across the three plants for that issue.

The next issue, II-10.A which is bypassing the thermal protection on the MOVs during accidents, we looked ast the data for various trips due to the spurious actuation of the thermal overload and we compared that to the failures of MOVs from other causes. And we decided that there was a small but probably detectable effect on the failure rate of MOVs due to not bypassing the thermal overload.

In the Dresden 2 and Oyster Creek assessment we said, "Well, it certainly cannot dominate the top event of any system fault trees because the MOVs usually do not dominate top events in system fault trees and, second, it is only a slight effect, it is not a dominating effect on the MOVs."

So, based on our criteria which I have presented earlier we said, "This is a medium-importance issue." That bypassing the thermal overload protection would probably have some effect on the top event of the system fault trees but it certainly could not dominate it. That is why we ranked it as medium.

When we got around to the Millstone case, we actully requantified the MOV failure data for the valves in question in the Millstone IREP PRA and we requantified the dominant accident sequences, including the changes in the failure data and we found it made a very small effect, about a one-percent reduction in the core melt frequency.

MR. SIESS: Now, a one-percent reduction in core melt frequency does not mean a one-percent reduction in risk.

MR. SPULAK: Not necessarily.

MR. SIESS: It depends on which release category.

MR. SPULAK: That is correct.

MR. SIESS: It could be more or less.

MR. SPULAK: That's right. In the table you referred to earlier - which you have, I suppose - Table EX-1, which gives the decrease in core melt frequency and the decrease in exposure and this ratio of new risk to old risk. The risk here is defined as total fatalities per reactor year.

So, in this case the risk is reduced by .4 percent instead of one percent for Issue III-10.A.

MR. SIESS: All right.

MR. SPULAK: The next issue, VI-4, is containment isolation. That is another issue --

MR. SIESS: Where are you, IV-10?

MR. SPULAK: That's correct.

The next issue, VI-4, containment isolation, is another one which was treated essentially the same in all three plants. The viewgraph you see has the change in core melt frequency. Actually, even if there was an effect on risk due to containment isolation, the effect on core melt frequency would probably still be very negligible.

So, this is sort of an inaccurate way to represent this particular issue. But in fact, it does have a zero effect on risk also. And the reason is that at all three plants, based on the IREP PRA in the core melt accident sequences in the containment wall always spill by over-pressure eventually.

So, even if the containment isolation fails it won't drastically affect the nature of the off-site release because the containment is going to fill by overpressure during a core melt anyway.

MR. SIESS: I don't understand that, I guess. If overpressure occurs three days later and the faulure to isolate occurs at three hours, it seems to me there would be a big difference.

MR. SPULAK: There would be, but the overpressure is not that late. It is called "late overpressure failure" but it is not, it is only a matter of hours.

MR. CATTON: I think that is still an open issue as to when it will fail. There must be half a dozen different scenarios that lead to the containment failure and nobody really agrees on any of them.

MR. SPULAK: I think that is true. This is based on the IREP PRA.

MR. SIESS: You don't need to explain it to me, but somebody else needs it.

What they mean by overpressure failure is rupture of the containment.

MR. CATTON: That's right.

MR. SIESS: And what I mean by containment failure is failure to contain.

MR. CATTON: Your definition includes --

MR. SIESS: Includes isolation failure of any kind.

MR. CATTON: And I think you are right.

MR. SIESS: Yes. I think the probability that something will go before the containment does is not very high. But again, they are both fairly early.

MR. SPULAK: Yes.

MR. THADANI: May I make a comment? Basically, the containment isolation systems do have valves. I believe the question there is, should there be one additional valve.

MR. SIESS: Oh, yes.

MR. THADANI: And that on these valves normally power is locked out and they close. So, we must not assume that the probability to isolate is high to begin with.

MR. SIESS: As I recall, the probability of a valve failing to close was high enough that the second valve did not make that much difference. We have been through that and I understand it, but I just wanted to get that relative time cleared up.

MR. SPULAK: All right, the last issue I am going to discuss - unless you have further issues you want me to discuss - is VIII-3.B, which is the DC instrumentation.

Essentially, the crux of this issue is that there is very little or no instrumentation in the control room to monitor the DC voltage and current, and so forth.

Our concern is that if you did have this instrumentation, you may be able to detect battery failures very early as opposed to waiting to have local sorts of tests of the batteries in the battery room.

MR. SIESS: So, a test frequency type question, whether it is a continuous test.

MR. SPULAK: It is essentially a detection frequency, how soon you detect the failure of a battery.

MR. SIESS: That is what I mean.

MR. SPULAK: Right.

MR. SIESS: Right now, you test the battery monthly or quarterly or something, and with instrumentation of the control room it would be almost a continuous test.

MR. SPULAK: That's correct.

For the qualitative analysis on Oyster Creek, we looked at how much improvement you could get in unavailability of the DC buses due to having improved instrumentation and found that this could have a significant effect o the DC power system, and therefore we ranked it as high. We said, "DC power does enter into some of the dominant accident sequences and also, it looks like the improved instrumentation could have a significant effect on DC power." So, we ranked it as high.

For Millstone, there is really one major point for why it came out as being very low, and that is that even though DC power is a support system and does enter into dominant accident sequences, the dominant cut sets for the accident sequences do not contain any DC power failure. So, improving DC power at Millstone does not seem to have much effect.

MR. RUSSELL: Bob, one point that needs to be made and that is that at Millstone there was already substantial DC system monitoring available, as compared to the other units.

For instance, the breaker supervision, the charger output current voltage, et cetera. So, a number of parameters that were monitored at Millstone were already there so that there would not be a significant change in DC availability.

I do not know how that affected it, but the one issue that was looked at was the lack of indication of battery amperage at Millstone as compared to a rather more substantial list of issues.

As I recall, on the other units it was not only battery conditioned but actual condition of important breakers which contributed about half to the importance. For instance, if a battery breaker were opened and you did not know it, whether your battery works or not does not help you. Your charger could carry the whole load.

So that there are differences in the issues as well as differences in the way they were treated.

MR. SPULAK: I confess that we probably did not treat those differences in the issues adequately at the other plants because we did not have a plant specific PRA on thoses plants.

this points up the advantage of having the plant specific PRA because you can go in and make the detailed changes to represent what the plant actually looks like and what the plant would actually look like after you resolved the issue and, you know, compare the two.

In this case for Millstone it did not make much difference.

MR. SIESS: Well, what you are saying, Bill, is that the plants were different.

MR. RUSSELL: That's correct.

MR. SIESS: That you had enough instrumentation at Millstone, that of eight ways you could fail the DC system, six of the[illegible] be indicated in the control room or something like [illegible]

MR. RUSSELL: This is one issue I recall, when we issued the draft of Chapter 4 and we had the previous subcomittee meeting, we did not have the Millstone IREP results at that time. That is the change due to exercising the models and the information that Bob was talking about earlier.

The fact that only one instrument was needed, or one alarm, that we subsequently received estimates of the cost of that instrumentation from the licensee in which pully cables and running battery ampers to the control room, and providing an alarm in the control room, is close to $100,000.

The change appears to be relatively small and they have other means of detecting battery failurs that we are re-considering that issue between the draft and the final.

MR. SIESS: All right.

MR. SPULAK: A point about this issue that I would like to make is that our analysis was based on NUREG-0666, which is the probabilistic study of DC power systems.

And they found that there were about half the battery failures - of course, you are talking about breakers and other components in the DC system - but about half the battery failures are not detected with any amount of instrumentation, and that they go undetected until testing.

So, even if you had lots and lots of DC instrumentation, you would still only detect about half the battery failures with that instrumentation. So, the effect is limited by that fact also.

MR. SIESS: The IREP, does it go into enough detail to distinguish between whether yo have six measuremewnts in the control room versus eight? I me.. which two are msssing?

MR. SPULAK: No, it does not.

MR. SIESS: It more or less goes on what you said about 0666.

MR. SPULAK: The IREP study did not take into account NUREG-0666.

MR. SIESS: Oh.

MR. SPULAK: However, they assumed the battery failure rate based on a weekly detection interval, based on a weekly battery test which essentially assumes that none of the battery failures are detected by instrumentation. We are saying that up to half of them can be.

MR. WARD: After hearing all this discussion, I get the impression there is not all that much difference between the actual plants and the design of Millstone and Oyster Creek and the rest.

MR. SIESS: In terms of the risk assessment, I think that is right. If they assume that half the battery failures are not going to be detected no matter how much instrumentation they have in the control room, then the differences between the plants as far as what instrumewnts they have in the control room is cut in half, at least.

MR. WARD: Yes. But that leaves me wondering whether the rankings, the qualitative rankings of high and the quantitative rating of .6 percent, are really warranted, whether there really is that much difference.

MR. SIESS: Which one is wrong, Bill?

MR. RUSSELL: There is one thing I would like to point out that we discussed the last time, and that is - if you recall - Dresden has essentially a two-battery system for two reactors, as compared to Millstone and Oyster Creek which essentially have two-battery systems for one reactor.

That aspect was not addressed in the ratings of the review. It was essentially looked at as if Dresden were a single reactor unit

MR. SIESS: Was that addressed in the IREP for Millstone, the fact that it only has one battery?

MR. RUSSELL: The systems at Millstone were modeled by what exists at Millstone. So, yes, clearly the IREP study represents what is there from the standpoint of numbers, and systems, and functions, and modifying that for Dresden which has not considered the fact that Dresden was a two-reactor station with shared systems.

MR. SIESS: Would a plant specific PRA for Dresden take that into account? The IREP does get down to that level of modeling?

MR. SPULAK: Yes.

MR. SIESS: Okay. Onward, unless there are more questions on this. Ivan, you had some questions about DC systems. Does this help you at all?

MR. CATTON: Yes.

MR. SIESS: Next item.

MR. CATTON: It doesn't say what one should do about it, but it does explain it.

MR. SIESS: Well, we will hear more about that.

MR. WARD: Well, I still haven't heard an answer to my question. Do you still, after doing the -- making the number for Millstone and having the IREP, do you still consider that these qualitative ratings of high are consistent, that there is a rational reason?

MR. SPULAK: Because the results of the PRA are sensitive to the exact plant design, and because we don't have a PRA for Dresden, for example, we develop the ranking criteria that I gave you earlier. Based on that, you sort of plug in the information you've got and out pops the answer and says, hi. Based on that, if we did it over again, we would still rank it high, because in our ignorance we had a couple of built-in conservatisms.

The conservatism in this case is the fact that DC power does contribute to dominant accident sequences, and instrumentation can have a large effect on the DC power system. Based on those two things, that is as much detail as we can get into because we don't have the plant specific PRA. Based on those two considerations, we would have to say in our ignorance we rank this as high.

MR. SIESS: You could almost rank those that way.

MR. WARD: Yes.

MR. SPULAK: For this, because PRA's in the past have shown DC power systems to be an important system, you could reach that conclusion. Now, if it was a drinking water system or something like that, I don't know.

MR. SIESS: I think you know without going into a lot of detail that the DC power system was important and ways of finding out when it isn't working are important, and I don't think you need a PRA.

MR. CATTON: It seems to me there ought to be a way of testing it, too, that you could read in the control room.

MR. SIESS: Well, they do test it once a week, but it is a question of failing in between.

MR. CATTON: DC batteries have been around a long time. I just can't believe there aren't systems that can continuously test it.

MR. WARD: There are. Millstone has them. They cost money.

MR. CATTON: Oh.

MR. SIESS: We will come back.

MR. THADANI: I think you are quite right, of course. Most people can tell you right off that DC systems are indeed very important. The point is, what is the specific issue that you are trying to address, and what is the importance of that issue only? I think, having had a plant specific PRA was helpful to that extent.

MR. SIESS: I think it is clear that with plant specific data, you can come to a different conclusion than you come to just on the basis of common sense, if you will, as to how important a specific thing is. I think that is the importance of plant specifics.

MR. RUSSELL: We may add just one insight. Bob, you can comment on this also. If you assume for a moment that the Millstone core melt number is dominated by a single event or sequence that contributes, say, on the order of 50 or 60 percent of the core melt number, and that that could be correctly relatively easily such that you would make a substantial change by changing that one scenario such that instead of having a core melt number that is 3×10^{-4}, you are down around 10^{-5} or, say, 5×10^{-5}. Then these numbers which are coming out on Millstone as being 1 percent of the core melt number, all other things being equal, would now be in the range of 3 to 5 or maybe even 10 percent of the core melt number.

Based upon changing one issue, that is in fact the situation that appears to me to exist based upon the concerns with depressurization for Millstone for a boiling water reactor on transient decay heat removal.

MR. SPULAK: That is because of the manual depressurization issue.

MR. RUSSELL: Yes, and other issues related to that. Now, that is one of the issues that has been identified on the IREP that is outside the scope of the SEP, but when you treat things on a relative basis, if there is one issue that dominates that and makes the core melt number relatively high, then on a relative basis you are considering it with respect to that one issue, and that may not be the same, for instance, if you did the same study and compared the importance, for instance, of batteries to Brown's Ferry that have different systems than at Millstone.

So, I don't think it is inconsistent to get the kinds of results we had with respect to importance of battery systems at, for instance, Oyster Creek or Dresden based on the way the study was done, or to have the kind of numbers that we have for Millstone because it is on a relative basis based upon changing core melt, changing only one parameter, and that issue may be dominated by something else that you are not considering or not changing.

MR. SIESS: Of course, that is a basic problem of operating the risk assessment without a safety goal. Every time you eliminate a major contributor to risk, you have the possibility of ending up with another major contributor to risk. Now, if you can get it down to 100 contributors, each contributing 1 percent, that is fine, but I don't think that is our safety goal right now. We don't have a safety goal right now.

If we understand, I believe the situation there has some merit in one direction, at least, of having plant specific risk assessments.

MR. SPULAK: That concludes my discussion.

MR. SIESS: So we remove certain conservatisms.

MR. SPULAK: If there are no more questions.

(No response.)

MR. SIESS: What is next?

MR. WARD: A break.

MR. SIESS: Is that all of the presentation on the PRA?

MR. THADANI: That is basically all we intended to discuss on SEP topics.

MR. SIESS: I had a lot more paper here.

MR. THADANI: Yes, we thought that we would give you the background information without going through so many slides. I expect it would take us an awfully long time.

MR. SIESS: No, that is fine. I am quite satisfied. Did anybody want to hear any more on the PRA right now?

(No response.)

MR. SIESS: Would you like to take a break?

MR. CATTON: Sure.

MR. SIESS: We'll have a break. I can always get agreement on one subject.

(Whereupon, a brief recess was taken.)

MR. SIESS: We will reconvene.

If the members or the consultants have any questions further about the PRA, they should be brought up now, because Mr. Thadani and his cohorts would like to get back to work out in the suburbs. Ivan?

MR. CATTON: In reading both of those IREP reports, it seemed to me there were three things. There was the operator failing to depressurize. In Millstone there was a gas turbine problem, and then there was DC power. Does the IREP go the next step and ask why these things are so dominant, and what might be done about them? Why does the operator fail to depressurize so consistently? Is it a lack of instrumentation? He doesn't understand past procedures?

MR. THADANI: It is my understanding in the case of Millstone 1 that the procedures were somewhat confusing, and again, it is my understanding that the utility either has taken steps to modify the procedures or is in the process of modifying the procedures, but I don't know that -- perhaps Paul -- We have Paul Amico here. I believe he has the details of what was specifically wrong with the procedures and so on.

MR. CATTON: I would like to hear a little bit about that, if I could.

MR. AMICO: Paul Amico from SAI. Basically, what was done for the IREP was that when we ran into a human error that was deemed to be important, we did an analysis of that error based on NUREG-1278, the technique for human error rate prediction. We would go through the actions that the operator had to do, the instrumentation that he had to look at, to diagnose a particular situation that would direct him to a certain procedure and the steps he had to follow through the procedure, and we would develop a decision tree for each of the tasks that he had to perform in doing this operation.

And the probabilities were assigned to those tasks based on NUREG-1278. In this particular procedure, yes, there was a confusing flow chart in the procedure that the operator had to follow that certain parts of it -- and I will give you an example -- there were four indications on the flow chart where the operator had to decide whether the level was increasing or decreasing. The first three said it in one way. They said level increasing, question mark, yes, no. The fourth one said, level decreasing, yes, no.

In that particular case, the violation of what they called a populational stereotype may cause the operator to answer the question as if it was the same one he had previously seen, and go off on the wrong branch on the procedure. That was specifically one of the things we found in that procedure, but yes, in the IREP studies we did go into a substantial amount of detail in modeling those human errors which were thought after a conservative screening quantification to have an impact on risk.

MR. CATTON: So I take it new procedures are being written, then?

MR. ROMBERG: Wayne Rybak, Northeast Utilities. Yes, we are working with the Owners' Group and should be implementing new procedures that clarify this whole issue of when to blow down. I think it makes it much, much clearer than it was before, and makes a much larger latitude for that blow down to take place in terms of what the operator has to look at and the guidance he is given. I think there is a significant improvement.

The flow chart that was confusing was not meant to be a document to be followed step by step during the actual dynamic operation of the plant. It was meant to be a training aid to show the logic of the operator. I think history has shown that the operators blow down when they have to based a lot on intuitive feeling which is the way a pilot would land an airplane. He doesn't do that by a flow chart, but he does it successfully most of the time.

MR. CATTON: But the operator doesn't have a chance to land his plant very often.

MR. ROMBERG: I understand what you are saying, although we do in the BWR utility industry, we have blow downs more than people realize. We broke our turbine, as an example, we put our turbine blades through the condenser tubes, which sorted that out very quickly, and the operator very quickly ascertained that he would lose his normal feed makeup, and within a very short period of time he elected to take a partial ADS to get down to his low pressure system, and that is not something he hesitates to do.

You don't get to a point where you don't have any other options open. You look at what you have in the primary, and you look at the kind of basic things of keeping the core covered, and if you look like you are going to lose your primary system, you immediately go over to one of the backups.

MR. CATTON: It may be that that particular -- this particular part of the PRA has a more dominant view than it should, from what you have said.

MR. ROMBERG: I think that is true, but again, I think most of the PRA's will get sort of a worst case analysis, and I really can't refute that. I have a guy on that that has a real problem, and we are looking at the analysis that we are doing to identify some problems here, and I think that is fair. I think in the real world we are better off than what the thing indicates.

MR. SIESS: That raises a question of how plant specific a plant specific PRA is. It is certainly plant specific for the hardware, but does it look at the operating history of a particular plant, past operator actions, or does it just look at paper?

MR. THADANI: Since he was involved in the study --

MR. SIESS: That makes it prejudiced.

(General laughter.)

MR. AMICO: I think in general what can be said is that for the most part, your comment of looking at paper to a certain extent is true, the problem with that being that the opportunities to perform the action are not significant to develop a data base. We are talking about a situation where in particular the particular problem we have was that the procedure was more confusing the way we analyzed it during loss of off-site power than during other conditions, and we got a chance in seven times in 100 tries that the operator would make a mistake.

They have had one loss of off-site power, and I don't believe whether they had to blow down or not was not all that important. The opportunities for the operator to act under that condition is true just as during any human error during an emergency condition. There is no data, no matter how long a plant has been operating, that can give you an accurate picture of what the operator will be able to do.

MR. CATTON: The second item of those three was the gas turbine. Did you go into this same kind of detail and conclude that preventive maintenance would cure the ills?

MR. AMICO: In general, I would say, no, we did not do that. It was not really part of the scope of the study to go into root causes of the turbine generator failures. We looked at the turbine generator failure data that existed in the plant in order to determine whether the failure rate we were going to use was representative of what was the problem.

In some cases, we were able to identify that -- well, let me go back a little bit. We would be able to identify it if it was simply something like it should be tested more often, because in fact we did put in a -- we factored in a change in failure rate due to extended periods of not being tested. For instance, if something was tested monthly, if a valve was tested monthly, and another valve was tested at every refueling, and they were essentially identical valves, the one tested at every refueling would have a higher failure rate based on the fact it was sitting around longer.

MR. CATTON: But in this case there was a pretty good history of trouble with the gas turbines. Did that get factored in?

MR. SIESS: Ivan, I think the SEP staff should address that question, because they are the ones who decided on what would improve the reliability of the gas turbine, and apparently not the PRA people.

MR. CATTON: Okay.

MR. AMICO: The PRA could be used to do that. Okay? There is no reason why you can't. It's just that the scope of the IREP study was not going to the root historical causes of components and determining what you could do to make them fail less often, but the information is there, and you can look at the history of their gas turbine and determine what the causes were, and then quantify what kind of reduction you could get by making certain changes in the way the unit is maintained and that you can produce certain failures, and you can do that. It was just not done.

MR. CATTON: The only reason I raised this, Chet, was, it was called out as a dominant contributor, and there was a history of trouble.

MR. SIESS: But we want the SEP staff to address why they think they can fix it.

MR. CATTON: Well, of course. Of course.

MR. SIESS: What he just said was, whatever fix is called for, they could evaluate how successful it is based on the limited statistical data they have, or time will evaluate it. There is some evidence that the failure rate has changed with time as things have been done. When we get to that item, we will expect to hear from somebody in the SEP on it.

Did you have a third one, Ivan?

MR. CATTON: The third one was the DC power, and that has already been addressed.

MR. SIESS: Anything else you want to hit the PRA people on before they take off?

(No response.)

MR. SIESS: Okay. You can be excused. Thank you.

Chris will get us back to the schedule.

MR. CATTON: We will save our questions until he is gone.

(General laughter.)

MR. SIESS: Let's see. Are we down to Item 5 on the agenda?

MR. GRIMES: Yes, sir.

MR. SIESS: Eight minutes ahead of time. That is unbelievable. But it is a tribute to the staff engineer who made out the schedule.

(Slide.)

MR. SIESS: Or was it you that made out the schedule?

MR. GRIMES: Yes, sir. My ego is now properly inflated.

(General laughter.)

MR. GRIMES: At this time, I would like to start into the integrated assessment summaries for Dresden and Millstone. As I mentioned earlier this morning, I have done my best to try and see to it that we have them organized in the category that we expect them to come out in. Although we haven't gotten all the documentation in from the licensees, we have had a substantial amount of discussion on these issues.

Greg Cwalina, the integrated assessment manager for Dresden, is here, and Lou Persinko, the project manager for Dresden, is here, and they are prepared to discuss the issues in detail if you have specific questions, and also, they will be correcting me throughout this presentation in case I accidentally slip something into the wrong bin.

I will start off with the issues that we determined did not require any form of backfitting as a result of the integrated assessment review.

(Slide.)

MR. GRIMES: On each one of the issues which are identified along with the corresponding topic that they evolved from, we have identified the section of the integrated assessment reports for Dresden, Millstone, and for the common comparison. We have also identified the section for Oyster Creek where the issue has been previously presented.

We have also identified an encapsulated common resolution for each of the issues. As we mentioned in the Oyster Creek meeting on the effects of pipe break outside containment, the staff had previously required an evaluation to demonstrate that the consequences of pipe break wouldn't cause an unisolatable LOCA outside containment. As a result of the subsequent PRA input on Dresden, we concluded, that it was a sufficiently low probability that it didn't need to be pursued.

On seismic design considerations, the ability of safety related electrical equipment to function was one that we deferred to A-46, generic activity that was pursuing that issue.

(Slide.)

MR. SIESS: Now, that is not all on seismic, is it?

MR. GRIMES: No, sir. I am only going through now those issues for which the integrated assessment concluded that no further action was warranted. When we get into the other discussions of procedural backfits or hardware modifications or further evaluations, we are going to run across --

MR. SIESS: We are at the issue level.

MR. GRIMES: We are at the integrated assessment at the issue level, going through a categorization by resolution.

MR. SIESS: Okay. I am clear. That is the way I want to do it.

(Slide.)

MR. GRIMES: On loose parts monitoring, the lack of loose parts monitoring capability for the primary system. This is a resolution that has been common to all five plants. The integrated assessment concluded that backfitting loose parts monitoring systems was not warranted.

(Slide.)

MR. GRIMES: On containment isolation, a common feature of boiling water reactors is two check valves in the feedwater system as opposed to general design criteria, which requires a check valve and a motor operated valve. The staff concluded that the existing containment isolation capability for the feedwater lines was adequate. For the location of valves, it is common in boiling water reactors because of the confined space of the dry well to have two isolation valves outside containment. The PRA, along with the staff's judgment that two valves outside containment was adequate, led to no action on that issue.

(Slide.)

MR. GRIMES: Core spray nozzle effectiveness evolved from a generic issue on spray nozzle effectiveness. We evaluated in the integrated assessment and deferred it back to the generic issue and concluded that there wasn't a need for any immediate action.

(Slide.)

MR. GRIMES: On testing of the reactor trip system and engineered safety features, the issue s one of testing channels, and the tests routinely d. ot require testing of the sensors as well, and the staff concluded that the existing testing was adequate.

MR. SIESS: How is Oyster Creek different?

MR. GRIMES: I believe that Oyster Creek was different because it wasn't an issue that only the sensor was not tested, it was an issue that there were entire channels that were not tested, and the staff recommended that those channels be incorporated into the technical specifications along with the other channel tests that were required in the technical specifications.

MR. SIESS: Okay.

MR. GRIMES: On on-site emergency power systems, there were specific requirements for annunciators and IEEE standard, I believe that should be 279 instead of 297, and that was previously reviewed by the staff, and the integrated assessment team concluded that that action was sufficient.

MR. SIESS: And again Oyster Creek?

MR. GRIMES: I believe on Oyster Creek that difference wasn't identified.

(Slide.)

MR. GRIMES: On Topic XV-1, that was common to all three boilers. The turbine bypass capability for a feedwater controller event, we deferred it to the reload review. To the extent to which the plant needs to rely on turbine bypass for that event, it is routinely reviewed with the reload so any requirements for technical specifications or procedures would be picked up during that review.

MR. SIESS: What is that, a fuel limit?

MR. GRIMES: Yes. MCPR limit typically is controlled by loss of load event.

Those were all the events that were common to both Dresden and Millstone for which the staff concluded that no action was required. Now I will go into the ones that were unique to Dresden.

The design basis ground water level was an issue that is similar to an issue that was raised at Oyster, although the elevations are different and the effects may be different. Based on the material that was reviewed in conjunction with Topic III-3.A, the staff concluded that the ground water level was adequate or the capability was adequate. That was similar to an issue on Oyster.

A point I should make here is, we only identified the Oyster section for the common issues. We didn't go through on the plant unique ones and identify which ones were similar to Oyster. Fracture toughness testing data do not exist for reactor building closed water cooling system, reactor water cleanup system, and what is RSCS?

MR. CWALINA: Reactor coolant check.

MR. GRIMES: The information wasn't available for that, and they were not of sufficient importance that there was a need to pursue that information. On the capability of the reactor building superstructure and the ventillation stack, based on the information that was presented during the topic review, the staff concluded that there was a sufficient capacity in those structures.

MR. SIESS: Is tornadi the plural of tornado?

(General laughter.)

MR. GRIMES: We may have coined a new phrase. That is a typographical error for which there wasn't sufficient time to make a correction.

(General laughter.)

MR. GRIMES: On inspection frequency of flow regulation station, the staff concluded that the flow regulation station was not of sufficient importance to warrant more specific inspection requirements. On the inspection frequency for the intake and discharge structures, based on the review of Topic II-4.D, the staff concluded that they have sufficient integrity that they shouldn't require inspection in accordance with current criteria.

On Topic III-4.A, with regard to the capability of the service water system to function given a loss of ventillation, in some cases we picked up ventillation issues under the specific system reviews, and in other cases we picked them up in the ventillation reviews. In this case it was picked up under the specific review based on the review, the related review under the TMI action plan, Item III-D, III-4, and the fact that the battery room is located in a missile protected area, the staff concluded that further evaluation of this issue was not warranted.

MR. SIESS: What is that TMI item?

MR. CWALINA: It is control room habitability.

MR. SIESS: Okay.

(Slide.)

MR. GRIMES: This is another seismic issue on piping supports. The Staff considered that the actions taken in conjunction with I&E Bulletin 7914 or those to be taken would adequately resolve the issue. On Topic III-10.A with regard to the torque switch, as a result of additional information that the Staff gathered during the integrated assessment process, we concluded that the criteria that had been met, even though the topic evaluation contended it hadn't, we concluded it was because of a lack of information.

On the Topic V-5 review, the Staff identified a difference with regard to the sump level monitoring. That issue by itself, the Staff concluded that the procedures that the plant had were adequate. We will get into other aspects of Topic V-5 later.

MR. SIESS: We sure will.

MR. GRIMES: On Topic V-6 with regard to the reactor vessel materials, there was additional information requested as a result of the topic review. The Staff concluded that a tech spec amendment request would sufficiently resolve that issue.

(Slide)

Continuing on with the Dresden specific interlocks on the reactor cleanup system, this issue is under the further evaluation section for Millstone. For

Dresden, the licensee submitted sufficient information for the Staff to conclude that there was adequate capacity in the reactor water cleanup system relief valve and the consequences were sufficiently low that no further evaluation of this issue was required.

The kind of information that was presented for Dresden is the kind of information that has been requested for Millstone under the further evaluation section. Topic VI-6 on the containment leak testing, the leak testing of the reactor building cooling water system and the containment air lock are not in conformance with current criteria. The Staff concluded that because the leak testing of these systems is reviewed in conjunction with the Appendix J leak test, that specific action on these aspects was not warranted.

MR. SIESS: I don't understand that. Is there a continuing review under Appendix J?

MR. GRIMES: Is there an exemption request in for these specific systems?

MR. CWALINA: There was a specific request from Dresden on these two items. The exemption was granted on many items. Their contention was denied. The licensee is going to have to backfit their design to accommodate these exemptions.

MR. SIESS: So it was handled under another category so they have to do something.

MR. GRIMES: This was an issue where we could not identify the solution in the context of the integrated assessment, and we felt the action being pursued would eventually resolve it outside the scope of the SEP.

MR. RUSSELL: If you go back for a minute, Chris, on the reactor water coolant isolation on Millstone, as you will recall, we discussed this last time. They are proposing a separate pressure switch to actuate isolation on high pressure. In the case of Dresden they have demonstrated that the relief valve had sufficient capacity and there was enough indication for operator action and that the consequences of the event were small. So the approach being taken by Oyster Creek is also one demonstrating sufficient relief valve size and that the consequences of the event are within the design basis. So the approach by the three utilities -- the three are similar, that is, Oyster Creek and Dresden 2 and on Millstone -- the approach is one of providing a hardware fix to resolve the issue.

MR. SIESS: Okay.

MR. GRIMES: Further proof that having three of these plants rattling around in my head will often lead me to confuse two of them. Topic VI-10.B on the capability to put swing diesel into bypass mode. The licensee modified the procedures and the Staff concluded that that was adequate.

On topics related to ability to achieve safe shutdown for Dresden, the issues related to the procedures are being reviewed in the context of Appendix R. The Staff reviewed, the integrated assessment team reviewed the procedures and concluded that they are adequate and deferred any other consideration to the Appendix R review.

(Slide)

The last item to Dresden specific is ventilation of the LPCI and core spray room, and the integrated assessment team concluded that the procedures to restore ventilation in the event that it is lost were sufficient.

(Slide)

I will go on to the Millstone specifics. On the hydrology topics there was an issue related to ponding in the vicinity of the radwaste and control buildings which could overflow into the buildings and could flood out potentially safety-related systems. Based on the assessment team's review of the potential for ponding and flooding and the existence of a flood gate in that area, the Staff concluded that no further action on that issue was warranted.

Similarly on the gas turbine building, the Staff concluded that the flood gate and the capability for using other systems to achieve safe shutdown was sufficient and no further action on that issue was warranted.

(Slide)

Another flooding issue was the potential for flooding out the diesel fuel oil transfer pumps. Based on the procedures and the relative location of the pumps, the Staff concluded that no further evaluation of that issue was warranted.

Topic III-5.B on pipe breaks outside containment.

MR. SIESS: Excuse me.

MR. GRIMES: Yes, sir.

MR. SIESS: In the report 4.1.5 wasn't closed out. The applicant was checked on that. Are you saying he has now done it and it is okay.

MR. GRIMES: This is Millstone specific?

MR. SIESS: Yes, the one you just did, diesel fuel oil transfer pumps.

MR. GRIMES: I will have to check. Drew, would you check and see whether that is an issue that was subsequently closed out?

MR. SIESS: Go ahead. We can check on it later.

MR. GRIMES: Okay. On pipe breaks outside containment, the effects of moderate energy piping were not evaluated as they should be for current criteria, and that the integrated assessment team determined that what information was available on monitored energy pipe breaks and their effects was adequate both in terms of the potential for flooding and spraying or wetting effects.

MR. RUSSELL: Chris. On the last question, Dr. Siess, the issue that was left open on 4.1.5 had to do with revision to the emergency procedures, which is addressed with 4.1.6, and they are being upgraded to address the shutdown issue. That was the last part of Section 4.1.5 and we combined that with the overall procedures issue.

MR. SIESS: I see. Thank you.

(Slide)

MR. GRIMES: Continuing with Millstone specific on the seismic issues, the LPCI and containment spray heat exchanger supports. The licensee provided additional information during the integrated assessment. The Staff concluded that there was adequate support of those systems. Similarly for the anchorage of transformers and control room panels. The additional information provided to the integrated assessment team led them to conclude that there was adequate anchorage of those systems.

MR. SIESS: The way you have the resolution on the slide, it looks like that is an open item.

MR. GRIMES: This is one that is in the transition. We are told we are going to get it. We haven't got it yet, but once we have got it, it goes away.

MR. SIESS: Fine. You have got the words but not the paper.

MR. GRIMES: Right. We are in the midst of getting all of the material necessary to resolve the issue. On the recirc pump supports, similarly, the material that the licensee has developed in conjunction with Bulletin 7914 and the actions that he is proposing will provide the information that the integrated assessment team needs to conclude that this issue has been adequately resolved.

(Slide)

MR. GRIMES: I am still continuing with Millstone on Topic IV-2. With regard to a single failure analysis of, I believe this is, the control rod drive system, the Staff reviewed it in the context of the evaluation for control rod misoperation events in XV-3 and concluded that those analyses are bounded and that additional information identified in the topic review did not need to be pursued.

Topic V-5 is another piece of the leakage detection inside containment. The Staff concluded that the information identified is necessary in the topic evaluation on intersystem leakage and did not need to be pursued because of the low significance of intersystem leakage, both from the standpoint of PRA and from the Staff's review.

Topic VI-4, which is another containment isolation issue. The Staff concluded that remote manual and excess flow check valves used on systems that normally would not be allowed, that the design of the systems was adequate.

(Slide)

The next topic on Millstone is VI-7.A.3 with regard to reactor protection system and ESF testing. The resolution was the Staff concluded, based on what testing was performed and the PRA input, that further evaluation of this issue was not warranted. Similarly on the safe shutdown topic, VII-3, the Staff concluded that the velocity instrument bus, based on the actions taken in conjunction with Bulletin 7927, that the procedures are adequate.

MR. SIESS: What is Bulletin 7927?

MR. RUSSELL: It is the issue of failures. The position we have taken, and this is one where there is a difference in the issue reviewed in the PRA from the issue that was identified, and we looked at this aspect of it and concluded that the capability existed to shut down using indications from outside the control room and that there were procedures in place to do that. So that we addressed only the single failure of the instrument bus itself and the loss of a portion of the indications.

The issue that was looked at that you will see later relates to the automatic bus transfer which feeds the same bus. In that instance the PRA concluded that because of the importance of the instrumentation in the control room, that redundant buses and instrumentation and also some controls should be provided and that that involved the 16 percent change in the core melt. That issue is related to the IREP review and it goes, in our opinion, beyond what was being done from a single failure in the old system and the loss of the instrument bus.

The Staff has previously accepted the capability to shut down from outside control room and does not require that you be able to accommodate single failures and still be able to shut down inside the control room. The related issue to that is the redundant instrumentation, which is being looked at in Reg Guide 1.97, in instrumentation to be followed during the course of an accident for which a position has not yet been taken. So that from the SEP standpoint, we felt that issue was beyond what we are currently requiring.

We then concluded that what they have with the capability to shut down from outside was sufficient.

MR. SIESS: It looks like what we need are integrated requirements. We have got IE bulletins, reg guides and a few other things that don't seem to mesh completely.

MR. GRIMES: I should point out that this issue was addressed here and only here because of the aspect of the recommendation evolving from the PRA being beyond the scope of the SEP and not really related to specific differences from current criteria. The Staff concluded that for the purpose of the SEP, the procedures they have are adequate and would allow the recommendation evolving from the PRA to go on to actions resulting from the IREP as a whole.

MR. SIESS: They are generic items of some kind.

MR. GRIMES: There is a plant-specific response to an IREP.

MR. SIESS: Okay.

MR. GRIMES: Topic XV-3. This relates back to the loss of load event. The Staff concluded that based upon the analysis that was performed for reload 8, that the difference between an assumed initial power that one should do in accordance with the standard review plan and what was done was negligible and no further evaluation of this issue was warranted.

That covers all of the issues, both common and plant-specific, for which the Staff concluded that no further action is warranted.

(Slide)

MR. SIESS: Okay. Now, it seems to me that at the Full Committee meeting -- did we go through those item by item last time or did we flash card the list?

MR. GRIMES: For the Full Committee meeting we just flashed the list.

MR. SIESS: Okay. I think that is what I would like to do, and I think you should have three lists: the common, the Dresden-unique, and the Millstone-unique.

MR. GRIMES: Do you want them listed by issue as they were presented here and just exclude the resolution?

MR. SIESS: Yes. Just list the issue, and if anyone has a question, then you can go to the resolution.

MR. GRIMES: All right.

MR. SIESS: I don't know how much trouble it would be, but it would probably be simpler for the Full Committee if somebody raises a question to have a single slide for each topic. That means doing all these things over and I am not sure it is worth it if you could find the topic that someone asks about that has the resolution on it. On these particular slides you have been showing, they are a little bit confusing to me because the resolution is underlined and the topic is not, and I have trouble getting from one to the other in following the list. But I think we will do that on sort of a flash card basis. We have gone through them item by item and had a few questions, so if they have any that they want called out, they can. Okay.

Now we will go on to the additional evaluation.

MR. GRIMES: These are issues for which the integrated assessment team concluded that further evaluation is warranted and that they have a potential for some form of backfit, whether it be procedural or hardware.

MR. SIESS: How are these arranged?

MR. GRIMES: These are first common, then Dresden-specific and Millstone-specific.

MR. SIESS: Is this going to tell us what "later" means?

MR. GRIMES: Yes, sir. I would like to preface it by saying that differences between the integrated assessments reflect the character uniqueness of the integrated assessment project managers. The differences from the basic form of the report are just a matter of the individual integrated assessment project manager assembling the issues and their resolutions into the draft report that has been presented to you.

Or Dresden, as Bill mentioned, because they were coordinating proposed actions not only for Dresden 2 but for Dresden 3 and Quad Cities 2 and 3, as well, we were only getting little bits and pieces of commitments from the licensee, so "later" means that licensees are in the process of developing a response and we haven't received it yet.

In the context of Millstone, it was one where as a result of the integrated assessment process, even though they had gone through their own integrated assessment, when the integrated assessment team came up with a resolution that they had not yet had an opportunity to evaluate, it was characterized as a "later" to determine what specific recommendations evolved from the integrated assessment.

MR. SIESS: So a "later" -- and that was used primarily in Dresden -- could end up being an issue requiring additional evaluation.

