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SUBCOMMITTEE ON SYSTEMATIC EVALUATION PROGRAMS

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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE ON SYSTEMATIC EVALUATION PROGRAMS

- - -

Room 1167
1717 H Street, N.W.
Washington, D.C.

Wednesday, October 27, 1982

The Subcommittee met, pursuant to notice, at 8:30 a.m., CHESTER SIESS, Chairman of the Subcommittee, presiding.

PRESENT FOR THE ACRS:

MEMBERS:

CHESTER P. SIESS, Subcommittee Chairman
DAVID WARD

CONSULTANTS:

D. FITZSIMMONS
I. CATTON
L. LIPINSKI

ACRS STAFF:

D. McCLAIN

DESIGNATED FEDERAL EMPLOYEE:

HERMAN ALDERMAN

P R O C E E D I N G S

MR. SIESS: The meeting will reconvene. This is a continuation of the meeting yesterday, and what I said at the beginning of the meeting yesterday applies today.

That wouldn't work. That will only get paper rattling.

That constitutes the Chairman's opening remarks, except that the agenda today includes a review of the topics considered for backfit and integrated assessment with Dresden Unit 2, and following that for Millstone Unit 1.

These are the items covered in chapter 4 of the SEP, right, which we received copies of yesterday. I have read the one for Dresden. Unfortunately, I couldn't stay up late enough to read the one for Millstone last night, so we will have to wing it.

Commonwealth Edison, then, starts off. You don't have anything you want to say first, Bill?

MR. RUSSELL: No.

MR. SIESS: All right. Who is speaking for Commonwealth?

MR. RAUSCH: My name is Tom Rausch, Commonwealth Edison.

MR. ALDERMAN: Would you use the microphone, Tom?

MR. RAUSCH: It would be difficult. I would need three hands.

MR. SIESS: I can hear you. Is there anyone who can't hear you?

(No response.)

MR. RAUSCH: Dresden Unit 2 is part of a three-unit site. We are located about 50 miles southwest of Chicago. It is a General Electric BWR-3. It was also a turnkey plant, rated for 2527 thermal and 834 megawatt electric gross.

Our major cooling mode is the Kankakee Illinois River, and after 1971 we had a cooling lake installed of 1275 acres. I have a brief history on this page. I will go a little bit more into capacity factor type history in a few moments.

I am not planning to go through all of the handouts we have provided as far as piping diagrams of the plant. You may wish to refer to some of the unique features of the plant. I will point those out in a moment.

We received our construction permit in 1966. Our operating license, not indicated on there, was December 1969, at which time we started fuel load. Our initial critical was shortly thereafter. Commercial service was later calculated to be in August of 1970.

We made our timely application for the full-term operating license conversion in November 1972, and just a couple of the larger modifications I have indicated on here. 1973, our modified offgas system was installed to keep effluents as low as reasonably achievable. 1979 was a major key date in the establishment of a new security building and a greatly augmented security force.

In 1980, and we are still working on them, our TMI modifications: new technical support center, a high radiation sampling system, emergency operating facility, the EOF. And we are also in the process of installing a greatly augmented and redundant process computer.

We just received last summer approval for the installation of high density spent fuel racks. We are still in the process of installing those. That was a major step for us. It was a contested case.

MR. SIESS: Is that your first round of changing racks?

MR. RAUSCH: We put five racks in last year for D-3, Dresden 3, and we have provisional preliminary approval from the Licensing Board.

MR. SIESS: This is the first time you've gone to new racks? Some plants are on the second round.

MR. RAUSCH: Well, it depends. We installed more of the old style racks several years ago to get us through to today. But we are in the first major go-round in Dresden 2.

MR. SIESS: All right.

MR. RAUSCH: This diagram may come in handy if you wish to discuss tornado loads again. You can see from this how we are a three-unit site. Our famous Unit 1 is here. We have a common control room between the three units. It is located -- this is upside-down -- right in the area of the turbine building between Unit 1 and Unit 2.

We have had several additions to the site since the plant was originally designed. The cooling lake is down in this area (Indicating), well off of the map here. We have these discharge canals on the top which go to the Illinois River.

There is a crib house a little bit off the map here, again. That can control the flow in several fashions, so that we can either cool by using the river only, or taking the lake only, or some combination of the two. And indeed, we run that way. We are required by the State of Illinois to use our cooling lake all year except for during the summer, and we run much better as soon as we go on the river.

One unusual feature: We have the confluence of three rivers here also: the Kankakee River to the east, and the Des Plaines River comes in on a Y shape here to meet the Illinois River where it flows down towards the Mississippi.

As I said, I will not discuss in detail our plants. People seem pretty well familiar with the BWR-3. We are a more recent BWR-3. Essentially, we are a two recirculation loop, 20 jet pump plant. We use motor generators, set flow control, and our feed pumps are electric-driven, which is typical for our vintage.

We also have a Mark I containment, and we would like to point out that our torus in the Mark I containment provides not only pressure suppression during a LOCA or a relief valve blowdown, but it is also a major source of emergency cooling water for makeup to the reactor.

We have typical ECCS for our vintage, again: four 33-1/3 percent capacity low pressure coolant injection pumps, located in the corners of the reactor building; two 100 percent capacity core spray pumps. Our high pressure coolant injection system is steam-driven by reactor pressure steam. All three of our major systems, high pressure and low pressure, are capable of taking the emergency water source from either the torus or condensate storage.

We have two tanks on the site of 200,000 gallons each, and our automatic depressurization system consists not only of four electromatic relief valves, but an additional valve called the Target Rock, made by Target Rock Corporation, and it is a combined safety and relief valve. That was installed in the early 1970's in an effort to obtain more margin for scram reactivity, which is a transient limit.

MR. SIESS: Are those the Target Rock three-stage?

MR. RAGAN: Yes, sir.

MR. SIESS: Have they been giving you any trouble?

MR. RAGAN: We haven't had trouble, no.

MR. RAUSCH: I might add, we have five people with us, two assistant superintendents on the site, two engineering personnel, and myself from Licensing. So we have tried to be prepared to answer about everything.

We also have a somewhat unique, but not unique among the three plants being discussed today, we also have an isolation condenser for Unit 2 and one for Unit 3. They are separate from each other. We do not have redundant isolation condensers because we have the full complement of ECCS. But it is a very valuable system in that it is a completely passive decay heat removal system, and over the last ten years it has proven to be extremely reliable.

MR. SIESS: One for Unit 2 and one for Unit 3, and either one can be used with either unit?

MR. RAUSCH: No. They are dedicated to each unit.

MR. SIESS: So as far as the two is concerned, there is one.

MR. RAUSCH: Right. And in our fire protection reviews we have noted, it takes very little manual operation outside the control room to operate the system. And we have a plethora of sources to feed the isolation condenser. I think you can count four or more. Clean demineralized water, a 200,000 gallon tank, condensate storage tank, are certainly readily available. And we also have, in conjunction with Unit 2, a diesel-driven fire pump, or even a Unit 1 diesel-driven source. It would take a lot to lose a water source to the isolation condenser.

We also have a separate shutdown cooling system. In the plants built right after us, they went into the RHR mode of LPCI for shutdown. So we are kind of unique in that we have extraordinary flexibility in achieving shutdown. We can do shutdown cooling, isolation condenser, normal feedwater condenser as a heat sink, or we can use even our low pressure ECCS, what we call the bleed and feed mode.

MR. SIESS: Now, you have three diesels for the two plants?

MR. RAUSCH: That's right.

MR. SIESS: You have a swing, one for 2, one for 3, and one that swings, is that right?

MR. RAUSCH: That's right. The diesels are located outside the reactor building, inside the building by Unit 2, one on the Unit 3 site, and one in between. I have a hard time doing this upside-down.

MR. SIESS: What kind of bypass capacity do you have?

MR. RAUSCH: We have 40 percent bypass capacity, and we haven't been able to -- we can't think of any times we've had that unavailable.

MR. SIESS: What other safety systems do you share with Unit 3 besides the diesel?

MR. RAUSCH: I don't think we really share safety systems. We have some bus transfers that can be made on the electrical side. I can't think of anything else. Ron?

MR. SIESS: You have bus transfers.

MR. SMITH: Batteries.

MR. SIESS: How are the batteries shared? Is there a swing battery?

MR. SMITH: There's a common battery that is really a swing battery.

MR. SIESS: There is a common battery for the two units?

MR. SMITH: For a swing battery, yes.

MR. RAUSCH: For the third battery.

MR. SIESS: Is it the third battery which is the swing?

MR. SMITH: There is a battery for each unit, and we can back up the two units by themselves.

MR. SIESS: I don't understand. I understand the swing battery. I don't understand the other words.

MR. SMITH: What we have is, each unit has its battery and it is the primary feed for that unit. Then we have, through an aux-plus arrangement, the Unit 2 battery serves as the reserve backup for Unit 3 and vice versa, the Unit 3 battery serves as the reserve for Unit 2.

MR. SIESS: So if I counted all of the batteries, you have two.

MR. SMITH: Per voltage level, yes.

MR. SIESS: Two for the two plants.

MR. SMITH: (Nods affirmatively.)

MR. SIESS: But you can use the Unit 3 battery for Unit 2, or the Unit 2 battery for Unit 3.

MR. SMITH: Correct.

MR. RAUSCH: Can you think of anything else we share?

MR. POWERS: There's the diesel.

MR. SIESS: I'm a little confused, or maybe just ignorant. I thought you needed at least two DC systems to operate your safety-related, certain valves with a single failure criteria. Do you have DC power in safety-related systems?

MR. RAUSCH: DC full power.

MR. SIESS: And what happens if your batteries are a single failure?

MR. RAUSCH: That could knock out one of the systems, but not the whole ECCS.

MR. SMITH: If we lose the primary feed, let's say we lose the Unit 2 battery, the Unit 3 battery is sized sufficiently large to feed Unit 3 and the Unit 2 emergency loads.

MR. SIESS: Yes, but I thought that your circuitry on certain systems -- for example, if you have two valves that have to close and you have two valves in a series and they are DC-operated, that they have to be off a separate system, so that one failure couldn't fail both valves. Am I wrong or do you have any safety-related valves that are DC-operated?

MR. RAGAN: I am Ron Ragan from Commonwealth Edison.

Yes, we do have safety-related DC valves on the HPCI system. There are three levels of battery voltage and each set of batteries is split into two buses, and each bus is a backup to the other as far as a tech spec requirement for startup and for emergency shutdown.

Besides that, Unit 3 is also divided the same way and, as Neal said, it can back up Unit 2 in the same manner.

MR. SIESS: I'm not talking about backup. I'm talking about normal operation and single failure. Do you understand what I am talking about, Bill?

MR. RUSSELL: Yes. I believe we will get into this more later with shared systems and DC systems in particular. For instance, a 250-volt battery, the Unit 2 battery, can provide both Unit 2 and 3, and in that sense that battery is shared. The Unit 3 battery can provide both Unit 2 and Unit 3, and therefore that battery is shared.