MR. GRIMES: The "later" only characterized licensees.

MR. SIESS: Say that again?

MR. CWALINA: Dr. Siess, let me try to explain. In Table 4.1, the integrated assessment, the column under "Licensee Agrees," whenever I said "later" in there, what I meant was the licensee had not provided us with a formal response yet as to their position on that item.

MR. SIESS: That is essentially no response in Millstone, then.

MR. CWALINA: Correct.

MR. SIESS: The outcome of a "later" could be that further evaluation was needed. Some of those items are needed. The outcome might be that no backfit is required or it might be a backfit.

MR. CWALINA: That is correct. I would also like to point out now that in about the last week I received seven or eight additional responses from

Dresden, and as Chris goes through these slides, I will try to point out what Dresden has said. In some cases they have provided commitments.

MR. SIESS: I have about 20 "later" items on Dresden, and if we could get any of them categorized as to additional evaluation or whatever, it would help.

MR. CWALINA: I think in most cases we had a verbal agreement or understanding with the licensee and it is just a matter of not having a formal response.

MR. RUSSELL: In fact, some of those agreements were provided by the licensee in the last subcommittee meeting and it is just a matter of going through the process. They are taking the proposed resolution through station engineering at both stations and coordinating schedules and making commitments, which is something that they can actually implement, and that takes time to do. So while we feel that there is essential agreement on what the issue is, there may be a difference on how it will be implemented, and that will be reflected.

MR. SIESS: Let me make clear the reason I ask. As you know, the ACRS when it writes its report tries to at least provide some guidance on the issues for which there is disagreement, and it is fairly obvious to me that most of these later items are not necessarily going to be disagreements. So I would like to get some idea, certainly by next Thursday, as to where the disagreements are or are likely to be. And as far as Millstone is concerned, I have on my list five "no response" items, which is in the same general category. When we get to those, we might want to see where they stand.

MR. RUSSELL: It is our intention to update Table 4.1. We have been told by the licensee that we will have all of the information approximately two days before the Subcommittee meeting, which will update Table 4.1 and eliminate as many "laters" as we can. We will do the same thing with most of them to indicate in fact where there are disagreements.

MR. SIESS: It would be helpful if you could get that to me before the Full Committee meeting. I will be out here on Tuesday and Wednesday. So then I could at least be prepared to tell the Committee where we stand.

Okay, Chris. Are there any questions anybody has about that list that Chris has just gone through?

[No response.]

MR. SIESS: Does anybody have any problem with just presenting the list to the Full Committee and letting them ask questions about which ones they want?

If there are any that you think we might single out and have the Staff talk about, fine, but I don't like to try to decide for the Full Committee what they want to hear. I have never been very successful with that anyway.

Go ahead.

MR. GRIMES: All right. ow I will go through the issues for which further evaluation is necessary. Topic III-2 with regard to wind and tornado loads. The licensee's safety analysis report didn't have an evaluation of loss of safety-related components outside of qualified structures or did not evaluate them. Both licensees have agreed to provide an evaluation of such components, which ones are defective and which ones are not.

MR. SIESS: Now, that is IV-3.3, isn't it?

MR. GRIMES: Yes, sir. For Dresden; IV-4.4 for Millstone 1.

MR. CWALINA: Dr. Siess, that is one of the items that Dresden has just responded to.

MR. GRIMES: Maybe I can simplify this by saying --

MR. SIESS: How does this compare to the Oyster Creek situation? Is this a multiple missle problem?

MR. RUSSELL: No, this is wind and tornado loads. We have not gotten to tornado loads yet.

MR. SIESS: Okay.

MR. GRIMES: Maybe I can simplify this by saying that we have got essentially verbal agreement on all issues, and in the last five in the package it identifies those for which we haven't at least gotten a commitment from the licensee that he is going to do something about it, although we have not worked out the details, and we have boiled it down to what we expect to be, once all the paper is in, the only areas of real disagreement, which would be the last set of issues that I was going to discuss.

MR. SIESS: Well, I may be getting ahead of myself, but what about the roof decks and snubbers for Dresden? Has that been agreed to?

MR. GRIMES: Dresden has agreed to evaluate it.

MR. CWALINA: Dresden has already provided an evaluation of the roof decks. That is part of the information that just came in within the last week, and they have already committed to installing scuppers on the roof decks.

MR. SIESS: Okay. I assumed they would.

MR. GRIMES: They are going to look at the loads on the roof and determine what action is necessary.

MR. SIESS: Okay.

MR. GRIMES: On Topic III.4.B on turbine missiles, the turbine inspection program is an issue that was common to all three boilers. The resolution here is worded for Dresden, but the results of the integrated assessment for all three boilers were the licensee should use his inspection results with more frequency. Dresden has already provided that information and Dresden is committed to providing it.

MR. SIESS: Okay.

(Slide)

MR. GRIMES: One of the seismic issues common to all plants was qualification of electrical cable trays. There is an SEP owners group program under way and all three licensees will provide plant-specific implementation of that program. Topic IX-5 with regard to ventilation systems, loss of battery room ventilation in buildup of combustible hydrogen. Here again it has been written specifically for Dresden because Greg was a major contributor to the section on the slides. All three licensees have agreed to evaluate the potential for and consequences of hydrogen buildup, and if they have not got adequate ventilation, they will do something about it.

MR. SIESS: That was a "later" on Dresden?

MR. GRIMES: Yes, that is going to be a

licensee agrees to do something, and the final report will reflect what he has committed to do.

MR. SIESS: It seems to me that that was an area where the PRA didn't really support your conclusion on that. Am I right?

MR. CWALINA: That issue was not evaluated in the PRA.

MR. PERSINKO: On Millstone it was that there were no areas requiring additional ventilation.

MR. GRIMES: Dr. Siess, the PRA input for Topic IX-5 was with regard to LPC on core spray and diesel generator rooms, and only that aspect of that issue under Topic V-5.

MR. SIESS: I have got a note here. I can't quite figure out what it was. But I won't worry about it. Okay.

(Slide)

MR. GRIMES: Now to the Dresden 2-unique issues and resolutions for the further evaluation section. There are certain aspects of the classification of equipment for which there was not sufficient information during the topic evaluation, and the licensee has agreed that he will incorporate that information into an update, a revision to the FSAR update because the FSAR for Dresden 2 has already been updated because of Unit 3.

MR. SIESS: That was a "later" on Dresden.

MR. CWALINA: This is one where Dresden has just come in with further information on those items within the last week, and their analysis is under review right now.

MR. SIESS: Okay.

MR. GRIMES: With regard to the wind and tornado loads topic, there was an issue related to the roof decks and capability to withstand the design basis tornado load. The licensee either is in the process of or will fairly shortly provide --

MR. CWALINA: They already have. That is another one. They have responded to Topic III-2, and we just got their letter, I believe it was, yesterday.

MR. SIESS: Let me get something straight on my bookkeeping. In the table in the Dresden report -- at the October 27 meeting you had not had a reply on 4.3.3, whatever that was, but it wasn't listed in your table in the report. Does that mean you have gotten something?

MR. CWALINA: That is correct. They have just responded to Topic III-2, all the items in Topic III-2.

MR. SIESS: Everything under III-2, and that is all the 4.3's, right?

MR. CWALINA: Yes.

MR. GRIMES: Yes, sir.

MR. GRIMES: On the combination of loads, licensee is going to address that in conjunction with Topic III-7.B, whis is load combinations.

(Slide)

There are three issues related to Topic III-4.A on exposed systems and protection against tornado missiles. This relates to the issue identified on Oyster Creek on providing a missile protected system for shutdown.

MR. GRIMES: This is Dresden-specific.

MR. SIESS: We don't have a problem at Millstone on tornado missiles, right?

MR. GRIMES: Drew, what is the resolution?

MR. PERSINKO: Millstone is going to provide a protected shutdown capability.

MR. SIESS: And what is Dresden's status on this now?

MR. CWALINA: Dresden hasn't responded.

MR. SIESS: But the situation is the same as at Oyster Creek, that if there were enough tornado issues, they could take out all that shutdown capability? Or you don't know?

MR. RUSSELL: It is much more limited in scope at Dresden than is the situation at Oyster Creek or Millstone. Dresden, as I recall, the issues were with some external tanks, the diesel exhaust lines, and that is about it. The diesel service water pumps were protected in the screen well house and that is not the same extent of the problem as exists at Oyster Creek and Millstone. The issue of whether failure of a diesel exhaust stack causes failure of the diesel or not, when you can take a suction on the turbine building in addition to taking a suction from the outside.

The issue would be crimping it and backpressure, and there are other sources of water available other than the tanks, such that Dresden has the capability to shut down for missiles, and some areas are not protected to the same level we would require today. I believe this came up at Sequoyah when the issue came up on the exhaust and intake not being protected, and that is a very narrow in scope problem as compared to the other units.

MR. SIESS: The Millstone situation is more like Oyster Creek and they have committed to protect at least one system.

MR. RUSSELL: That is correct. The area of disagreement on that issue amongst the utility and the Staff was influenced by the ACRS letter and it is no longer an area of disagreement.

MR. SIESS: You mean you understood what we said?

MR. RUSSELL: Yes.

MR. WARD: You didn't really say that. He said it was influenced by the letter.

[Laughter.]

MR. SIESS: Okay, Chris.

MR. GRIMES: Topic III-5.A, pipe breaks inside containment. There were certain aspects of jet impingement that were left open as a result of the topic review. Dresden has committed to demonstrate that the information submitted on Oyster Creek is applicable for Dresden, and that would resolve that issue.

MR. SIESS: Let me go back a second. On the III-4.A tornado issues, which were "later" on Dresden, are they still "later"? You haven't heard from them on that?

MR. CWALINA: Excuse me?

MR. SIESS: On III-4.A, it was "later" for Dresden. That is still "later"?

MR. CWALINA: Yes. We still haven't heard from them.

MR. SIESS: IV-7.1 was a "later"? That was the one Chris is on now?

MR. CWALINA: This is again one where Dresden has just submitted their final analysis on Topic III-5.A, and it is a big report that the Staff is reviewing right now. It will take a while to go through that report, but that addresses all the items in Sections IV-7 of the integrated assessment report.

MR. SIESS: That is all of the IV-7 items.

MR. CWALINA: Correct.

MR. SIESS: Okay. I just want to keep my bookkeeping straight.

On that last one to be addressed in licensee's final report --

MR. GRIMES: That is the report that Greg just referred to. We will have to go through that report and review it and make sure all the issues identified in the integrated assessment report have been addressed.

MR. SIESS: Do you want to bet it is not final?

MR. GRIMES: To use the licensee's terminology.

[Laughter.]

MR. CATTON: Wishful thinking.

(Slide)

MR. GRIMES: On seismic review, there were some specific issues identified for Dresden. Again, as I mentioned before on "no further action required," there is information recently submitted to the Staff and information to be submitted to the Staff that resolved the questions raised there.

MR. SIESS: That is an open item as of now?

MR. GRIMES: There is some information that the licensee has committed to provide, other information the Staff has that we are going to go back and look at, and between the two of them, hopefully all of the seismic issues will be resolved.

MR. CATTON: Aren't the internals in all the three plants the same?

MR. GRIMES: That was one of the issues. The Staff has agreed to go back and evaluate the reactor vessel internal submittal on Oyster Creek to see if it is applicable to Dresden.

MR. CATTON: Is there any reason to think it might not be?

MR. GRIMES: It could be that the difference between a jet pump and a non-jet pump plant is significantly different that the plants cannot be extrapolated that far.

MR. SIESS: Those are all 4.9.2 issues. What was .3?

MR. GRIMES: 4.9.3 was the qualification of cable trays, which was implementation of the owners group program. 4.9.4 was the safety-related equipment, which was deferred to A-46.

MR. SIESS: Okay.

MR. GRIMES: Topic III-7.B on original design codes and standards. There were certain aspects of that review for which there was missing information. Licensee has provided that additional information and the Staff is reviewing it now. On Topic III-10.A, the issue of whether or not thermal overload should be bypassed, during the integrated assessment review we concluded that the licensee should evaluate the setpoints, and if they couldn't be conservatively established, he should bypass the thermal overloads. Licensee has verbally advised us that he has gone through a setpoint evaluation and concluded that all the setpoints are conservatively established and all that is lacking is for him to document that evaluation.

(Slide)

Topic V-5. This is the issue that was raised on Oyster Creek with regard to leakage detection design and sensitivity. The Staff, after the presentation to the Full Committee for Oyster Creek, modified their position to reflect a consideration of the need for system design to SSE. The licensee -- both licensees, both Millstone and Dresden, have agreed to evaluate this issue in conjunction with III-5.A on pipe breaks inside containment. Dresden has submitted their pipe break inside containment report, and following the Staff's review, we will then determine what design requirements there should be for leakage detection systems inside containment.

MR. SIESS: Now, by relating this III-5.A, this then becomes the high energy pipe break avoidance by detecting leaks early.

MR. GRIMES: Yes, sir.

MR. SIESS: It is that issue. So this is identical with the Oyster Creek issue.

MR. GRIMES: Yes, sir.

MR. SIESS: All three plants do not have air monitors operating.

MR. CWALINA: No, that is not correct. Dresden has gaseous air and particulate monitors operating.

MR. SIESS: Do they work?

MR. CWALINA: I believe.

MR. SIESS: Oyster Creek couldn't make theirs work.

MR. CWALINA: Dresden's work. The question at Dresden is as to their sensitivity.

MR. GRIMES: And the seismic qualifications.

MR. CWALINA: And the seismic qualification.

MR. SIESS: Okay, but the issue is the same as Oyster Creek.

MR. GRIMES: With the subtle twist that in Oyster Creek's case they hadn't completed certain aspects of their pipe break inside containment evaluation. It was obvious that the leakage detection systems were going to be necessary to resolve that issue. Dresden has submitted their report to attempt to resolve all of the issues in the context of III-5.A such that they wouldn't need to rely on the leakage detection system to resolve them.

So once we have reviewed that report and have had an opportunity to see how sensitive that analysis is, then we will make a conclusion regarding the sensitivity and design requirements for leakage detection systems inside containment. The difference I guess I was trying to get to is a subtle difference in terms of the need for the system to resolve related issues.

MR. SIESS: How does Millstone stand on that?

MR. GRIMES: We don't know yet the extent to which Millstone will have to rely on it to rely pipe break inside containment issues. They have evaluated pipe break inside containment in the context of Topic III-5.A.

MR. SIESS: Okay. And your position right now is what you have mentioned before, that is, a reliable leakage detection system.

MR. GRIMES: That is correct. The reliability and sensitivity of the system should be dependent on the need to preclude pipe breaks inside containment or simply to monitor for cracks inside containment, depending on the extent to which the design can withstand pipe breaks inside containment.

MR. CATTON: Just out of curiosity, is there any data on this leak before break kind of idea that leads to this?

MR. RUSSELL: This is one area where SEP has been doing a lot of work. We have had members of the Branch observe testing that has been done on flawed sections to demonstrate the adequacy of the analytical methods that are being used for fracture mechanic evaluations. The work and the codes that were developed to do the fracture mechanics work were developed for the SEP for the review of these, and the position on leak before break is an area where I think the SEP is ahead of or at least working in parallel with the resolution on USIA 2 on the asymmetric LOCA loads where the proposal from Westinghouse was essentially a leak before break for the vessel nozzles for mitigating the consequences of the asymmetric LOCA load model.

With respect to leakage detection, we have also observed testing and qualification of leakage detection systems. We know that they exist. What we are talking now about is a global leakage detection system inside the constainment and whether that global system is adequate to detect leaks due to flaws in pipes such that you can shut down before the leak becomes a break so that you do not have to be concerned with the consequences of the break.

On the Dresden situation, they are trying to show that the consequences of a high energy line break inside containment are essentially no worse than a LOCA, that is, you are not going to eliminate other systems, and therefore they have an adequate design from the standpoint of separation, et cetera to meet the guidelines of GDC-4 on pipe breaks.

If that is the case, when we finish our review of their pipe breaks inside containment, then the adequacy of the existing leakage detection system will be looked at from a different perspective and not tied to Topic III-5.A; it will just be done in comparison to the Reg Guide 1.45, which is required for leakage detection on new plants.

The conclusion would probably be that the existing systems are adequate based on what we have seen from the PRA if they do not have a problem with pipe breaks inside containment.

MR. CATTON: My question was a lot simpler than that.

[Laughter.]

I was just sort of curious if you knew enough about the time from leak to break to say anything conclusive about what the requirements should be. I always thought when a pipe went, it went.

MR. RUSSELL: The approach we are taking there is one of assuming a flaw size and assuming there is a rather substantial margin for that flawed section where with loads beyond design basis, the flaw would rapidly propagate.

MR. SIESS: Are you talking about one load beyond the design basis or are you talking about cycles or loads or both?

MR. RUSSELL: If it is a cyclic problem like a thermal problem, that would be a longer period of time. Generally it is a large, sudden load.

MR. SIESS: This is likely to come up again at the Full Committee meeting, even though we wrote a letter on it.

MR. RUSSELL: Yes.

MR. SIESS: The letter was not all that specific, I guess. One of the concerns, as I follow it, was that using inelastic fracture mechanics is a pretty sharp pencil as a basis for deciding what leak rate you have to give to detect at what time. I don't think the Committee has a very high level of confidence in where we are right now, and there was just some concern about that. So if you have got some experts on this, you might want to bring them with you.

MR. RUSSELL: There were a number of phone conversations with those people back in Bethesda the last time around, but the approach is one of a conservatively assumed flaw size and showing that that flaw size would remain stable, and then relating for that flaw size a leakage rate, and it generally varies by as much as an order of magnitude, depending on the geometry of the flaw and how tight the crack is, et cetera. So there is a lot of conservatism.

We feel that the guidance we provided, along with the safety evaluation on Palisades which is being followed does accommodate some of those uncertainties, and that approach took almost a year to get internal agreement in the Staff as to the approach. That has been looked at and that is the approach we are following on these five plants.

MR. SIESS: You did provide us some paper on that, didn't you?

MR. RUSSELL: That is correct. In fact, at the last Subcommittee meeting we were asked for the references -- it is in an enclosure -- to the lead plant safety evaluation report on pipe breaks inside containment, which was a Palisades review.

MR. SIESS: The problem is you are using our best consultant on this already.

MR. RUSSELL: True. He has looked at it in quite a bit of detail.

MR. SIESS: Yes, I know. I spoke to him at breakfast.

MR. CATTON: So you can predict the flow, the leakage rate out of a given flaw, and then you pick the low end of that and have a measuring system that will pick that out.

MR. RUSSELL: That is correct. That is essentially the approach.

MR. SIESS: Okay, Chris.

MR. GRIMES: Topic VI-4 for Dresden with regard to providing leakage detection capability for remote valves, when to isolate them. The licensee agreed to evaluate the leakage detection capability currently there and determine whether he should augment them.

MR. CWALINA: Dr. Siess, that is another one that the l. ensee has just responded to.

MR. GRIMES: There is a similar issue there.

MR. CWALINA: It is Section 4.18, I guess.

MR. SIESS: I have got it, all of them.

MR. CWALINA: They responded on all of them.

MR. SIESS: The other was lock valves and putting the valve cap on the tap line.

MR. CWALINA: Right.

MR. GRIMES: There is a similar issue on Millstone that will be addressed under procedures. Topic VI-7.C.1 for Dresden. There are issues related to sharing the batteries and the swing diesel. Licensee has agreed to provide a short circuit analysis and verify that he has adequate protective relays. Similarly, there is an issue related to isolation between Class 1E and non-Class 1E loads. The licensee has agreed to perform a short circuit analysis there also.

MR. SIESS: Let's see. This is 4.21.1. Okay, I have got it.

MR. GRIMES: And 4.21.5.

MR. SIESS: Yes. There are some more 4.21 items there.

MR. CWALINA: That is correct. They will be addressed under the procedural section.

MR. SIESS: Okay.

MR. GRIMES: Topic VI-10.B with regard to battery room ventilation as it relates to the onsite power sources. That was deferred to Topic IX-5. The licensee has agreed to provide an evaluation under IX-5 on adequacy of battery room capability.

MR. SIESS: These were "laters" on Dresden?

MR. CWALINA: That is correct. They still are. We have not gotten the response yet.

MR. GRIMES: I would remind you that we are categorizing these things based on verbal commitments in some cases.

MR. SIESS: That is all right.

MR. GRIMES: Topic VII-1.A. This is a common issue to all three boilers. It falls in different bins for different plants. Commonwealth has agreed to demonstrate that there is adequate isolation between process recorders and the flux monitoring.

MR. SIESS: That was an Oyster Creek issue, wasn't it?

MR. GRIMES: That is correct. In the Oyster Creek case they also agreed to evaluate the adequacy of the isolation between the safety-related portion and the process recorders in the computer. In Millstone's case

I believe that they have agreed to perform a test to determine the extent to which isolation exists.

MR. SIESS: Okay.

MR. GRIMES: Topic VIII-3.A. There was identified a difference with regard to the battery program with regard to the specific requirements of Reg Guide 1.129. Licensee has proposed to demonstrate that his existing testing is either equivalent to or more severe than the testing required by the Reg Guide.

(Slide)

Topic IX-5 on ventilation systems. The effects of loss of ventilation on the diesel generator operability. The licensee has agreed to evaluate the consequences of a loss of diesel generator room ventilation.

MR. SIESS: Doesn't that tie in with the tornado missile question, or is this a different loss of ventilation?

MR. GRIMES: It is a different loss of ventilation.

MR. SIESS: That was exhaust spray.

MR. GRIMES: Intake and exhaust for the diesel.

Now for the Millstone specifics --

MR. SIESS: There is a pretty long list of those. I was wondering if people might not like to go to lunch in between, or would you rather take another 40 minutes or so and not lose your train of thought?

MR. WARD: I would rather go to lunch now.

MR. SIESS: Okay. We will recess for lunch for one hour and be back at 1:15.

[Whereupon, at 12:15 p.m. the meeting was recessed, to reconvene at 1:15 p.m. the same day.]

AFTERNOON SESSION

MR. SIESS: Okay, Chris, we can take up where we left off. The projector is not working. Don't we have another projector? Just an AC power problem.

(General laughter.)

(Slide.)

MR. GRIMES: The backup lamp worked.

I am going to go through the issues --

MR. SIESS: You had to switch it over manually, did you?

MR. GRIMES: These are the further evaluation issues for Millstone. The first one is an issue related to Millstone on the flood level, and the licensee is going to evaluate in the context of the integrated structural assessment. I will refer a number of times to the integrated structural assessment. Millstone is going to address a number of related issues together in one evaluation that is described in III-7.B.

The next issue relates to the intake structure, and the licensee is going to evaluate the flooding effects of a PMH surge on the intake structure, and identify any necessary corrective action. With regard to roof loads, those, as I mentioned before, are going to be -- in the context of Dresden, I mentioned them. The licensee for Millstone is going to evaluate that in the integrated structural assessment.

(Slide.)

MR. GRIMES: The next issue is related to Topic II-4.F, which we affectionally refer to as our dirt topic. The licensee is going to evaluate the piles supporting the turbine building, and determine if they have sufficient capacity to support the structure.

MR. SIESS: This comes up under seismic. I assume this is a seismic question. Isn't it?

MR. GRIMES: This is an issue that was raised in the context of --

MR. SIESS: The plant has been sitting there for a few years, and to ask now whether the piles will hold it up seems to be somewhat --

MR. PERSINKO: It is a seismic question.

MR. SIESS: It has to be seismic, because the structure is obviously still there.

(General laughter.)

MR. SIESS: How can you have that kind of soil when you are sitting right next to a quarry? Is the rock that far down? I just assumed you were on rock there.

MR. ROMBERG: The site is a granite quarry, but it is not a uniform structure. There are places where the ground has an overburden of sand and peat and so on. In some places, it was too far away, and they just drove it into what they thought was an adequate pile, but in many places the granite comes right to the surface, but it does not do that in all cases.

MR. SIESS: You said this is a part of the integrated --

MR. GRIMES: This will be evaluated in the integrated structural assessment along with the next issue or set of issues which also are addressed under Topic II-4.F. As you noted, they are issues related to seismic capability, but they are contained in the foundation evaluation. The licensee is going to evaluate the capacity of the turbine building, the gas turbine generator building, and the integrated structural assessment.

MR. SIESS: Okay.

MR. GRIMES: The next issue is also in Topic II-4.F. It relates to a supply line for the service water, emergency service water that is located over potentially unsuitable peat material such that it wouldn't be adequately supported, and the licensee has agreed to evaluate that in the context of the integrated structural assessment. That issue is cross-referenced in the integrated assessment summary to the service water section in terms of the capability to provide adequate service water.

This is a single line such that you could lose service water if the line were to fail. One of the comments that we got from Dr. Zudans on this issue that I noted last night was that he feels that possibly it is preferable to have the line supported on soft soil than normal lines that are supported on irregular, rigid restraints. That is a comment that we will have to address in the final report.

MR. SIESS: That doesn't sound unreasonable, does it?

MR. GRIMES: On the surface, it sounds like a good argument. We will have to address it in the final report.

MR. SIESS: I will tell you something, though. It is probably a lot easier to analyze it when it is supported on those rigid restraints than when it is supported on soft ground.

MR. GRIMES: Yes, sir, that's true.

The next issue relates to classification of equipment. For Millstone, there was not sufficient information available regarding radiography of equipment, and the licensee has agreed to provide that information. Drew, this was an FSAR update, like Oyster and a revision to Dresden?

MR. PERSINKO: Yes.

MR. GRIMES: Similarly on Topic III-1, fracture toughness information was not available. This was an issue that was fairly common to all plants, lack of original design information regarding radiography and fracture toughness. Also, on Topic III-1, with regard to stress limits for valves in vessels, that is like tanks, we requested that the licensee verify that there is a margin of safety in the structures by reviewing the classification, and the licensee has agreed to evaluate those components.

MR. SIESS: There is a very interesting word in the next to the last line.

MR. GRIMES: It should be comparable, not imparable.

MR. SIESS: You should get one of these spelling checks on your word processor.

MR. GRIMES: We wish we had had time.

(General laughter.)

MR. GRIMES: There was a question about whether or not these slides were going to be typewritten or handwritten.

(General laughter.)

MR. GRIMES: Also on Topic III-1, a similar lack of information to determine the design bases for pumps, the licensee has agreed to evaluate the original design standards and determine whether or not there is a margin of safety in the pump designs.

MR. SIESS: Am I correct that this is a question of whether the current requirements are met, or is it a question as to whether the requirements in existence at the time the plant was built are met?

MR. GRIMES: It is a question of whether or not the criteria that were originally used for the design were met, and if so, what margin of safety exists today.

MR. SIESS: You mean at the time these plants were built, they did not have to document that they met ASME?

MR. RUSSELL: No. The issue in this instance is the change in the requirements. We get a comparison for the quality standards that were imposed at the time the plant was licensed as compared to those which are in place today.

MR. SIESS: Okay, that's what I thought.

MR. RUSSELL: We had reviewed those to identify which ones were potentially significant from the standpoint of the quality of the component which was procured to the two different sets of standards, so there was a subset which was potentially significant.

We then looked at the data for the components, and in some instances we were able to identify that they had essentially the same safety factors or that they had adequate margin. In other cases, there was insufficient data available on the component to determine not only whether it met the original standards, but what it was constructed to, and that data search is what is going on now.

The areas of concern were essentially fracture toughness, radiography requirements, valve body shape requirements, requirements on members containing pumps, the codes and standards used for field erected tanks. Those are the areas. There were six areas that came out of quality comparison that were potentially significant based on changes either due to experience or changes in the design process.

MR. SIESS: But you are not willing to assume that they met the codes then in effect or the documentation that they met the codes then in effect, or --

MR. RUSSELL: We have made the assumption that they have met the codes then in effect. We have identified significant changes in the codes where they may not have adequate margins even if they met the original codes. If they exceeded the original code for some reason, and we found cases of that, then they would still be aiequate under today's standards.

The issue on component fracture toughness, for instance, a lot of the components that are typically used are stainless steel, et cetera, so if the component is stainless steel, it would be exempt from the fracture toughness requirements, and that would not be a problem. However, we have found cases in these plants where a pharatic or cast iron material was used for components support where it was part of a casting, and we do have examples where quality standards were not met, and corrective actions are being required.

MR. SIESS: Okay. Onward, Chris.

MR. GRIMES: The next issue is similar. It relates to the original design bases for tanks. The staff has identified criteria to evaluate specific features of tanks that should be evaluated.

The next issue is wind and tornado loads. This was brought up previously on Dresden based on information that was available on what material -- or what evaluations have been concluded. The staff concluded that the reactor building superstructure was okay. For both Millstone and Oyster Creek, we have a position that the licensee establish the capacity of the structure.

MR. SIESS: Let's see. As I recall, you didn't conclude that it was okay, but you concluded that a failure would not --

MR. GRIMES: We established that the capability of the structure, the limiting capability of the structure was adequate.

MR. SIESS: I thought on Dresden you decided that the sheeting in the upper part of the structure could not withstand a tornado, but if it fell, it couldn't do anything but fall in the spent fuel pool?

MR. GRIMES: Dr. Siess, in the evaluation we concluded that the capability that it did have was like 10^{-5}, but even in the event that you should get a failure, the consequences would be low, so we had a two-pronged argument for concluding that it was acceptable.

MR. SIESS: Well, at least a prong and a half, because I don't think the committee has accepted those tornado probabilities yet. I would rather hang in on the second part than the first part.

MR. RUSSELL: We assess the capacity, and on Dresden they have blow out panels for venting areas. While there was a concern that the panels would detach, they had substantially greater capacity than the paneling systems that we had seen at other units. The capacity, I don't remember what the numbers were, was on the order of 150 miles an hour.

MR. SIESS: It seems to me if you have blow out panels, the tornado is essentially going to be a decreasing pressure on the outside, which will tend to pull the panels out. For straight winds, you could go the other way. Did you look at straight winds also?

MR. RUSSELL: That's correct.

MR. SIESS: Of course, you want the panels to go, because you would rather have them flying around than large pieces of structural steel. Let's don't hang too much on those tornado probabilities. You have got at least a factor of ten uncertainty.

MR. PERSINKO: There is a difficulty getting a real accurate handle on capacity. In the case of Dresden, we have high capacities as stated by the licensee, and it came down to a low probability. If the capacities were less, they would blow off before the steel fell, and reduce the load on the structure.

MR. SIESS: The lower capacity of the siding, the better off you probably are.

MR. PERSINKO: That is hard to analyze.

MR. GRIMES: What it boils down to is, for Millstone and Oyster Creek, we are trying to get the other half prong to go along with the consequence evaluation. We would like to have the capability of the structure to know what its capability is.

MR. PERSINKO: In the case of Millstone, it is not siding on that level. They have reinforced concrete up on that level. That is one difference between Millstone and the other two BWR's.

MR. SIESS: And you are worried about the reinforced concrete?

MR. PERSINKO: No, that was found to be okay, but the steel columns were lower than the tornado load.

MR. SIESS: Is this a structural concrete, or just precast concrete panels?

MR. PERSINKO: I believe it is structural.

MR. SIESS: What are the steel columns doing in there?

MR. PERSINKO: They are supporting the roof, but then the concrete, if you put a lateral load on the concrete, you put the load back onto the columns.

MR. SIESS: You've got a steel frame roof supported on steel columns inside a concrete wall?

MR. ROMBERG: Yes, that's essentially what you have. You also have structural steel going up to support the refueling crane, so we have some good sized members that go up just about to the roof, and then we've got lighter structural steel that goes up and actually supports the roof. The roof is a steel structure that has metal components in it.

MR. SIESS: Thank you. Onward.

MR. GRIMES: The next issue is also wind and tornado loads. Drew likes "chimney" over "stack." We typically refer to it as a stack.

MR. SIESS: Stacks are higher than chimneys. Chimneys always fall down in earthquakes.

MR. CATTON: Stacks don't?

MR. SIESS: No.

MR. GRIMES: Licensee has agreed to evaluate the consequences of stack failure from either the capability to shut down Units 1 or 2.

(Slide.)

MR. SIESS: Let's see. This is Millstone, isn't it?

MR. GRIMES: Yes, sir.

MR. SIESS: You are not worried about Unit 3?

MR. GRIMES: It hasn't got a license yet.

(General laughter.)

MR. SIESS: That's not your worry.

MR. GRIMES: We will presume that since this was found in the context of evaluating an operating plant against current criteria, that it would be similarly reviewed to determine for the effects of a new plant.

MR. RUSSELL: We have made great progress by reviewing Unit 2.

MR. GRIMES: The next issue is also a wind and tornado load issue regarding the effects of failure of non-qualified structures on safety related equipment. The licensee has agreed to evaluate this issue and identify any necessary corrective actions.

MR. SIESS: Non-qualified in this sense means what, since I doubt that Millstone 1 was designed for any kind of tornado?

MR. GRIMES: This was designed from the standpoint of not designed to withstand design basis wind loads.

MR. SIESS: A lot of the plant wasn't designed to withstand that.

MR. PERSINKO: Millstone was designed for a 300-mile-an-hour wind.

MR. SIESS: Oh, it was? I am sorry.

MR. PERSINKO: That is why they have less than others.

MR. SIESS: Parts of it were?

MR. PERSINKO: Parts of it were.

MR. SIESS: What tornado loading was Dresden designed for?

MR. PERSINKO: I am not sure. It is either 300 miles an hour or it is a full 360.

MR. SMITH: Dresden was designed for 300 miles an hour with a six-pound pressure drop, six pounds, very large.

MR. SIESS: I got something out of the report that said it was not designed for 360 and three psi, but it didn't say it was 306 psi.

MR. SMITH: At one time we had a disagreement. We thought that was a relatively minor difference.

MR. SIESS: It was a little misleading. Okay.

MR. GRIMES: The next issue is also a wind and tornado load issue. It is the capacity of the roofs, and the licensee has proposed to evaluate the roof capacity in the context of the integrated structural analysis.

MR. RAY: Apparently these are heavy criteria.

(General laughter.)

MR. SIESS: Okay.

MR. GRIMES: The next issue is also a wind and tornado issue. With regard to the loads, the wind loads in combination with other loads, the licensee has proposed to address that in the context of the integrated structural assessment.

(Slide.)

MR. SIESS: That sort of relates also to the -- I am not sure I know what the topic number is. III-2 is tornadoes, right?

MR. GRIMES: Wind and tornadoes.

MR. SIESS: You have one in code criteria load combinations.

MR. GRIMES: That is where all the integrated structural assessment is being focused.

MR. SIESS: Okay, that's good. We know they were designed for wind loads, but you just don't know what combinations.

MR. GRIMES: That's correct.

The next issue is Topic III-3.A, with regard to the effects of wave action from a PMH. The Millstone plant has a flood wall up to, I believe it's a 19-foot level. The staff requested that the licensee determine what the effects of wave action on the flood wall is and the potential consequences of overtopping would be. The licensee has agreed to evaluate that also in the context of the integrated structural assessment.

MR. SIESS: Is this a monolithic concrete flood wall? Is it individual pieces?

MR. ROMBERG: Wayne Romberg, Northeast

Utilities.

The flood protection for the basic structure is poured concrete. That is where the siding starts or whatever. That is how high it goes. Above that, you've got structural steel siding or block walls, depending on the structure. For the most part, you've got a poured concrete foundation up to that elevation.

MR. SIESS: The flood wall I'm talking about.

MR. ROMBERG: You say flood wall. I'm not sure we're talking about the same thing.

MR. SIESS: It says here there is a flood wall.

MR. ROMBERG: The flood wall is really the perimeter of the building.

MR. SIESS: They used the word "sea wall."

MR. ROMBERG: We don't really have a sea wall per se. There is the perimeter of the building that is the foundation, and there are floodgates in that to bring us up to that minimum flood height, around the 14-6 grade elevation. We -- the grade around the plant, we have the rip wrap and so on that goes down to the ocean, but there is no outer wall, so to speak. No dyke would be breached.

MR. SIESS: The sea wall is not part of the building. The reference to safety related structures are protected by sea walls is something I think I read.

MR. GRIMES: I believe the term was flood wall, from what I remember.

MR. SIESS: Well, even that is not a good term.

MR. GRIMES: I agree. We should reword that.

MR. SIESS: Okay.

MR. GRIMES: The next topic is III-3.A. The next issue is in Topic III-3.A, with regard to the combination of ground water loads, with the end load combinations. The licensee has agreed to evaluate this on a sampling basis to determine how ground water was combined with other loads.

The next issue is on turbine missiles. As I mentioned before, this was brought out as a unique issue for Dresden, and actually it's a common issue for all three plants. The inspection frequency for the turbine, the staff has concluded that in the interim, while the GE probabilistic frequency is being reviewed by the Staff, the licensees use the results of inspections over the past three years and propose an inspection frequency for the future.

(Slide.)

MR. ROMBERG: Another item. We inspected both low pressure turbines this last outage, all the inspections GE recommended, so that has been completed, and we will have that scheduled for subsequent inspections. We have no problems with that.

MR. SIESS: Okay.

MR. GRIMES: As I mentioned before, Dresden has already proposed a schedule.

MR. SIESS: Okay.

MR. GRIMES: The next issue is Topic III-5.A. This is a common issue to at least Oyster Creek and potentially to Dresden, depending on the outcome of the Staff's review of pipe break inside containment analysis for Dresden. The Staff has requested and the licensee has agreed -- excuse me. On this issue, the Staff has deferred resolution of cascading pipe breaks to leakage detection sensitivity. For Millstone, the licensee has proposed to perform an evaluation of cascading pipe breaks, similar to the pipe break inside containment analysis that has been submitted by Dresden.

MR. SIESS: Let me refresh my memory. High energy line breaks outside containment -- inside containment was backfit to everybody?

MR. RUSSELL: No, the other way around.

MR. SIESS: Outside containment was backfitted to everybody, inside containment was not?

MR. RUSSELL: Correct.

MR. SIESS: Does anybody know why?

MR. RUSSELL: No.

MR. CATTON: Chris, would it be possible to get a copy of this analysis that was done? I would like to take a look at it.

MR. GRIMES: Yes, I believe Rick should have that with the sets of SER's that we provided for both Dresden and Millstone. This issue was raised on Millstone here, but a similar issue was raised under Oyster Creek, with regard to the degree in which the jet impingement evaluation for all three plants met current criteria.

MR. SIESS: Is that under III-5.A, or 5.5?

MR. GRIMES: It is under III-5.A.

MR. SIESS: Rich is looking for it.

MR. GRIMES: And when it refers to the above four items, there were four aspects of the jet impingement analysis that the Staff took exception to and that the licensee has agreed to address.

Another issue related to pipe breaks inside containment was the potential for penetrating the dry well by pipe whip. The licensee has agreed to evaluate the potential for and, if necessary, the consequences of this.

MR. SIESS: What was the status of that on

Oyster Creek? Well, let's say on Dresden. Would these plants be that much different inside the dry well?

MR. GRIMES: Oyster is different enough because it is five loops, but I believe that the evaluation that was done for Oyster Creek may be extrapolatable. I know we are looking at similar arguments with regard to the potential for the glancing blow aspect, the limits on how far the pipe can move.

MR. SIESS: Does that kind of stuff inside the dry well come under balance of plant or ISSS? That is within GE's scope of supply?