MR. SIESS: In normal operation --

MR. RUSSELL: And the size of the batteries are large enough to support both units.

MR. SIESS: But in normal operation, valve A would be on a Unit 2 battery and valve B on Unit 3 only if the Unit 2 battery went out?

MR. RUSSELL: Well, that is essentially, as I understand it, correct. But the nomenclature of primary bus, bus one, bus two, and whether it's coming from Unit 3 or Unit 2, you would almost have to have the schematic. We have spent a lot of times with pictures and blackboards to understand it.

MR. SIESS: But you understand the question?

MR. RUSSELL: Yes, and I believe it meets that criteria.

MR. SIESS: A single DC failure will not --

MR. RUSSELL: That's correct. The principal issue we have with the DC systems is the fact that there are periods of time when they parallel the batteries and we feel that should not be done. And we will get into that later.

There are no other issues with respect to separation or potential single failures that were identified as a result of the reviews, and we spent quite a bit of time looking at all of the normal operating and emergency procedures associated with both AC and DC systems to reach the conclusion that the procedures were adequate, with the one exception of paralleling DC sources.

MR. SIESS: All right, go ahead.

MR. RAUSCH: This is the last slide I plan to put up. The others are available for your reference.

MR. SIESS: Move it up as high as you can.

MR. RAUSCH: Sure. We don't need "Commonwealth Edison" on there.

Especially in the last several years, it's been a high performing unit: the life of the plant, 78 percent availability, 57 percent capacity factor. There really haven't been very many problems.

In 1981 -- we run 18-month cycles, and in '81 our availability was low because we had a very long refueling outage to replace the feedwater sparger and a lot of Mark I containment modifications and inside containment rehanging of seismic piping.

MR. SIESS: I assume that in say '78 and '80 you had no refueling outages?

MR. RAUSCH: That's right. Those were very good years for the unit.

At this point I would like to introduce Neal Smith, who will give you five minutes or so on our experience with the SEP program. Some of the comments may fit in towards the end, but I think it is appropriate.

MR. SIESS: That's all right. Whatever is comfortable for you.

MR. SMITH: Good morning.

Going back over the history a little bit of SEP phase two, it was originally introduced to us in 1977. It was to be a documentation review to be done by the Staff. I think one of the major lessons we have learned out of SEP phase two at this point is, the Staff has an extremely difficult time performing all of the analysis and all of the documentation reviews; that a lot of the backup material is in our house, and the FSAR's, as suggested yesterday, the updated FSAR's would probably not allow the Staff to do the detailed level of review that SEP phase two went into.

The program was to be a documentation review and it was to be done totally by the NRC, and we were supposed to sit back, relax, and supply them with a few pieces of paper now and then, and everything was going to be very happy.

MR. SIESS: It sounds very utopian.

MR. SMITH: Well, that was the way our program started. However, the program went on that way for a couple of years. We had TMI, which caused some disruptions in the program, and eventually it got into a redirection which I will cover in a few minutes.

We received our chapter 4 early last week, slightly ahead of you. However, we have not yet seen the slides. We haven't compared numbers with the Staff, so some of the numbers I have today will be slightly different. And I believe the Staff at this point has worked very hard to get chapter 4 together and out.

But Commonwealth Edison hasn't had time to review it or to comment on all of the pieces of it, and I don't think we are in major disagreement with most of the items yet. I do believe that we are in fairly close agreement.

This slide represents where I think the status is right now. I think we have complete agreement on approximately 72 of the topics. We think we have agreement on about seven more verbally. We have discussed it and our common basis appears to be acceptable both to the NRC and Commonwealth Edison.

Our major problems are getting the words down so that we can both live with it. We look at it from an operating plant point of view and say, we have got to be able to operate and live with whatever we commit to, and it takes time to run it through our station and operations staff to make sure we can in fact do that.

Commonwealth is committed to perform seven items for additional studies. We have minor cleanup items on a couple of topics. The NRC is reviewing one of our submittals and we have three topics where we haven't really come to firm grips with it. I don't know that it necessarily means that we are decisively in disagreement; it just means in the priority of going through things we just haven't gotten quite that far yet.

Commonwealth Edison to date has made four modifications to our Dresden 2. We have committed for five additional modifications and five plant procedural changes.

Our experience to date on the program is that we have spent approximately $2.6 million for studies to support the SEP program. We expect that that number will rise to about $3.6 million before we are completely finished with SEP phase two. Commonwealth has spent, not included in that figure, 8-1/2 Commonwealth Edison man-years on the program, and project that we will spend 10-1/2 before we are finished.

We ought to note that any modification we have made to Dresden 2 or have committed to make to Dresden 2, we have also made to Dresden 3 and our Quad Cities units. As a result of that policy, when we find something on Dresden 2 we look at our other three

BWR-3's and see if we have similar type problems there, and if so we fix it.

MR. SIESS: Dresden 2 and 3 and Quad Cities 1 and 2 are essentially identical?

MR. SMITH: Essentially identical. The major difference between Dresden and Quad Cities is Dresden has the iso condenser and the Quad Cities has a RCIC system. I think that is the major difference.

So as a result, we have spent about $1.3 million in modifications to date. It's difficult to predict what our total modifications out of SEP will cost us, because we have several large topics that we have to come to resolution with the Staff, and that could have a significant effect on the dollars.

MR. WARD: That is 1.3 for all four plants?

MR. SMITH: That's correct.

MR. SIESS: That's for all four?

MR. RAUSCH: This isn't counting -- I'm not sure if we will get this in. It's not counting areas like 79-14 Bulletin.

MR. SMITH: If we could charge the money off to a separate project that was ongoing or if it fit in there reasonably well, we put it on the other budgets and we have not charged SEP for that. We are saying this is truly the SEP cost. This is money that we probably would not have found readily without SEP.

MR. SIESS: What would one day of forced shutdown at the four plants cost you?

MR. SMITH: What is the going rate?

VOICE: About $700,000 per unit.

MR. SIESS: So that is less than one day's forced shutdown.

MR. SMITH: That is correct.

MR. SIESS: So if any of these modifications improve your reliability as well as decreasing the risk to the public, it is a good investment.

MR. SMITH: Viewed from that point, that is correct. We will get into the modifications and what they were shortly.

Commonwealth Edison believes that SEP, the major benefit of SEP at this point in time is the strong project management that has come out of it under Mr. Russell's reign, that he moved the program forward and he has caused the Staff to make reasoned judgments, and that the standard review plan and reg guides were looked at with reason under his stewardship. And we feel if the Staff could do that on more topics we would be better off as an industry.

MR. SIESS: When did Mr. Russell take over?

MR. SMITH: When was it, Bill?

MR. RUSSELL: September 1980. The first meeting with the owners was October 3rd, when we proposed redirection.

MR. SMITH: But the program did drift for a number of years. When Bill took over, the redirection -- and again, this goes to show, I believe, that the Staff cannot do all of the analysis and all of the work that they proposed to do. As you said, it was a rather utopian idea and trying to make it work didn't. And Bill forced it back into a more conventional licensing mode and we ended up doing a lot more than we originally planned.

MR. SIESS: Was that when you switched to having the Licensee prepare the initial evaluation?

MR. RUSSELL: There was approximately two or three months of discussion back and forth between the Staff and the Licensee. I initially proposed putting all of the Staff resources on Palisades and finishing Palisades as the lead plant.

MR. SIESS: Yes.

MR. RUSSELL: The owners proposed back to do a larger number of topics, to complete lead topic evaluations, to identify the criteria, scope of review, and what type of approaches would be acceptable, and then perform their own analyses on their plants using those lead evaluations done by the Staff.

That turned out to be quite effective, and something on the order of half of the total number of topic evaluations were based upon reviews of Licensee submittals, rather than the Staff performing a review.

MR. SIESS: The Staff did a lead review to set up the criteria.

MR. RUSSELL: That's correct. The lead reviews were much more efficient, based upon the active participation of the utility in developing those lead reviews.

MR. SMITH: And that lead topic concept allowed us to determine what the criteria was that the Staff was really using to judge us, so that we could in fact do our reviews consistent with what the SEP branch was looking for, rather than using just the SRP's and reg guides.

MR. SIESS: Is that same procedure being used and working on the group two plants?

MR. RUSSELL: Yes, it is.

MR. SIESS: There is more difference there.

MR. RUSSELL: There's a greater interaction with the Staff as a result of the marked differences in some areas between the group two and group one plants.

MR. SIESS: Go ahead.

MR. SMITH: The modifications we have made: The electrical equipment anchorage is probably the one modification we would not have found without SEP, the normal bypass, which to normal-normal was really a procedural modification on the diesel generator as to which unit got preferred service. We installed a 125-volt disconnect. We had a disconnect at one end of the cable.

They decided that was wasn't single failure-proof, they wanted a disconnect on the other end. So we did that. Then we separated our DC buses further. We have now ordered additional DC buses. We will put them in separate fire zones completely, and that came out of the -- the SEP found it, and then the fire protection people found it two or three weeks later.

Modifications we have committed to: battery rack seismic upgrade --

MR. SIESS: Stop just a minute. The electrical equipment anchorage and the battery rack seismic upgrade. On the electrical equipment anchorage, was there no anchorage?

MR. SMITH: Oh, no. We believe that our anchorage probably was sufficient for a .2 g earthquake, except by the time we get done doing all of the conservative calculations and all of those other good things we have to do --

MR. SIESS: It originally was?

MR. SMITH: Archored and anchored quite well.

MR. SIESS: And what about the battery racks? Were those originally seismically designed?

MR. SMITH: Commonwealth Edison never really agreed our battery racks were inadequate. We just got tired of arguing with the Staff over it. When they refused to accept gravity as an existing force, we gave up.

MR. SIESS: Did they have any kind of anchorage?

MR. SMITH: The battery racks?

MR. SIESS: Yes.

MR. SMITH: Oh, yes, they are anchored. The only thing we are doing to the battery rack is right now there are wooden batons holding the cells in place and we are replacing that with a metal strap.

MR. SIESS: The reason I ask is, I recall when we first started thinking about seismic a number of years ago, you could walk into a plant and the batteries were just sitting there. They wouldn't have taken .02 g. It was the one very obvious thing. This was when no seismic design was being used at all.

This is just an upgrade, then?

MR. SMITH: Yes. Our analysis done by Sergeant-Lundy indicated that our racks could take a .2 g earthquake, and the Staff dug in their heels and we decided, rather than to continue to fight, the modification was relatively small and we would do it. But we have done it to all four plants.

MR. SIESS: Is that true of all of these?

MR. SMITH: That is true for all of them -- well, it's true for Dresden 3. We are going back and looking at Quad Cities for the electrical anchorage. It's true for all four units for the normal bypass and all four units are normal-normal, and the DC systems have been reviewed for all systems. The battery rack has been done for all four units. The DC generator protective trip bypass I'm not sure has been done for Quad Cities yet. The roof parapets we will be doing for all four units.