MR. RUSSELL: The analysis that was done on Oyster Creek was, I believe, a static or quasi-static analysis for large pipe. It looked at the displacement and potential for penetration of the liner. Dresden has done some additional work on it which we will review, and I believe on Dresden we concluded that the potential did not exist for failure of the liner.

What we are looking for here is the licensee to review both sets of tests and demonstrate that they are applicable to his situation. There are some differences in thicknesses of the metal in the dry wells and the potential impact points based upon the configuration of the liners.

MR. SIESS: Okay.

(Slide.)

MR. GRIMES: The next issue is pipe breaks outside containment. The model used for jet impingement effects for the isolation condenser appear to be potentially non-conservative. The licensee has agreed to evaluate the Staff's concern.

The next issue is with regard to seismic, the structural integrity of motor operated valves. I believe that this might be double listed here. This one is also listed under the no response. The Staff had indicated a concern regarding the seismic integrity of motor operated valves attached to small piping. We have not gotten a complete response from the licensee in terms of how he is going to evaluate this. He is looking at the Staff's concern, and he will provide us with a response in the near future.

The resolution here is identified as a lack of information, and that is a correct resolution, but we are not sure whether the licensee agrees or disagrees.

(Slide.)

MR. GRIMES: With regard to Topic III-7.B, this is the issue that pulls together a lot of the other concerns. Licensee has agreed to evaluate load and load combinations and code changes all in the context of integrated structural assessment to resolve issues related to Topic III-3.B, II-4.F, III-2.3, III-A, III-4.A, and III-6.

The next issue is related to Topic III-10.A. There are several issues related to valve position, thermal overload protection devices that are not bypassed, and the set points. The licensee has agreed to evaluate the set points and identify any necessary corrective actions.

With regard to Topic V-5, this is a common issue again inadvertently put in the plant specifics. The licensee has agreed to evaluate leakage detection in the context of pipe break inside containment.

MR. SIESS: I have that listed as a no response.

MR. GRIMES: It was listed in a no response at the draft stage because we did not even have a commitment that the licensee would evaluate it in the context of pipe breaks inside containment. He has agreed that he will evaluate it. We still do not have a specific course of action.

MR. SIESS: This falls in the category of will evaluate, to be decided later.

MR. GRIMES: That's correct.

The next issue is related to Topic V-12.A. The licensee has agreed to evaluate the capacities for the reactor water cleanup system and the condensate -- or the condensate demineralizers to determine the need for any technical specification limit. If he can demonstrate that the consequences of a lack of this capacity are acceptable, then a technical specification would not be necessary.

The next issue is related to Topic VI-4 on containment isolation. This is a common issue again. The leakage detection provision for remote manual valves, the licensee has agreed to demonstrate that there is sufficient leak detection capability present that -- the subtle twist here is that Millstone is going to demonstrate that what he has got is okay. Dresden and Oyster Creek are going to evaluate what they've got and identify whether they need to fix anything. Essentially the same position.

MR. SIESS: Now, this is leak detection during operation, or is this leak testing of penetrations?

MR. GRIMES: This is leak detection during penetration or during an accident to determine when the operator should use the remote manual capability to isolate the system.

MR. SIESS: And this would be leakage of water or leakage of containment atmosphere or either?

MR. GRIMES: It would predominantly be leakage of --

MR. SIESS: These are leakage in the systems. I am sorry.

MR. GRIMES: This is just leakage detection capability to identify a need to isolate.

MR. SIESS: This would mean a leakage that would let something inside containment out. It wouldn't be a leak of that line inside containment, would it?

MR. GRIMES: That's correct. It's outside containment.

MR. SIESS: Given an accident, you don't care if it leaks inside. You are not going to shut off the spray system just because it is leaking inside somewhere.

MR. RUSSELL: This would be the type of thing where you had, for example, a pump seal failure. You have a sump alarm in the corner room. You want to isolate it to keep the corner room from filling up. The algorithim we are talking about is, under what conditions would the operator manually isolate. In order to do that, he has to know what is going on, and he has to have adequate procedures to tell him when the close the valve. We are looking for both. We are looking for by what means does he detect leakage in the space, either by a sump alarm or by airborne radioactivity monitors or some other means, and under what conditions does he shut the valves? He may decide to shut them if the pump doesn't run. If the pump isn't operable for some reason, he may elect to isolate the pump.

MR. SIESS: He may elect to just let it spray inside and leak outside as being more likely to mitigate the consequences of an accident.

MR. RUSSELL: That may also be. For example, the equivalent case for the pressurized water reactor may be an RHR pump seal. Under what conditions would you want to isolate that if you could determine which one it was that was leaking to reduce the consequences of the radioactive leakage outside.

MR. SIESS: You want him to know enough as to which is the proper course.

MR. RUSSELL: We want him to have the indicators to tell him what is happening, sufficient procedures in place to describe under what conditions he would in fact isolate. So it is really, what is he monitoring and then what action does he take. Think about it ahead of time so that he is not ad hocing this scenario during the event.

MR. SIESS: If I have a core melt and I am trying to keep the containment from blowing up, I would use the core spray. I don't want to turn the core spray off just because I've got a pump seal leak.

MR. RUSSELL: Correct.

MR. SIESS: We want the tech specs to be a little flexible.

MR. RUSSELL: This is not a technical specification item. This is a procedural item to address in plant operations or emergency procedures, wherever it is appropriate. They have in fact a remote manual capability. The valves are operated from the control room. The question becomes under what conditions would he isolate them to ensure containment integrity and what parameters does he set to tell him that that is appropriate.

MR. SIESS: Okay.

(Slide.)

MR. GRIMES: The next issue relates to the containment isolation provisions for specific branch lines for which the integrated assessment team couldn't draw a conclusion because of a lack of information. The licensee has agreed to evaluate the capability of the specific lines identified and to identify whether or not there is any corrective action needed.

MR. SIESS: This thing has been going on for quite a while. There has been an awful lot of paper going back and forth between you and the licensee. And you still don't have the information, or he doesn't have it?

MR. GRIMES: We don't have the information. Given this were the only issue we had to address, this probably could have been readily cleaned up in the process of exchanging paper. We still haven't picked up the piece of paper to close this one particular issue out, also, given the fact that the integrated assessment team has been out to the site and back and forth and has every conceivable drawing at their disposal.

MR. SIESS: When you get down to it, there is just one missing.

MR. GRIMES: There is either one drawing missing or we just haven't been able to find the right drawing.

The next issue is related to Topic VI-7.A.3 regarding tech spec requirements for testing of the containment core spray pump space coolers. The licensee is going to justify his conclusion that the space coolers are not essential to functioning of the containment spray system pumps, which is simply an evaluation of the loss of cooling or loss of -- I believe these are ventilation.

The next issue relates to Topic VI-7.C.1, which is an issue that was brought up on Oyster Creek, the issue of automatic bus transfers of faulted loads. The licensee has agreed to evaluate the existing circuit arrangement and determine whether or what corrective action is necessary to preclude transferring of faulted loads.

This is an issue that was brought up before in relation to the PRA. The ABT's got into the evaluation of failure of the instrument bus.

MR. SIESS: Yes.

MR. GRIMES: Another issue related to Topic VI-7.C.1 was manual transfers. The licensee has agreed to evaluate the existing manual transfer arrangement and determine whether any corrective actions are necessary to prevent automatic transfer that would parallel the emergency power source and potentially transfer faults and knock out both power sources.

MR. SIESS: The 125 volt DC one source is battery. What is the other source?

MR. GRIMES: I will have to defer.

MR. SHOAL: My name is Ray Shoal. I am the technical monitor for electrical instrumentation and control systems review under the SEP program.

You have got several problems.

MR. SIESS: Ray, I asked what was the other DC system besides the batteries?

MR. RUSSELL: The schematic is on Page 65 in the IREP. You come off the battery or off the battery chargers into the two DC buses, and there are two separate buses that could be fed from either train A or train B.

MR. SIESS: I just wanted to know what the other source was. It was a charger.

MR. RUSSELL: That's correct.

MR. SIESS: I understand. Thank you.

MR. RUSSELL: This is an issue where the electrical schematics are not clear. The electrical schematics that were provided to the people doing the IREP study show that the breakers were electrically interlocked, and yet the information we got based upon the licensee's review of our earlier evaluation showed that there were no interlocks, and there were manual breakers for transfer, but it shows that the trip circuit on one is interlocked with the other.

So we are not sure if it is an issue or not. The drawing of the information is not clear. We have asked the licensee to look at it to make sure that there is not a potential for tying the two DC trains together.

MR. SIESS: The fact that the drawings may or may not be correct would seem to be an issue in itself.

I just read a report on an incident in a foreign reactor that was compounded considerably by the fact that the drawings were not correct that the people were working from, and somebody did the wrong thing without any effort at all.

MR. GRIMES: The next issue relates to Topic VII-1.A. This is a common issue. This is an uncommon resolution. Dresden and Oyster Creek have agreed to evaluate the difference between the flux monitoring and the process recorders in the computer. Millstone has proposed to perform a test to determine the extent of isolation.

MR. SIESS: One of them is going to do it by calculation, the other is going to do it by test?

MR. GRIMES: One will do it by test and two will do it by calculation.

MR. SIESS: That will be a good test, won't it?

MR. GRIMES: We think so.

The next issue relates to Topic VIII-3.B, with regard to a conclusion drawn from the PRA on battery outage time. The licensee has agreed --

MR. SIESS: This is the issue we were questioning in connection with Oyster Creek as to why you wanted a two hour limit on battery outage when you had a seven-day limit on the diesels?

MR. GRIMES: That was an issue that was related to Dresden on -- and that will come up.

MR. SIESS: I noticed in the SER it got discussed a little bit more thoroughly.

MR. RUSSELL: That was on Dresden. I believe it was the DC control power ABT. It was how long it could be lined up to the alternate source.

MR. GRIMES: I believe that is going to be covered under the procedures.

MR. SIESS: If Millstone only has one battery, what do they do when the battery is out, run off the chargers?

MR. RUSSELL: They have two batteries and two chargers. The ABT's that we were talking about before were manual bus transfers to transfer certain DC load centers from train A to train B. In the back of the integrated assessment report, in Section D, there is a schematic on Page 65 that shows the 125-volt DC system, and the three manual transfers that are located at the bottom of that schematic.

MR. GRIMES: The licensee has agreed to evaluate the battery outage limits in the context of the existing technical specification requirements, and if necessary, propose a technical specification change.

The next issue relates to Topic IX-5, with regard to ventillation. A single failure could result in a loss of ventillation to the LPSI and core spray pumps. This was a similar issue to Oyster Creek. The licensee has agreed to evaluate the consequences of a loss of ventillation.

Another issue related to ventillation was the effects of a loss of ventillation on the feedwater coolant injection and diesel generator areas. The licensee has agreed to provide the missing information for us to identify that information.

MR. SIESS: That was somewhere else. Was that on Dresden?

MR. GRIMES: Yes, it was. The loss of ventillation to the diesel generator room.

MR. SIESS: Some of these are more common than are indicated here.

MR. GRIMES: Yes, sir. The lack of commonality is the lack of resolution aspect. In this case it is a further evaluation. With Dresden --

MR. CWALINA: That is a further evaluation.

MR. GRIMES: Yes.

(Slide.)

MR. GRIMES: The next issue relates to ventillation also, with regard to a loss of off-site power effect on the ventillation system for the intake structure and the effects on the cooling water pumps. The licensee has agreed to perform an evaluation and attempt to demonstrate that sufficient ventillation will be provided to assure a functional performance of the cooling water system.

MR. SIESS: How will opening the doors affect the susceptibility to flooding?

MR. ROMBERG: Wayne Romberg. The intake structure it doesn't affect. The flooding path would be up through the grates in the floors.

MR. GRIMES: That completes the further evaluation issues.

(Slide.)

MR. GRIMES: Now I will go on to the issues with procedural or technical specification changes.

(Slide.)

MR. SIESS: Okay.

MR. GRIMES: Starting with the hydrology topics, all three licensees have agreed to modify their emergency procedures to cope with flooding events. With regard to in-service inspection of water control structures, both Dresden and Millstone have agreed to modify their existing inspection programs.

(Slide.)

MR. GRIMES: Those are all of the common ones.

(Laughter.)

MR. GRIMES: With regard to Dresden specifics, I think we have some more comments, but they were just inadvertently misplaced.

On the flooding topic there was a specific issue related to coping with a PMF. The licensee has agreed to revise his procedures to address that specific issue. I cannot remember what 4.1.2 is.

MR. SIESS: I do not see how that is much different from emergency plan that is inadequate to provide --

MR. CWALINA: It was not that much different. It just is identified as separate issues in the integrated assessment.

MR. SIESS: I keep looking for some integration in this assessment.

MR. GRIMES: I integrated it on a common slide, and then Greg pulled the specific one out. We are trying to make sure we got all the basics covered but at the same time get everything integrated.

MR. CWALINA: We wanted to address all the issues for you.

MR. SIESS: Okay.

MR. GRIMES: The next issue relates to containment isolation.

(Slide.)

MR. GRIMES: This is a common issue. On Oyster Creek, it related to locking devices. The licensee has agreed to provide the administrative controls to assure that the valves are locked closed.

With regard to topic VI-7.C.1, the issue was raised regarding administrative controls to assure correct positioning of disconnect links. The licensee has agreed to provide such controls.

MR. SIESS: I assume that "verbally" means "orally"?

MR. GRIMES: Yes, sir. We have not got it on paper yet.

MR. SIESS: That is verbal. Anything is words is verbal.

MR. GRIMES: It should have said "orally."

Another issue related to topic VI-7.C.1, with regard to the procedures for the breakers, the licensee has agreed to provide procedures for breaker control.

The next issue is the one that you brought up just a few moments ago with regard to the limits on the extent of time for which the battery can be out of service. The Staff cited a two-hour requirement in the standard tech specs. Licensee has agreed to identify a proposed limit for the extent of time the batteries can be out of service.

MR. SIESS: Is there anything in the tech specs that says if something can be out of service for seven days that limits the number of seven day periods that it can be out during the year? It can be out of service for seven days, be up for one, then be back out for seven, ad infinitum?

MR. GRIMES: Yes, sir, that is the case. There are technical specification provisions for cumulative periods, and those are usually cited specifically in the tech spec, but normally any tech spec specification that says something can be out for an hour or seven days or 31 days, there normally are not cumulative limits.

That is not something an inspector monitors. When something continually goes out of service, it is raised as an item for corrective action.

MR. SIESS: This may play hob with the PRAs. What do you assume in a PRA when it says seven days? How many seven-day periods do you assume when you go back and get the statistics off a plant?

MR. RUSSELL: When they are looking at the reliability of the equipment, they often go to plant-specific data on what has been the reliability or the availability of that specific equipment, as compared to how long they can operate a particular piece of gear out of service.

The earlier question you asked as to what corrective action is taken for repetitive events, in each case when they go into the action statements of their technical specifications -- for example, if a piece of gear is out of service for more than -- up to seven days, that would generate a licensee event report.

In the licensee event report you identify whether this is a repeating type of event or not, and what corrective action you have taken to keep it from being repeated in the future. That is the mechanism for reporting, when the action is taken, and that is reviewed by the Office of Inspection and Enforcement.

So we do not explicitly address it. There are mechanisms to review that, collect the data, and monitor it, but we do not specifically state it in the tech specs.

MR. SIESS: Does anybody have any idea for how somebody comes up wi( ) number like seven days? Is that a reasonable period within which to repair it, or is it arrived at on some PRA-type basis?

MR. GRIMES: I believe that in the development of the technical specifications there were words bantered about like "good engineering judgment." They are fairly common. They vary somewhat from plant to plant, but you get hours for things that if its failure is going to cause a lot of trouble, to as much as a month or so, that you have got a lot of redundancy and backup.

MR. SIESS: It makes sense to allow enough time for it to be repaired properly and planned and so forth. But, again, if it is easy to repair something in two days, it does not make a lot of sense to give somebody seven.

MR. RUSSELL: I think this issue just generally reflects more of what Staff practice has been as it has evolved. I know of cases where earlier plants could operate continuously with a piece of safety-related equipment out of service, provided they tested the remaining one at periodic intervals.

MR. SIESS: We have worn out diesels doing that, too.

MR. RUSSELL: And there are other cases where if it is seven days or thirty days it varied rather significantly from unit to unit, depending on the vintage of the unit and whether you have custom tech specs or standard tech specs.

So the issue here is that the general practice has been to use two hours for a battery out of service, rather than the seven days. There was at one time a generic activity to look at allowable equipment outage times and develop some basis for that, and I do not know myself what the status of that work is.

MR. SHOAL: Dr. Siess, I would like to add that on this specific issue, the battery out-of-service limit for Dresden, we had a discussion in which many of these elements came up in a telephone conference about a week ago, and the licensee's calculation of limits are going to include such things as the time they have to have it out of service for testing and the cumulative effect of a battery being out of service on a risk analysis.

MR. SIESS: I would like to see that when the report comes in.

Okay.

(Slide.)

MR. GRIMES: Continuing on with the Dresden-specific procedural changes, the topic VI-10.B regarding procedures to preclude paralleling the station batteries, the resolution indicates licensee has not responded. I think that the licensee generally agrees in philosophy and we just have to work out the details. Is that a fair characterization?

MR. SIESS: They still have not responded.

MR. CWALINA: That is correct.

MR. SMITH: What you are saying is probably a fair characterization. However, we are having technical problems in having equipment to carry out that particular type of commitment, and as a result, until we can solve the specific type of those problems we presently detect very high impedence faults. We call it a fault, and it is very high impedence which makes it very difficult to find and detect on an individual circuit. The equipment that is presently available in the marketplace, unless you go to some extremely elaborate, exotic system ere you put indications on each of the circuits, it does not exist.

Our operational analysis department is presently working on developing a device that may help us resolve this problem.

MR. SIESS: This is the parallel operation?

MR. SMITH: To avoid parallel operation.

What we do now is for very high impedence faults -- and that is what we are talking about; they are not low impedence faults -- you are talking things in the 100,000 Ohm, 50,000 Ohm, range or higher. We start to detect -- the OAD device that we have presently seems to work pretty well at 50,000 Ohms-down. Above 50,000 Ohms, we have problems.

MR. SIESS: Do you agree with the Staff that parallel operation is bad and should be prevented?

MR. SMITH: We agree with the Staff for low impedence ground faults, but we do not agree with the Staff for high impedence ground faults, because with the high impedence ground faults you just do not get high currenct, and that is really what you are trying to avoid.

MR. RUSSELL: We recall that the way the issue was identified, it is only applicable to the 125-volt DC batteries. The 250s are not parallel for ground isolation, but the 150s, when they detect a ground as part of their ground isolation procedure to locate the faulted component, they actually parallel the systems.

MR. SMITH: It is done circuit-by-circuit or bus-by-bus. It is done piecemeal. It is only done for the relatively high impedence faults. You have got to remember it is a floating system.

MR. RUSSELL: The issue that the Staff has concern with is that the two systems are being placed in parallel, reducing the redundancy of the DC systems, and that is not permitted by the general design criteria. And in this case it is being done only under the circumstance where there is reason to believe that a fault does exist, whether it is a high impedence fault or a low impedence fault, without knowing what is causing the fault.

The Staff position is that parallel operation should not be permitted, and in fact parallel operation should not be performed when a potential ground fault exists.

MR. SIESS: You think the cure is worse than the disease, then. You want the faults cleared some other way.

MR. RUSSELL: The only reason they parallel them is to isolate the fault to whatever bus or component is causing the problem. So it is a ground isolation procedure that causes them to parallel because they do not want to trip by doing dead bus isolation, tripping things off to see when the ground goes away.

MR. RAY: If you know by indication there is a ground fault someplace but specific circuitry sensors do not tell you where it is, one way to locate it is to progressively transfer the loads to another source. And when you transferred one and the ground still exists, you know that one is still okay.

When you come to the point where you turn one over to the new source and the ground indication disappears, you know that is the one that has a fault on it.

MR. RUSSELL: That is correct. That is the procedure they follow.

MR. RAY: If you introduce another source for this transfer purpose, there is no other way to do this in the technology yet. That is why you are having trouble with the equipment.

MR. SMITH: Yes, we are having trouble with the technology. We can sympathize with what the Staff is saying, but, on the other hand, we have technical limits.

MR. RAY: The only thing you can do is put in a new transfer bus and call it such.

MR. SIESS: Why is this unique to Dresden?

MR. RAY: I do not think it is. I do not know that.

MR. SHOAL: Ray Shoal.

Most nuclear power plants have two batteries per unit. In this case you have two units sharing two batteries. So what you are doing when you parallel batteries, you are putting all your eggs in one basket for not one unit but two units.

The failure of the DC system in these plants, by the 125-volt procedure, indicates that you would lose such things as the ability to trip the field and recirculation motor generator sets. You would lose your speed control on the recirculation generator motor sets, and there is a whole lot of other things listed in the procedures.

So you are not just talking about losing DC and, therefore, losing control of switching. You are actually initiating a transient or you stand the risk of initiating a transient.

MR. RAY: What you are saying, in effect, is instead of jeopardizing the other unit's battery, from a reliability viewpoint you should put in another source to which the loads within each unit can be transferred for this detection. A two-battery source would do that on a per unit basis.

MR. SHOAL: Putting in another battery source is one possible way.

MR. RAY: Or put in a third battery which would be used, if I could call it such, as a transfer bus and allocate it to whichever unit has this problem at the time it has a problem.

MR. RUSSELL: There are other methods of ground isolation or ground detection. One could also shift operating equipment by starting another piece of equipment and see if that causes the ground to transfer. That is more tedious because you have to go equipment by equipment rather than isolating it down to a bus.

But it is just that in this instance they are in fact parallelling the 125-volt DC systems. Under the circumstances, they already have a problem that they have identified, and they are jeopardizing the DC system for two units.

MR. RAY: There is no question but that the problem could be solved. It is just a matter of how much money you will spend to do it.

MR. SMITH: It is also a question of how big a problem it is. We have a floating DC system. Until you get the complete circuit, you do not have a problem. In many AC systems, 40-volt systems are run with what we call a dephased ground. You put a ground on the system purposely so you know what is going on.

A ground in and of itself is not necessarily bad. When you get a large fault current, you can damage equipment and then it becomes a problem.

MR. RAY: That is a matter of viewpoint. How long it is going to stay a high impedence flow is another matte:.

MR. SMITH: We check for the ground faults relatively frequently. We have an on-line ground fault detection system, and as soon as they find it they start looking. It is not our practice to run a ground fault. The practice is to get rid of them after we find them.

MR. SIESS: I think we understand the problem. If we knew the answer, we would tell you.

The next one?

MR. GRIMES: The next issue relates to the safe shutdown topics. It is a lack of testing of the shutdown cooling system temperature interlocks. Licensee has agreed to provide the testing.

The last topic on Dresden relates to Topics XV-16 and XV-18, regarding primary coolant activity. I would like to defer that to the licensee "disagrees" list, where it is addressed for Millstone.

MR. SIESS: It is not a disagreement for Dresden, or they do not know whether they agree?

MR. GRIMES: It may not be a problem. It

appears that they can live with the limits the Staff wants. They are reviewing it right now and they are going to determine whether or not they can in fact comply with the Staff position. We have presented the same position that we presented to Oyster Creek to both Dresden and Millstone, and they are evaluating what the consequences would be and what they could propose.

But Millstone would like to make a pitch on that subject, so I will defer all of it to discussion on that issue.

MR. SIESS: Fine.

(Slide.)

MR. GRIMES: For the plant-specifics on Millstone, the first one is an issue related to Topic V-12-A. This was an issue that was also raised at Oyster Creek regarding the conductivity and chlorides for the reactor vessel and conductivity of the feedwater. Licensee has agreed to either change the limits in his technical specifications to be consistent with Reg Guide 1.56, or he will justify why the limits that he either has or proposes as an alternative are adequate.

With regard to Topic VI-4 on containment isolation, this is an issue that was raised a few moments ago with regard to isolation capability for remote manual valves, where leakage detection or provisions exist that show where contain ent should be isolated. Licensee has agreed to implement procedures to tell the operator when and under what circumstances to isolate.

An issue related to -- excuse me?

MR. SIESS: Why is that listed separately for the two?

MR. GRIMES: In our efforts to make sure we got all the bases covered and get everything in its proper bin, this one showed up as a procedural aspect. It was covered under the evaluation section before.

With regard to Topic VIII-1.A, the integrated assessment concluded that procedures should be developed to protect Class 1E systems from degraded grid voltage conditions, those aspects that were not being evaluated in conjunction with multi-plant action B-23. The licensee has agreed to develop and implement such procedures.

(Slide.)

MR. GRIMES: An issue related to VIII-3.A is a lack of battery service testing in the technical specifications. Licensee has agreed to propose a technical specification change.

(Slide.)

MR. GRIMES: That is all of the procedural and technical specification issues, with the exception of two that we will discuss in the context of licensee disagrees.

MR. SIESS: Chris, just to clarify something, in the Dresden NUREG-0823 the summary at the front has got a listing of the various items and the various categories. There is a category on page xvi, Safety Improvements Required by the Staff to Which the Licensee has not yet Responded, which is, I assume, the later category of the table.

There were some items in the table that were not in that list. Is this just mechanical error, or is there a reason?

MR. GRIMES: That is a bookkeeping error.

MR. SIESS: Okay. They were 4.9.3, 4.9.4, and 4.10 that I did not find referenced in there, and I did on the list, and I was not sure which was right.

MR. GRIMES: The table is the most accurate at the time the report was published.

MR. SIESS: One of them comes under A.46, one under the Owners' Group program, and the other is something you said will be in a supplement. So they were all items that were taken care of; it is just a question as to --

MR. GRIMES: They were borderline. We were not quite sure which way they would fall, so they got left out of the summary.

MR. SIESS: Okay. Hardware backfits.

(Slide.)

MR. GRIMES: The first hardware backfit is one that is common to both Dresden and Millstone. This is also common to Oyster Creek, as I recall, but I do not know what section it is in. Licensee has agreed to put Class 1E protection in at the interface between the RPS and the IPS power supply.

The issue related to VIII-2 with regard to bypassing protective trips for the diesel generator or turbine generator, this one got sort of lumped together. There are certain -- there are individual trips that the licensee has agreed to bypass hat the Staff concluded were appropriate.

With regard to Topic VIII-3.B, on indication of battery status in the control room, all three plants have proposed to upgrade the battery status indication in the control room.

As we mentioned earlier in the context of the PRA, we are evaluating the PRA input and the cost information on the improvement for Millstone.

[Slide]

That was all of the common hardware backfits with regard to Dresden specifics. This is an issue that was also common to Oyster Creek. Licensee has proposed to put in scuppers to prevent ponding on the roofs. With regard to containment isolation, the licensee has agreed to provide either a second isolation valve or welding the threaded cap.

MR. CWALINA: They have just committed to putting in an isolation valve.

MR. SIESS: That was a "later."

MR. CWALINA: We have just got the response this past week -- I just got it yesterday, as a matter of fact -- to install the second lock closed valve.

MR. GRIMES: That was for the branch lines that the Staff identified in its integrated assessment. An issue related to Topic VI-10.B. With regard to battery status, the issue raised there will be resolved as part of VIII-3.B.

MR. SIESS: That was separate for all three of them? That is a separate item because Dresden has shared batteries and Millstone doesn't?

MR. GRIMES: That is correct. With regard to the Millstone-specific hardware backfits, an issue that was raised on both Oyster and Millstone with regard to providing protection from tornado missiles, Millstone has agreed to identify any corrective actions necessary to provide a protective train. I can't recall why Dresden wasn't listed there.

MR. RUSSELL: Dresden fell under the continuing evaluation and we believe they will have the capability to shut down without hardware modification once the information comes in.

MR. GRIMES: The next issue relates to III-4.A. Millstone -- as Bill pointed out earlier today, my inadvertent slip in mixing up Millstone and Oyster Creek -- Millstone has proposed to put in an interlock on the reactor water coolant system.

An issue related to Topic VI-4 on containment isolation for Millstone. Licensee has agreed to provide locking devices to lock the valves closed and the associated administrative controls. An issue related to Topic VIII-2 on trips on the turbine generator. The licensee has agreed to provide bypasses for selected trips. I have previously identified that in the context of a related issue to diesels or turbine generators.

There were specific trips that the Staff identified for the turbine generator that should not be bypassed, and those are trips that protect the turbine from destruction.

(Slide)

There were a number of issues related to Topic VIII-2. This is a continuation of the previous issue. It not only identifies the need for not having to provide bypasses for other associated trips. Hopefully, during this entire presentation I have, if not directly, at least indirectly addressed all of the 72 issues on Dresden and the 87 issues on Millstone, with the exception of these three, which are the only areas that we have been able to focus on as issues of disagreement.

(Slide)

MR. SIESS: Now let me again do a little bookkeeping.

MR. RUSSELL: We did miss one, I might comment, the review of the maintenance program on the gas turbine.

MR. SIESS: Yes.

MR. RUSSELL: Evaluation of the licensee event reports and failure history of the gas turbine. The licensee is doing a continuing review and also a maintenance program and the experience with respect to the gas turbine to see if his preventative maintenance or testing program needs to be modified to anticipate some of these problems rather than having problems reoccur.

MR. SIESS: So you have had a response on that?

MR. RUSSELL: That is correct. That is not an area of disagreement. It was left off of the list of continuing review by the licensee.

MR. SIESS: Okay. I have on my list that there was no response on the containment, 40.22 and VI-4. That is the second valve and lock. You just covered that, didn't you?

MR. GRIMES: Yes, sir. That was the hardware backfit.

MR. SIESS: What about 4.11.2, the motor-operated valve demonstrates structural integrity? That was in that list, too.

MR. GRIMES: Is that Topic III-6?

MR. SIESS: That is on the top of the list I just put up. That is under the area of licensee hasn't responded yet.

MR. SIESS: What about 4.11.8 under III-6, reactor vessel internals?

MR. GRIMES: That was one that should have been covered under the further evaluation section.

MR. SIESS: You have had a response?

MR. GRIMES: Dresden has agreed --

MR. SIESS: This is Millstone.

MR. GRIMES: Millstone has agreed to provide an evaluation, I believe.

MR. SIESS: Can Millstone confirm that?

MR. RUSSELL: They have verbally indicated they would do that. It has not yet been confirmed in writing.

MR. SIESS: Okay. That was a "no response" item. And then in the introduction on page xviii, 4.11.7, which I don't know what it is, was listed as a "no response," provide an analysis of recirc pump snubber supports. That has been committed to, as I recall, somewhere back in further evaluation.

MR. GRIMES: I thought that was Dresden.

MR. SIESS: I don't know. They are sort of running together.

MR. RUSSELL: That should not be on the list. In the evaluation of the body of the report, that was one we looked at in conjunction with the supports for I&E Bulletin 7914. We determined that the procedures that they were using for evaluating the supports were adequate and concluded that that adequately resolved the issue on the recirc pump supports.

MR. SIESS: Okay. No issue.

Now we are up to that list up there.

MR. GRIMES: The first one is just an issue of the licensee has not yet determined how he is going to respond to the Staff's position, and we don't have an official response. We anticipate that he is going to resolve it, but he has not yet determined how.

MR. SIESS: You are talking about Millstone.

MR. GRIMES: Dresden has responded. They have provided the information and that information is currently under review. It relates to seismic capability of large motor-operated valves on small lines.

MR. SIESS: Millstone just hasn't responded yet. They are working on it.

MR. GRIMES: That is correct, sir. They have not determined how they are going to respond to this issue.

MR. SIESS: So it is not really an area of disagreement or agreement or anything else yet.

MR. GRIMES: That is correct.

The next one relates to -- this was an issue that was similar to one that was raised on Oyster Creek with regard to technical specification requirements. The technical specifications exist in Millstone tech specs for flux channels surveillance, but the frequency of those tests not only differs from that required in the standard tech specs but also has a kickout clause for longer frequencies given certain test results.

MR. SIESS: Which they said they never

utilized.

MR. GRIMES: That is correct.

MR. SIESS: The tests have never been good enoug?

MR. GRIMES: They haven't satisfied the requirements.

MR. SIESS: Or they could have done it and didn't.

MR. GRIMES: Was it that you could have done it and didn't? I would like the licensee to explain it.

MR. SIESS: As I understand your tech specs, they do it monthly but with certain favorable results you could increase that accordingly.

MR. BING: Mike Bing, Northeast Utilities.

I don't believe that at this point in time we have actually gotten to the level of exposure hours that would be required for any one component to relax the testing to a quarterly basis.

MR. SIESS: I don't quite understand.

MR. BING: There is a provision in the spec that allows the surveillance frequency to be reduced from monthly to quarterly once you reach a certain level of what is called exposure hours for that given component, and the exposure hours are a function of the number of identical components that you have and the number of failures that you have of that component over the period that you have been testing it.

If you have a number of failures below what is called an acceptable level for a given number of exposure hours, you can reduce the .requency from monthly to quarterly.

MR. SIESS: What you have computed is a statistically significant sample at a failure rate that you consider below some acceptable level and then you can relax your test from monthly to quarterly?

MR. BING: It is not actually a failure rate we consider to be acceptable. There is actually a curve in the technical specifications that sets acceptable failure rates.

MR. SIESS: If you don't consider it acceptable, who does?

MR. BING: I don't mean we don't consider it acceptable; I just mean we are not establishing --

MR. SIESS: Who did?

MR. SHOAL: Jacobs G.E. did the paper, didn't he?

MR. BING: I can't answer where that came from. I don't know.

MR. SIESS: Somebody had to set a failure rate. If you fall below that failure rate through a statistically significant number of tests, you can relax; is that right? It is done by G.E. or somebody?

MR. SHOAL: I believe it was Jacobs at General Electric.

MR. SIESS: The Staff position is that they don't agree with that approach? It seems like a reasonable approach.

MR. RUSSELL: We actually have two separate issues. I think we have somewhat gotten the two issues confused. In the evaluation, we identified some testing which was not being performed or not required by the technical specifications which should be from a frequency standpoint. That is, the testing was being done at a larger frequency than monthly.

In another instance the technical specifications currently would require testing monthly. That is what they are doing, and what we want them to do is remove the section which would allow testing at a longer frequency.

MR. SIESS: Okay. Now let's address that part of it. Now, what he said was in the tech specs, it seems to be a procedure that has some basis in statistical failure rate, that once you have accumulated enough data to have confidence that you have established reasonable confidence limits, you can increase your test level. I think this is done in sampling. It is a statistically-based procedure.

Now, does the Staff disagree with the philosophy of that approach or do they disagree with the numbers which the tech specs contain at which level you can decrease the frequency?

MR. RUSSELL: The philosophy of the approach of increasing testing intervals based upon satisfactory performance has been adopted in other areas of the technical specifications. For example, snubber testing. Current licensing criteria for new plants does not include that provision for instrumentation. That provision, however, does exist in the Millstone 1 technical specifications. That is the difference in the criterion.

MR. SIESS: That is the difference in the current criterion.

MR. RUSSELL: That is correct. The philosophy is there are areas where that has been adopted, for mechanical equipment, for example, but it is not a part of current practice for electronic instrumentation where we have the history of problems with set point drift, calibration problems, et cetera. We are staying with the monthly calibration frequency.

MR. SIESS: So the Staff then as a matter of philosophy doesn't want that kind of a variable test period for electrical components.

MR. RUSSELL: That is correct.

MR. SIESS: How did it get into the Millstone tech specs and not anybody else's when Millstone says they didn't do it, that G.E. did it? Do we just catch G.E. in a six-month window there between Oyster Creek and Dresden or something?

MR. SHOAL: I believe that the history on these things is that these sort of requirements have been removed from the tech specs as they have been changed for operating plants. The procedure was proposed, for instance, in the original Zimmer tech specs, and the Staff as a matter of policy didn't buy it.

MR. SIESS: But that is not removing it. I have got Dresden and Millstone, two plants done by the same outfit not too far apart, and I assume it is a G.E.-type thing, not a balance of plant item, from what I heard. Are you sure Dresden doesn't have the same thing in there?

MR. RAUSCH: Tom Rausch.

I think we have a similar situation in our bases defined in there that takes into account the interval you are looking at in the times between failures. I think it was used to justify the intervals we have chosen, which in many cases are wider than for an SDS, which were found to be still acceptable, but I don't think we have any permissive like you are discussing there either.

I would like to point out that these surveillances that Bill mentioned were the opposite type of thing where if you found something wrong, you would check more often.

MR. SIESS: It just depends on which edge you start at.

[Laughter.]

MR. WARD: Well, this is called a permissive but it is really just reacting to experience in the plant with the equipment. I am wondering, is there really some technical reason why this sort of approach cannot be applied to electronic equipment and instruments, technical staff?

MR. SIESS: I can think of one problem with this. That is if you believe the mathematical curve, the components begin to age and it goes in the other direction, but you should catch that by the -- it has to go two ways. One you get above a certain rate, you have to go back. You can't go to quarterly and stay there.

MR. WARD: If it is a reactive procedure reacting to experience.

MR. SIESS: Does your tech spec, in fact, once you got to the point you could go to quarterly, also indicate circumstances where you have to go back to monthly?

MR. BING: I don't know if it does or not. I would suspect -- I better not answer. I don't know.

MR. SIESS: Bring a copy in next week, would you?

MR. BING: Yes. Just another point I wanted to add to add a risk perspective to the issue. That is, one of the conclusions of IREP was that failures in the RPS are completely dominated by mechanical failures, and although increased surveillance of the electrical portion of the reactor protection system would identify more instrument problems, it does not contribute at all to the overall failure probability. It is just completely dominated by mechanical failures. So you would get zero gain in safety by performing the surveillance more often.

MR. SIESS: And what was the Staff's reaction to that? How did you use the PRA there, Bill?

[Laughter.]

I think we are on record that you have used the PRA very conservatively.

MR. RUSSELL: The conclusion that common mode mechanical faults are the only problems associated with the reactor protective system is a rather sweeping conclusion that I have not yet been convinced is always valid, in that common mode problems cause losses, for instance, of all the nuclear instruments, or problems with the reactor protective system. And I am not ready to adopt that judgment without seeing some more.

I understand the common mode failure at Brown's Ferry with failure to scram was actually due to the mechanical systems. That would require redundancy and reliability of the control room systems which are so good that the control room is the weak link.

MR. SIESS: This was an interesting use of PRA, as I look it up. The Staff refers to the PRA and said it was done using the test frequencies at Millstone and concluded that the system components did not contribute to the dominant failure mechanism for the reactor protective system. Rather, the RPS failure probability is dominated by common mode mechanical failures.

The PRA did conclude, however, that the increased testing required by the STS as compared with Millstone Unit 1 testing procedures would lower the failure probabilities of the affected instrumentation. I am quoting now from the Staff's SER. That last sentence: "The PRA did conclude, however" is correct.

The PRA reads as follows: "The increased testing recommended would lower the failure probabilities of the affected instrumentation." That is what the Staff quoted as a "however". That "however" also has a "however" attached to it, because the PRA goes on to say, "However, none of this instrumentation contributed to the dominant failure mode of the RPS and the decrease in their failure probability would have no effect on the RPS failure probability."

Now that is known as selective quotation. Do you want to give us your reason again for, shall I say, overriding the PRA? I am not arguing for the PRAs and I will continue to see that you use them conservatively if you believe them, and your own instincts and judgment is something else --

MR. RUSSELL: I think that is the category this one is in. There are two conclusions in the PRA with respect to instrumentation control with reactive protective systems which relied on this common mode mechanical fault being the dominant issue.

One was related to isolation devices for the nuclear instruments and the potential for common mode failure because the nuclear instruments were tied back to the process computer or other non-safety systems and the loss of one could cause the loss of instrumentation.

The PRA concluded that a loss of the nuclear instrumentation was not really a problem from a core melt standpoint because other things could trip the reactor. Yet having operated those things, it would bother me not to have any nuclear instrumentation to know what is going on in the plant and to not know that that condition existed and to use that as a basis for providing relief from IEEE 279-1971, which is embodied in the regulation, which may involve an exemption since these units are in a licensing conversion, did not seem to me to be, on balance, the proper thing to do.

On balance, the proper thing to do would be to evaluate and determine whether there was adequate isolation and whether the potential existed for a common electrical fault. This one falls into a similar category. The regulations in 50.36 talk about limiting safety system settings and qualifications are quite clear with respect to what things are relied upon for reactor protection. They are instrumentation.

Again, we have a difference which has been identified and the fact that the testing would improve instrument availability and provide indication to the operator as to what is happening, even though that does not directly relate to core melt probabilities, seemed a prudent action to take. It did not have sufficient bases, I felt, for concluding that no action was required.

MR. SIESS: All right. Now having worked on you a little bit, let me ask the licensee.

Since you have operated this plant for ten years with monthly test intervals on these systems and in that period you either have not gotten a failure rate low enough or have not yet made enough tests to trigger the relaxation to quarterly, why do you object so strongly to staying at monthly?

MR. CASING: Richard Casing from Northeast Utilities.

Dr. Siess, you alluded earlier to a remark about diesel generators and how we sometimes overtest them. Referring back to the history of these things, which we have not researched and I hope we can accomplish that before next week, what we can do is find out when it got issued -- I think it was over ten years ago -- and see if there is any paperwork that will help explain the basis for it.

Today I do not think either one of us are in a position to say that the curve that existed in the tech specs that say how many hours you have to achieve to have a relaxed surveillance is either right or wrong. The point is there is a mechanism. There is a technique in place to determine what the optimum surveillance frequency is. You do not want to overtest it; you do not want to undertest it.

The only difficulty I have with what Bill just said is that there is an inherent presumption because standard tech specs have it in there and that is the way it is done today, and that is the right answer.

I would like the option to be able to look at our equipment that has been performing for ten or twelve years that is not on the new plant, and to do that kind of evaluation. If it turns out that a more appropriate testing frequency is something different than monthly, the technical specifications allow us to do that. Even though they do, we could not institute that change without doing a 50.59 type evaluation and making sure that the change is in fact in the direction of improved safety.

That constraint is on us right now, and that is our line of reasoning to say with what we know right now we had better leave it the way it is. If the Staff wants to backfit it, we can continue that discussion.

MR. SIESS: Okay. I suspect you can find the basis for it in the mill standards, if you know where to look.

MR. WARD: That comment seems eminently sensible to me. Through so much of the SCC program the Staff seems willing to take that general approach. I am kind of surprised why they are not doing it here.

MR. SIESS: They probably did not think it was a great big deal.

MR. CASING: That is a good point. If I could just suggest that, I do not think it is a real big deal and, in fact, if this is the biggest single issue that we have a disagreement with the Staff, if you will, I think that speaks very highly for the program.

(Laughter.)

MR. WARD: Things can be overtested, and I am not sure how PRAs considered testing frequencies, but there is always the possibility that the system does not get set back to normal after it is tested, and the more frequently you test it the more likely you are to have that sort of error.

Also, I want to comment here on what I heard as the Siess Doctrine of conservative PRA.

(Laughter.)

MR. WARD: That is one that kind of bothers me. If you use the PRA, if you believe it when it says something bad and you do not believe it when it tells you something good.

MR. SIESS: Well, of course.

MR. WARD: Well, I think that is a lousy way to use the PRA.

MR. SIESS: I agree with you. That is the only way it has been used and the only way it is going to be used in this imperfect world, I am afraid, by the

Staff.

MR. WARD: I do not agree with that, Chet. I do not think that is right.

MR. SIESS: I think the SEP Staff has used the PRA to relax requirements. I would hesitate to say it, but I would suspect that they are unique in the regulatory staff in that respect. They have clearly done it on the containment isolation provisions, for an obvious one, but they have used it conservatively.

If there was any question in their mind, they tended to be conservative, and basically the Sandia studies were in the conservative direction. Is this the only place in your tech specs that you have this theoretically varying test period?

MR. CASING: With the exception of the snubber issue, I think that is true.

MR. RUSSELL: I think the only other area is the diesel generator testing, where you have the accelerated testing based upon diesel generators.

MR. SIESS: I meant in the electrical systems.

MR. RUSSELL: I am unaware of any in the electrical system area.

MR. CATTON: When one takes a look at the operational records of these different plants and sees that gee, a whole lot of it is personnel area, maintenance area, you say, gee, whiz. They might be better off not testing them.

I do not think the PRA builds that in or not. Every time you maintain it there is a certain probablity you are going to screw it up. If you do not build that in properly, then I am not sure the PRA reflects this concern that Dave has voiced.

MR. WARD: I have asked that question of the PRA people and gotten a pretty mixed answer. I am not very confident. Perhaps there are in some cases stabs at doing it, but I do not think it is consistent.

MR. CATTON: I do not think they do it consistently.

MR. SIESS: It is an interesting point. I think the SEP Staff approach has been that if it is not a big deal, why not get it in line with the tech specs. I do not think they have any technical objections to this sort of varying test period, test interval. I do not see how anybody can. It is common to everything that is done, if it is done right.

MR. CATTON: I made some notes, and I do not think I wrote down which plants were which. Of the significant events, 90 percent were human error.

MR. SIESS: I think that was Dresden.

MR. CATTON: I am not sure. One was less than the other, but in both cases that was a big number. That is something we ought to be careful about the number of times they send the maintenance people out to check something, or be careful about the maintenance people.

MR. SIESS: They should all be licensed operators.

MR. CATTON: I think maybe we ought to license maintenance people.

MR. SIESS: If we can license vice presidents, we can license maintenance people.

MR. RAUSCH: I just want to add one quick comment. I agree completely with Millstone about that my frustration is more from the standard tech spec aspect.

They rarely look at the direction of the LaSalle tech specs that are twice as long as Dresden and the surveillance frequency are incredible. We lost every single argument because of the carrot in front of our nose. If you want a license, you do it this way. That is why I am glad to hear infrequent references to 50.36 provisions saying you can force us to do anything that a new plant can do because it is not a real review of what a new plant does. It is what one or two people think is the most possible safe thing you can do with complete disregard to the other side of the coin that you bring up.

That is, one issue that you have missed in there is that a lot of these testings cause reaction protective system challenges through unrelated events. In other words, if you add up all the number of instrument tests you do, the numbers that cause half-scrams, all it takes is another random half-scram for another malfunction. Now you have got a reactor trip, a potential transient, et cetera, et cetera.

You do all these things and challenge the operator and, as a matter of fact, our design resident inspector was on a personal crusade about a year ago to change the tech specs at Zion so they would quit having so many transients. He blamed the tech specs. I do not know how far he got, but I know we have been supporting him.

MR. LIPINSKI: Everybody is missing the issue of ATWS. When General Electric does a calculation on their protective systems, they come back with a reliability number and it is based on a test interval. If you were to let your equipment go to one year without testing and you got your unannounced failures, someday you may be looking for a scram and it will not be there.

The probability that those systems are going to respond are directly related to that test interval, and the shorter the test interval the higher the reliability of the equipment. So you draw a line saying that this test interval gives me the desired reliability.

MR. RAUSCH: You have to look at both is what I am saying.

MR. LIPINSKI: That is what I am saying. You have to look at what is the required reliability for that equipment based on the existing failure rates and guarantee that you are going to have a certain reliability and just arbitrarily extending the period is not going to say that now we are not going to see an ATWS.

MR. CATTON: If you arbitrarily shorten it, you are going to pick up the human error.

MR. LIPINSKI: We are talking about two different things. If I have equipment standing by, like a diesel, and I go challenge that equipment by a test, then we are seeing that the diesels are being affected by frequent testing.

But where I have equipment that is continuously in operation and let's assume it has an exponential failure rate, then this equipment is failing at random and it is not always designed to fail safe. So you are getting unannounced failures. The only way they are detected is by testing your equipment to see if it is in a failed state.

MR. CATTON: I still think it is an optimization problem.

MR. SIESS: Yes, it is an optimization problem. It is not an easy problem.

MR. RAUSCH: There is tremendous redundancy in a lot of the scram, especially neutron monitoring. You have one out of three twice. You can afford to lose a lot. You also have failure alarms for the gross failures -- loss of power supply, downscale, upscale.

MR. CATTON: It is also an important part of your system. You have to have lots of redundancy.

MR. SIESS: Is the new GE nuclear net, whatever they call it, this continuous testing, does that test these things regularly?

MR. LIPINSKI: It runs periodic tests, but there is no disabling of the circuits because it is a fast pulse, so nothing actually triggers but the pulse is traced through the system and determines that it has come back properly. If it fails to return, then you know that there is something failed in the chain.

MR. SIESS: But that is a very frequent test.

MR. LIPINSKI: It is a frequent test and all it does is verify that the equipment is always operational and is able to propagate the pulse and verify that the equipment is functioning properly.

MR. WARD: Is it just testing for open circuits?

MR. LIPINSKI: The fact that when the pulse is put through that it returns up to the point that it does not actually drop the rods -- it does not go that far -- but it goes to the point where it determines that if it exists there long enough the rods would drop, but it is not allowed to be in place long enough to actually cause a rod drop.

MR. CATTON: That is sort of non-destructive testing.

MR. LIPINSKI: It is non-destructive testing. It is electrical. It is a pulse method. The pulse is not allowed to exist long enough to actually create a scram.

MR. SIESS: So it eliminates a lot of the problems we are talking about here.

MR. LIPINSKI: Right. It is an advanced technique that is in place in some of the plants.

MR. SIESS: Okay. Anything else you want to hear about this? I think we have heard both sides of it.

MR. RUSSELL: I would like to comment on a general observation that was made. We have attempted in SEP, where we have received input from PRA, to not only assess that input from the standpoint of how was it developed, is it meaningful, what insights does it provide with respect to the issues at hand, but also where engineering judgment or intuition tells you that there is something else that is important about it, in addition to just core melt, that for other reasons you may take action.

We tried to describe what those are. Now we have not, to my knowledge, rejected any information we have had from any source, and we have considered that in trying to document what the bases were for taking the various positions.

MR. SIESS: We have no complaints about that.

Incidentally, this particular question on the surveillance frequency, I think we would like to have that discussed a little bit at the full Committee meeting, not because it is a great big deal in this particular instance. Putting monthly intervals in the tech specs probably is not going to change what is done at that plant for quite some time. But I think it is technically and philosophically of some interest to the Committee and they ought to think about it, and there has been a great deal of concern expressed in the Committee about maintenance and testing.

This would be a good point to bring this up and have a little discussion.

Were you planning to be here next week, Ivan? Walt?

MR. CATTON: (Nods in the negative.)

MR. LIPINSKI: Oh, yes, I am coming back. Monday there is a meeting, or Tuesday.

MR. SIESS: I do not know how much we will get into it, but --

MR. LIPINSKI: I will be here Tuesday on the 7th for Sequoyah.

MR. SIESS: This will be Thursday before we are on. You are not planning to be out, Ivan?

MR. CATTON: I am going to be here Tuesday for Sequoyah. Then I have to go back and teach class.

MR. SIESS: I would not ask you to come back again Thursday. Do you want to write something for us, put your thoughts down on this?

As I say, I am not sure that it is a major issue in connection with the SEP, but it looks to me like for the next few years they are going to be testing anyway. They have been, so I do not think it is going to change anything as to what is in the tech specs. But I think I would like for the Committee to hear the arguments on both sides.

Okay, where does that bring us, Chris?

MR. GRIMES: Now that we have gotten over the easy area of disagreement --

MR. SIESS: Let's take a break. Really all we have got left are the 15 and 16.

MR. GRIMES: 16 and 18, but principally 16.

MR. SIESS: Well, if we solve 16, we can solve 18.

MR. GRIMES: Yes.

(A brief recess was taken.)

MR. SIESS: Back to work. Let's see. We are down to Item 15, 16, and 18, but they are coupled to such an extent that if 16 is solved, 18 is solved. Am I right?

MR. GRIMES: That's correct, Dr. Siess.

MR. SIESS: This is not an unfamiliar item, gentlemen. We are back to the same problem we went through with Oyster Creek in the full committee, and the subcommittee explored this with the other licensees at the subcommittee meeting on October 27th.

Just by way of introduction, let me point out the full committee had no problem whatsoever with the staff's approach of considerable relaxation in the standard review plan allowable off-site doses. The standard review plan, I think, says a small fraction of Part 100, and that was taken to be 10 percent, 30 rem to the thyroid.

The Staff has come up with looking at again their bottom line, not how they got there with accepting fixes that would still get you up into the couple of hundred or maybe even over 300, I think, rem, 327 in one case and 180 in the other.

MR. GRIMES: It was -- Dresden was 128. Millstone was 370, with the standard tech specs.

MR. SIESS: And Oyster Creek was something comparable, as I recall.

MR. GRIMES: Four hundred.

MR. SIESS: That is even better, but the poimt I want to make is, the ACRS did not have any problem with that kind of a relaxation in the requirements, whether it was Part 100 or the standard review plan requirements, which is an endorsement of the staff's relaxation of existing criteria.

The problem is that even to meet these limits, we are going to hear from the licensee, licensees that this does make operation difficult. So I think we need to hear the stories, both sides of it, and we will start with the Staff.

Now, one thing I need to get, I am not going to understand all of the mechanics of this thing, I know, but we got into discussions of gross iodine isotopic analysis, whether you assumed all of this was iodine or something. At one stage it seemed that the staff was being conservative by saying, if you don't know the isotopic concentration, we are going to assume this.

Now, it seems to me that unless that assumption has some probability of being correct, it is not a particularly good one. If you know that this is going to be -- if you know it is not always going to be iodine, why do I assume that? Are you still doing that, or are you not?

MR. GRIMES: No, sir. We are not. In the Staff's original analysis, in performing an evaluation of a small line break, they assumed that because the technical specifications did not specify dose equivalent iodine 131, that any iodine would be iodine 131. That was a conservative assumption.

It resulted in doses on the order of 12,000 rem for Oyster Creek, and would result in comparable doses for Dresden and Millstone.

Subsequently, they redid -- the Staff's technical reviewers redid the analysis using the standard technical specification, which is a dose equivalent iodine 131, which incorporates a spectrum approach. We have recommended that the licensees adopt a technical specification limit that is in the technical specifications of .2 microcuries per gram dose equivalent iodine 131 rather than establishing a plant specific dose equivalent iodine 131 given the conservatisms in the standard review plan approach.

MR. SIESS: What do you mean by plant specific? Do you go by dose to get plant specific?

MR. GRIMES: Given the limit, you could adjust the primary coolant activity assumed dose equivalent iodine 131 until you hit the limit. The problem is --

MR. SIESS: The limit would be what, 30?

MR. GRIMES: Thirty is the standard review plan.

MR. SIESS: Yes.

MR. GRIMES: I believe Millstone wants to consider a plant specific limit based on Part 100.

MR. SIESS: Three hundred.

MR. GRIMES: Three hundred. Now, the problem comes about, the reason that these calculations result in high off-site doses is one that you conservatively assume the break is unisolatable. Then you make conservative assumptions regarding the lack or the existence or lack of mitigating systems like standby gas treatment systems, and then you take conservative meteorological conditions, and you can calculate artificially an extremely high off-site dose.

Which one of those conservatisms you start chopping away at to select a more appropriate plant specific primary coolant activity can be debated and debated at length. Rather than go into plant specific calculations with an arbitrary siting criteria as a basis for establishing primary coolant activity and arguing the merits of individual assumptions, the staff concluded that we should just adopt the standard tech specs which result in numbers that are over Part 100 for two plants and less than Part 100 but over 30 rem for one plant.

MR. SIESS: The reason they are high for these plants is because they do not have flow restricters which the more modern plants do?

MR. GRIMES: That's correct.

MR. SIESS: This was in lieu of putting in flow restricters.

MR. GRIMES: That's correct.

MR. SIESS: You said Millstone wanted to go to Part 100. I thought you had figured it with the tech spec, standard tech spec, .2 curies per whatever it is, that they were still 300 plus.

MR. GRIMES: Yes. If they were to adopt the standard tech spec limit of .2 microcuries per gram, given all of the assumptions in the standard review plan, they would calculate 370 rem thyroid off-site. They felt that it would be appropriate to perform an analysis and look at the conservatisms in that analysis and perform a more realistic off-site dose calculation.

I believe that -- I don't want to pre-empt their presentation, but I believe that is their position, and that is what this issue has evolved down to. We had a number of discussions with Dresden along the lines of the presentation that we gave to the full committee regarding Oyster Creek, regarding the sampling frequency, and the issue related to restrictions associated with sampling for iodine.

This is the position as we presented it at the Oyster Creek meeting. All we want from the licensees is to adjust -- is to use the dose equivalent iodine equilibrium limit with a max limit on iodine and then a sampling frequency to be proposed by the licensee which is commensurate with the sampling methods and the plant operational characteristics.

MR. SIESS: To get the dose equivalent, it takes into account the different iodine isotopes that are in there?

MR. GRIMES: And their effect on thyroid dose.

MR. SIESS: Any other isotopes besides iodine?

MR. GRIMES: No, it doesn't.

MR. SIESS: You believe that since the iodine has to come from fuel, that it is still a suitable surrogate for the other isotopes that might be in there?

MR. GRIMES: Yes, we do. We did not incorporate into our position a proposal that would also restrict the 100 over E bar energy level of activity in the primary coolant. We felt that iodine would be sufficient.

MR. SIESS: To get the dose equivalent, they would get it from actual isotopic sampling of their plant? That is what the tech specs would govern.

MR. GRIMES: Yes, with fixed dose conversion factors which apply to each isotope that give you the dose equivalent iodine 131.

MR. SIESS: You listed a whole bunch of assumptions that are made, including the unlimited release of, what, 5 percent meteorology, I assume?

MR. GRIMES: I assume so.

MR. SIESS: Essentially a source term somewhere.

MR. GRIMES: The source term is the primary coolant activity.

MR. SIESS: That is all right. Lack of cleanup. And did you also include the 300 rem as an assumption of conservatism or something? It is just as arbitrary as the others.

MR. GRIMES: One of the lead in points was, if you are going to establish it to a limit, it in itself is arbitrary because it is a siting criteria. For evaluating operating plants, we don't believe that we should get excited because they exceed Part 100 with a somewhat artificial off-site dose, given the conservatisms in that analysis.

MR. SIESS: Now, the basis for the 10 percent or small fraction was that this accident has a somewhat higher probability than the LOCA which presumably would be the basis for the Part 100. Well, the unmitigated LOCA presumably was the basis for Part 100, right? Part 100 is not a LOCA.

MR. RUSSELL: My understanding is, at the CP stage, we generally look at like half of the 100 rem.

MR. SIESS: That is a LOCA dose. That is simply because everything changes, and experience shows that it always went up.

MR. RUSSELL: At the OL stage, you would use 300 and for more probable events you use a small fraction of it. In this case we used 10 percent.

MR. SIESS: And this event is assumed to be more probable.

MR. RUSSELL: That's correct.

MR. SIESS: Has anybody ever looked at risk assessment to see how much more probable it is?

MR. RUSSELL: Risk assessment generally concludes that events that do not involve core melt do not involve risk. In the PRA, they concluded that these type of events were not significant.

MR. SIESS: They concluded a LOCA wasn't significant either.

MR. RUSSELL: True.

MR. SIESS: So comparing this with a LOCA, neither one is significant in terms of the PRA, so it doesn't help us.

MR. WARD: I don't think it is fair to characterize the 10 CFR 100 source term as something you get from a LOCA. It is just an arbitrary source term.

MR. SIESS: I called it an unmitigated LOCA.

MR. WARD: Whatever that is.

MR. SIESS: You assume certain ECCS fails.

MR. CATTON: Take all the fission products out and throw them on the floor.

MR. WARD: A lot of other exciting things might happen in that sort of a situation, too. A little hydrogen, maybe.

MR. SIESS: This is the way we used to think of it, failure of the ECCS system or something. Now we call it core melt, I guess. Okay, I understand. The Staff's position is that looking at all of the ways to go at it, it seems straightforward and makes some sense to say, take the standard ten specs, .2 microcuries per gram, and we will buy the 100, 200, 300 rem doses.

MR. GRIMES: That's correct.

MR. SIESS: You opened the door more in the SER. You mention that you might get some filtration and you might get something else.

MR. RUSSELL: Those were some of the factors that we considered to qualitatively describe the conservatisms in the analysis and why it was sufficient to go to this level, and you need not go lower based upon a conservative calculational technique. The other observation is that we believe that the .2 microcurie per gram dose equivalent iodine 131 level would not be an operational problem based upon reviewing the information which was presented by the licensees on what their actual levels have been over the last couple of years, that the operational problem that was involved was associated with changes in power, on monitoring for iodine spikes, and other issues which were part of the technical specifications.

The procedure already did include a rather large iodine spike at equilibrium level. The level we want to control to is in fact equilibrium level. So we felt that that was sufficient, and the other aspects of the sampling techniques would not be required. We believe it is about a factor of two lower. The levels that I have seen, I believe they were Millstone, and they can correct me if I am wrong, but I believe they were generally less than .1 microcuries per gram for the last couple of years.

MR. SIESS: The levels we are talking about, does this just multiply everything by 500?

MR. RUSSELL: That is the approach that we used. The tech spec limit is .2 microcuries per gram, and you can exceed that, I believe, for up to 48 hours, and you cannot go above, I believe it is 20 -- excuse me, a factor of 20, a total of four.

MR. SIESS: But in the dose calculation you use the iodine spike?

MR. RUSSELL: Yes, the spike of 500.

MR. SIESS: That multiplies everything by 500, including the doses?

MR. GRIMES: No, that multiplies the activity.

MR. CWALINA: That is the release from the fuel, so in terms of the dose, it is not a direct multiplier. It multiplies the release rate from the fuel, and you combine that with going through the system, decay, cleanup, and going out. That doesn't have a direct effective factor of 500.

MR. SIESS: It is a release rate.

MR. CWALINA: Correct.

MR. SIESS: Not the release amount.

MR. CWALINA: Correct.

MR. SIESS: And the iodine spike occurs when, how often?

MR. GRIMES: Once.

MR. CWALINA: It occurs once at the outset of the accident.

MR. SIESS: It accompanies the accident. It is not the kind of thing you get from startup.

MR. RUSSELL: The actual phenomena is associated with power change. We assumed that it occurred -- for the purpose of the analysis, it is assumed to occur right at that time.

MR. SIESS: But not as a result of the accident. It is at simultaneous occurrence of an accident and a transient that causes a power spike.

MR. CWALINA: I believe the approach that is taken is the accident causes the iodine spike, the transient resulting in the shutdown causes the iodine spike.

MR. FELL: Bob Fell, SEP.

The small line break, the accident doesn't necessarily cause a sudden change in reactor pressure. What really happens is, it is assumed that you have an iodine spike due to the reactor power change. Then the accident. And the power change results in the iodine event.

MR. SIESS: Now, a power change can be a fairly brief occurrence. Does it have to be a large power change, or just a load power change? I am just trying to get a feel for the probabilities of the spike and the line break simultaneously.

MR. GRIMES: Dr. Siess, the discussions that I have had with the accident evaluation branch, there seems to be a sufficient amount of uncertainty in what levels of power changes or what degrees of pressure reduction might cause spiking and how much spiking would occur as a result of those changes. They have adopted a multiplier of 500, and they apply it whenever there is a power change or a pressure change associated with the transient.

MR. SIESS: But this is a conservatism, I gather, of some sort, unless the spike is caused by a break. I am just trying to get a feel for it. Now, we are going to hear from the licensee, but maybe I will just ask --

MR. WARD: Could I ask something about this spike? This factor of 500, I take it this is considering some definite stereotype transient or something. It isn't a factor of 500 on the release from the fuel and then the whole coolant system coming into equilibrium with that, is it?

MR. GRIMES: Yes, it is.

MR. WARD: It is?

MR. GRIMES: You get a release rate of nuclides into the coolant that --

MR. WARD: It goes on for hours or something, or it is a spike of some duration? Is that right? And then the coolant and cleanup system come to equilibrium from that input. Is that right?

MR. CWALINA: The spike is for the duration of the accident.

MR. SIESS: Is that an assumption or a fact?

MR. CWALINA: That is an assumption.

MR. SIESS: We are trying to get straight on the actual phenomena. I think we are straight on the assumptions. What are the actual phenomena?

MR. RUSSELL: We will have to bring additional staff back to address that later. The details of what the phenomena are, how large a spike you can have, and phenomenologically how it occurs and how it is cleaned up, we aren't prepared to address.

MR. SIESS: This may not be important.

MR. WARD: And how much does that affect the bottom line number?

MR. SIESS: I think the licensee is going to address this. I know the licensees have a problem with operations on these limits, and I don't know what the problem is, whether it is a spike or power changes or what. So let's hear their presentation on this and then we can ask questions after that. So who is going to speak first and for whom?

MR. RYBAK: I would like to address the spiking.

MR. SIESS: I would rather you start at the beginning with whatever your -- if that is part of your presentation.

MR. RYBAK: I am Bob Rybak with Commonwealth Edison. We had a telephone conversation with the Staff last week and we agreed with the Staff on setting up the tech spec change on two limits that they proposed, the .2 and the 4 microcuries per gram. The big issue that we had was, as you had alluded to earlier, the eight pages of the standard tech spec. Every time you had one of the items where you had a 15 percent change of thermal power rating, you go out and take a sample.

We thought that sampling frequency was far excessive and would have really taxed our chemistry department because often on weekends and fuel foulings, we take samples probably at least every two days, if not more frequently. We raised concerns about some of the assumptions that were made during the analysis, and we take no credit for standby gas treatment, assuming the break was before the excess flow check valves.

And those items, once the Staff made clear to us that the only item they were enforcing or attempting to enforce on us was the limitation of the .2 and the 4 microcuries per gram and they were giving us some latitude as to the action statement that we were proposing in our tech spec, we tentatively agreed to those limits and then we were going to prepare a tech spec change.

MR. SIESS: And you can operate your plant reliably at the .2 microcurie per gram limit?

MR. RYBAK: Our operating history shows we have at least an order of magnitude below on a dose equivalent for the iodine. Our past history has been it is our belief that to exceed the iodine limit we would have exceeded really an off-gas limit that we have in the tech specs. That would be what would be the indication, in fact, from previous experiences with fuel. We have developed some experience in estimating exactly what the problems were that would arise in looking at the analysis from the off gas.

Again, when we sat down with the Staff and we crystallized exactly what they wanted from us and what they would be willing to accept, we wrote off on those particular items.

MR. SIESS: Does that constitute agreement?

MR. RUSSELL: I believe it does.

MR. GRIMES: Yes, sir.

MR. RUSSELL: The disagreement was not with Dresden but was with Millstone.

MR. RYBAK: But I wanted to maybe clear up the --

MR. SIESS: Both of them were on the list, according to what is up on the board.

MR. RYBAK: The reason I jumped in here was I possibly wanted to clarify the spiking factor.

MR. SIESS: The thing is that one doesn't concern me, if you have no problem with the other, but we may come back to it.

MR. RYBAK: All right. Okay.

MR. RUSSELL: On the previous slide we had --

MR. SIESS: I don't want to get educated beyond my demand.

MR. RUSSELL: We had Dresden agreed, so the position has been agreed to by Oyster Creek and Dresden but not by Millstone.

MR. SIESS: I stand corrected.

Okay, Northeast Nuclear can have the floor and tell us that it disagrees and why.

MR. BAIN: As you probably recall, we spoke about this at length during the last subcommittee meeting, so I am just going to take a minute to update you.

MR. SIESS: That is about all I recall of it.

[Laughter.]

So don't hesitate to repeat anything you think is important.

MR. BAIN: The last time we spoke, our comments were limited to the steam line break analysis since that was the only analysis we had received. We recently did get the small line failure analysis from the Staff.

MR. SIESS: The steam line break is the 18 --

MR. BAIN: It is the 16, 18, right. I think Chris summarized pretty well where we stand right now. We just received the analysis. We took a quick look at it. A few red flags popped up. We think there is enough room, enough margin in the conservatism that we can sharpen our pencils and whittle the doses down a little bit, still staying in the conservative direction, with the ultimate goal of justifying the plant-specific value, which may or may not be the same as what is already in the standard tech specs. We won't know that until we see how much margin we can cut out of the dose calculations.

MR. SIESS: What iodine limits do you operate under now?

MR. BAIN: Right now we just have a 20 microcuries per gram gross iodine limit.

MR. SIESS: You must take samples and measure isotopic distribution from time to time.

MR. BAIN: Right. An isotopic analysis is done every three days.

MR. SIESS: What is your gross iodine that you are operating with? I mean your iodine gross equivalent, I'm sorry. I-131 equivalent.

MR. BAIN: As Bill said, we did submit some data for the last complete cycle of operation, and every data point for the three-day samples was well below even the .1 microcuries per gram dose equivalent. So in normal operating conditions we would normally be -- we would be below the .2, assuming we have good fuel.

MR. SIESS: If you have not normal operating conditions, does this change the isotopic conditions such that your 20 microcuries gross would come more than .2 microcuries dose equivalent? Have I got the numbers right? You say you have been operating with 20 microcuries gross and running less than a tenth of a microcurie dose equivalent, right?

MR. BAIN: That's right.

MR. SIESS: What would change that ratio? Don't assume I know anything, because I don't.

MR. BAIN: That makes two of us. No. I believe that if you did increase the gross iodine, you would have a proportional increase in the 131. I don't think there is any real phenomena that could cause you to get a great increase in the percentage of 131, the percentage of iodine that is 131.

MR. SIESS: Then why would you object to the tech spec requirement of .2 microcurie per gram dose equivalent since you seem to be able to meet it?

MR. BAIN: In the past we have had some experience with some leaky fuel that has pushed us up closer to the limit. That was in the early seventies. The problem has not recurred since, but we were worried that if it does recur and we do have a tech spec of the .2 microcuries per gram, that we may end up going over tha for an extended period of time.

MR. SIESS: When you had leaky fuel, did it put you over your gross limit? Your gross limit is 20, you said?

MR. BAIN: No, we never went over the gross. It is 20 microcuries per gram.

MR. SIESS: How close have you ever gotten to it?

MR. BAIN: We don't have that information.

MR. SIESS: Of course, there is a reason, it seems to me, for having a tech spec that causes you to do something when you get above some limit. It is just a question of what the limit should be. I know what the standard review plan says. Your approach is you want to take your present limits, you want to assume some fuel failures, right, which would get you up to your present limit. Presumably you don't get up there unless you have a fuel failure, right?

MR. BAIN: Yes, that is right.

MR. SIESS: And then show that with 20 microcuries gross and a given isotopic concentration and the other things you can bring in on mixing and where the break is or something, that you can stay below the 30 rem dose?

MR. GRIMES: Dr. Siess, if I might clarify, the approach Millstone wants to take is, rather than just adopt the .2 microcurie per gram from the standard tech spec, they prefer to take the evaluation that was done in accordance with the standard review plan, look at the conservatisms in that analysis, take some of the conservatisms out, do a calculation to Part 100, and then see whether or not they could have something higher than .2, let's say .4, .5, still calculate an offsite dose less than Part 100, the siting criteria, and then adopt that limit in their tech specs rather than the gross activity limit that they currently have.

MR. SIESS: Now, the conservatisms are not -- Part 100 is a rule, right? And 300 rem is a rule, right?

MR. GRIMES: It is a guideline. The lawyers always require that we say that.

MR. SIESS: But it is in the regulations. The conservatisms that are used in making this calculation are in the standard review plan, right? The 30 rem versus 300 is in the standard review plan. So if we were going to comply with the rules alone, they could go to 300, right?

MR. RUSSELL: (Nods in the affirmative.)

MR. SIESS: It just seems to me that if I were going to take out conservatisms and then go from 30 up to 300, I have taken out a big chunk of conservatism all at one time and I have a little more difficulty picturing that.

MR. GRIMES: The Staff has argued that --

MR. SIESS: The Staff wants to take out conservatisms and still wind up with 30. That one I can understand is getting down to a basis of currently licensed plants and sort of using conservatisms to get rid of the flow restrictions. But to end up without the flow restrictor and the 300 and without the conservatisms seems to put this almost in a different category, so far out.

MR. GRIMES: The major part of the Staff's argument for just adopting the standard technical specifications is we recognize the conservatisms in the analysis and that we don't feel that the resources that would be required or expended in arguing about the individual conservatisms are warranted. We recognize that they are there and I think we all agree that if we sharpened pencils, we could calculate a number less than Part 100. We could probably calculate a number less than 30 if we really sharpened the pencil. But the arbitrariness of the siting criteria in establishing the primary coolant activity seems to us not to be worth that effort.

MR. BAIN: If I could add just one thing, I think that one of the assumptions that the Staff made that we are going to take a closer look at is that the Staff assume no credit for the standby gas treatment system. We do not intend to go to Part 100 limits unless we have to. For example, if we can show that the standby gas treatment system would remain effective, that would give you quite a substantial reduction there. If we can take out enough conservatisms, we might be able to get down to 30 rem with a higher iodine limit than .2.

MR. SIESS: I guess what bothers me is that everything you are saying applies to a plant licensed yesterday, which would get it down to millirem, probably. It seems to me that what the Staff is trying to justify is some relaxation on a ten year old plant as compared to one that is being licensed today or tomorrow or yesterday. What they have done is accept something about ten times the dose as an alternative to putting in flow restrictors. That didn't seem too unreasonable to me and I don't think it seemed too unreasonable to the Committee.

Now, if I have got to accept two or three more unconservative -- I won't call them unconservatisms, but if I have to wipe out a few more conservatisms simply because if you have fuel failures you are going to have to do something about it, I am having a little difficulty relating that in relative terms to a new plant. The new plant is likely to have fuel failures. He is operating low enough that they are not supposed to provide any threat. He has flow restrictors and he has the standard tech specs, and he has all the other conservatisms in it.

It is just a question of -- you know, I don't think anybody would buy the 12,000. How far down are you willing to go?

MR. KACICH: I think your characterization of what the Staff is doing here is one we would agree with, the problem of recognizing there is a difference between a plant that is ten years old and a new plant, and a less rigorous means of arriving at what appears to be an acceptable tech spec because it is in the standard is not something we take great exception to.

Again, we just got this evaluation and we are looking at it and I am confident we will be able to arrive at an acceptable compromise, if you will. All we are saying is there may be plant-specific features. Whether there are some differences in our modeling, whether there is credit for the standby gas treatment system, there is a number of factors we want to take an opportunity to look at.

It may turn out when we get all the facts put together there won't be that much of an issue left and we will end up dropping it there.

The other isue I think we have right now is we cannot hypothesize a set of circumstances as far as fuel performance goes. We can say we need .5 as a number of we need .874, whatever it is. We are trying to find the path of least resistance here. We can recognize circumstances where .2 could give us a little trouble. If we can sharpen our pencil right now and find a way to get our margin, not forfeit the margin we have, that would be our premise.

MR. SIESS: I think that it would be my position, and I don't know what the Committee's position will be, but I know the Committee bought what what I would call a factor of about 10. I have got a feeling that I would balk and they might at 100 or 200 or 300 as we look at this. It is the kind of thing that tends to bother you a little bit. We are all concerned about these terms. We know they are artificial, and yet they are the way we have been doing it. We have got a lot of background and a lot of history.

So I think we will just have to wait until next Thursday to see how the Committee feels about it, but I think you are closer -- we are not that far apart, necessarily. I have got a feeling the Committee will probably say the same thing it said the last time.

Do you feel that way, Jerry?

MR. RAY: Yes.

MR. SIESS: Do you have any opinions?

MR. RAY: (Nods in the negative.)

MR. SIESS: I don't know who will have --

MR. RUSSELL: Let me just make one comment. This is an area where there is additional work going on on the Staff to try to come up with procedures or mechanisms for more realistic evaluations of consequences of events. There have been some recent NUREGS published that describe approaches to do this, to consider some of these conservatisms. We are not there yet.

Essentially what we have is a very deterministic type of approach. In the standard review plan, the similarity could be made to the Appendix K type of review, what you have done for ECCS, which has its conservatism in it. We have a process that we go through deterministically to reach a judgment. In this case we are trying to consider some of those conservatisms to argue that this is sufficient and that more need not be done.

MR. SIESS: Bill, one of the problems is the way we do it in Appendix K and the way we do it in siting, we put conservatisms in at every step, with the result that when we get through, we don't know how much wse have got.

MR. RUSSELL: That is right.

MR. SIESS: We multiply them together and we don't really know how much we have got. And then, for example, here we don't really know what the probability of this accident is as compared to a Part 100 accident. We have had a TMI. I don't think we have ever had a release from this kind of thing, have we, a small line break?

MR. RUSSELL: Issues that relate to coolant activity for PWR steam generator tube ruptures clearly come to mind. We have had those and we have had offsite releases from PWRs.

MR. SIESS: That is not for boilers, though.

MR. RUSSELL: For boilers, I can't answer that question. I guess an approach would be to establish a limitation on coolant activity based upon fuel performance, which would be just as logical if one could come up with a mechanism for doing that. You can recall back to the naval reactor days, you used to have a fuel failure limit based upon activity, and you were concerned about activity in the system for maintenance, crud buildup, things like that.

So the issue from offsite dose and its relationship to fuel performance, and the comments about fuel failures, I think there are a lot of concerns that are secondary in nature or in some cases even primary with respect to coolant activity, not just offsite dose.

MR. SIESS: See, I think the Staff in not requiring flow restrictors which will be in a new plant has made a judgment, a very qualitative judgment that has relaxed the standard review plan or whatever the present regulations, however they may be embodied, by a factor of about 10, which didn't cause too much concern with the ACRS. I don't think it caused any. Essentially it seemed not an unreasonable thing to do. We recognized the conservatism.

I don't know how the Committee will react to further possible relaxations. They may not be significant relaxations. Millstone might operate like this for ten years without ever getting over the .2 microcuries or getting over it on the near end cycle with the fuel failures that they take out with the next refueling. The effect on the public health and safety probably will not be any more than changing that tech spec on monthly versus quarterly, because they are probably going to be testing monthly for the next five years to get enough data.

But there is here a principle involved of a relaxation that we should look at. As I said, you have done it pretty much on the basis of judgment. I think the Committee bought it. If you go much farther, I think you have got to have more backup, shall I say.

Maybe Millstone will come up with enough information to convince somebody. I don't think you will have a final answer next week, and I don't think it is important that you do.

I don't think the plant represents a danger to anybody.

MR. KACICH: If I could just offer one other comment, if I am not mistaken -- correct me if I am wrong -- in order for this incident to occur, there is only a very limited length of pipe that has to fail. We are not talking about an event that has an extremely high probability of occurrence in the first place. I think we are being pretty conservative just by getting into this area in the first place. That might be considerations in deciding whether 300 or 30 is the appropriate number.

MR. SIESS: What leads to that on the length of pipe?