The DC monitoring is relatively recent. We have not yet discussed it with Quad Cities. The installation of redundant isolation valves is again relatively recent and we will be discussing it with Quad Cities in the near future. But Commonwealth's stated philosophy right now is that what we do to Dresden we will do to Quad Cities, and we do intend to do it for all four. But it has not been done for all four yet.

And then a list of procedures that we are modifying.

MR. SIESS: As I recall, Quad Cities have a little higher safe shutdown rate than Dresden.

MR. SMITH: Dresden is .2.

MR. SIESS: And I believe Quad Cities is .22.

MR. RAUSCH: Slightly higher. We never really considered them different seismic zones. It just came in later in the process.

MR. SIESS: The seismic g values are time-dependent.

(Laughter.)

MR. SMITH: Our new site-specific g value for Dresden is .1 g.

MR. SIESS: Yes, they are site and time-specific.

MR. SMITH: Right.

I will list the major analysis that we and the Staff have done. We are about ready to submit mass and energy release from containment following steam line break. Containment line integrity analysis has been finished, but the Staff hasn't received it yet. We have submitted containment electrical penetration studies. Short-circuit analysis of Class 1 systems we have committed to and are in the process of doing, and we are doing an analysis of our reactor protective system isolation devices and we will have the results of that shortly.

The NRC -- Dresden 2 was reviewed by the senior seismic review team for the seismic program. That program started while we were in the original mode of SEP. That is, the Staff was going to do all of the work and all of the calculations involved in the seismic work. The senior seismic review team consisted of Nate Newmark, Bill Hall, John Stevenson, Frank Kennedy and Frank Tokars. Then they had Staff assistants to help support them.

As a result, the Staff has done a major portion of the analysis. They developed a building structural model, they have done piping analysis, they have done various stress studies. And in general, what we have been doing is the original intent of SEP: we have been supplying them drawings and data they requested, and they have been having their consultants do the work.

MR. SIESS: Who did that for the Staff?

MR. RUSSELL: The structural work was done by Lawrence Livermore Laboratories, with support from SMA, Structural Mechanics Associates, and other subcontractors. Most of the piping analysis work was done by EG&G-Idaho, and there was some work done directly by the Staff.

MR. WARD: Bill, why was this done for Dresden 2?

MR. RUSSELL: We split up the plants into two groups, group one and group two.

The Staff felt the differences in design were sufficiently close to current practice that it was good to do an audit review to assess what the differences were and try to quantify whether those margins were acceptable or not, and to do that for five plants, to try and show that the earlier practices, while they were substantially different from what we would do today, resulted in a reasonable design.

From that standpoint, that aspect of the program was quite successful. When we did it for Dresden, we found we could not monitor just Dresden because of the structures being closely coupled, so we monitored the reactor buidings for both Dresden 2 and 3 and both turbine buildings. So it became a complex and detailed structural analysis.

And then we did sampling analysis of various piping systems. As I mentioned yesterday, that is when we identified the problem with how they determined the loadings on the various supports based upon the chart span method being used at the time. That program was folded into the I&E Bulletin IEB 79-14 program, which was an as-built problem, the issue of is it an as-designed or an as-built problem. The two were folded together and the program there has been coordinated between SEP and the region doing the follow-up. We are satisfied that the program will result in a substantial upgrade of the piping and the piping support systems, and it is being done in all four units.

So it is appropriate to consider those costs in the bulletin, although it was originally identified by SEP.

MR. SMITH: That is a case where you can probably say we understated our SEP costs, but it goes with the philosophy that really from an integrated point of view or a coordinated point of view, that should be done as the piping analysis is done. It should be folded in to those budgets.

MR. RUSSELL: It is an example of how SEP integration has been to consider other programs going on and fold the SEP work into that rather than doing them piecemeal or having any duplication of effort with other programs.

MR. SMITH: These are other topics that you have probably seen before that the Staff has done work on, my list of open items, which may or may not correspond with the Staff's because we haven't had time to check them out against each other.

On the first four items, III-1, III-2, III-4.A and III-5.A, Commonwealth Edison owes the Staff studies or additional information.

On III-6, seismic design considerations, I believe we have had a disconnect on who is doing the work because of the different philosophies that have occurred over a period of time. I have been used to the Staff giving me seismic design work and me reviewing it, which is reverse from the normal mode, and the Staff recently decided I should be doing it and they reviewing it.

III-7.B is in the Staff's court.

III-10.A and 7.1.A I believe just have minor cleanup items with no major difficulties.

8.3.A, station battery testing. In 1516, we at Commonwealth Edison have to decide what we are going to do and report to the Staff, and it is open for that reason.

MR. SIESS: That concludes your presentation?

MR. SMITH: That concludes my presentation.

MR. SIESS: Any questions at this point?

[No response.]

MR. SIESS: I was just noticing on our agenda that we have about two-thirds as much time allocated for Millstone as we have for Dresden. Is this by agreement or accident?

MR. RUSSELL: It appears to me to be about 2 hours and 15 minutes for Millstone and the rest of the day on Dresden, so if we could pick up on Dresden, I think we can finish Dresden before lunch, for instance, and handle Millstone after lunch and we could still adjourn by 3:00.

MR. SIESS: Well, that is the way we have it scheduled. I indicated we would try to adjourn by 3:00. I will modify that. I have to leave about 3:00, but Mr. Ward and, I believe, some of the consultants could stay on beyond that. So 3:00 is not an absolute figure but it would be nice. I would like to hear most of it.

MR. RUSSELL: I might comment on just one thing from the Commonwealth presentation. The issue on the battery racks became an issue of how much do you consider frictional factors and how well do you know them under vibratory ground motion to be able to assess whether the batteries will fall off the racks or not. There was not lateral support other than a small wooden batten.