MR. GRIMES: It is a break between the containment boundary and the excess flow check valve which is outside containment for Millstone resulting in an unisolatable, unrestricted blowdown outside containment.

MR. SIESS: These are instrument signs?

MR. GRIMES: Yes, sir.

MR. SIESS: These are the Schedule 80 lines we worried about once?

MR. GRIMES: Yes, sir.

MR. SIESS: Mr. Fraley has still got a piece of Schedule 80 pipe in there on his desk to show us what we were worried about. The excess flow check valve acts as a flow restricter, doesn't it?

MR. GRIMES: Yes.

MR. SIESS: I think the physical issue is one thing. The more philosophical issue on relaxing how far you relax and what you relax in the SEP is another one. And it is not very quantifiable.

MR. GRIMES: And any further evaluation that we did to look at some of those conservatisms are going to still end up being differences from current licensing criteria in the way they have been applied. The assumptions that were used in the analysis are the same assumptions that are used for a new plant, including an unisolatable break, the iodine spiking factor, lack of standby gas treatment system, and all of the other conservatisms.

MR. SIESS: All of the other worst cases we can think of.

MR. GRIMES: Yes, sir.

MR. SIESS: That is not new. Does Millstone have anything more?

MR. BAIN: No, sir.

MR. SIESS: You will have a chance to be heard at the full committee meeting. More or less than you have said today, whatever you choose.

Gentlemen, I think we have completed the agenda down to what is now listed as Item 7, and I don't really see any need of taking time today. We heard on October 27th from both Millstone and Dresden their comments on the SEP integrated assessment, and we would like for you to present those, if you wish, to the full committee, but I don't see any reason for the subcommittee to hear it again, even if there are changes.

MR. KACICH: We corrected two typographical errors.

MR. SIESS: We really don't need a dress rehearsal on that. Let's see if I can come up with something for the full committee presentation. We have got scheduled about a little -- I guess the schedule says five hours and 45 minutes, which is Mr. Fraley's way of saying six or so. I told him my best estimate was seven, with a standard deviation of two. And he always likes to estimate low. And then we run late. But then that is standard practice.

I had already mentioned on the early items to do it by lists. I think on many of the items I would like to do it by lists, and tie it back to Oyster Creek to point out similarities. There are a couple or a few areas that we will want to elaborate on that I know I would like to have you elaborate on even if nobody has a question, but I think there will be enough questions from the full committee that someone will want to have discussed, and I don't want to clutter it up in advance.

If they don't come up with anything, I will think of two or three that I want you to elaborate on. By elaborate, I mean to the extent of a single sheet type thing that we did before. If I think of any particular ones between now and next week, I will let you know, just so that you will be prepared.

On the PRA, I cannot predict how that will go. What I think we should be concerned with is the differences between the usefulness of the PRA for Millstone and Dresden. That is, the plant specific versus the not. And the presentation we got from Totelac on that, which was a good start. If the committee tries to get into looking at the Millstone IREP, I will try to restrain them.

Our objective should be to look at the Millstone IREP only as it relates to the SEP. That is all I am going to use my scheduled time for on Thursday, if I can help it.

So, putting it in at about the stage we did, I think, is an appropriate time, and I think Thadani should be here, and not just the contractors.

Is there anything else you would like advice on?

MR. GRIMES: Do you want us to use the same general organization of common and plant specific in the same order we presented them today?

MR. SIESS: I think so. I think that worked about as good. The committee seems to be about as much interested in the procedural changes as it is in hardware changes, perhaps more so. I think the committee is very much interested in real procedural changes, that is, changes in procedures, like the flood procedures, the shutdown procedures, ADS, that type of thing, because we are very interested in the human factors operator performance, and I think a little emphasis on some of those would be useful.

The gas turbine came in for quite a bit of discussion on both of the things I read. That needs to be brought out, I think, so that the committee knows the importance of that particular item. Now, I didn't see any plots, but it looked like it was getting better as time went on. We have been hearing about the French installing gas turbine generators at all of their sites for a safe shutdown power source as opposed to something that has to start in ten seconds. I think this is of some interest. I am just mentioning things. If they run out of things to ask about and time is not used up, I may want to hear something about those. That is a unique feature.

Let's see. The only other plant that doesn't depend strictly on diesels is Oconee?

MR. RUSSELL: Right.

MR. SIESS: You have got one gas turbine generator and one diesel?

MR. ROMBERG: Yes.

MR. SIESS: How did you get into that? Did you just happen to have it?

MR. ROMBERG: No, it didn't turn out that way. We were sold a bill of goods. No, that is not exactly true. Back in the days when high pressure injection systems were not as we know them today required to be on emergency power supplies, we had an option of either putting in a high pressure HPSI turbine-driven system or putting emergency power supply to our feedwater coolant injection system at either Oyster Creek or Nine Mile.

That was also in the days when we were buying a good number of peaking gas turbines, and we thought that was such a good idea we put the ten megawatt gas turbine in, and when it wasn't used for emergency power supply, it was used for peaking on the system. We don't use it for peaking, but that is how we got into this.

Overall, when we look back at it, I don't think it was a real bad decision. We have had some problems with it over the years, but --

MR. SIESS: This is just the HPSI, just one-half of your system?

MR. ROMBERG: It is like the other diesel, except it is ten megawatts instead of 3.3.

MR. SIESS: How fast -- will it start at the same speed as the diesel?

MR. ROMBERG: No, I am afraid it doesn't. You couldn't spin it up that fast. It is set for 48 seconds. It normally does it in about 42. A good number of our failures are 50 or 53. If you look at the speeds it has got to wind up to to get there in 42 or 48 seconds, it is really screaming.

MR. SIESS: A diesel has to start in ten seconds and take load in what, 30?

MR. ROMBERG: Our specs, I don't remember exactly, I think it's 13 seconds it starts loading, and we normally do much better than that for diesel.

MR. SIESS: Do you know what accident governs that time?

MR. ROMBERG: For the gas turbine?

MR. SIESS: The requirement that the diesel start in ten seconds. There must be some LOCA that you analyze in Appendix K that if it starts any later than that, it exceeds peak clad temperature. Does anybody know what governs that ten seconds?

MR. RUSSELL: It varies somewhat from plant to plant. There have been changes in the starting times. Also, there can be a change from different accidents. For instance, in some cases, the steam generator blow down event, where you are concerned about boration to prevent recriticality for an excessive cooldown, as I recall, that was one of the controlling features on Patonac for timing. Generally the load sequencing is ECCS analysis, Appendix K, and the termination of timing for valve stop rate and loading.

MR. SIESS: What bothers me is, we have got the diesels designed and the system designed to take care of that ten, fifteen-second emergency, and we have all these other things that station blackout now we worry about, you get one started in 30 minutes, that that is plenty of time, and the reliability that something starts in 30 minutes versus reliability in ten seconds is quite different.

MR. ROMBERG: I think in our LOCA analysis the basis for the very rapid start times was based on the guillotine rupture of a major pipe, which within 30 seconds the core is essentially dry, all the water is out of the vessel. It is a matter of being able to reflood up to the jet pump risers within, I think, two minutes. There is a calculation we do for every reload that demonstrates that that can be done based on having a worst case analysis that shows the diesel makes it, the gas turbine doesn't, et cetera.

MR. SIESS: It just seemed to me that we could have much more reliable diesels than 30 seconds or one-minute start time than we have for a ten-second start time. I suspect that there is one accident, perhaps a double-ended guillotine, that is governed by ten seconds, and we are using -- ending up with less reliable equipment because of that one accident which I think we are almost ready to get rid of, the double-ended pipe break. Some people have already gotten rid of it.

Well, on that philosophical statement, unless there is some other business, the meeting stands adjourned. Thank you.

(Whereupon, at 4:37 p.m., the meeting was adjourned.)

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

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in the matter of: ACRS/Subcommittee on Systematic Evaluation Program (SEP) Millstone Unit 1 and Dresden Unit 2

Date of Proceeding: November 30, 1982

Docket Number:

Place of Proceeding: Washington, D. C.

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

M. E. Hansen

Official Reporter (Typed)

M. E. Hansen

Official Reporter (Signature)

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Jane N. Beach

Official Reporter (Typed)

Jane N. Beach

Official Reporter (Signature)

COMMONWEALTH EDISON COMPANY

DRESDEN UNIT 2

TYPE: GE BWR-3

RATED THERMAL POWER: 2527 MWt

RATED ELECTRICAL OUTPUT: 834 MWE GROSS

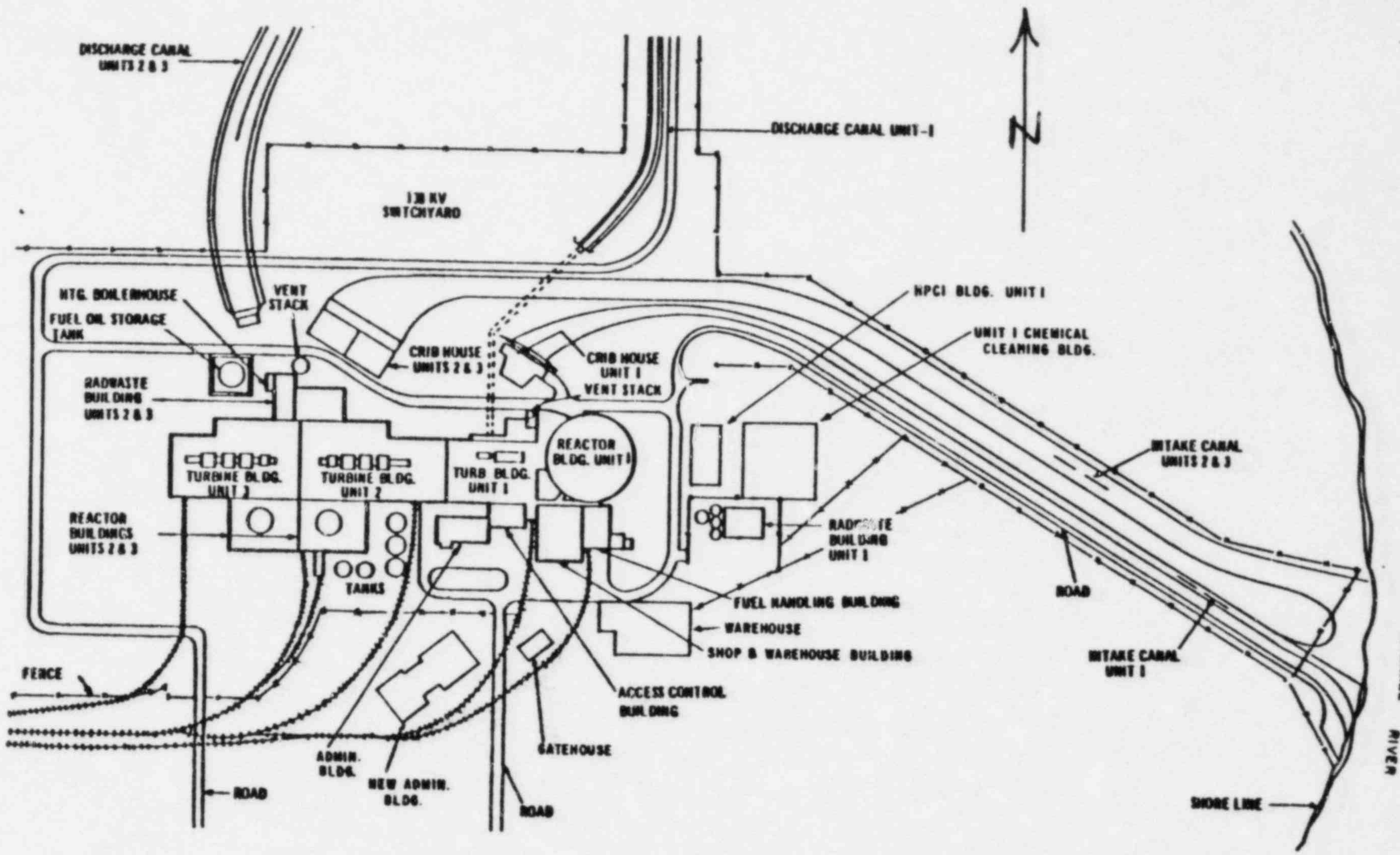
COOLING MODE: ONCE THROUGH KANKAKEE/ILLINOIS RIVER;
AFTER 1971 COOLING LAKE

HISTORY:	JANUARY 1966	CONSTRUCTION PERMIT ISSUANCE
	DECEMBER 1969	PROVISIONAL OPERATING LICENSE, BEGIN FL
	JANUARY 1970	INITIAL CRITICAL
	AUGUST 1970	COMMERCIAL SERVICE
	AUGUST 1971	1275 ACRE COOLING LAKE IN-SERVICE
	NOVEMBER 1972	APPLICATION FOR FTOL CONVERSION
	1973	MODIFIED OFF GAS SYSTEM
	1979	SECURITY
	1980-83	TMI MODS
	1982	HIGH DENSITY SPENT FUEL RACKS

For: ACRS SEP Subcommittee Meeting - November 30, 1982
T. J. Rausch

5309N

TO ILLINOIS RIVER



PLOT PLAN

COMMONWEALTH EDISON

DRESDEN UNIT 2

PLANT FEATURES

BWR-3 - 2 LOOP 20JP RECIRCULATION SYSTEM MG SET FLOW CONTROL

3 ELECTRIC FW PUMPS

MARK I CONTAINMENT - TORUS SUPPRESSION POOL AND WATER SOURCE

TYPICAL ECCS - HPCI STEAM DRIVEN

4 - 33 1/3% LPCI PUMPS

2 - 100% CORE SPRAY PUMPS

ADS - 4EMR + COMBINED S/RV

ISOLATION CONDENSER - PASSIVE DECAY HEAT REMOVAL

SEPARATE SHUTDOWN COOLING SYSTEM

5309N

COMMONWEALTH EDISON

OPERATING HISTORY OF DRESDEN 2

MWE HRS. GENERATED - LIFE OF PLANT = 51,828,113

CAPACITY FACTOR 57.249

AVAILABILITY 78.06%

YEAR	AVAILABILITY	MWE HRS.	CAP. FAC.
1970 (AS OF APRIL 13 @ 2325)	47.79%	1,252,204	24.82%
1971	65.01%	2,806,520	38.41%
1972	59.67%	3,370,476	46.00%
1973	87.58%	5,256,417	71.94%
1974	63.79%	3,594,104	49.19%
1975	55.13%	3,130,632	42.85%
1976	76.01%	4,610,359	62.93%
1977	71.90%	3,760,955	51.47%
1978	94.15%	6,013,057	82.30%
1979	81.56%	5,211,895	71.33%
1980	93.32%	4,866,244	66.42%
1981	60.09%	3,610,449	49.41%
1982 (THRU SEPT.)	91.71%	4,344,801	79.52%

FOR THE YEAR OF 1980, THE AVAILABILITY OF UNIT 2 AT DRESDEN WAS THE HIGHEST PERCENTAGE IN THE ENTIRE WORLD FOR A NUCLEAR PLANT.

5309N

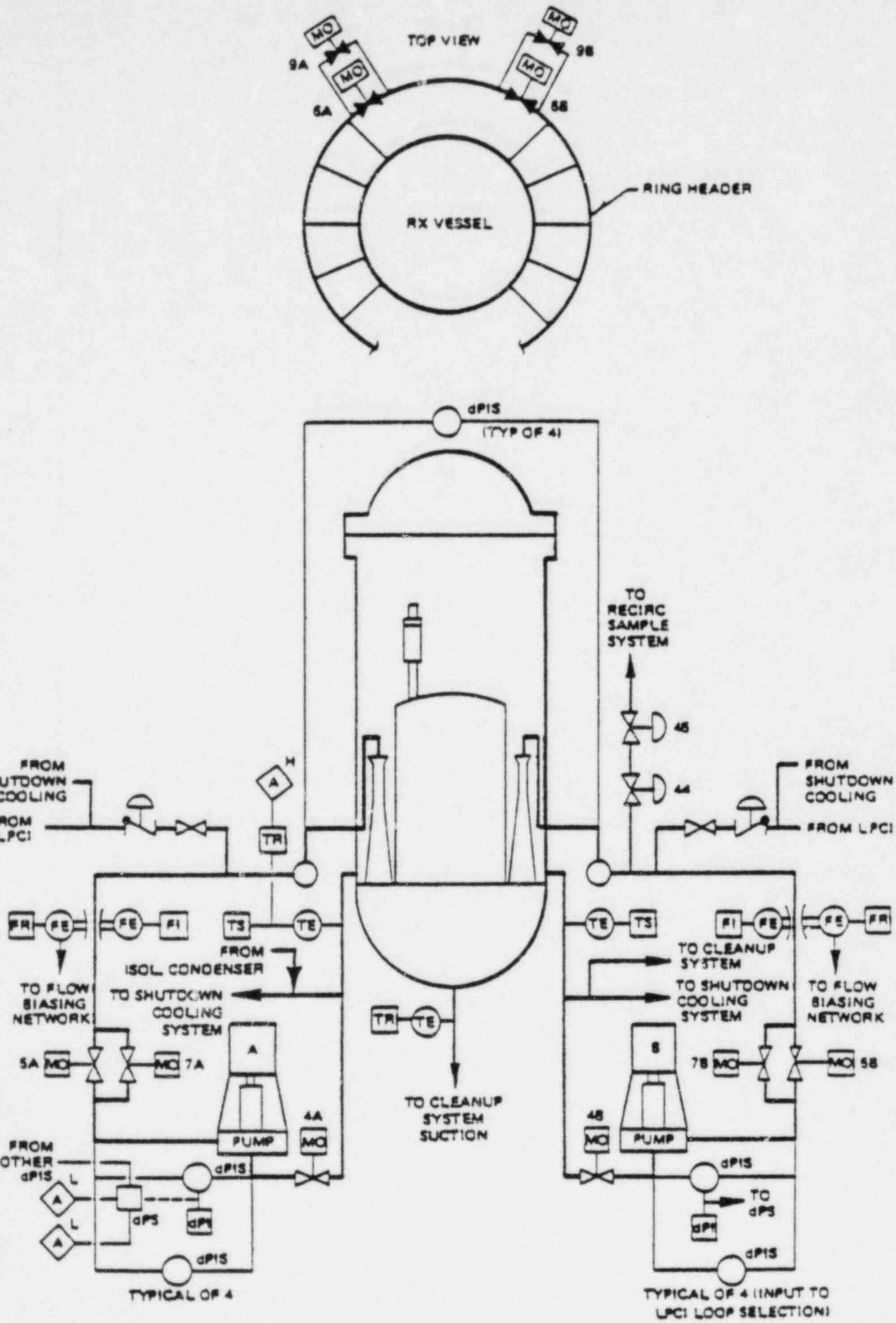
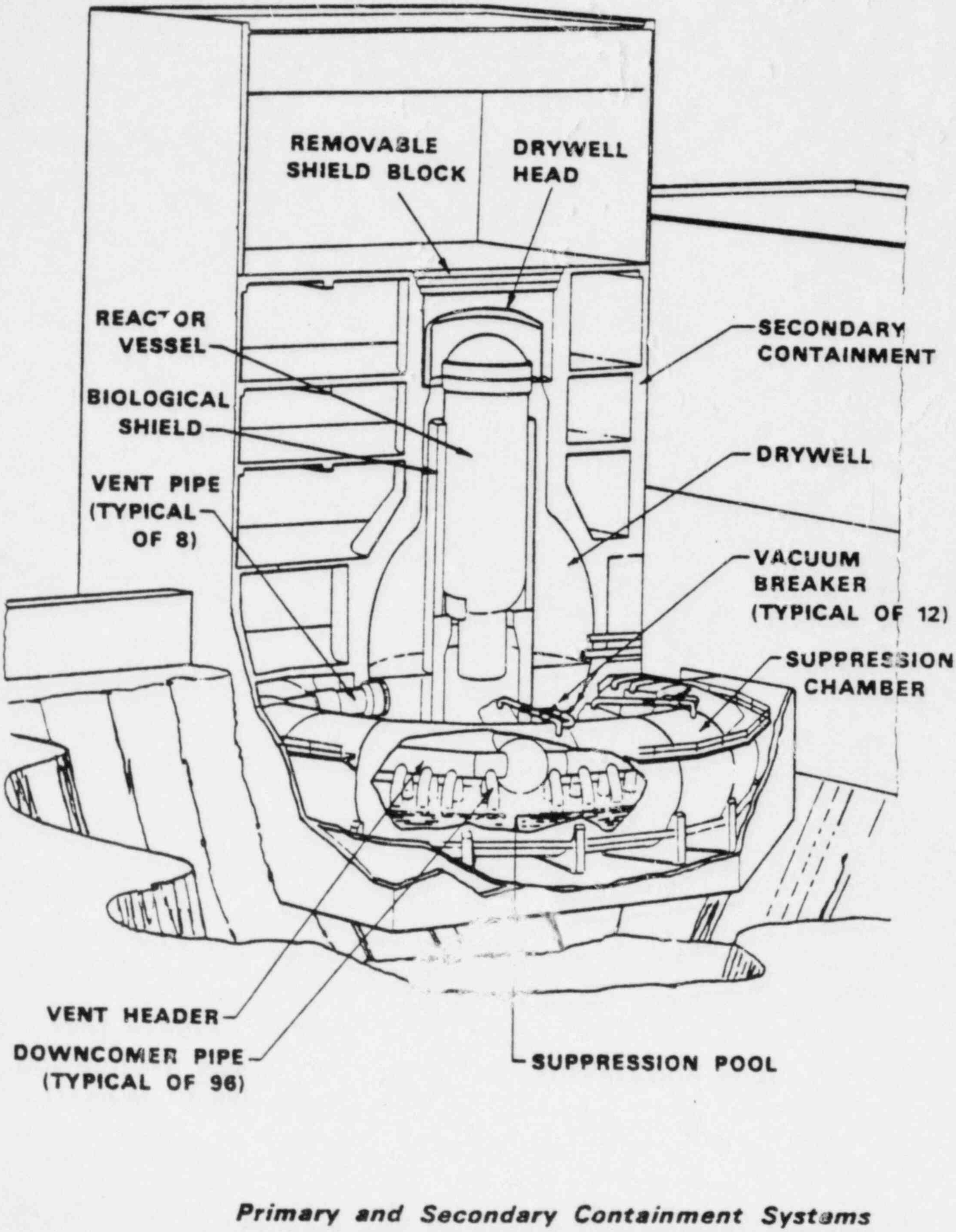


Figure 2. Recirculation System Schematic



Primary and Secondary Containment Systems

COMMONWEALTH EDISON

DRESDEN UNIT 2

EMERGENCY CORE COOLING SYSTEM SUMMARY

Function	Number of Pumps	Design Coolant Flow	Effluent Pressure Range	Required Electrical Power	Additional Backup Systems
Core Spray[1]	2-100%	4500 gpm @ 90 psid (1 Pump)	260 psig to 0 psig	Normal aux power or emer diesel generator	2nd core spray subsystem and LPCI subsystem
LPCI[1]	4-33%	8000 gpm @ 200 psid 14,500 gpm @ 20 psid (3 pumps)	275 psig to 0 psig	Normal aux power or emer diesel generator	Core spray subsystems and 4th LPCI pump
HPCI[2]	1-100%	5600 gpm constant	1125 psig to 150 psig	DC battery system for control[3]	Automatic pressure relief plus core spray and LPCI

[1]Automatic start-up of the core spray and LPCI systems is initiated by: (1) reactor low-low water level and reactor low pressure, or (2) drywell high pressure.

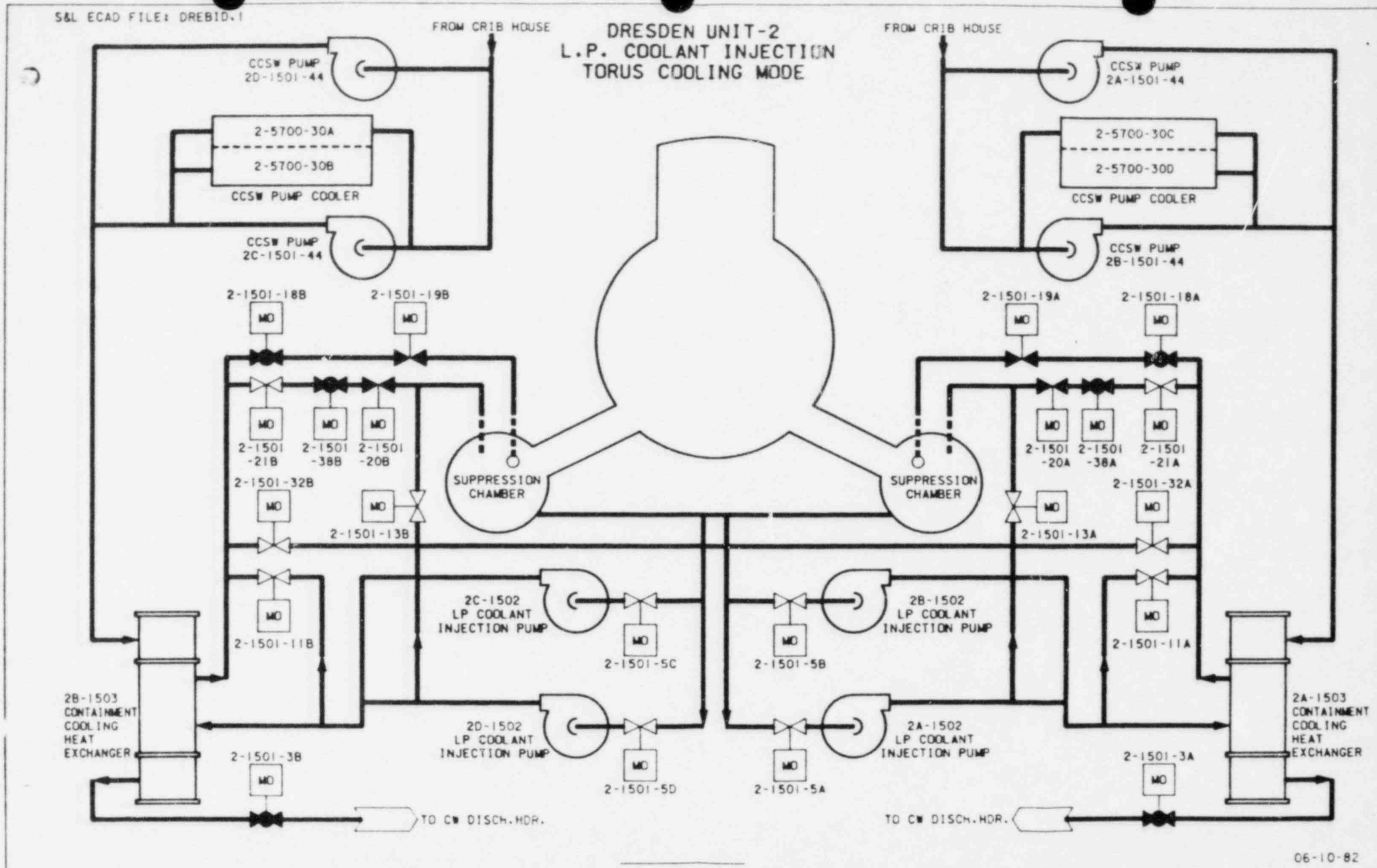
[2]Automatic start-up of the HPCI system is initiated by: (1) reactor low-low water level, or (2) drywell high pressure.

[3]Reactor steam-driven pump.

ADS - 4 Electromatic Relief Valves plus Target Rock Combined S/RV

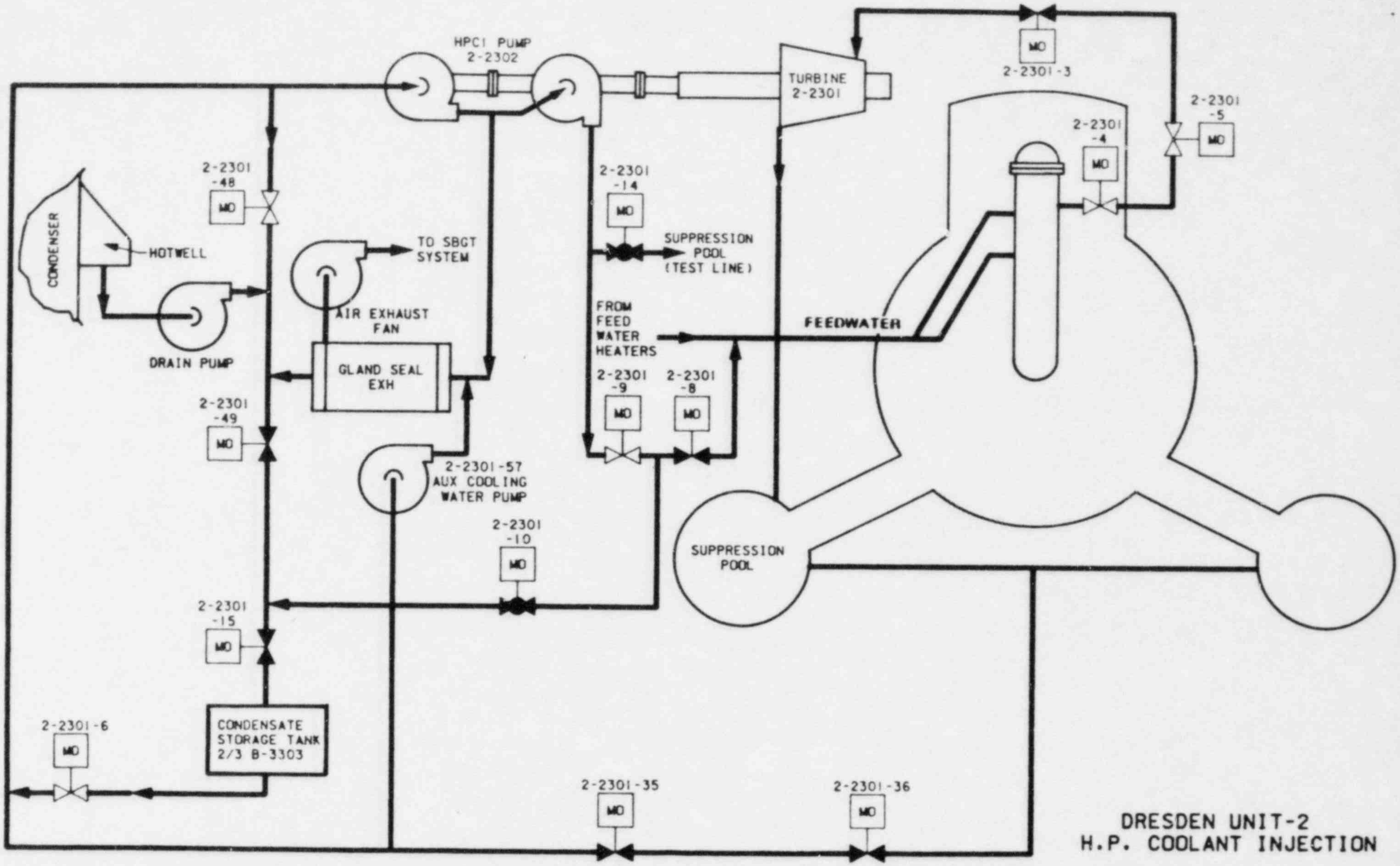
- Initiates on (1) drywell high pressure, (2) reactor low-low water level, (3) 120 second timer (4) CS or LPCI running

- Also provides Automatic Pressure Relief on Reactor High Pressure.



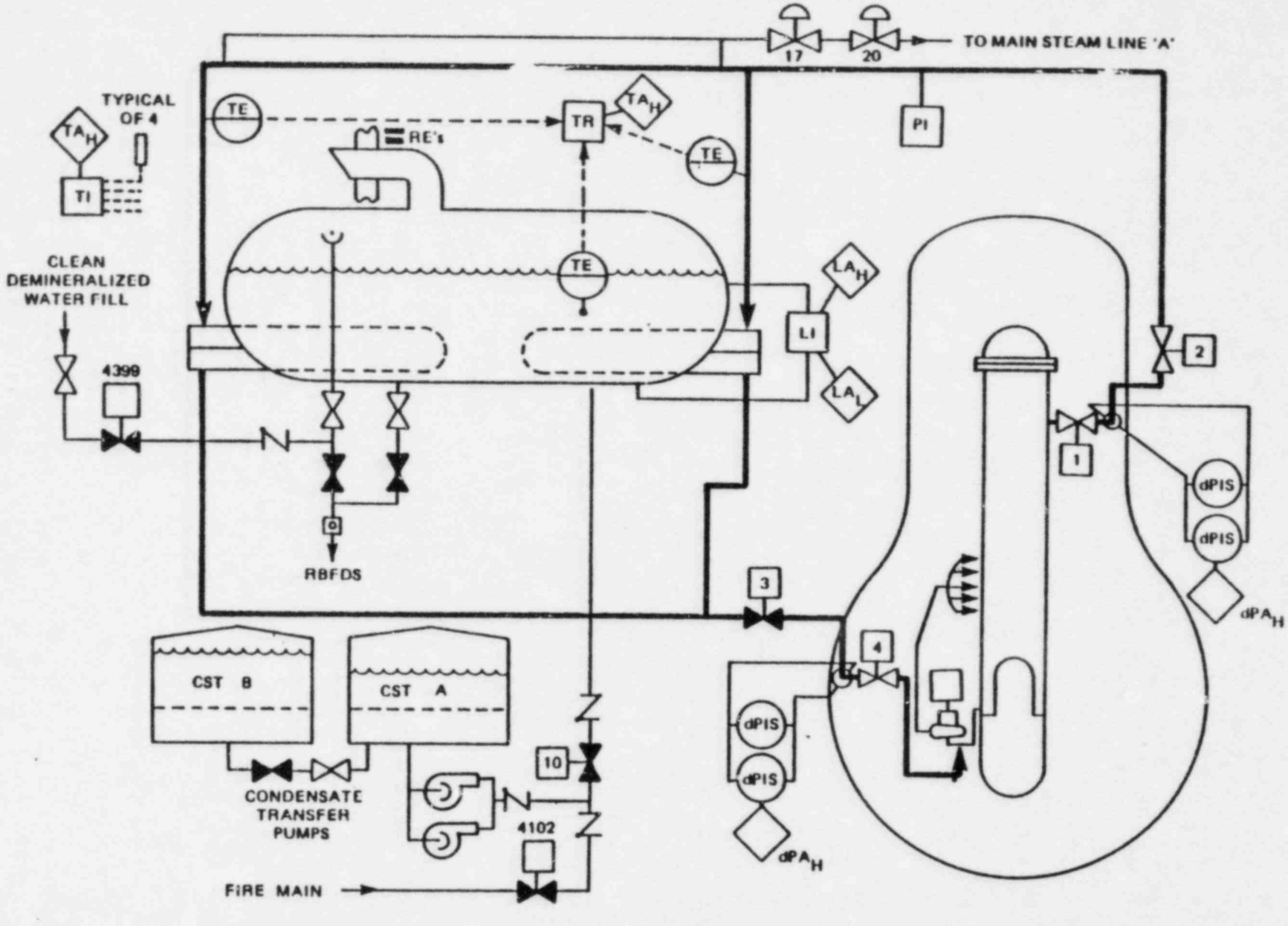
- Shown in Suppression Pool Water or Spray Cooling Mode
- LPCI Reflood Capability through Unbroken Recirculation Piping (Not Shown)
- Also can provide Drywell Spray Cooling (Not Shown)