In addition to the friction, there was a tipping and falling off of an elevated rack that was about a foot in the air. While there are disagreements on how much friction is actually there, the end result is one we are satisfied with. They have modified the racks.

MR. SIESS: Okay. Now, suppose you give me an outline of how you propose to present the issues on Dresden and Millstone.

MR. RUSSELL: We propose to go through similar to what we did yesterday; that is, follow the same format, identify those topics which were deleted, those which did not involve backfits, and to shorten it somewhat by not spending a lot of time on those issues we reviewed yesterday as common issues for Oyster Creek, Millstone and Dresden. We want to highlight what the differences were now as they apply to these two units.

MR. SIESS: Okay.

MR. RUSSELL: And that should help you review later.

MR. SIESS: It sure will. I don't really see much point in going through the items that were deleted because they are not applicable unless there is something unusual in there, Bill, and the same with the TMI-USI items. Again, we have seen those lists several times. They all seem to be soundly based. And you would certainly know if there were any in there that are peculiar for Dresden that we should know about.

MR. RUSSELL: I would propose, then, we start with the topics which meet current criteria, are acceptable on other defined bases and identify that list.

MR. SIESS: There aren't any oddballs in the first two lists?

MR. RUSSELL: No.

MR. SIESS: All right.

MR. RUSSELL: With that, I would like to introduce Greg Cwalina, who is the integrated assessment project manager for the Dresden 2 review.

MR. SIESS: Do you have a different project plant manager for each one of the ten plants?

MR. RUSSELL: Presently I have eight integrated assessment project managers. There are two units which are doubled up. The Palisades project manager also has one other unit, that one essentially completed.

MR. SIESS: Then you have some specialists working outside.

MR. RUSSELL: That's correct. There are some technical specialists in the seismic pipe break structural areas that work on those areas as well.

MR. SIESS: Electrical and instrumentation specialists?

MR. RUSSELL: Within the group of project managers I have a diverse group. They were made up of technical specialists who had expertise in their individual areas, so some of the project managers were previously electrical reviewers. Some were structural engineers. So that I have a multidisciplined group of people who are working for me in the SEP Branch.

About the only areas not covered are the hydrology and seismology areas. The other areas are all covered.

MR. SIESS: Okay.

MR. CWALINA: Before we go farther, I would like to say that the topic deletion list for Dresden 2 is slightly different from Oyster Creek. It is just a different plant design. For instance, Dresden has jet pumps and Oyster Creek does not. So there are a couple of differences in those tables.

MR. SIESS: But they are not oddballs; they are perfectly reasonable.

MR. CWALINA: Yes.

MR. SIESS: All right.

MR. CWALINA: This is just a list of the total topics we have looked at at Dresden, obviously, 137 for all plants. We found 30 not applicable to the plant design, 19 deleted due to an ongoing generic review, which gave us a total list of 88 topics. Of these, we found 54 acceptable and reviewed the other 34 in the integrated assessment.

Following is a list of the topics which meet current criteria or were found acceptable on another defined basis. There are a couple of typos on this list. Topic III-3.A was not found acceptable on other defined bases. That met current licensing criteria.

MR. SIESS: Take the asterisk off. Mr. Bush found that one for you.

MR. CWALINA: Right. 2.1.A, 2.4.A and 2.4.C, the other defined bases were the same as we reviewed yesterday in Oyster Creek.

MR. CWALINA: Okay. Here is the other list. Also 5.10.A met current criteria. That is another one where the asterisk should be taken off.

MR. SIESS: Which one?

MR. CWALINA: 5.10.A.

MR. SIESS: 5.10.A.

MR. CWALINA: Topic 8.4 is a topic which was found acceptable on another defined basis, and I will go to that one in just a moment.

MR. SIESS: Are there any items that were not acceptable, say, on Oyster Creek that were acceptable on Dresden?

MR. CWALINA: Yes.

MR. SIESS: Can you spot them real easy?

MR. GRIMES: As I mentioned yesterday when we were going through the Oyster Creek review, there were a number of issues raised in the Oyster Creek integrated assessment due to a lack of information or an inability to draw a conclusion during the topic review that were brought up in Oyster Creek that were resolved in the topic review for Dresden, and those are identified in the Oyster Creek packages resolved during topic review for Dresden.

MR. SIESS: I would just like to identify them on this list if you can do it without a lot of trouble.

MR. CWALINA: I don't remember what they were offhand.

MR. SIESS: Don't bother.

MR. CWALINA: They water purity of BWR coolant was found acceptable in Dresden. Topic 6.1 -- that is, organic material and post-accident chemistry -- was found acceptable in Dresden.

MR. SIESS: Which was the first you mentioned?

MR. CWALINA: Topic 5.12.A. And I know Topic 6.1 also fell in that category. Topic 15.19, the LOCA dose, was acceptable for Dresden, and I don't know what the other one was. I believe there were about six; is that correct? I think there were 40 topics.

MR. RUSSELL: For instance, 8.4 is one we discussed yesterday on Oyster Creek as a part of the integrated assessment review and recommended no backfit on electrical penetrations. A similar conclusion was reached later in time, and you will see that in the next slide as being acceptable on another defined basis.

MR. SIESS: That is a different category than it was for Oyster Creek.

MR. RUSSELL: That is correct. There are slight differences, and we will review them in just a minute.

MR. SIESS: Okay. Now, 19 was one -- that was on tech spec iodine.

MR. CWALINA: No, that was on the LOCA dose.

MR. SIESS: Okay, LOCA dose. And the dose comes out different?

MR. CWALINA: Yes. Dresden meets current criteria.

MR. SIESS: Why?

MR. CWALINA: I believe their MSIV leakage was in acceptable limits. I think that was the issue on Oyster Creek.

MR. SIESS: All right. Does anyone want to hear anymore about those?

[No response.]

All right. Then let's skip over to the next list.

MR. CWALINA: I will skip Topics 2.1.A, 2.4.A and 2.4.C since we covered those yesterday. Topic 8.4

was one found acceptable on another defined basis. It was found that the low voltage penetrations don't conform to current licensing criteria. However, the licensee has implemented a corrected program and the Staff has reviewed and found that the margins between the outer seal damage and the breaker trip points indicate that there is no significant risk.

MR. SIESS: This is the overload protection problem.

MR. CWALINA: Right.

MR. SIESS: All right. Any questions?

I should point out that we lost Mr. Lipinski and he has been replaced by Mr. Catton. We lost our electrical expert and replaced him by a thermal hydraulic, et cetera.

MR. CATTON: So we are going to discuss electrical systems?

[Laughter.]

MR. CWALINA: That's all right, we brought our electrical expert.

MR. SIESS: Ivan, you weren't here yesterday, but anytime you have a question, just pop it. We tend to move fairly fast and we don't go back more than two slides, preferably not more than one.

All right.

MR. CWALINA: The following are the issues not requiring backfit for Dresden, Unit 2.

MR. SIESS: Now we are down to the 35 issues.

MR. CWALINA: Thirty-four issues, right. Well, it's 34 topics. It is more issues.

MR. SIESS: Oh, yes, yes.

MR. CWALINA: The first topic is the flooding potential and protection requirements. The Dresden design basis groundwater level is 514 feet main sea level, and the plant grade is 517 feet, which would be current licensing criteria. However, our Topic III-3.A did an analysis of the structural integrity at 517 foot groundlevel and found it acceptable.

MR. CWALINA: In Topic III-1, there were three systems where Dresden has indicated they don't have fracture toughness testing data. That is the reactor cooling system, reactor building enclosed cooling water, and the RWCU. We reviewed systems required for safe shutdown, service water systems and reactor water systems and have determined that they are not important to safety. In addition, there are interlocks which prevent those systems from being put in operation unless the requirements are met.

MR. RUSSELL: I wouldn't say they are not important to safety. They are not as important and there are other systems that can be used should these have problems.

MR. SIESS: You could tolerate a failure.

MR. RUSSELL: That's correct.

MR. CWALINA: They are not required to perform any post-accident functions.

MR. SIESS: Yes. I don't have too much trouble here because I have read Chapter 4 for Dresden. I don't know whether I will be able to do as well on Millstone, but some of them are similar, I guess. Okay.

MR. CWALINA: Topic III-3.C. We found the inspection frequency of the flow regulation station does not comply with current criteria. The licensee has indicated the station is not safety-related and the operation would continue in whatever mode it was in when it failed. The inspection frequency of the intake and discharge structure does not comply with current criteria.

Our review of Topic II-40, which is, I believe, stability of slopes, has indicated the rock is sound and will maintain a vertical cut under earthquake conditions. In addition, licensee has committed to perform inspections following extreme events as a part of their flood emergency plan.

MR. SIESS: And an extreme event in this case would be an earthquake?

MR. CWALINA: Earthquake, flood, tornado.

Topic III-4.A. The review indicated the station batteries are located in a concrete block wall room. However, that room is in the East Turbine Building, and the East Turbine Building itself is missile protected.

MR. SIESS: That is an item that really wouldn't be in this list if you had had the information earlier; is that correct?

MR. CWALINA: That was discovered on the site visit.

MR. RUSSELL: When we went later. Some of these offer completeness of record because we issued the topic evaluation and then the topic evaluation was identified as open, so we are closing it out here as a convenient place for closing it out rather than having to reissue all of the topic evaluations.

MR. SIESS: For the documentation I still think it will be a little confusing because the integrated assessment report is available. Your topic reports are in the public document room somewhere.

MR. RUSSELL: We have provided complete sets of all of the documentation, three sets to the ACRS.

MR. SIESS: It gives a little bit of a wrong impression, but I don't know that it is of concern.

MR. RUSSELL: That will be cleaned up as a part of the FSAR updates when the licensees submit their updates. We just wanted to make sure there was a clearly stated staff position that represented the facts, either in the topic review or in the integrated assessment report.

MR. SIESS: Why did you have to go to the site to find out that that battery room was inside?

MR. RUSSELL: The initial review was done from drawings and records and it was identified as being a block wall. This was put up as a part of the fire protection as a fire barrier, and it was in the turbine building and it wasn't known how much protection was in that area.

MR. SIESS: But when you wrote your SAR, Commonwealth gets a copy of it. Wouldn't they write back and say, look, that is just a partition wall, there is a 12-inch concrete wall outside?

MR. RUSSELL: It may have been the paperwork was passing back and forth. I really can't respond to why it wasn't identified.

MR. SIESS: You send the SAR for them to comment on.

MR. CWALINA: This was a topic where the

licensee sent in the original SAR and did not identify this item. The item was picked up by a reviewer who did not know the plant design. The site visit was not specifically to look at this; it was an integrated assessment meeting with a plant tour, and in the course of the plant tour they showed them the station battery rooms, and that is how it was discovered.

MR. SIESS: But Commonwealth said it wasn't a problem and the reviewer didn't believe them.

MR. CWALINA: Essentially, Commonwealth sent in the evaluation but they didn't address the room at all. That is where it was missed.

MR. SIESS: Okay.