S&L ECAD FILE: DREBID.1

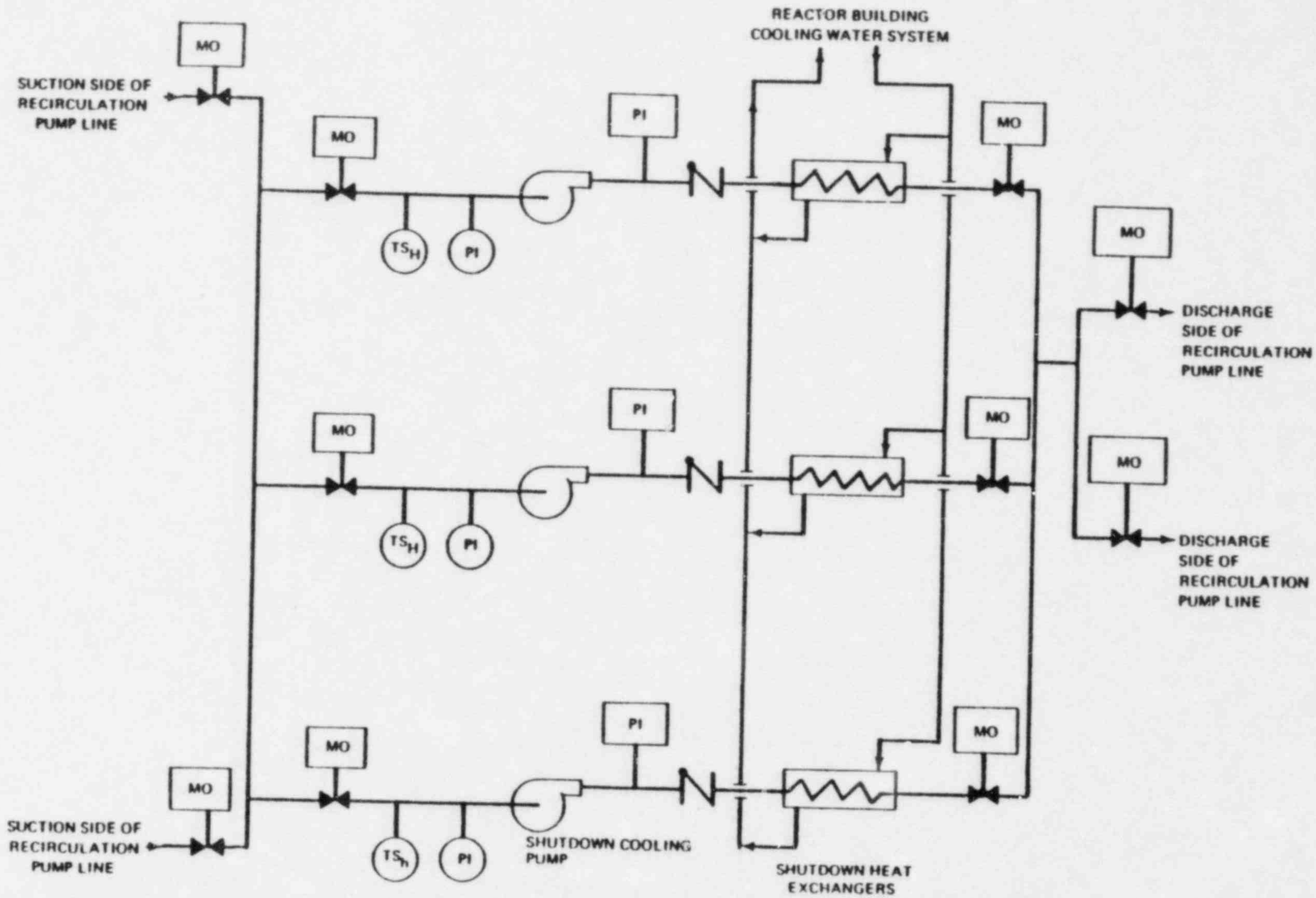


DRESDEN UNIT-2
H.P. COOLANT INJECTION

06-10-82



Isolation Condenser System



SHUTDOWN COOLING - PIPING DIAGRAM

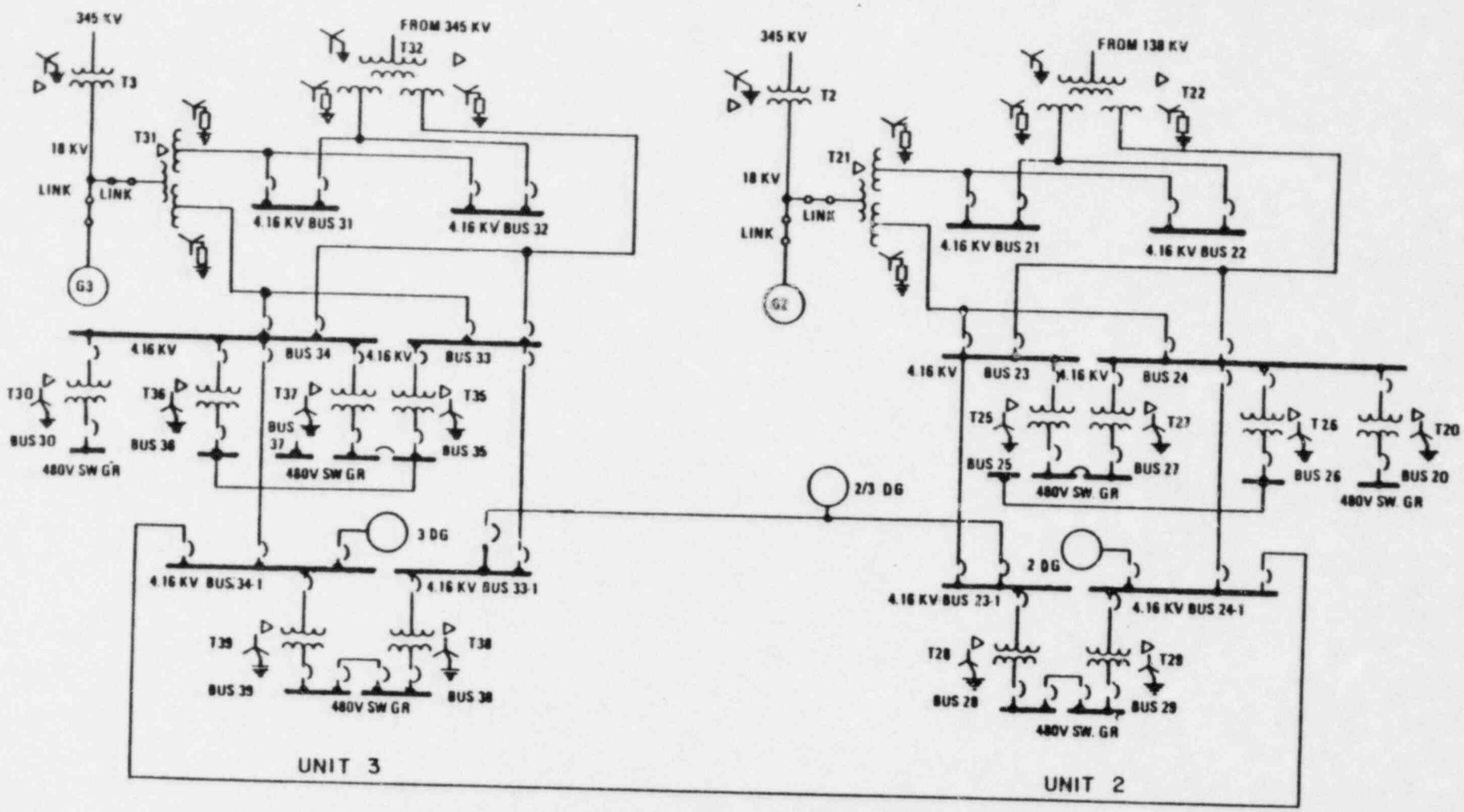


FIGURE 8.2.2:3 AUXILIARY ELECTRICAL SYSTEM - 4160 VOLT AND 480 VOLT

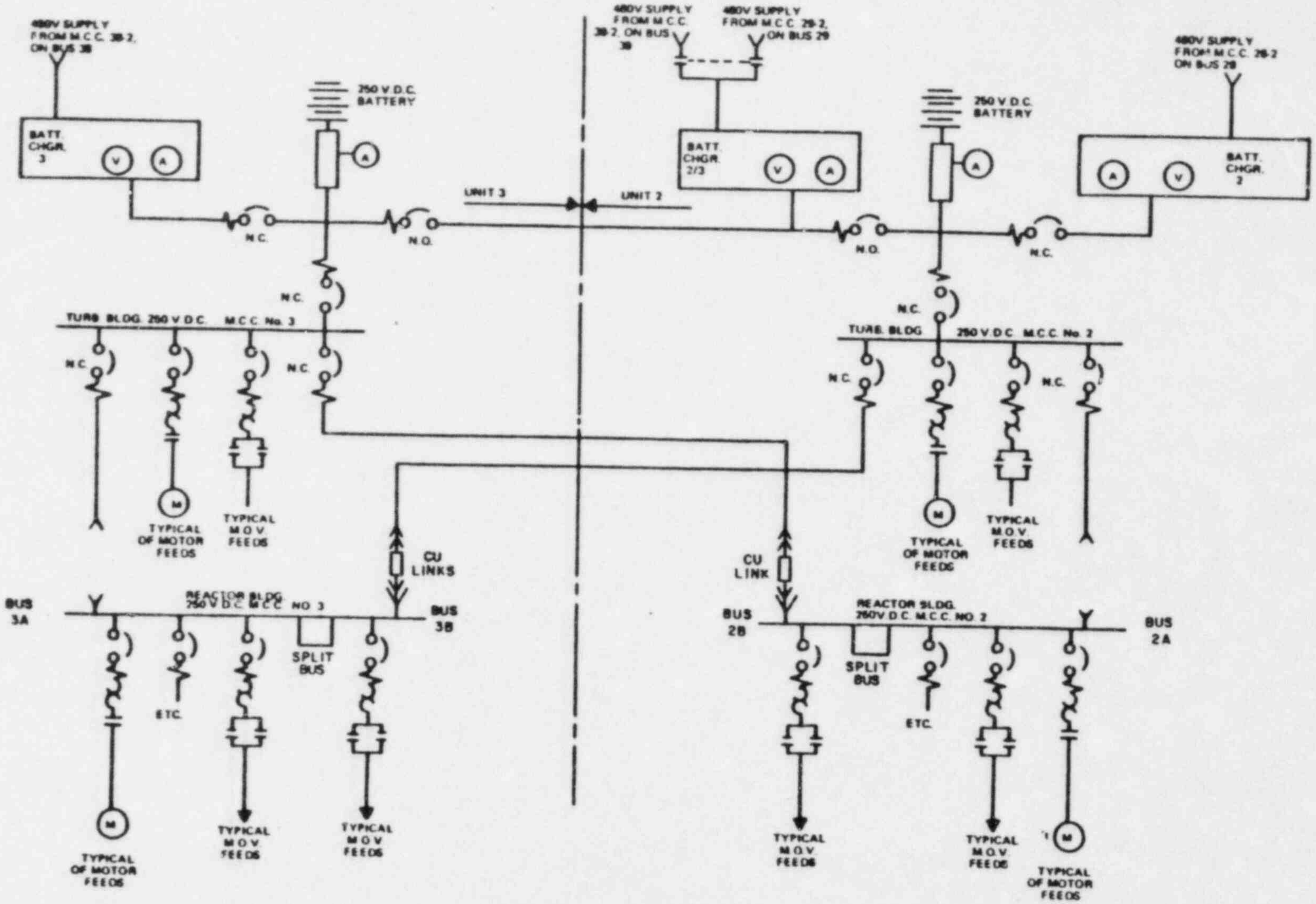


FIGURE 8.2.2:1 250 V DC STATION BATTERY SYSTEM

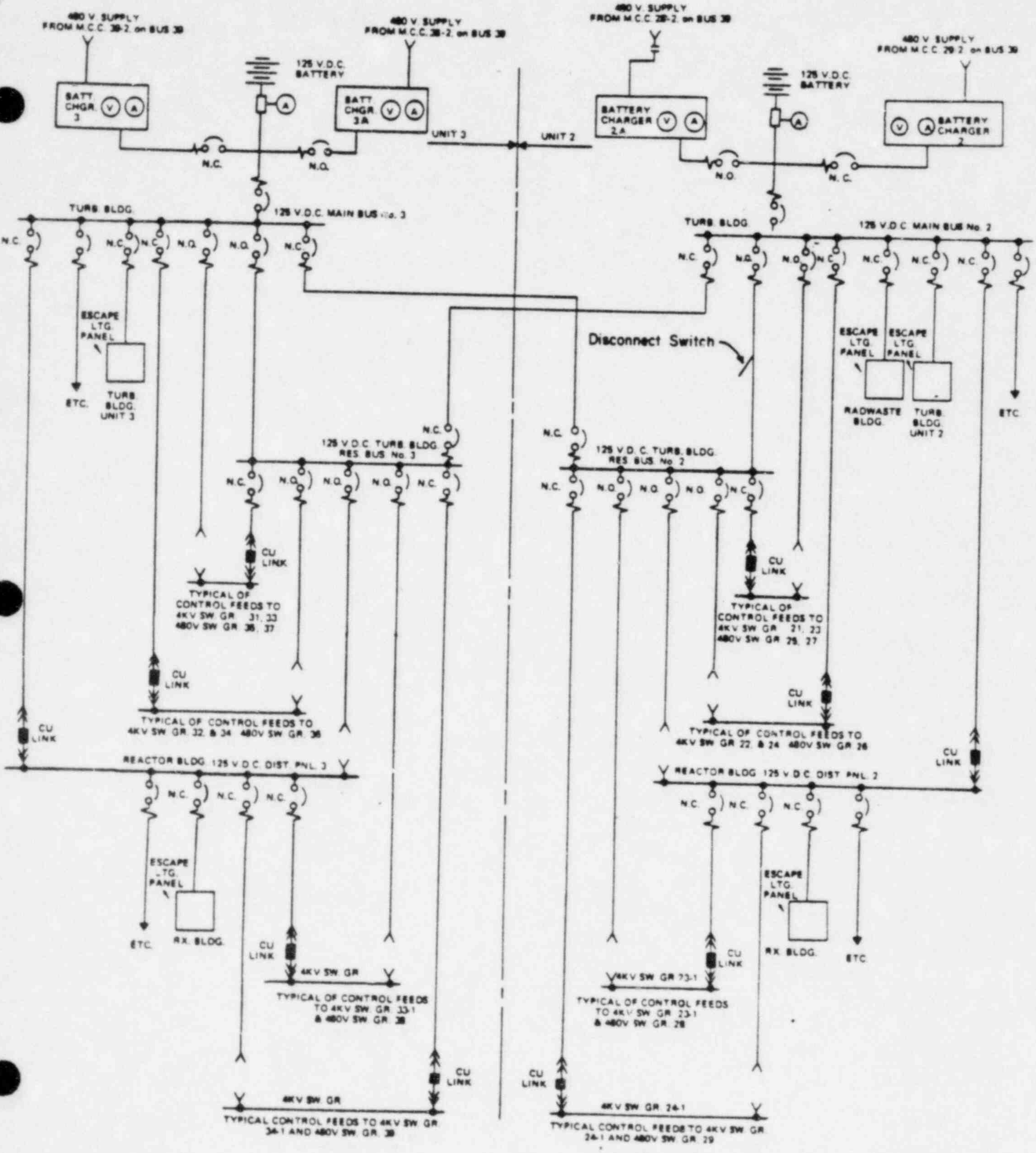


FIGURE 8.2.2:2 125 VDC SYSTEM

Lay In 2

ACRS SUBCOMMITTEE ON SEP

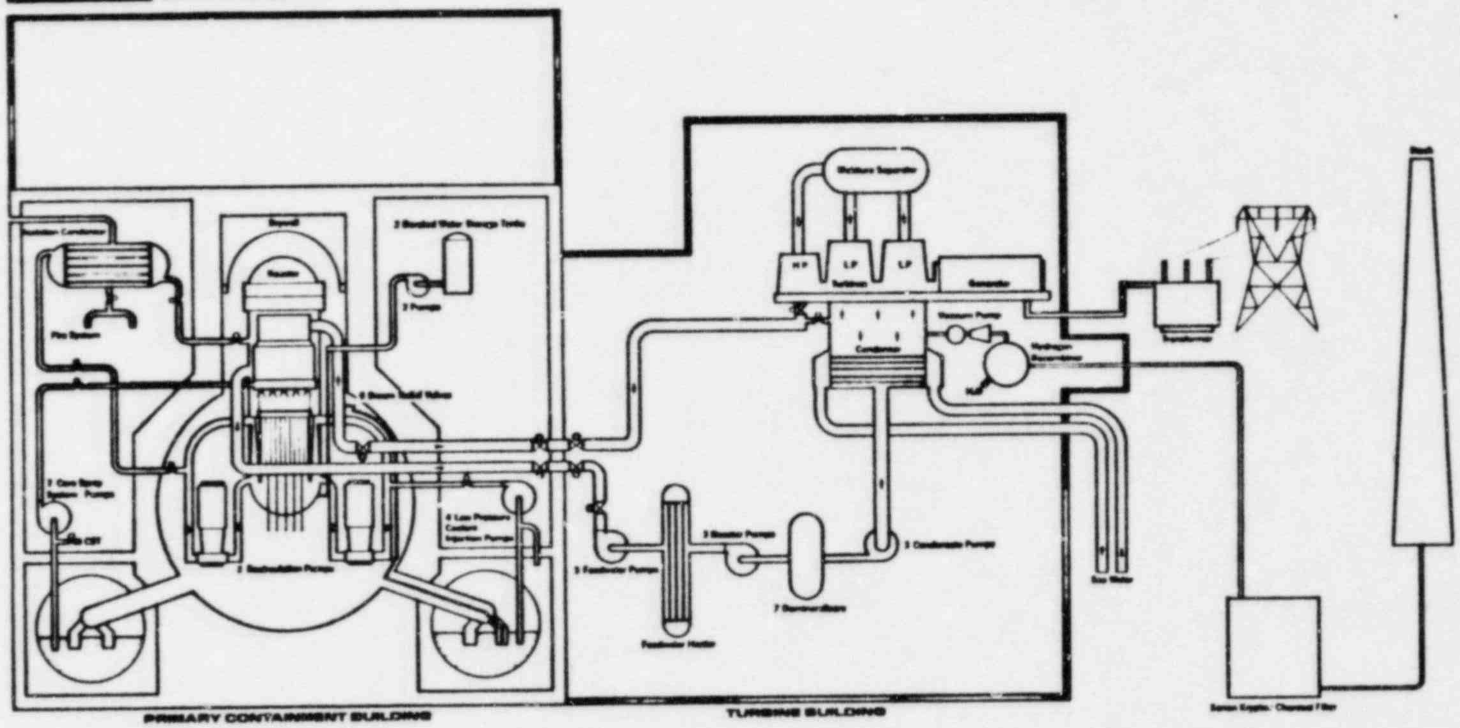
NOVEMBER 30, 1982

MILLSTONE UNIT NO. 1

NORTHEAST UTILITIES

NORTHEAST UTILITIES

Millstone I



MILLSTONE UNIT 1 SEP

UNIT HISTORY

CONSTRUCTION AND OPERATION

CONSTRUCTION START:	MAY 1966
INITIAL CRITICAL:	OCTOBER 26, 1970
INITIAL ON-LINE:	NOVEMBER 29, 1970
COMMERCIAL OPERATION:	DECEMBER 1970
100% POWER:	JANUARY 3, 1971
APPLICATION FOR FTOL	SEPTEMBER 1, 1972

MAJOR OUTAGES

	START DATE	DURATION (DAYS)
FIRST REFUEL:	SEPTEMBER 1, 1972	189
1ST. F.W. SPARGER REPLACEMENT	APRIL 18, 1973	102
SECOND REFUEL:	SEPTEMBER 1, 1974	63
THIRD REFUEL:	SEPTEMBER 14, 1975	35
FOURTH REFUEL:	OCTOBER 1, 1976	60
FIFTH REFUEL:	MARCH 10, 1978	36
SIXTH REFUEL:	APRIL 28, 1979	61
SEVENTH REFUEL:	OCTOBER 4, 1980	197
TURBINE OUTAGE:	APRIL 21, 1981	57
EIGHTH REFUEL:	SEPTEMBER 11, 1982	69

MILLSTONE UNIT 1 SEP

UNIT PERFORMANCE

PERFORMANCE STATISTICS (LIFE TO DATE)

MWE GENERATED:	45,077,796 (GROSS)
CAPACITY FACTOR:	63.3%
AVAILABILITY:	71.9%

ANNUAL CAPACITY FACTORS

YEAR	CAPACITY FACTORS (%)	INDUSTRY AVERAGE
1970 (DEC. ONLY)	25.9	----
1971	63.2	58.9
1972	54.9	54.3
1973	33.2	57.2
1974	63.1	57.5
1975	68.4	58.6
1976	65.6	56.8
1977	83.4	62.9
1978	80.5	65.2
1979	73.0	58.9
1980	58.5	56.0
1981	43.6 (1)	59.9
1982 (TO 10/82)	79.5 (2)	60.0 (EST.)

(1) DUE TO BOTH REFUELING AND TURBINE OUTAGES.

(2) ACHIEVED WITHOUT LP TURBINE 'A' & 'B' 14TH STAGE BUCKETS INSTALLED.

RISK ANALYSIS OF OYSTER CREEK, DRESDEN-2, AND MILLSTONE-1 SEP ISSUES

SANDIA NATIONAL LABORATORIES

ROBERT G. SPULAK, JR.
PAUL AMICO, SAI
DANIEL GALLAGHER, SAI

BASIS OF EVALUATION

- OYSTER CREEK AND DRESDEN-2:

  QUALITATIVE ANALYSIS OF IMPACT OF RESOLUTION OF EACH ISSUE ON DOMINANT CORE MELT SEQUENCES.

- MILLSTONE-1:

  QUANTITATIVE ANALYSIS OF CHANGE IN CORE MELT FREQUENCY, EXPOSURE, AND RISK FROM RESOLUTION OF EACH ISSUE.

IREP MILLSTONE-1 PRA USED FOR BASE CASE:

- APPLIES DIRECTLY TO MILLSTONE-1.

- OYSTER CREEK AND DRESDEN-2 FAIRLY SIMILAR TO MILLSTONE-1. CHANGES MADE TO MILLSTONE-1 FAULT TREES TO REPRESENT OTHER PLANTS FOR QUALITATIVE CONSIDERATION.

OYSTER CREEK/DRESDEN-2 CLASSIFICATION
OF ISSUE IMPORTANCE

CLASSIFICATION	CRITERION
HIGH	RESOLUTION OF ISSUE DOMINATES VALUE OF TOP EVENT OF A DOMINANT "PLANT" FAULT TREE OR DOMINANT SEQUENCE EVENT.
MEDIUM	RESOLUTION OF ISSUE IMPACTS BUT DOES NOT DOMINATE VALUE OF DOMINANT FAULT TREE OR DOMINANT SEQUENCE EVENT.
LOW	RESOLUTION OF ISSUE HAS NO IMPACT ON VALUE OF TOP EVENT OF DOMINANT FAULT TREE OR DOMINANT SEQUENCE EVENT.

SEP COMPARATIVE RISK RESULTS

ISSUE		IMPORTANCE		
		DRESDEN-2	OYSTER CREEK	MILLSTONE-1 (Δ CORE MELT)
III-8.A	LOOSE PARTS	LOW	LOW	0%
III-10.A	MOV THERMAL OVERLOAD BYPASS	MEDIUM	MEDIUM	1%
VI-4	CONTAINMENT ISOLATION	LOW	LOW	0%
VIII-3.B	DC INSTRUMENTATION	HIGH	HIGH	0.6%

OBJECTIVE:

EVALUATE THE SEP ISSUES FOR OYSTER CREEK, DRESDEN-2, AND MILLSTONE-1 BASED ON THE IMPACT THEIR RESOLUTION WOULD HAVE ON PROBABILISTIC CALCULATIONS OF RISK.

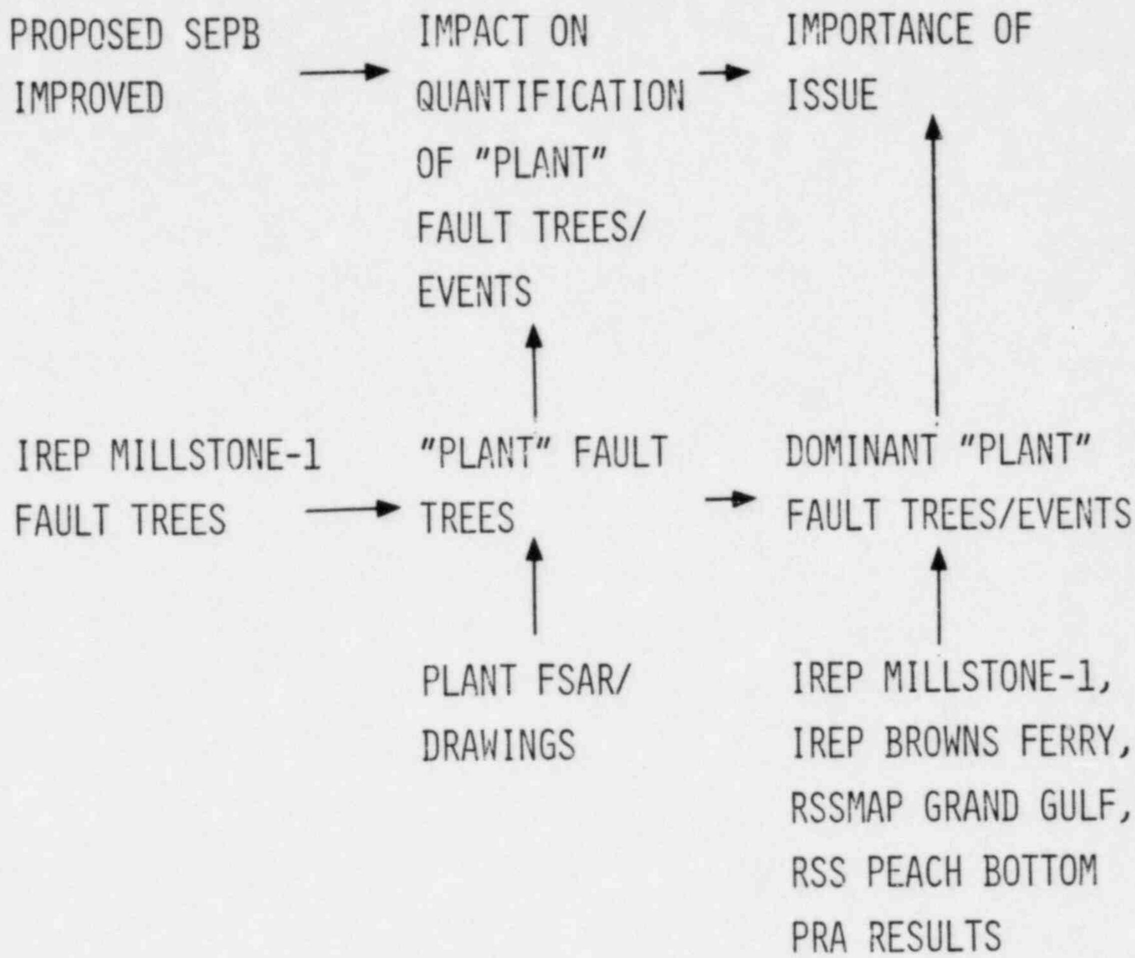
SCOPE:

THOSE ISSUES WHICH WERE WITHIN THE SCOPE OF WELL ESTABLISHED PRA TECHNIQUES.

DOMINANT FAULT TREE OR EVENT WOULD

APPEAR IN DOMINANT ACCIDENT SEQUENCES.

OYSTER CREEK/DRESDEN-2 METHODOLOGY



"PLANT" ≡ DRESDEN-2 OR OYSTER CREEK

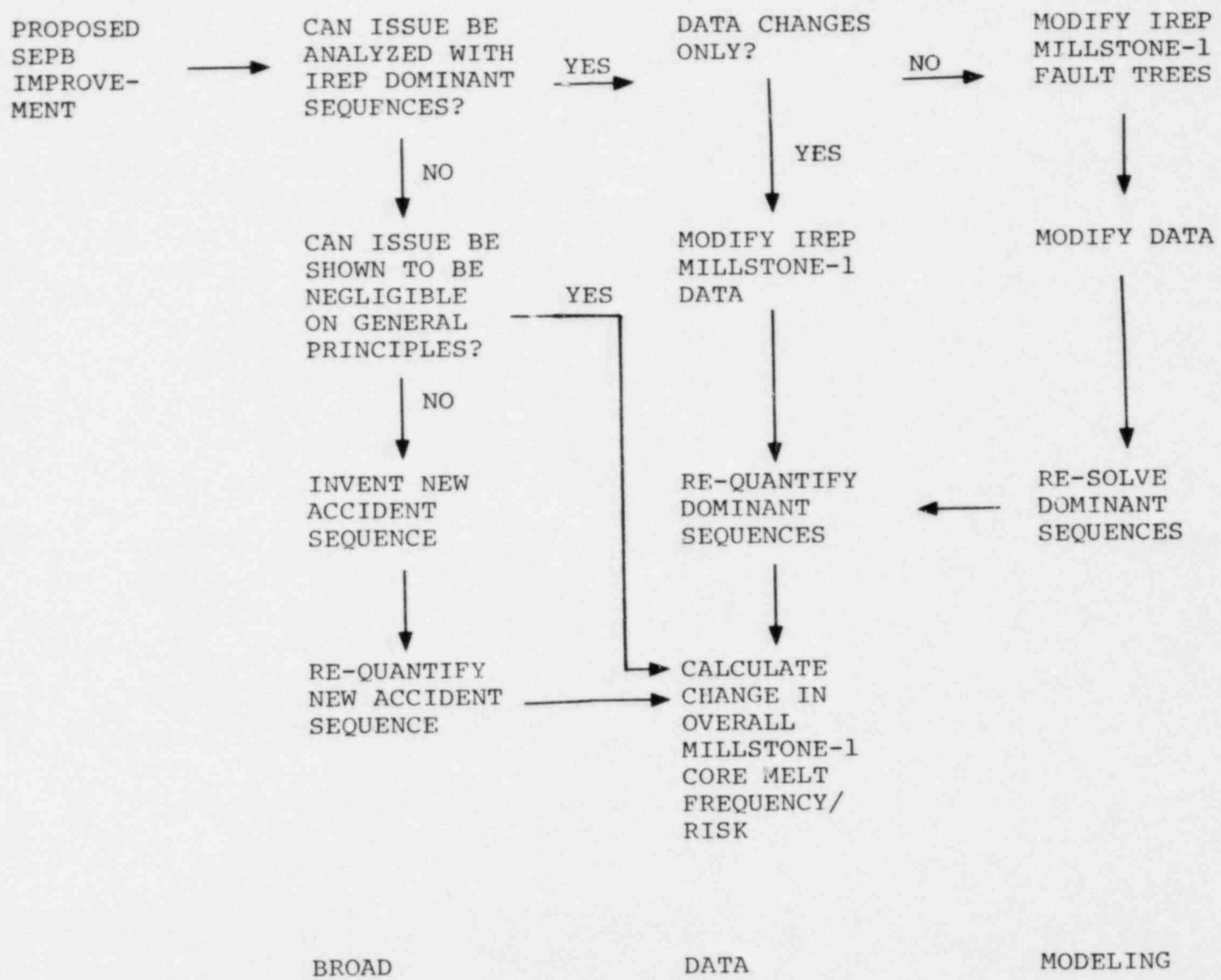
MILLSTONE-1 ANALYSIS:

RE-CALCULATED RESULTS OF IREP MILLSTONE-1 PRA INCORPORATING RESOLUTION OF EACH SEP ISSUE.

CATEGORIES OF MILLSTONE-1 ISSUE ANALYSIS

CATEGORY	DESCRIPTION
DATA	ISSUE AFFECTS ONLY BASIC EVENT DATA. NEW CUT SETS NOT REQUIRED.
MODELING	ISSUE AFFECTS DESIGN OF SYSTEM AND SYSTEM FAULT TREE. NEW CUT SETS WERE GENERATED.
BROAD	ISSUE NOT ANALYZED WITH IREP ACCIDENT SEQUENCES. ASSESSMENT MADE ON GENERAL PRINCIPLES OR INVENTION OF NEW SEQUENCES.

MILLSTONE-1 METHODOLOGY



RESULTS OF MILLSTONE-1 ANALYSIS

ISSUE	CONCERN	DECREASE IN CORE MELT FREQUENCY (1) $(R\text{-}YR)^{-1}$	DECREASE IN EXPOSURE (2) (MAN-REM/R-YR)	NEW RISK/ OLD RISK
III-5.B	PIPE BREAK OUTSIDE CONTAINMENT	(3)		
III-8.A	LOOSE PARTS	0.0	0.0	1.0
III-10.A	MOV THERMAL OVERLOAD PROTECTION	$3x10^{-6}$	3	0.996
V-5	LEAK DETECTION	$3x10^{-6}$	16	0.98
V-10.B	COLD SHUTDOWN	0.0	0.0	1.0
V-11.A	RWCU LOCA	$4x10^{-7}$	3	0.991
VI-4	CONTAINMENT PENETRATIONS	0.0	0.0	1.0
VI-6	CONTAINMENT LEAK TESTING	0.0	0.0	1.0
VI-7.A.3	TESTING OF ECCS	0.0	0.0	1.0
VI-7.C.1 VII-3	REDUNDANCY OF ELECTRICAL BUSES	$3x10^{-5}$	90	0.84
VI-10.A	TESTING OF RPS	0.0	0.0	1.0
VII-1.A	ISOLATION OF RPS	0.0	0.0	1.0
VIII-2	BYPASSING GAS TURBINE TRIPS	$1x10^{-6}$	3	0.995
VIII-3.A	BATTERY TESTING	(4)		

RESULTS OF MILLSTONE-1 ANALYSIS (Cont.)

ISSUE	CONCERN	DECREASE IN CORE MELT FREQUENCY (1) $(R\text{-}YR)^{-1}$	DECREASE IN EXPOSURE (2) (MAN-REM/R-YR)	NEW RISK/ OLD RISK
VIII-3.B	DC BUS INSTRUMENTATION	1.7×10^{-6}(5) 7.4×10^{-6}(6)	2(5) 8(6)	0.997(5) 0.987(6)
IX-3	PIPE BREAK SINGLE FAILURE IN SWS, TBSCCW	0.0	0.0	1.0
IX-5	VENTILATION	0.0	0.0	1.0
XV-1	TRANSIENTS WITH TURBINE BYPASS UNAVAILABLE	0.0	0.0	1.0
XV-3	MCPR, LOSS OF EXTERNAL LOAD	0.0	0.0	1.0
XV-18	MAIN STEAM LINE BREAK	0.0	0.0	1.0

(1) TOTAL CORE MELT FREQUENCY = 3×10^{-4}/REACTOR-YEAR.

(2) TOTAL EXPECTED EXPOSURE = 550 MAN-REM/REACTOR-YEAR.

(3) INFORMATION TO ANALYZE THIS ISSUE NOT RECEIVED FROM UTILITY.

(4) ISSUE COULD REDUCE BATTERY UNAVAILABILITY, AT MOST, BY A FACTOR OF 16. EFFECT ON RISK OUTSIDE SCOPE OF THIS ANALYSIS.

(5) WITHOUT DECREASE IN MAINTENANCE UNAVAILABILITY.

(6) WITH DECREASE IN MAINTENANCE UNAVAILABILITY.

RESULTS OF DRESDEN-2 ANALYSIS

Issue	System/Component	Change in Unavailability q_{new}/q_{old}	Appears in Dominant Fault Tree/Event	Affects Top Event	Importance
III-5.B	Pipe break outside containment	---	No	No	Low
III-8.A	Transients	1.0 (transient frequency)	Yes	No	Low
III-10.A	Valves in all ECCS	0.86 (1 valve)	Yes	Yes	Medium
V-5	Small LOCA	1.0 (LOCA frequency)	No	No	Low
V-11.A	RWCU LOCA	$1.2x10^{-6}$	No	---	Low*
V-11.B	Shutdown Cooling	0.85 (shutdown cooling)	Yes	Yes	Medium
VI-4	Containment integrity	---	No	---	Low
VI-6	Containment integrity	---	No	---	Low
VI-7.C.1	AC and DC power	1.0 (AC or DC)	Yes	No	Low
VI-10.A	Reactor Trip System, Engineered Safety Features	1.0 (RTS)	Yes	No	Low
VI-10.B	AC and DC power	1.0 (DC power)	Yes	No	Low

*If pressure relief valve sufficiently sized. High importance if not sufficiently sized.

RESULTS OF DRESDEN-2 ANALYSIS

Issue	System/Component	Change in Unavailability q_{new}/q_{old}	Appears in Dominant Fault Tree/Event	Affects Top Event	Importance
VII-1.A	Reactor Trip System	1.0 (RTS)	Yes	No	Low
VII-3	Cooldown procedures	---	No	No	Low
VIII-2	AC power	0.98 (1 Diesel)	Yes	No	Low
VIII-3.A	DC power	6.5×10^{-2}** (1 battery)	Yes	Yes	High
VIII-3.B	DC Power	0.19 (1 bus)	Yes	Yes	High
IX-5	Ventilation	---	No	No	Low
XV-1	Power Conversion System	1.0	Yes	No	Low
XV-16	Offsite doses	---	No	---	Low
XV-18	Offsite doses	---	No	---	Low

**If present battery testing is totally ineffective.

RESULTS OF OYSTER CREEK ANALYSIS

Issue	System/Component	Change in Unavailability q_{new}/q_{old}	Appears in Dominant Fault Tree/Event	Affects Top Event	Importance
III-8.A	Transients	1.0 (Transient Frequency)	Yes	No	Low
III-10.A	Valves in Most Systems	0.86 (1 valve)	Yes	Yes	Medium
IV-2	Reactor Trip System	1.0	Yes	No	Low
V-5	Small LOCA	≥0.24 (LOCA Frequency)	No	---	Low
V-10.B	Residual Heat Removal Procedures	1.0 (RHR)	Yes	No	Low
V-11.A	Interfacing Systems LOCA	---	No	---	Low
VI-4	Containment Integrity	---	No	---	Low
VI-7.A.3	Emergency Condensers	1.0 (Emergency Condensers)	Yes	No	Low
VI-7.C.1	AC Power	0.85 (AC Power)	Yes	Yes	Medium

RESULTS OF OYSTER CREEK ANALYSIS

Issue	System/Component	Change in Unavailability q_{new}/q_{old}	Appears in Dominant Fault Tree/Event	Affects Top Event	Importance
VI-10.A	Reactor Trip System, Engineered Safety Features	1.0 (RTS)	Yes	No	Low
VII-1.A	Reactor Trip System	1.0 (RTS)	Yes	No	Low
VII-1.B	Setpoints for Several Systems	0.93 (1 Sensor)	Yes	No	Low
VII-2	Breakers for Several Systems	0.71 (1 Breaker)	Yes	No	Low
VII-3	Vital Instrumentation	$0.36 - 1.2 \times 10^{-4}$ (Vital AC Panel)	Yes	No	Low
VIII-2	AC Power	0.98 (1 Diesel)	Yes	No	Low
VIII-3.B	DC Power	~0.25 (1 Bus)	Yes	Yes	High
VIII-4	Containment Integrity	---	No	---	Low
XV-16	Offsite Doses	---	No	---	Low
XV-18	Offsite Doses	---	No	---	Low
XV-19	Offsite Doses	---	No	---	Low

SUMMARY

PHASE II TOPICS - 137

	DRESDEN 2	MILLSTONE 1
GENERIC TOPICS DELETED	19	20
PLANT SPECIFIC DELETED	30	31
TOPICS REVIEWED	88	86
TOPICS ACCEPTABLE	54	48
INTEGRATED ASSESSMENT TOPICS	34	38
ISSUES	72	87

T/

GENERIC TOPICS DELETED

SEP Topic No.	SEP Title	TMI, USI, or SEP No.	TMI, USI, or SEP Title
II-2.B	Onsite Meteorological Measurements Program	TMI II.F.3 TMI III.A.1	Instrumentation for Monitoring Accident Conditions Improve Licensee Emergency Preparedness - Short Term
II-2.D	Availability of Meteorological Data in the Control Room	TMI II.F.3 TMI III.A.1 TMI I.D.1	Instrumentation for Monitoring Accident Conditions Improve Licensee Emergency Preparedness - Short Term Control Room Design Reviews
III-8.D	Core Supports and Fuel Integrity	USI A-2	Asymmetric Blowdown Loads on Reactor Primary Coolant System
III-9	Support Integrity	USI A-12 USI A-7 USI A-24 USI A-46 SEP III-6 SEP V-1	Fracture Toughness of Steam Generator and Reactor Coolant Pump Supports Mark I Containment Long-Term Program Environmental Qualification of Safety-Related Equipment Seismic Qualification of Equipment in Operating Plants Seismic Design Considerations Compliance With Codes and Standards (10 CFR Part 50, Section 50.55a)
III-11	Component Integrity	USI A-46 USI A-2 SEP III-6	Seismic Qualification of Equipment in Operating Plants Asymmetric Blowdown Loads on Reactor Primary Coolant Seismic Design Considerations
III-12	Envi[illegible]mental Qualification of Safe[illegible]-Related Equipment	USI A-24	Qualification of Safety-Related Equipment
* V-4	Piping and Safe-End Integrity	USI A-42	Pipe Cracks in Boiling Water Reactors
V-13	Waterhammer	USI A-1	Waterhammer
VI-2.A	Pressure-Suppression-Type BWR Containments	USI A-7	Mark I Containment Long-Term Program
VI-2.B	Subcompartment Analysis	USI A-2	Asymmetric Blowdown Loads on Reactor Primary Coolant System
VI-5	Combustible Gas Control	TMI II.B.7 USI A-48	Analysis of Hydrogen Control Hydrogen Control Measures and Effects of Hydrogen Burns on Safety Equipment
VI-7.E	Emergency Core Cooling System Sump Design and Test for Recirculation Mode Effectiveness	USI A-43	Containment Emergency Sump Reliability
VI-8	Control Room Habitability	TMI III.D.3.4	Control Room Habitability Requirements
VII-4	Effects of Failure in Nonsafety-Related Systems on Selected Engineered Safety Features	USI A-47 USI A-17	Safety Implications of Control Systems Systems Interactions in Nuclear Power Plants
VII-5	Instruments for Monitoring Radiation and Process Variables During Accidents	TMI II.F.1 TMI II.F.2 TMI II.F.3	Additional Accident Monitoring Instrumentation Identification of and Recovery From Conditions Leading to Inadequate Core Cooling Instruments for Monitoring Accident Conditions
IX-2	Overhead Handling Systems (Cranes)	USI A-36	Control of Heavy Loads Near Spent Fuel Pool
XIII-1	Conduct of Operations	TMI I.C.6 TMI III.A.1 TMI III.A.2	Procedures for Verification of Correct Performance of Operating Activities Improve Licensee Emergency Preparedness - Short-Term Improving Licensee Emergency Preparedness - Long-Term
XV-21	Spent Fuel Cask Drop Accidents	USI A-36	Control of Heavy Loads Near Spent Fuel Pool
XV-22	Anticipated Transients Without Scram	USI A-9	Anticipated Transients Without Scram
XV-24	Loss of All AC Power	USI A-44	Station Blackout

*MILLSTONE 1

TOPICS NOT APPLICABLE (CONT.)

SEP Topic No.	SEP title	Reason for deletion of topic
XI-2	Radiological (Effluent and Process) Monitoring Systems	Being resolved under generic activities A-02, "Appendix I." (See "Basis for Deletion" in Appendix A under Topic XI-2.)
XV-2	Spectrum of Steam System Piping Failures Inside and Outside Containment (PWR)	Not applicable to BWRs.
XV-6	Feedwater System Pipe Breaks Inside and Outside Containment (PWR)	Not applicable to BWRs.
XV-10	Chemical and Volume Control System Malfunction That Results in a Decrease in Boron Concentration in the Reactor Coolant (PWR)	Not applicable to BWRs.
XV-12	Spectrum of Rod Ejection Accidents (PWR)	Not applicable to BWRs.
XV-17	Radiological Consequences of Steam Generator Tube Failure (PWR)	Not applicable to BWRs.
XV-23	Multiple Tube Failures in Steam Generators	Not applicable to BWRs.
XVI	Technical Specifications	Will be addressed after completion of the integrated assessment.

TOPICS WHICH MEET
CURRENT CRITERIA OR
ARE ACCEPTABLE ON
"ANOTHER DEFINED BASIS"*

* THESE TOPICS ARE IDENTIFIED BY ASTERISKS

TOPIC	TITLE
II-1.A*	EXCLUSION AREA AUTHORITY AND CONTROL
II-1.B	POPULATION DISTRIBUTION
II-1.C	POTENTIAL HAZARDS OR CHANGES IN POTENTIAL HAZARDS DUE TO TRANSPORTATION, INSTITUTIONAL, INDUSTRIAL, AND MILITARY FACILITIES
II-2.A	SEVERE WEATHER PHENOMENA
II-2.C	ATMOSPHERIC TRANSPORT AND DIFFUSION CHARACTERISTICS FOR ACCIDENT ANALYSIS
II-3.A	HYDROLOGIC DESCRIPTION
II-4	GEOLOGY AND SEISMOLOGY
II-4.A*	TECTONIC PROVINCE
II-4.B	PROXIMITY OF CAPABLE TECTONIC STRUCTURES IN PLANT VICINITY
II-4.C*	HISTORICAL SEISMICITY WITHIN 200 MILES OF PLANT
II-4.D	STABILITY OF SLOPES
III-4.C	INTERNALLY GENERATED MISSILES
III-4.D	SITE-PROXIMITY MISSILES (INCLUDING AIRCRAFT)
III-7.D	CONTAINMENT STRUCTURAL INTEGRITY TESTS
III-8.C	IRRADIATION DAMAGE, USE OF SENSITIZED STAINLESS STEEL, AND FATIGUE RESISTANCE

III-10.C	SURVEILLANCE REQUIREMENTS ON BWR RECIRCULATION PUMP AND DISCHARGE VALVES
IV-1.A	OPERATION WITH LESS THAN ALL LOOPS IN SERVICE
IV-3	BWR JET PUMP OPERATING INDICATIONS
V-10.A	RESIDUAL HEAT REMOVAL SYSTEM HEAT EXCHANGER TUBE FAILURES
VI-1	ORGANIC MATERIALS AND POST ACCIDENT CHEMISTRY
VI-2.D	MASS AND ENERGY RELEASE FOR POSTULATED PIPE BREAK INSIDE CONTAINMENT (MILLSTONE EQUIVALENT)
VI-3	CONTAINMENT PRESSURE AND HEAT REMOVAL CAPABILITY (MILLSTONE EQUIVALENT)
VI-7.C	EMERGENCY CORE COOLING SYSTEM (ECCS) SINGLE-FAILURE CRITERION AND REQUIREMENTS FOR LOCKING OUT POWER TO VALVES, INCLUDING INDEPENDENCE OF INTERLOCKS ON ECCS VALVES
VI-7.C.2	FAILURE MODE ANALYSIS (EMERGENCY CORE COOLING SYSTEM)
VI-7.D	LONG-TERM COOLING PASSIVE FAILURES (E.G., FLOODING OF REDUNDANT COMPONENTS)
VII-1.B	TRIP UNCERTAINTY AND SETPOINT ANALYSIS REVIEW OF OPERATING DATA BASE

VII-2	ENGINEERED SAFETY FEATURES SYSTEM CONTROL LOGIC AND DESIGN
VII-6	FREQUENCY DECAY
VIII-4	ELECTRICAL PENETRATIONS OF REACTOR CONTAINMENT (DRESDEN EQUIVALENT)
IX-1	FUEL STORAGE (MILLSTONE EQUIVALENT)
IX-6	FIRE PROTECTION
XIII-2	SAFEGUARDS/INDUSTRIAL SECURITY
XV-4	LOSS OF NONEMERGENCY AC POWER TO THE STATION AUXILIARIES
XV-5	LOSS OF NORMAL FEEDWATER FLOW
XV-7	REACTOR COOLANT PUMP ROTOR SEIZURE AND REACTOR COOLANT PUMP SHAFT BREAK
XV-8	CONTROL ROD MISOPERATION (SYSTEM MALFUNCTION OR OPERATOR ERROR)
XV-9	STARTUP OF AN INACTIVE LOOP OR RECIRCULATION LOOP AT AN INCORRECT TEMPERATURE, AND FLOW CONTROLLER MALFUNCTION CAUSING AN INCREASE IN BWR FLOW RATE
XV-11	INADVERTENT LOADING AND OPERATION OF A FUEL ASSEMBLY IN AN IMPROPER POSITION (BWR)

XV-13	SPECTRUM OR ROD DROP ACCIDENTS (BWR)
XV-14	INADVERTENT OPERATION OF EMERGENCY CORE COOLING SYSTEM AND CHEMICAL AND VOLUME CONTROL SYSTEM MALFUNCTION THAT INCREASES REACTOR COOLANT INVENTORY
XV-15	INADVERTENT OPENING OF A PWR PRESSURIZER SAFETY/ RELIEF VALVE OR A BWR SAFETY/RELIEF VALVE
XV-19	LOSS-OF-COOLANT ACCIDENTS RESULTING FROM SPECTRUM OF POSTULATED PIPING BREAKS WITHIN THE REACTOR COOLANT PRESSURE BOUNDARY
XV-20	RADIOLOGICAL CONSEQUENCES OF FUEL-DAMAGING ACCIDENTS (INSIDE AND OUTSIDE CONTAINMENT)
XVII	OPERATIONAL QUALITY ASSURANCE PROGRAM

DRESDEN 2

II-4.E	DAM INTEGRITY
II-4.F	SETTLEMENT OF FOUNDATIONS
III-3.A	EFFECTS OF HIGH WATER LEVEL ON STRUCTURES
IV-2	REACTIVITY CONTROL SYSTEMS
V-4	PIPING AND SAFE-END INTEGRITY
V-12.A	WATER PURITY AND BWR PRIMARY COOLANT
VI-7.A.3	ECCS ACTUATION SYSTEM
VIII-1.A	POTENTIAL EQUIPMENT FAILURES ASSOCIATED WITH DEGRADED GRID VOLTAGE
IX-3	STATION SERVICE AND COOLING WATER SYSTEMS
XV-3	LOSS OF EXTERNAL LOAD, TURBINE TRIP, LOSS OF CONDENSER VACUUM, CLOSURE OF MAIN STEAM ISOLATION VALVE

MILLSTONE 1

V-6	REACTOR VESSEL INTEGRITY
V-11.B	RESIDUAL HEAT REMOVAL SYSTEM INTERLOCK REQUIREMENTS
VI-6	CONTAINMENT LEAK TESTING
VI-10.B	SHARED ENGINEERED SAFETY FEATURES

ISSUES ADDRESSED BY PRA*

III-5.B	UNISOLATABLE PIPE BREAK OUTSIDE CONTAINMENT DRESDEN (4.8) - LOW MILLSTONE (4.10) - INFORMATION NOT AVAILABLE
III-8.A	LOOSE PARTS MONITORING DRESDEN (4.11) - LOW MILLSTONE (4.13) - 1.0
III-10.A	THERMAL OVERLOAD BYPASSES DRESDEN (4.12) - MEDIUM MILLSTONE (4.14) - 0.996
V-5	PRIMARY COOLANT LEAKAGE DETECTION DRESDEN (4.13) - LOW MILLSTONE (4.16.1) - 0.98
V-11.A	HIGH/LOW PRESSURE ISOLATION (RWCU) DRESDEN (4.16) - LOW (IF RELIEF WORKS) MILLSTONE (4.18) - 0.991
VI-4	CONTAINMENT ISOLATION DRESDEN (4.18) - LOW MILLSTONE (4.20) - 1.0
VI-10.A	RESPONSE TIME TESTING DRESDEN (4.22) - LOW MILLSTONE (4.24.3) - 1.0

* DRESDEN CHARACTERIZED AS LOW, MEDIUM OR HIGH
MILLSTONE RATIO OF NEW TO OLD RISK

VII-1.A	RSP ISOLATION DRESDEN (4.24) - LOW MILLSTONE (4.25) - 1.0
VIII-2	DIESEL/TURBINE ANNUNCIATORS AND BYPASSES DRESDEN (4.26) - LOW MILLSTONE (4.28.5) - 0.995
VIII-3.A	BATTERY TESTING DRESDEN (4.27) - HIGH (IF EXISTING TEST INADEQUATE) MILLSTONE (4.29) - BEYOND SCOPE (QUALITATIVE)
VIII-3.B	DC SYSTEM MONITORING DRESDEN (4.28) - HIGH MILLSTONE (4.30) - 0.987
IX-5	LOSS OF VENTILATION DRESDEN (4.29) - LOW MILLSTONE (4.32) - 1.0
XV-1	FEEDWATER CONTROLLER FAILURE WITHOUT BYPASS DRESDEN (4.30) - LOW MILLSTONE (4. 33) - 1.0
XV-18	MAIN STEAM BREAK CONSEQUENCES DRESDEN (4.32) - LOW MILLSTONE (4.36) - 1.0

DRESDEN

V-11.B (4.17) - SHUTDOWN COOLING INTERLOCK TESTING MEDIUM

VI-7.C.1 (4.21) - DISCONNECT LINK/BREAKERS PROCEDURES LOW

VI-10.B (4.23) - PARALLELING BATTERIES LOW

VII-3 (4.25) - SHUTDOWN PROCEDURES LOW

XV-16 (4.31) - SMALL LINE BREAK CONSEQUENCES LOW

MILLSTONE

V-10.B (4.17) - SHUTDOWN PROCEDURES
1.0

VI-7.A.3 (4.21) - CSS/ESW TESTING
1.0

VI-7.C.1/VII-3 (4.23) - BUS TRANSFERS, LOSS OF INSTRUMENT BUS
0.84

VI-10.A (4.24) - RPS TESTING
1.0

IX-3 (4.31) - SERVICE WATER NONREDUNDANT PIPE FAILURE
1.0

XV-3 (4.34) - LOSS OF LOAD INITIAL POWER
1.0

ISSUES NOT

REQUIRING BACKFIT

AS A RESULT OF SEP REVIEW

T1

TOPIC III-5.B, EFFECTS OF PIPE BREAK OUTSIDE CONTAINMENT

DIFFERENCE

4.8 DRESDEN 2
4.10.3 MILLSTONE 1
4..10(1) OYSTER CREEK

- PIPE BREAKS BETWEEN THE OUTBOARD ISOLATION VALVE AND THE CONTAINMENT WITH FAILURE OF THE INBOARD ISOLATION VALVE OR PIPE BREAKS DOWNSTREAM OF THE OUTBOARD ISOLATION VALVE WHICH DAMAGES THAT VALVE AND RENDERS IT OPERABLE WITH FAILURE OF THE INBAROD ISOLATION VALVE RESULTS IN AN UNISOLABLE BREAK. NO STRESS DATA HAS BEEN PROVIDED FOR THE MAIN STEAM ISOLATION CONDENSER PIPING OR THE RWCU PIPING IN THESE LOCATIONS.

COMMON RESOLUTION

- PRA CONCLUDED THAT LOCA FREQUENCIES ASSOCIATED WITH THESE SCENERIOS IS ON THE ORDER OF 2×10^{-7}/YR.

TOPIC III-6, SEISMIC DESIGN CONSIDERATIONS

DIFFERENCE

4.9.4 DRESDEN 2
4.11.5 MILLSTONE 1
4.11 (4) OYSTER CREEK

- THE ABILITY OF SAFETY-RELATED ELECTRICAL EQUIPMENT TO FUNCTION DURING AND AFTER A SEISMIC EVENT HAS NOT BEEN DEMONSTRATED

COMMON RESOLUTION

- THE SEP OWNER'S GROUP PROGRAM FOR EQUIPMENT QUALIFICATION WILL BE CONSIDERED IN THE DEVELOPMENT OF USI A-46 CRITERIA AND WILL BE IMPLEMENTED THROUGH THE GENERIC A-46 PROGRAM.

TOPIC III-8.A. LOOSE PARTS MONITORING AND CORE BARREL VIBRATION MONITORING

DIFFERENCE

4.11 DRESDEN 2
4.13 MILLSTONE 1
4.14(1) OYSTER CREEK

- NO LOOSE PARTS MONITORING PROGRAM EXISTS AT EITHER FACILITY.

COMMON RESOLUTION

- LOOSE PARTS INCIDENTS AT 31 REACTORS RESULTED IN STRUCTURAL DAMAGE IN ONLY 9 INCIDENTS AND NONE OF THESE CAUSED AN ACCIDENT.

- MOST LOOSE PARTS CAN BE DETECTED DURING REFUELING.

- LIMITED PRA CONCLUDED THAT ELIMINATING LOOSE PARTS INDUCED TRANSIENTS BY INSTALLING A LOOSE PARTS MONITORING PROGRAM HAS NO EFFECT ON RISK.

- BACKFITTING WILL ALSO BE CONSIDERED WHEN IMPLEMENTATION REQUIREMENTS OF REVISION 1 TO REGULATORY GUIDE 1.133 ARE DETERMINED.

TOPIC VI-4, CONTAINMENT ISOLATION

DIFFERENCE

4.18.4 DRESDEN 2
4.20.6 MILLSTONE 1
4.22.5 OYSTER CREEK

- TWO CHECK VALVES ARE USED IN SERIES OUTSIDE THE CONTAINMENT AN ISOLATION VALVES IN THE FEEDWATER SYSTEM.

COMMON RESOLUTION

- HIGH PRESSURE HEATER DISCHARGE VALVES PROVIDE BACKUP ISOLATION CAPABILITY.

- EXISTING FEEDWATER CHECK VALVES ARE SUBJECT TO LOCAL LEAK RATE TESTING TO INSURE THEIR FUNCTIONABILITY.

- ISOLATION RELIABILITY WOULD NOT BE SIGNIFICANTLY IMPROVED BY ADDING A REMOTE MANUAL VALVE.

DIFFERENCE

4.18.5 DRESDEN 2
4.20.4 MILLSTONE 1
4.22.3 OYSTER CREEK

- BOTH ISOLATION VALVES ARE LOCATED OUTSIDE CONTAINMENT INSTEAD OF ONE INSIDE AND ONE OUTSIDE.

COMMON RESOLUTION

- LIMITED PRA FOR PALISADES CONCLUDED LITTLE IMPROVEMENT WOULD BE OBTAINED BY HAVING ONE VALVE INSIDE AND ONE OUTSIDE BECAUSE THE PROBABILITY OF FAILURE OF BOTH VALVES IS GREATER THAN THE PROBABILITY OF PIPE FAILURE BETWEEN THE CONTAINMENT AND THE FIRST ISOLATION VALVE.

TOPIC VI-7.A.4, CORE SPRAY NOZZLE EFFECTIVENESS

DIFFERENCE

4.20 DRESDEN 2
4.22 MILLSTONE 1
4.26.1 OYSTER CREEK

- INFORMATION DERIVED FROM JAPANESE CORE SPRAY TESTS SUGGEST THAT THE CENTRAL FUEL BUNDLES OF A BWR/3 CORE MAY RECEIVE LOW CORE SPRAY FLOW.

COMMON RESOLUTION

- THE ISSUE IS BEING REVIEWED INDEPENDENTLY OF SEP AS A MATTER RELATED TO GENERIC ISSUE A-16.

- THE JAPANESE DATA FOR A BWR/5 MAY ONLY BE APPLICABLE TO A BWR/4 AND A BWR/5 BECAUSE THEIR NOZZLE DESIGN IS SIMILAR AND IS DIFFERENT FROM A BWR/3 NOZZLE.

- GE HAS INFORMED THE STAFF THAT ANALYSES CAN BE PERFORMED TO SHOW THAT EVEN FOR LIMITING CASES OF A BWR/3 WITH CORE SPRAY ASSUMED TO FLOW DOWN PERIPHERAL CHANNELS, THE CALCULATED PEAK CLAD TEMPERATURES WILL NOT EXCEED THE 10 CFR 50.46 LIMIT OF 2200°F.

TOPIC VI-10.A, TESTING OF REACTOR TRIP SYSTEM AND ENGINEERED SAFETY FEATURES, INCLUDING RESPONSE TIME TESTING

<u>DIFFERENCE</u>

4.22 DRESDEN 2
4.24.3 MILLSTONE 1

- NOT ALL SENSORS OR CHANNEL RESPONSE TIME BETWEEN CHANNEL TRIP AND DE-ENERGIZATION OF THE SCRAM RELAY ARE TESTED.

<u>COMMON RESOLUTION</u>

- LIMITED PRA INDICATED THAT THE ISSUE HAS LOW SAFETY SIGNIFICANCE BECAUSE THE TESTING IS CONCERNED WITH EVENTS ON THE ORDER OF SECONDS AND PRA HAS SHOWN THAT RESPONSE TIMES ON THE ORDER OF MINUTES IS SUFFICIENT.

TOPIC VIII-2, ONSITE EMERGENCY POWER SYSTEMS

<u>DIFFERENCE</u>

4.26.1 DRESDEN 2
4.28.5 MILLSTONE 1

- EMERGENCY AC POWER ANNUNCIATORS DO NOT MEET CURRENT CRITERIA (IEEE STD. 279-1971).

<u>COMMON RESOLUTION</u>

- MODIFICATIONS APPROVED BY THE NRC WERE MADE TO THESE SYSTEMS PREVIOUSLY.

TOPIC XV-1, DECREASE IN FEEDWATER TEMPERATURE, INCREASE IN FEEDWATER FLOW, INCREASE IN STEAM FLOW, AND INADVERTENT OPENING OF A STEAM GENERATOR RELIEF OR SAFETY VALVE

DIFFERENCE

4.30 DRESDEN 2
4.33 MILLSTONE 1
4.35 OYSTER CREEK

- FEEDWATER CONTROLLER FAILURE WITH THE TURBINE BYPASS INOPERABLE MAY BE THE LIMITING TRANSIENT.

COMMON RESOLUTION

- WILL BE HANDLED AS PART OF THE RELOAD.

- PRA INDICATES LOW IMPORTANCE TO RISK.

DRESDEN 2

TOPIC II-3.B - DRESDEN DESIGN BASIS GROUNDWATER LEVEL WAS 514 FT MSL. PLANT GRADE IS 517 FT MSL. (4.1.1).

RESOLUTION

SEP TOPIC III-3.A CONCLUDED STRUCTURAL INTEGRITY WOULD BE MAINTAINED AT WATER LEVELS UP TO 517 FT MSL.

TOPIC III-1 - FRACTURE TOUGHNESS TESTING DATA DO NOT EXIST FOR RSCS, RBCCW AND RWCU SYSTEMS. (4.2.2).

RESOLUTION

NOT NECESSARY DUE TO LOW IMPORTANCE OF SYSTEMS TO SAFETY.

TOPIC III-2 - REACTOR BUILDING STRUCTURE ABOVE OPERATING FLOOR CANNOT WITHSTAND DESIGN BASIS TORNADI (360 MPH). (4.3.1).

VENTILATION STACK CANNOT WITHSTAND DESIGN BASIS TORNADO. (4.3.2).

RESOLUTION

PROBABILITY OF TORNADO (APPROXIMATELY 10^{-5} FOR REACTOR BUILDING AND 10^{-6} FOR VENT STACK) IS ACCEPTABLY LOW. RADIOLOGICAL CONSEQUENCES OF FAILURE ARE SMALL.

TOPIC III-3.C - INSPECTION FREQUENCY OF FLOW REGULATION STATION DOES NOT COMPLY WITH CURRENT CRITERIA (4.4.1).

RESOLUTION

STATION IS NOT SAFETY RELATED.

TOPIC III-3.C - INSPECTION FREQUENCY OF INTAKE AND DISCHARGE STRUCTURE DOES NOT COMPLY WITH CURRENT CRITERIA (SECTION 4.4.2).

RESOLUTION

TOPIC II-4.D CONCLUDED ROCK IS SOUND. INSPECTIONS WILL BE PERFORMED FOLLOWING EXTREME EVENTS.

TOPIC III-4.A - PORTIONS OF SERVICE WATER SYSTEM SERVICING CONTROL ROOM VENTILATION ARE NOT MISSILE PROTECTED (4.5.1(1)).

STATION BATTERIES ARE LOCATED IN CONCRETE BLOCK WALL ROOM (4.5.2).

RESOLUTION

TO BE ADDRESSED AS PART OF TMI ACTION PLAN (NUREG-0737, ITEM III.D.3.4.).

BATTERY ROOM IS LOCATED IN MISSILE PROTECTED TURBINE BUILDINGS.

TOPIC III-6 - SAFETY-RELATED PIPING SUPPORTS MAY NOT BE DESIGNED CONSERVATIVELY (4.9.1).

RESOLUTION

TO BE RESOLVED AS PART OF IE BULLETIN 79-14.

TOPIC III-10.A - LIMIT SWITCH MUST BYPASS TORQUE SWITCH TO INITIATE VALVE MOVEMENT (4.12.2).

RESOLUTION

CRITERIA IS MET.

TOPIC V-5 - SUMP LEVEL MONITORING TESTABILITY DOES NOT MEET CURRENT REQUIREMENTS (4.13.3).

RESOLUTION

PROCEDURES FOR PUMPING SUMP ONCE PER SHIFT ASSURES OPERABILITY.

TOPIC V-6 - STAFF REQUESTED INFORMATION ON REACTOR VESSEL MATERIALS AND UPPER SHELF ENERGY (4.14).

RESOLUTION

LICENSEE REQUEST FOR TECHNICAL SPECIFICATION AMENDMENT REGARDING REACTOR MATERIAL SURVEILLANCE IS BEING REVIEWED AS ROUTINE LICENSING ACTION.

T2

TOPIC V-11.A - RWCU SYSTEM ISOLATION VALVE INTERLOCKS ARE NOT INDEPENDENT (4.16).

RESOLUTION

RWCU SYSTEM RELIEF CAPACITY IS SUFFICIENT OPERATOR WILL HAVE SUFFICIENT INFORMATION TO TAKE MANUAL ACTION.

TOPIC VI-6 - RBCCW SYSTEM AND CONTAINMENT AIRLOCK ARE NOT LEAK TESTED (4.19).

RESOLUTION

REVIEWED AS PART OF 10 CFR 50, APPENDIX J.

TOPIC VI-10.B - DIESEL GENERATOR 2/3 CAN BE PLACED IN "BYPASS" MODE DURING OPERATION (4.23.2).

RESOLUTION

LICENSEE HAS MODIFIED OPERATING PROCEDURES TO REQUIRE DIESEL GENERATOR MODE TO BE PLACED IN "NORMAL" POSITION.

TOPICS V-10.B, V-11.B AND VII-3 - NO PROCEDURES FOR ACHIEVING HOT AND COLD SHUTDOWN FROM OUTSIDE CONTROL ROOM (4.25.1); NO PROCEDURES FOR ACHIEVING COLD SHUTDOWN USING ONLY SAFETY GRADE SYSTEM (4.25.2); AND LONG TERM COOLING IS SUSCEPTIBLE TO SINGLE FAILURES IF SHARED DIESEL GENERATOR IS NOT AVAILABLE TO UNIT 2 (4.25.3).

RESOLUTION

LICENSEE HAS MODIFIED PROCEDURE (APRIL 1982) TO ACHIEVE AND MAINTAIN HOT SHUTDOWN. APPENDIX R - FIRE PROTECTION SUBMITTAL HAS COMMITMENT TO ACHIEVE COLD SHUTDOWN. PROCEDURES EXIST FOR SHUTDOWN USING ISOLATION CONDENSERS AND HPCI UNTIL SHARED DIESEL GENERATOR IS MANUALLY TRANSFERRED.

TOPIC IX-5 - LPCI/CORE SPRAY ROOM VENTILATION IS SUSCEPTIBLE TO SINGLE FAILURES (4.29.2(1)).

RESOLUTION

VENTILATION CAN BE MANUALLY RESTORED. ROOM COOLING IS PROVIDED.

MILLSTONE 1

TOPICS II-3.B, II-3.B.1 AND II-3.C - PONDING MAY OCCUR NEAR THE RADWASTE AND CONTROL BUILDING (4.1.3).

RESOLUTION

- ALTHOUGH NO CREDIT HAS BEEN GIVEN FOR THE FLOOD-GATE WHICH PROTECTS THIS DOOR, A NORMALLY CLOSED CONTROLLED ACCESS DOOR EXISTS TO PROVIDE SOME RESISTANCE TO INLEAKAGE.
- IF INLEAKAGE DOES OCCUR, THE WATER WOULD HAVE TO TRAVEL THROUGH TWO ADDITIONAL DOORS BEFORE AFFECTING SAFETY-RELATED EQUIPMENT.
- THE SAFETY-RELATED EQUIPMENT WHICH COULD BE AFFECTED IF INLEAKAGE OCCURS THROUGH THESE TWO ADDITIONAL DOORS, ARE ELEVATED, SURROUNDED BY GRATING OR LOCATED IN WATER TIGHT ROOMS.

TOPICS II-3.B, II-3.B.1 AND II-3.C - THE GAS TURBINE BUILDING MAY BECOME FLOODED DURING A PMP (4.1.4).

RESOLUTION

- THE LICENSEE WILL KEEP THE LARGE FLOOD-GATE CLOSED.
- A CONTROLLED ACCESS DOOR EXISTS AT THE OTHER ENTRANCE TO PROVIDE SOME RESISTANCE TO INLEAKAGE.
- ALTERNATE SHUTDOWN METHODS EXIST.

TOPICS II-3.B, II-3.B.1 AND II-3.C - THE DIESEL FUEL OIL TRANSFER PUMPS ARE SUSCEPTIBLE TO WAVE ACTION DURING A PMH (4.1.5).

RESOLUTION

- SHUTDOWN CAN BE ACHIEVED AND MAINTAINED BY USE OF THE ISOLATION CONDENSER AND DIESEL-DRIVEN FIRE PUMPS. (FLOOD PROTECTED WITH SUPPLY FOR 12 HOURS).
- THE FUEL OIL TRANSFER PUMPS ELECTRICAL MOTORS ARE ONLY 1.3 FT. BELOW THE CONSERVATIVELY ESTIMATED PMH WAVE ACTION HEIGHT.
- UNDER SECTION 4.1.6, FLOOD EMERGENCY PROCEDURES WILL BE REVISED TO ADDRESS SHUTDOWN WITH A LOSS OF OFFSITE POWER AND FAILURE OF THE FUEL OIL TRANSFER PUMPS.

TOPIC III-5.B - THE EFFECTS OF MODERATE-ENERGY PIPING CRACKS WAS NOT ADDRESSED BY THE LICENSEE (4.10.1).

RESOLUTION

- AN ANALYSIS OF THE MODERATE ENERGY SYSTEMS INDICATES THAT:
  - FLOODING IN THE TURBINE BUILDING (CONDENSER BAY) WOULD AFFECT THE FEEDWATER COOLAINT INJECTION SYSTEM, BUT THE REST OF THE ECCS WOULD REMAIN AVAILABLE FOR PLANT SHUTDOWN.
  - FLOODING IN THE REACTOR BUILDING (CORNER ROOMS) DOES NOT PREVENT SAFE SHUTDOWN.
- THE WETTING OR SPRAYING OF SAFETY-RELATED ELECTRICAL EQUIPMENT IS BEING ADDRESSED GENERICALLY AS PART OF THE ENVIRONMENTAL QUALIFICATION PROGRAM OF ELECTRICAL EQUIPMENT (USI A-24).

TOPIC III-6 - THE SUPPORT OF THE LOW-PRESSURE COOLANT INJECTION/CONTAINMENT SPRAY HEAT EXCHANGERS MIGHT NOT BE ADEQUATELY RESTRAINED (4.11.3).

RESOLUTION

THE LICENSEE PROVIDED ADDITIONAL INFORMATION. THE STAFF HAS REVIEWED THE RESTRAINTS AND MOUNTING DETAILS AND HAS FOUND THEM ACCEPTABLE.

TOPIC III-6 - THE DESIGN ADEQUACY OF THE ANCHORAGE SYSTEM OF SOME TRANSFORMERS AND CONTROL ROOM PANELS MIGHT NOT BE ADEQUATE TO PREVENT THE SLIDING OR OVERTURNING OF THE EQUIPMENT DURING A SEISMIC EVENT (4.11.4).

RESOLUTION

THE LICENSEE WILL PROVIDE THE STAFF ADDITIONAL INFORMATION ON THE ANCHORAGE DESIGN OF THE AFFECTED EQUIPMENT.

TOPIC III-6 - THE STAFF WAS UNABLE TO EVALUATE THE RECIRCULATION PUMP SNUBBER SUPPORTS BECAUSE OF INSUFFICIENT INFORMATION.

RESOLUTION

THE LICENSEE HAS REVIEWED THIS ISSUE AS PART OF THE IEB 79-14 AND HAS COMMITTED TO INSTALL SUPPORT MODIFICATIONS AS A RESULT. THE LICENSEE WILL PROVIDE THE STAFF WITH AN ANALYSIS OF THE RECIRCULATION PUMP SNUBBER SUPPORTS.

TOPIC IV-2 - THERE WAS INSUFFICIENT INFORMATION AVAILABLE TO COMPLETE A SINGLE-FAILURE ANALYSIS (4.15).

RESOLUTION

ADDITIONAL INFORMATION PROVIDED TO SHOW THAT THE TYPES OF ROD MOTIONS ASSUMED IN TOPIC XV-8 ARE BOUNDING MOTIONS.

TOPIC V-5 - INFORMATION ON RCPB INTERSYSTEM LEAKAGE WAS INCOMPLETE (4.16.2).

RESOLUTION

PRA FOR DRESDEN 2 AND OYSTER CREEK CONCLUDED THAT THIS WAS NOT A SIGNIFICANT CONTRIBUTOR TO RISK.

MILLSTONE 1 HAS ACTIVITY MONITORS ON THE CCW SYSTEM AND EFFUENT MONITORS TO IDENTIFY SUCH LEAKAGE.

TOPIC VI-4 - THREE SYSTEMS USE LOCAL MANUAL ISOLATION VALVES AND EXCESS FLOW CHECK VALVES (4.20.5).

RESOLUTION

TWO OF THE SYSTEMS ARE ESF RELATED AND THEREFORE A SINGLE EXCESS FLOW CHECK PROVIDES ADEQUATE ISOLATION.

THE THIRD SYSTEM (TORUS LEVEL) MONITORS ESSENTIAL PARAMETERS AND THEREFORE THE ISOLATION VALVES SHOULD NOT BE AUTOMATIC.

TOPIC VI-7.A.3 - TESTING OF THE LPCI DOES NOT DEMONSTRATE THAT THE EMERGENCY SERVICE WATER SYSTEM (ESWS), WHICH PROVIDES COOLING TO THE LPCI SYSTEM HEAT EXCHANGERS, WILL START WHEN THE LPCI IS INITIATED (4.21.2).

RESOLUTION

THE ESWS IS MANUALLY INITIATED.

TECHNICAL SPECIFICATION 3/4-5.B AND STATION PROCEDURE SP623.19 ESTABLISH SURVEILLANCE REQUIREMENTS OF THE ESWS TO MAINTAIN A HIGH SYSTEM AVAILABILITY.

STATION PROCEDURE OP506 DIRECTS THE OPERATOR TO PLACE THE ESWS IN OPERATION, IN ACCORDANCE WITH OPERATING PROCEDURE 322, WHEN THE SUPPRESSION CHAMBER TEMPERATURE APPROACHES 90°F AND PLANT LOAD CONDITIONS PERMIT.

ACCORDING TO IREP LOCA SEQUENCE 2 (THE CONTAINMENT HEAT REMOVAL FAILS AND ALL OTHER FUNCTION SUCCEED). THE OPERATOR WILL HAVE ABOUT 20 HOURS TO START THE CONTAINMENT HEAT REMOVAL FUNCTION, THAT IS, START THE ESWS, TO AVOID CONTAINMENT OVERPRESSURE AND CONSEQUENT LOSS OF CORE-COOLING CAPABILITY.

TOPIC VII-3 - LOSS OF THE INSTRUMENT AC (IAC) BUS WOULD RESULT IN LOSS OF INDICATION IN THE CONTROL ROOM OF FLOW, TEMPERATURE LEVEL, AND/OR PRESSURE OF SYSTEMS REQUIRED TO SHUTDOWN THE REACTOR (4.26).

RESOLUTION

THE ISSUE WAS REVIEWED IN IE BULLETIN 79-27 AND FOUND TO BE ADEQUATE.

TOPIC XV-3 - THE MINIMUM CRITICAL POWER RATIO (MCPR) WAS CALCULATED BASED ON AN INITIAL POWER LEVEL OF 100% WITHOUT ALLOWANCE OF 2% TO ACCOUNT FOR POWER MEASUREMENT UNCERTAINTIES (4.34).

RESOLUTION

THE LICENSEE HAS ANALYZED THIS TRANSIENT FOR RELOAD 8 USING THE NRC-APPROVED ODYN CODE. ALTHOUGH THE INITIAL POWER LEVEL USED WAS 100%, AN UNCERTAINTY FACTOR OF 1.044 WAS USED. THIS 4.4% OVERALL UNCERTAINTY FACTOR COMPENSATES FOR THE DIFFERENCE IN INITIAL POWER LEVEL ASSUMED.

ISSUES REQUIRING

ADDITIONAL EVALUATION

WITH POTENTIAL FOR

BACKFIT

TOPIC III-2

4.3.3 DRESDEN 2
4.4.4 MILLSTONE 1

NO EVALUATION OF SAFETY RELATED COMPONENTS OUTSIDE OF QUALIFIED STRUCTURES.

RESOLUTION

LICENSEE IDENTIFY COMPONENTS AND ASSURE THEY ARE PROTECTED OR SAFE SHUTDOWN CAN BE ACHIEVED WITHOUT THEM.

TOPIC III-4.B

4.6 DRESDEN 2
4.8 MILLSTONE 1
4.7 OYSTER CREEK

TURBINE INSPECTION PROGRAM FOR LOW PRESSURE STAGES DOES NOT MEET CURRENT CRITERIA.

RESOLUTION

LICENSEE HAS PROVIDED SCHEDULE AND BASIS FOR CURRENT INSPECTION PROGRAM - UNDER STAFF REVIEW.

TOPIC III-6

4.9.3 DRESDEN 2
4.11.6 MILLSTONE 1
4.11(5) OYSTER CREEK

INSUFFICIENT INFORMATION REGARDING QUALIFICATION OF ELECTRICAL CABLE TRAYS (4.9.3).

RESOLUTION

LICENSEE IMPLEMENT PLANT SPECIFIC ANALYSIS UPON COMPLETION OF SEP OWNERS GROUP DEVELOPMENT OF ANALYTICAL METHODOLOGIES.

TOPIC IX-5

4.29.1 DRESDEN 2
4.32.2 MILLSTONE 1
4.34(4) OYSTER CREEK

LOSS OF BATTERY ROOM VENTILATION COULD RESULT IN BUILDUP OF COMBUSTIBLE HYDROGEN GAS (4.29.1).

RESOLUTION

LICENSEE TO DEMONSTRATE THAT HYDROGEN WILL NOT REACH COMBUSTIBLE LIMITS.

DRESDEN 2

TOPIC III-1 - RADIOGRAPHY REQUIREMENTS FOR CLASS 2 VESSELS BUILT TO CLASS C REQUIREMENTS CONTAINING CATEGORY C JOINTS AND THE EXAMINATION GIVEN TO RECIRCULATION SYSTEM PUMP CASING HAVE NOT BEEN ADDRESSED (4.2.1). FRACTURE TOUGHNESS DATA FOR SYSTEM COMPONENTS INTERFACING WITH THE REACTOR COOLANT PRESSURE BOUNDARY HAVE NOT BEEN PROVIDED (4.2.2(2)).

RESOLUTION

PROVIDE NECESSARY INFORMATION IN A FSAR UPDATE REVISION WITHIN 2 YEARS.

TOPIC III-2 - ROOF DECKS WITH BUILT UP ROOFING MAY NOT WITHSTAND DESIGN BASIS TORNADO LOADINGS (4.3.4 AND 4.4.5).

RESOLUTION

LICENSEE DEMONSTRATE ADEQUACY OF ROOF DECKS OR ASSURE FAILURE WILL NOT AFFECT SAFE SHUTDOWN OR CAUSE UNACCEPTABLE RADIOLOGICAL CONSEQUENCES.

TOPIC III-2 - INSUFFICIENT INFORMATION REGARDING COMBINATION OF WIND LOADS WITH OTHER LOADS (4.3.5).

RESOLUTION

TO BE ADDRESSED IN TOPIC III-7.B.

TOPIC III-4.A - PORTIONS OF SWS SERVICING THE AUXILIARY ELECTRICAL EQUIPMENT ROOM VENTILATION SYSTEM ARE NOT MISSILE PROTECTED (4.5.1(2)). DIESEL GENERATOR AIR INTAKE AND EXHAUST SYSTEMS (DG 2 AND DG 2/3) ARE NOT MISSILE PROTECTED (4.5.3). EXTERIOR TANKS ARE NOT MISSILE PROTECTED (4.5.4).

RESOLUTION

LICENSEE DEMONSTRATE THAT FAILURE OF EXPOSED SYSTEMS WILL NOT AFFECT PLANT SAFETY OR PROVIDE MISSILE PROTECTION.

TOPIC III-5.A - LICENSEE MUST EVALUATE EFFECTS OF JET IMPINGEMENT ON TARGET PIPE REGARDLESS OF RATIO OF PIPE SIZES (4.7.1). LICENSEE MUST DEMONSTRATE ACCEPTABILITY OF PIPE WHIP AND JET IMPINGEMENT ON CONTAINMENT LINER (4.7.4).

RESOLUTION

DEMONSTRATE APPLICABILITY OF OSYTER CREEK ANALYSIS TO DRESDEN-2 DESIGN.

TOPIC III-5.A - LICENSEE MUST DEMONSTRATE FUNCTIONAL CAPABILITY OF TARGET PIPE FOLLOWING PIPE TO PIPE IMPACT (4.7.2). LICENSEE MUST ASSURE DETECTABILITY FOR THROUGH WALL CRACKS (4.7.3). LICENSEE MUST PROVIDE CRITERIA AND RESULTS FOR PIPE WHIP LOAD FORMULATION (4.7.4).

RESOLUTION

TO BE ADDRESSED IN LICENSEE'S FINAL REPORT.

TOPIC III-6 - INADEQUATE INFORMATION WAS AVAILABLE REGARDING:

(1) LIMITING MOMENT FOR PIPE STRESS DUE TO MOVs (4.9.2(1)).

(2) STRUCTURAL INTEGRITY OF REACTOR VESSEL AND INTERNAL SUPPORTS (4.9.2.(2)).

(3) STRUCTURAL INTEGRITY OF RECIRCULATION PUMP AND SUPPORTS (4.9.2(3)).

RESOLUTION

(1) STAFF REVIEWING LICENSEE INFORMATION.

(2) STAFF TO EVALUATE REACTOR INTERNALS IN CONJUNCTION WITH OYSTER CREEK REVIEW.

(3) LICENSEE TO PROVIDE FURTHER INFORMATION.

TOPIC III-7.B - INSUFFICIENT INFORMATION TO EVALUATE SAFETY MARGINS FOR ORIGINAL PLANT DESIGN (4.10).

RESOLUTION

LICENSEE HAS PROVIDED INFORMATION REGARDING APPLICABILITY OF CODE CHANGES AND ASSESSMENT OF SAFETY MARGINS - UNDER STAFF REVIEW.

TOPIC III-10.A - THERMAL OVERLOADS ARE NOT BYPASSED. INSUFFICIENT INFORMATION TO EVALUATE ADEQUACY OF SETPOINTS (4.12.1).

RESOLUTION

LICENSEE TO DEMONSTRATE ADEQUACY OF SETPOINTS FOR UNBYPASSED THERMAL OVERLOADS.

TOPIC V-5 - LEAK DETECTION SENSITIVITY DOES NOT MEET CURRENT ACCEPTANCE CRITERIA (4.13.1). DETECTION SYSTEMS ARE NOT SEISMICALLY QUALIFIED (4.13.2).

RESOLUTION

LEAK DETECTION SENSITIVITY AND SEISMIC ADEQUACY WILL BE EVALUATED IN CONJUNCTION WITH RESOLUTION OF SEP TOPIC III-5.A (HELB INSIDE CONTAINMENT).

TOPIC VI-4 - INSUFFICIENT INFORMATION REGARDING LEAKAGE DETECTION CAPABILITY FOR MANUAL ISOLATION VALVES ON LPCI AND CORE SPRAY SYSTEMS (4.18.2).

RESOLUTION

LICENSEE TO EVALUATE LEAKAGE DETECTION CAPABILITY.

TOPIC VI-7.C.1 - BATTERY CHARGER FAULTS CAN BE TRANSFERRED TO REDUNDANT AC SOURCES (4.21.1(1). DG 2/3 CONTROL SYSTEM FAULTS CAN BE TRANSFERRED TO REDUNDANT DC SOURCES (4.21.1(2)). INTERCONNECTION BETWEEN REDUNDANT DIVISIONS COULD TRANSFER FAULT FROM ONE DC SYSTEM TO OTHER DC SYSTEM (4.21.1(3).

RESOLUTION

LICENSEE IS PERFORMING A SHORT CIRCUIT ANALYSIS TO VERIFY ADEQUACY OF PROTECTIVE RELAYING.

TOPIC VI-7.C.1 - CLASS 1E SOURCES MAY NOT BE ADEQUATELY ISOLATED FROM NON-CLASS 1E LOADS (4.21.5).

RESOLUTION

LICENSEE WILL PERFORM SHORT CIRCUIT ANALYSIS TO DEMONSTRATE ADEQUACY OF PROTECTION.

TOPIC VI-10.B - BATTERY ROOM VENTILATION IS NOT POWERED FROM ONSITE SOURCE (4.23.4).

RESOLUTION

ADDRESSED AS PART OF TOPIC IX-5.

TOPIC VII-1.A - COMMON MODE ELECTRICAL FAULTS IN CONTROL ROOM PROCESS RECORDERS AND INDICATORS MAY DISABLE NEUTRON FLUX MONITORING SYSTEMS (4.24.1). COMMON MODE ELECTRICAL FAULTS IN PROCESS COMPUTER COULD BE TRANSFERRED TO RPS (4.24.2).

RESOLUTION

LICENSEE TO DEMONSTRATE ADEQUATE PROTECTION.

TOPIC VIII-3.A - BATTERY TEST PROGRAM DOES NOT MEET REGULATORY GUIDE 1.129 RECOMMENDATIONS (4.27).

STATUS

LICENSEE TO DEMONSTRATE CURRENT PROGRAM EXCEEDS RECOMMENDATIONS OF REGULATORY GUIDE 1.129.

TOPIC IX-5 - LOSS OF DG ROOM VENTILATION COULD RESULT IN LOSS OF DG OPERABILITY (4.19.2(2)).

RESOLUTION

LICENSEE TO EVALUATE CONSEQUENCES OF LOSS OF DG ROOM VENTILATION.

MILLSTONE 1

TOPICS II-3.B, II-3.B.1 AND II-3.C - THE PROBABLE MAXIMUM HURRICANE (PMH) FLOOD LEVEL, INCLUDING WAVE EFFECTS, RESULTS IN A WATER LEVEL OF 22.3 FT MSL (18.1 FT MSL STILLWATER LEVEL PLUS WAVE ACTION). SAFETY-RELATED STRUCTURES ARE PROTECTED BY CONCRETE FLOOD WALLS TO 19.0 FT MSL (4.1.1).

RESOLUTION

- THE LICENSEE WILL ANALYZE THE POTENTIAL EFFECTS OF THE INLEAKAGE AND IMPLEMENT ANY CORRECTIVE ACTION DEEMED NECESSARY.
- THE LICENSEE WILL ADDRESS THE STRUCTURAL CONCERNS IN THE INTEGRATED STRUCTURAL ASSESSMENT PROPOSED IN TOPIC III-7.B (4.12).

TOPICS II-3.B, II-3.B.1 AND II-3.C - THE INTAKE STRUCTURE MAY BE FLOODED BY A PMH SURGE AND HIGH WAVES ENTERING THROUGH THE OPENINGS BELOW (4.1.2).

RESOLUTION

THE LICENSEE WILL ANALYZE AND IMPLEMENT ANY NECESSARY CORRECTIVE ACTION.

TOPICS II-3.B, II-3.B.1 AND II-3.C - ROOFS WITH PARAPETS MAY BE OVERSTRESSED AS A RESULT OF LOCAL PMP (4.1.7).

RESOLUTION

THE LICENSEE HAS AGREED TO ADDRESS THIS CONCERN BY ANALYZING THE ROOFS OF SAFETY-RELATED STRUCTURES THAT HAVE PARAPETS AND INITIATE CORRECTIVE ACTION IF NECESSARY. THE ANALYSIS WILL BE PERFORMED AS PART OF AN INTEGRATED STRUCTURAL ANALYSIS CONDUCTED IN SEP TOPIC III-7.B.

TOPIC II-4.F - THE LICENSEE HAS NOT DEMONSTRATED THAT THE PILES SUPPORTING TURBINE BUILDING (4.2.1):

- WILL PROVIDE ADEQUATE LATERAL RESISTANCE TO THE SSE-INDUCED HORIZONTAL LOADS.
- HAVE SUFFICIENT EMBEDMENT INTO THE FOUNDATION MAT TO RESIST THE SSE-INDUCED LATERAL OR UPLIFT LOADS.
- WILL NOT UNDERGO A REDUNCTION OF SUPPORT CAPACITY DUE TO CORROSION (STEEL H-PILES).

RESOLUTION

THE LICENSEE WILL EVALUATE THE STRUCTURAL CAPACITY OF THE PILES AS PART OF THE INTEGRATED STRUCTURAL ASSESSMENT PROPOSED IN TOPIC III-7.B (4.12).

TOPIC II-4.F - THE CONCERNS OF THE TURBINE BUILDING (4.2.1) ARE APPLICABLE TO THE GAS TURBINE GENERATOR BUILDING, ADDITIONALLY (4.2.2). THE LICENSEE HAS NOT DEMONSTRATED THAT AN SSE WILL NOT PRODUCE A LOSS OF STRENGTH IN THE SATURATED GRANULAR SOILS SURROUNDING THE FRICTION PILES THAT WOULD CAUSE LARGE VERTICAL SETTLEMENTS OF THE BUILDING.

RESOLUTION

THE LICENSEE WILL EVALUATE THE STRUCTURAL CAPACITY OF THE PILES AS PART OF THE INTEGRATED STRUCTURAL ASSESSMENT PROPOSED IN TOPIC III-7.B (4.12).

TOPIC II-4.F - ONE AREA OF THE SERVICE WATER AND EMERGENCY SERVICE WATER LINES MAY BE SUPPORTED ON UNSUITABLE PEAT MATERIAL (4.2.3).

RESOLUTION

THE LICENSEE WILL CONDUCT SOIL INVESTIGATIONS IN THE SPECIFIED AREA AND WILL ADDRESS THE ISSUE AS PART OF THE INTEGRATED STRUCTURAL ASSESSMENT PROPOSED IN TOPIC III-7.B (4.12).

TOPIC III-1 - INFORMATION WAS NOT AVAILABLE DURING THE TOPIC REVIEW TO DETERMINE WHETHER PIPING, PUMPS, VALVES AND VESSELS HAD BEEN RADIOGRAPHED (4.3.1).

RESOLUTION

THE LICENSEE SHOULD VERIFY THAT ALL CLASS 1 AND 2 PIPING, PUMPS AND VALVES AND CLASS 2 VESSELS HAVE BEEN RADIOGRAPHED OR SUBSEQUENTLY VOLUMETRICALLY INSPECTED. IF NEITHER HAS BEEN DONE, A VOLUMETRIC INSPECTION SHOULD BE PERFORMED.

TOPIC III-1 - INFORMATION WAS NOT SUFFICIENT DURING THE TOPIC REVIEW TO DETERMINE WHETHER FRACTURE TOUGHNESS REQUIREMENTS ON CERTAIN CARBON STEEL COMPONENTS ARE MET (4.3.2).

RESOLUTION

THE LICENSEE SHOULD DETERMINE WHETHER THE COMPONENTS IDENTIFIED IN THE TOPIC ARE EXEMPT FROM FRACTURE TOUGHNESS REQUIREMENTS AND IF NOT, PERFORM AN EVALUATION OF THOSE COMPONENTS TO DETERMINE WHETHER THE TOUGHNESS OF THE MATERIAL MEETS THE FRACTURE TOUGHNESS REQUIREMENTS. IF IT DOES NOT DEMONSTRATE THAT THE CONSEQUENCES OF FAILURE ARE ACCEPTABLE OR REPLACE THE COMPONENTS.

TOPIC III-1 - INFORMATION WAS NOT SUFFICIENT DURING THE TOPIC REVIEW TO DETERMINE WHETHER STRESS LIMITS FOR CLASS 1 VALVES AND PRESSURE-TEMPERATURE RATINGS FOR CLASS 2 AND 3 VALVES USED IN THE ORIGINAL DESIGN MEET CURRENT ASME CRITERIA (4.3.3).

RESOLUTION

THE LICENSEE SHOULD VERIFY THAT STRESS LIMITS ARE MET AND THAT PRESSURE-TEMPERATURE RATINGS ARE IMPARABLE TO CURRENT STANDARDS. IF THEY ARE NOT, CORRECTIVE ACDTION (ANALYSIS OR UPGRADING) SHOULD BE TAKEN.

TOPIC III-1 - INFORMATION WAS NOT SUFFICIENT DURING THE TOPIC REVIEW TO DETERMINE WHETHER ASME REQUIREMENTS FOR PUMPS ARE MET (4.3.4).

RESOLUTION

THE LICENSEE SHOULD EVALUATE ORIGINAL DESIGN STANDARDS IN RELATION TO CURRENT REQUIREMENTS AND DETERMINE WHETHER ADEQUATE MARGINS EXIST.

TOPIC III-1 - INFORMATION WAS NOT SUFFICIENT DURING THE TOPIC REVIEW TO DETERMINE WHETHER THE STANDBY LIQUID CONTROL SYSTEM AND CONDENSATE STORAGE TANKS MEET CURRENT ASME COMPRESSIVE AND TENSILE STRESS REQUIREMENTS (4.3.5).

RESOLUTION

THE LICENSEE SHOULD EVALUATE THE ORIGINAL DESIGN OF THESE TANKS TO DETERMINE WHETHER THE ORIGINAL STRESS LIMITS ARE COMPARABLE TO CURRENT CRITERIA.

TOPIC III-2 - THE CAPACITY OF THE REACTOR BUILDING ABOVE THE OPERATING FLOOR IS LESS THAN REQUIRED BY CURRENT CRITERIA (4.4.1).

RESOLUTION

THE LICENSEE HAS PROPOSED TO EVALUATE THESE STRUCTURES AS PART OF AN INTEGRATED STRUCTURAL ANALYSIS IN SEP TOPIC III-7.B AND IDENTIFY ANY NECESSARY CORRECTIVE ACTION.

TOPIC III-2 - THE CAPACITY OF THE CHIMNEY IS LESS THAN REQUIRED BY CURRENT CRITERIA (4.4.2).

RESOLUTION

THE LICENSEE HAS PROPOSED TO DEMONSTRATE THAT FAILURE OF THE CHIMNEY WILL NOT PREVENT UNITS 1 OR 2 FROM ACHIEVING AND MAINTAINING SAFE-SHUTDOWN.

TOPIC III-2 - INSUFFICIENT INFORMATION EXISTED DURING THE TOPIC REVIEW TO DETERMINE THE EFFECTS FAILURE OF NON-QUALIFIED STRUCTURES ON OTHER STRUCTURES (4.4.3).

RESOLUTION

THE LICENSEE HAS PROPOSED TO REVIEW THIS CONCERN AND IDENTIFY ANY NECESSARY CORRECTIVE ACTION.

TOPIC III-2 - ROOFS OF SOME SAFETY-RELATED STRUCTURES APPEAR TO HAVE INSUFFICIENT RESISTANCE TO WITHSTAND CURRENT CRITERIA LOADING (4.4.5).

RESOLUTION

THE LICENSEE HAS PROPOSED TO EVALUATE ROOFS AS PART OF AN INTEGRATED STRUCTURAL ANALYSIS IN SEP TOPIC III-7.B AND IDENTIFY ANY NECESSARY CORRECTIVE ACTION.

TOPIC III-2 - SUFFICIENT INFORMATION WAS NOT AVAILABLE DURING THE TOPIC REVIEW TO DETERMINE WHETHER STRAIGHT WIND LOADS WERE CONSIDERED IN THE CORRECT LOAD COMBINATION (4.4.6).

RESOLUTION

THE LICENSEE HAS PROPOSED TO EVALUATE THIS AS PART OF AN INTEGRATED STRUCTURAL ANALYSIS IN SEP TOPIC III-7.B AND IDENTIFY ANY NECESSARY CORRECTIVE ACTION.

TOPIC III-3.A - FORCES RESULTING FROM WAVE ACTION FROM A PROBABLE MAXIMUM HURRICANE (PMH) MAY CAUSE STRUCTURAL DAMAGE TO THIS FLOODWALLS (4.5.1).

RESOLUTION

THE LICENSEE HAS PROPOSED TO EVALUATE THE STRUCTURAL CONSEQUENCES AS PART OF AN INTEGRATED STRUCTURAL ANALYSIS IN SEP TOPIC III-7.B AND IDENTIFY ANY NECESSARY CORRECTIVE ACTION.

TOPIC III-3.A - SUFFICIENT INFORMATION WAS NOT AVAILABLE DURING THE TOPIC REVIEW TO DETERMINE WHETHER GROUNDWATER LOADS WERE CONSIDERED IN THE CORRECT LOAD COMBINATIONS (4.5.2).

RESOLUTION

THE LICENSEE HAS PROPOSED EVALUATE THIS CONCERN BY REVIEWING ORIGINAL DESIGN INFORMATION OR DEMONSTRATE ACCEPTABILITY ON A SAMPLING BASIS.

TOPIC III-4.B - FUTURE INSPECTION SCHEDULES OF TURBINE DICS ARE UNKNOWN (4.8).

RESOLUTION

THE LICENSEE WILL PROPOSE A FUTURE INSPECTION SCHEDULE OF TURBINE DICS OF RESULTS OF THE LATEST INSPECTION ARE KNOWN.

TOPIC III-5.A - THE LICENSEE HAS NOT DEMONSTRATED THAT CASCADING PIPE BREAKS WOULD NOT PRODUCE CONDITIONS MORE SEVERE THAN THOSE ANALYZED BY THE LIMITING DBA (4.9.1).

RESOLUTION

THE LICENSEE WILL SUBMIT AN ANALYSIS OF CASCADING PIPE BREAKS AND PROPOSE ANY NECESSARY CORRECTIVE MEASURES. IF THE PROPOSED CORRECTIVE MEASURES INCLUDG LEAK DETECTION, THE LEAKAGE DETECTION SYSTEM SENSITIVITY WILL BE CONSIDERED UNDER TOPIC V-5 (4.16.1).

TOPIC III-5.A - THE LICENSEE'S JET IMPINGEMENT ANALYSIS WAS NOT IN CONFORMANCE WITH CURRENT CRITERIA (4.9.2).

RESOLUTION

THE LICENSEE HAS AGREED TO ADDRESS THE ABOVE FOUR ITEMS.

TOPIC III-5.A - PENETRATION OF THE DRYWELL BY PIPE WHIP HAS NOT BEEN ADEQUATELY ADDRESSED (4.9.3).

RESOLUTION

THE LICENSEE HAS AGREED TO EVALUATE THE POTENTIAL FOR AND THE CONSEQUENCES OF PIPE WHIPPING INTO THE CONTAINMENT LINER.

TOPIC III-5.B - THE JET EXPANSION MODEL USED BY THE LICENSEE FOR THE ISOLATION CONDENSER SYSTEM RESULTS IN A NON_CONSERVATIVE CALCULATION OF THE JET IMPINGEMENT LOADS ON TARGETS THAT ARE MORE THAN FIVE PIPE DIAMETERS FROM THE BREAK LOCATION.

FOR OTHER SYSTEMS THE CRITERIA USED BY THE LICENSEE TO CALCULATE THE JET IMPINGEMENT LOADS WERE NOT PROVIDED TO THE STAFF (4.10.2).

RESOLUTION

THE LICENSEE WILL PERFORM A REVIEW OF THE AFFECTED JET IMPINGEMENT ANALYSIS AND WILL SUBMIT IT TO THE STAFF.

TOPIC III-6 - THE STRUCTURAL INTEGRITY OF MOTOR-OPERATED VALVES ATTACHED TO SMALL PIPING (4 IN. OR SMALLER) WAS NOT ADDRESSED BY THE LICENSEE (4.11.2).

RESOLUTION

THE STRUCTURAL INTEGRITY OF THE VALVE REMAINS UNRESOLVED DUE TO LACK OF INFORMATION. THE LICESEE WILL ADDRESS THE STRUCTURAL INTEGRITY OF THE VALVES.

TOPIC III-7.B - CODE, LOAD AND LOAD COMBINATION CHANGES HAVE BEEN IDENTIFIED WHERE EXISTING SAFETY MARGINS IN STRUCUTRES HAVE BEEN REDUCED FROM THOSE THAT WOULD BE REQUIRED BY CURRENT CRITERIA (4.12).

RESOLUTION

THE LICENSEE HAS PROPOSED TO PERFORM ON A SAMPLING BASIS AN EVALUATION OF CODE, LOAD AND LOAD COMBINATION CHANGES ON AS-BUILT STRUCTURES AND ADDRESS THE STRUCTURAL ISSUES RAISED IN SEP TOPICS II-3.B, II-4.F, III-2, III-3.A, III-4.A, AND III-6.

TOPIC III-10.A - VALVES EXIST WHICH ARE NOT NORMALLY IN THEIR EMERGENCY POSITION AND HAVE THERMAL-OVERLOAD PROTECTION DEVICES WHICH ARE NOT BYPASSED BY AN EMERGENCY SIGNAL NOR HAS IT BEEN SHOWN THAT THEIR TRIP SETPOINTS HAVE BEEN CONSERVATIVELY SET (4.14).

RESOLUTION

THE LICENSEE WILL DEMONSTRATE THAT THE SETPOINTS ARE CONSERVATIVELY SET OR WILL MODIFY OR BYPASS THE THERMAL OVERLOAD PROTECTION DEVICES.

TOPIC V-5 - THE LICENSEE SHOULD PROVIDE A SEISMICALLY QUALIFIED RCPB LEAKAGE DETECTION SYSTEM THAT IS TESTABLE DURING OPERATION AND WHOSE SENSITIVITY SHOULD BE DETERMINED IN CONJUNCTION WITH SEP TOPIC III-5.A, PIPE BREAK INSIDE CONTAINMENT (4.16).

RESOLUTION

THE LICENSEE HAS AGREED TO ADDRESS SYSTEM SENSITIVITY IN CONJUNCTION WITH SEP TOPIC III-5.A.

TOPIC V-12.A - PLANT TECHNICAL SPECIFICATIONS DO NOT ADDRESS ACTIONS NEEDED TO INSURE ADEQUATE CAPACITY IN THE RWCU SYSTEM OR CONDENSATE DEMINERALIZERS (4.19.2).

RESOLUTION

THE LICENSEE WILL DEMONSTRATE THAT MAINTAINING MINIMUM RESERVE CAPACITIES IS NOT NECESSARY OR PROPOSE TECHNICAL SPECIFICATIONS TO ADDRESS THIS CONCERN.

TOPIC VI-4 - ADEQUATE SYSTEM LEAKAGE DETECTION CAPABILITIES SHOULD EXIST IN ORDER TO INFORM THE OPERATOR WHETHER TO CLOSE REMOTE MANUAL VALVES IN THE LPCI AND CORE SPARY SYSTEMS (4.20.3).

RESOLUTION

THE LICENSEE WILL DEMONSTRATE THAT ADEQUATE SYSTEM LEAK DETECTION EXISTS AND THAT THE OPERATOR HAS INDICATION OF ANY LEAKAGE.

TOPIC VI-4 - THE STAFF WAS UNABLE TO EVALUATE THE ISOLATION CAPABILITIES OF THE BRANCH LINES RELATED WITH PENETRATIONS X-204 AND X-211A BECAUSE OF INSUFFICIENT INFORMATION (4.20.7).

RESOLUTION

THE LICENSEE WILL REVIEW THE ISOLATION CAPABILITY OF THESE LINES AND EITHER IMPLEMENT MODIFICATIONS OR DEMONSTRATE THAT ADEQUATE ISOLATION CAPABILITY EXIST.

TOPIC VI-7.A.3 - THE TECHNICAL SPECIFICATIONS DO NOT REQUIRE THE TESTING OF THE CORE SPRAY SYSTEM PUMP SPACE COOLERS (4.21.1).

RESOLUTION

THE LICENSEE STATES THAT THESE SPACE COOLERS ARE NOT ESSENTIAL AND, THEREFORE, THEIR TESTING IS NOT REQUIRED. THE LICENSEE WILL PROVIDE THE STAFF WITH INFORMATION TO SUBSTANTIATE THIS CONCLUSION.

TOPIC VI-7.C.1 - BUSES EXIST WHICH ARE SUPPLIED FROM AUTOMATIC BUS TRANSFER SWITCHES WHICH CAN TRANSFER LOADS BETWEEN REDUNDANT SOURCES (4.23.1).

RESOLUTION

THE LICENSEE HAS PROPOSED TO EVALUATE THE EXISTING ABTs AND IDENTIFY ANY NECESSARY CORRECTIVE ACTION.

TOPIC VI-7.C.1 - THE 125-V DC SYSETM HAS THREE LOAD CENTERS THAT MAY BE MANUALLY TRANSFERRED BETWEEN REDUNDANT SOURCES UNDER ADMINISTRATIVE CONTROL; HOWEVER, THERE ARE NO INTERLOCKS TO PREVENT AN OPERATOR ERROR THAT WOULD PARALLEL THE EMERGENCY POWER SOURCES (4.23.2).

RESOLUTION

THE LICENSEE WILL EVALUATE THE EXISTING MANUAL TRANSFERS AND IDENTIFY THE CORRECTIVE ACTIONS DEEMED NECESSARY.

TOPIC VII-1.A - THERE ARE NO ISOLATION DEVICES BETWEEN THE NUCLEAR FLUX MONITORING SYSTEMS AND PROCESS RECORDERS AND INDICATING INSTRUMENTS NOR BETWEEN THE APRM SYSTEM AND THE PROCESS COMPUTER (4.25.1).

RESOLUTION

THE LICENSEE HAS PROPOSED TO CONDUCT TESTS TO DETERMINE IF INFACT, ISOLATION DOES EXIST AND WILL IDENTIFY CORRECTIVE ACTION IF NECESSARY.

TOPIC VIII-3.B - THE LIMITED PRA DETERMINED THAT EXISTING BATTERY OUTAGE LIMITS ARE TOO LONG AND THAT IF THESE LIMITS ARE REDUCED BY 50%, A REDUCTION OF 2.5% IN CORE-MELT FREQUENCY RESULTS (4.30).

RESOLUTION

THE LICENSEE WILL PROPOSE REVISED TECHNICAL SPECIFICATIONS OR JUSTIFY PRESENT ONES.

TOPIC IX-5 - A SINGLE ACTIVE FAILURE COULD DISABLE SPACE COOLING IN ROOMS WHERE LPCI AND CORE SPRAY PUMPS ARE LOCATED (4.32.1).

RESOLUTION

THE LICENSEE HAS PROPOSED TO DEMONSTRATE THAT THE SPACE COOLERS ARE NOT ESSENTIAL.

TOPIC IX-5 - THE STAFF WAS UNABLE TO EVALUATE THE DESIGN AND OPERATION OF THE AREA SPACE COOLERS FOR THE FWCI AND DIESEL GENERATOR AREAS BECAUSE OF INSUFFICIENT INFORMATION (4.32.3).

RESOLUTION

THE LICENSEE WILL PROVIDE THE REQUIRED INFORMATION.

TOPIC IX-5 - THE INTAKE STRUCTURE VENTILATION SYSTEM, WHICH SERVICES THE STATION COOLING WATER PUMPS, DOES NOT RECEIVE ELECTRICAL POWER FROM EMERGENCY SOURCES, THEREFORE, ITS OPERATION CAN NOT BE ENSURED AFTER LOSS-OF-OFFSITE-POWER (4.32.4).

RESOLUTION

THE LICENSEE WILL DEMONSTRATE THAT SUFFICIENT VENTILATION BY THE OPENING OF DOORS AND OTHER INFILTRATION CAN BE PROVIDED IN A TIMELY MANNER, OR WILL PROPOSE THE CORRECTIVE ACTIONS DEEMED NECESSARY.

ISSUES WITH PROCEDURAL

OR TECHNICAL SPECIFICATION

CHANGES

TOPICS II-3.B, II-3.B.1 AND II-3.C

4.1.4 DRESDEN 2
4.1.6 MILLSTONE 1
4.1(6) OYSTER CREEK

FLOOD EMERGENCY PLAN IS INADEQUATE TO PROVIDE FOR SAFE SHUTDOWN.

RESOLUTION

LICENSEE TO MODIFY FLOOD EMERGENCY PLAN TO ASSURE CAPABILITY TO ACHIEVE SAFE SHUTDOWN IN EVENT OF SEVERE FLOODING CONDITIONS OR UPON LOSS OF ULTIMATE HEAT SINK.

TOPIC III-3.C

4.4.3 DRESDEN 2
4.6.3 MILLSTONE 1

INSPECTION PROGRAM NOT IN COMPLIANCE WITH CURRENT CRITERIA.

RESOLUTION

LICENSEE HAS COMMITTED TO MODIFY EXISTING INSPECTION PROGRAM.

DRESDEN 2

TOPIC II-3.B.1 - PLANT IS NOT DESIGNED TO WITHSTAND PMF (4.1.2).

RESOLUTION

INCLUDED IN PROCEDURAL REVISION TO FLOOD EMERGENCY PLAN.

TOPIC VI-4 - VALVES BETWEEK INBOARD AND OUTBOARD CONTAINMENT ISOLATION VALVES ARE NOT ADMINISTRATIVELY CONTROLLED TO ASSURE CLOSURE (4.18.1).

MANUAL CONTAINMENT ISOLATION VALVES ARE NOT LOCKED CLOSED (4.18.3).

RESOLUTION

LICENSEE HAS COMMITTED TO PROVIDE ADMINISTRATIVE CONTROLS TO ASSURE VALVES ARE LOCKED CLOSED.

TOPIC VI-7.C.1 - NO ADMINSITRATIVE CONTROLS TO VERIFY CORRECT POSITIONING OF DISCONNECT LINKS BETWEEN REDUNDANT DIVISION (4.21.2).

RESOLUTION

LICENSEE VERBALLY AGREED.

TOPIC VI-7.C.1 - CLOSURE OF THE BREAKERS FOR REDUNDANT 480V BUSES COULD RESULT IN OVERLOADING DIESEL GENERATOR (4.21.3).

RESOLUTION

LICENSEE VERBALLY AGREED.

TOPIC VI-7.C.1 - OPERATION WITH FAILED BATTERY OUT OF SERVICE EXCEEDS CURRENT CRITERIA LIMITS (7 DAYS) (4.21.4).

RESOLUTION

PROPOSE LIMITS FOR OPERATION WITH FAILED BATTERY.

TOPIC VI-10.B - THERE ARE NO PROCEDURES PREVENTING PARALLEL OPERATION OF SHARED BATTERY SYSTEMS (4.23.1).

RESOLUTION

LICENSEE HAS NOT RESPONDED.

TOPICS V-10.B, V-11.B AND VII-3 - SHUTDOWN COOLING SYSTEM TEMPERATURE INTERLOCKS ARE NOT TESTED (4.25.4).

RESOLUTION

LICENSEE WILL PROVIDE FOR TESTING.

TOPICS XV-16 AND XV-18 - RADIOLOGICAL CONSEQUENCES EXCEED CURRENT ACCEPTANCE CRITERIA (SMALL FRACTION OF 10 CFR 100) (4.31 AND 4.32).

RESOLUTION

REVISE LIMITS FOR PRIMARY COOLANT SYSTEM IODINE ACTIVITY.

MILLSTONE 1

TOPIC V-12.A - MILLSTONE 1 TECHNICAL SPECIFICATIONS DO NOT MEET THE LIMITS ESTABLISHED IN REGULATORY GUIDE 1.56 FOR CONDUCTIVITY AND CHLORIDES OF THE REACTOR VESSEL WATER AND CONDUCTIVITY OF THE FEEDWATER (4.19.1).

RESOLUTION

THE LICENSEE HAS PROPOSED TO REVISE THE EXISTING TECHNICAL SPECIFICATIONS FOR CHLORIDES AND CONDUCTIVITY TO BE CONSISTENT WITH REGULATORY GUIDE 1.56 OR WILL PROVIDE JUSTIFICATION FOR NOT DOING SO.

TOPIC VI-4 - OPERATING PROCEDURES SHOULD BE DEVELOPED TO INDICATE UNDER WHAT CONDITIONS REMOTE MANUAL CONTAINMENT ISOLATION VALVES SHOULD BE CLOSED. THESE VALVES REQUIRE OPERATOR ACTION TO CLOSE UPON INDICATION OF SYSTEM LEAKAGE (4.20.3).

RESOLUTION

THE LICENSEE HAS AGREED TO DEVELOP AND IMPLEMENT SUCH PROCEDURES.

TOPIC VIII-1.A - OPERATING PROCEDURES SHOULD BE DEVELOPED TO PROTECT CLASS 1E SYSTEMS UNDER NON-ACCIDENT CONDITIONS IF A DEGRADED GRID VOLTAGE CONDITION OCCURS. THE BALANCE OF THIS TOPIC IS COVERED BY MULTI-PLANT ACTION B-23 (4.27).

RESOLUTION

THE LICENSEE HAS AGREED TO DEVELOP OPERATING PROCEDURES TO COPE WITH SUCH SITUATIONS.

TOPIC VIII-3.A - THERE IS NO BATTERY SERVICE TESTED REQUIRED IN THE STATION TECHNICAL SPECIFICATIONS (4.29).

RESOLUTION

THE LICENSEE WILL PROPOSE A TECHNICAL SPECIFICATIONS CHANGE TO REQUIRE A BATTERY SERVICE TEST AT LEAST ONCE EVERY 18 MONTHS.

ISSUES WITH HARDWARE BACKFITS

TOPIC VII-1.A

4.24.3 DRESDEN 2
4.25.2 MILLSTONE 1

RPS CHANNEL IS NOT PROPERLY ISOLATED FROM ITS MOTOR GENERATOR SET.

RESOLUTION

LICENSEE HAS COMMITTED TO INSTALL CLASS 1E PROTECTION AT INTERFACE BETWEEN RPS POWER SUPPLY AND RPS.

TOPIC VIII-2

4.26.2 DRESDEN 2
4.28.4 MILLSTONE 1
4.31 OYSTER CREEK

EMERGENCY GENERATOR PROTECTIVE TRIP IS NOT BYPASSED DURING ACCIDENT CONDITIONS.

RESOLUTION

LICENSEE HAS COMMITTED TO BYPASS TRIP.

TOPIC VIII-3.B

4.28 DRESDEN 2
4.30 MILLSTONE 1
4.32 OYSTER CREEK

CONTROL ROOM HAS INCOMPLETE INFORMATION OF BATTERY STATUS.

RESOLUTION

LICENSEE HAS COMMITTED TO PROVIDE CONTROL ROOM INDICATION OF RECOMMENDED BATTERY STATUS INFORMATION.

DRESDEN 2

TOPIC II-3.B - ROOFS OF SAFETY-RELATED STRUCTURES CANNOT SUSTAIN PMP LOADING (4.1.3).

RESOLUTION

LICENSEE HAS COMMITTED TO MODIFY PARAPETS TO ASSURE PONDED WATER LOADING IS WITHIN ROOF STRUCTURAL CAPABILITY.

TOPIC VI-4 - BRANCH LINES CONTAIN SINGLE ISOLATION VALVE AND THREADED CAP (4.18.6).

RESOLUTION

STAFF HAS RECOMMENDED INSTALLING A SECOND LOCKED CLOSED VALVE OR WELDING THE CAP.

TOPIC VI-10.B - OPERATOR DOES NOT HAVE COMPLETE INFORMATION ON STATUS OF SHARED BATTERIES, CHARGERS AND BUSES (4.23.3).

RESOLUTION

ADDRESSED AS PART OF TOPIC VIII-3.B.

MILLSTONE 1

TOPIC III-4.A - SYSTEMS AND COMPONENTS WERE IDENTIFIED WHICH WERE INADEQUATELY PROTECTED FROM TORNADO MISSILES (4.7).

RESOLUTION

THE LICENSEE HAS AGREED TO EVALUATE ALTERNATIVES AND PROVIDE A SHUTDOWN METHOD WHICH IS PROTECTED FROM THE EFFECTS OF TORNADO MISSILES.

TOPIC V-11.A - FAILURE OF THE PRESSURE INTERLOCK WILL LEAK TO OVERPRESSURIZATION OF THE REACTOR WATER CLEANUP SYSTEM (RWCU) BECAUSE THE PRESSURE INTERLOCK ARE NOT INDEPENDENT (4.18).

RESOLUTION

THE LICENSEE HAS PROPOSED TO INSTALL AN INDEPENDENT PRESSURE INTERLOCK.

TOPIC VI-4 - A NUMBER OF VALVES ON TEST, VENT, DRAIN, OR SAMPLE LINES SHOULD HAVE MECHANICAL LOCKING DEVICES AND APPROPRIATE ADMINISTRATIVE CONTROLS (4.20.1).

RESOLUTION

THE LICENSEE HAS AGREED TO PROVIDE LOCKS AND APPROPRIATE ADMINISTRATIVE CONTROLS.

TOPIC VIII-2 - THERE ARE FOUR STARTUP TRIPS (LIGHT-OFF SPEED, LIGHT-OFF TEMPERATURE, STARTING AIR-IGNITION CUTOFF SPEED, AND GENERATOR EXCITATION SPEED) NOT PRESENTLY BYPASSED DURING EMERGENCY OPERATION OF THE GAS TURBINE GENERATOR (GTG) (4.28.1).

RESOLUTION

THE LICENSEE WILL BYPASS THE LIGHT-OFF SPEED AND GENERATOR EXCITATION SPEED TRIPS UNDER ACCIDENT CONDITIONS.

THE LIGHT-OFF TEMPERATURE AND STARTING AIR-IGNITION CUTOFF SPEED TRIPS WILL BE RETAINED IN ORDER TO PROVIDE PROTECTION AGAINST A POTENTIAL EXPLOSION.

TOPIC VIII-2 - THERE ARE SIX OPERATIONAL TRIPS (HIGH EXHAUST GAS TEMPERATURE, HIGH LUBE OIL TEMPERATURE, HIGH GAS GENERATOR SPEED, HIGH TURBINE OVERSPEED, HIGH VIBRATION JET, AND LOW LUBE OIL PRESSURE) NOT PRESENTLY BYPASSED DURING EMERGENCY OPERATION OF THE GTG (4.28.2).

RESOLUTION

THE LICENSEE WILL BYPASS THE HIGH LUBE OIL TEMPERATURE TRIP UNDER ACCIDENT CONDITIONS.

- THE HIGH GAS GENERATOR SPEED AND HIGH TURBINE OVERSPEED TRIPS ARE ANALOGOUS TO THE ENGINE OVERSPEED TRIP ON A DIESEL GENERATOR AND ARE NECESSARY TO PREVENT OVERSPEED FAILURES.

- THE HIGH EXHAUST GAS TEMPERATURE TRIP PROTECTS THE UNIT AGAINST MELTING OF MECHANICAL PARTS.

- THE HIGH VIBRATION JET TRIP PROTECTS AGAINST TOTAL MECHANICAL DEGRADATION OF THE GTG CAUSED BY HIGH VIBRATION.

- THE ADDITION OF ANOTHER CHANNEL TO PROVIDE COINCIDENT LOGIC FOR ALL THE UNBYPASSED TRIPS WOULD NOT PROVIDE SIGNIFICANT IMPROVEMENT IN RELIABILITY.

  - PRECAUTIONS ARE TAKEN IN SETTING THE TRIP POINTS SO THAT THE PROBABILITY OF A TRIP DURING ACCIDENT CONDITIONS IS MINIMIZED.

  - IN ALMOST ALL THE CASES WHEN A FAILURE OF THE GTG OCCURRED, IT OCCURRED BECAUSE OF AN ACTUAL COMPONENT FAILURE AND NOT BECAUSE OF SPURIOUS SIGNALS.

TOPICS FOR WHICH LICENSEE DISAGREES

OR HAS NOT RESPONDED

III-6 SEISMIC EVALUATION OF MOTOR OPERATED VALVES
MILLSTONE (4.11.2) - NO RESPONSE
*DRESDEN (4.9.2(1)) - NEW INFORMATION UNDER REVIEW

VI-10.A FLUX CHANNEL SURVEILLANCE FREQUENCY
MILLSTONE (4.24.1&2) - DISAGREE

XV-16 & PRIMARY COOLANT ACTIVITY LIMITS - STS
XV-18 MILLSTONE (4.35 & 4.36) - DISAGREE
*DRESDEN (4.31 & 4.32) - VERBALLY AGREED