MR. CWALINA: Topic III-10.A. This was the same as Oyster Creek where the limit switch must bypass the torques which do initiate valve movement, and the licensees investigated their plant design and informed us that criteria is met in all cases for the first 10 percent of valve travel.

MR. SIESS: Yes, Dave?

MR. WARD: Let me ask you a question., Let's see, I guess this is a case where the criteria are met with the original design. There isn't any backfitting here.

MR. RUSSELL: (Nods affirmatively)

MR. WARD: Okay. I hold the question.

MR. CWALINA: Topic VI-10.B. This is the shared engineered safety features, emergency power and service systems. The difference is the operator does not have complete information on the status of the shared battery charges and busses. This is covered under Topic VIII.3.B, and recently, the licensee sent in a commitment to provide that information in the control room to the operator.

MR. SIESS: This is a pretty generic issue, isn't it?

MR. RUSSELL: This has come up on most of the units.

MR. SIESS: Isn't it being addressed outside the SEP on some other plants? I thought there was a generic letter or something.

MR. RUSSELL: There is a NUREG on DC systems, NUREG 0666, that identifies sort of a minimum set of DC systems ba tery testing and indication. That has not yet gone to CRGR for review.

We have factored back into that recommendations from SEP, and what we found, for instance, on five of ten plants we found that battery testing was not being performed, the discharge test, to identify whether cells were potentially defective or not. In one case upon testing we did find in the Ginna station one bad cell that had to be jumpered out. The indication for monitoring breaker position disconnects, charger output amperage in the control rooms has been marginal on all of the units, and different proposals have been made, generally along the lines of providing an alarm in the control room that indicates something is wrong, and you have to go to a local panel and look.

MR. SIESS: All right, that's enough.

MR. CWALINA: In terms of the battery room ventilation system not being powered from an onsite source, that will be addressed as part of the ventilation system review in Topic IX-5. I believe it is the licensee's position that that does not need to be powered. The concern there is the generation of hydrogen to an explosive limit. I believe the licensee will provide an analysis which says it will not reach a combustible limit.

Topic VII-3, systems required for safe shutdown. We have found that longterm cooling is susceptible to single failures if the shared diesel generator is not available to Unit 2. If the shared diesel generator is being used for an accident at Unit 3, it is not available to shut down Unit 2 and they are susceptible to single failures. We have found there are procedures existing for shutdown using the isolation condensers and high pressure coolant injection until the diesel generator can be manually transferred.

MR. SIESS: Let's see. There is a current requirement -- I don't know whether it is current -- but for shared diesels that you could handle shutdown of one unit and an accident in the other, and that came along after Dresden, did it?

MR. RUSSELL: I believe that was considered in the design of Dresden at the time. At least based upon the review, we did not find any problems in meeting that. I don't know what the original documentation was.

MR. SIESS: How long was this time we are talking about until the shared diesel was manually transferred?

MR. RUSSELL: With our capability in maintaining hot shutdown using the isolation condenser or the HBI system, whether it is minutes or a few hours or even up to a few days, they can maintain hot shutdown.

MR. SIESS: That is because the HPCI is on turbine-driven pumps.

MR. RUSSELL: And the makeup to the isolation conedenser can come from other sources.

MR. SIESS: Does Millstone have a turbine-driven HPCI?

MR. RUSSELL: Yes.

MR. ROMBERG: No, we do not.

MR. RUSSELL: They are shifting to DC powered makeup to the isolation condenser.

MR. SIESS: The reason I asked is I recall not too long ago there were some questions about the reliability of the turbine-driven HPCI pumps because there had been a number of failures for various reasons. I wondered if that had been looked at in the PRAs for Millstone. If you do not have them, it would not have been looked at.

MR. RUSSELL: I believe the most reliable method, the one the Staff considered the most important, was the use of the isolation condenser and the various ways of making up water at the isolation condenser. You will see later in Millstone's case they are making that AC independent.

MR. SIESS: This says isolation condensers and

HPCI.

MR. RUSSELL: You have both, the capability for both.

MR. SIESS: It is one or the other, one or the other, and/or.

MR. RUSSELL: Yes.

MR. SIESS: All right, thank you.

MR. CWALINA: The next list is those requiring additional information or analysis. Topic III.2. The Staff has identified there are some safety-related complements outside of qualified structures such as condensate storage tanks and demineralizer tanks. I believe there are also some safety-related components in the crib house.

MR. SIESS: How does this compare with Oyster Creek, where everything that was needed for shutdown was outside and subject to tornado? Does Dresden have some tornado-protected components that can be used for shutdown?

MR. CWALINA: Yes.

MR. SIESS: So they can find one path for shutdown.

MR. CWALINA: The HPCI, the ABT and the isocondensers are all tornado protected.

MR. RUSSELL: Also the cooling water to the diesels is in the screen wellhouse below grade in reinforced concrete, so they don't have a problem with cooling water. The pumps are in a cribhouse that is protected as compared to being outside in the air.

MR. SIESS: So it looks like when the licensee gets finished identifying these components, you will find at least one train for shutdown after a tornado.

MR. RUSSELL: That is correct.

MR. WARD: Who is the architect engineer for Dresden?

MR. SIESS: Sargent & Lundy.

MR. WARD: Sargent & Lundy.

MR. SIESS: They do everthing for Commonwealth.

MR. ROMBERG: Not anymore.

MR. SMITH: Now we hae a tremendous variety of consultants and AEs.

MR. SIESS: You have a lot of help now?

MR. SMITH: Yes, they are all out there trying to help.

MR. CWALINA: Topic III-5.A, pipe break inside of containment. The licensee has provided us with a parametric study with a list of their criteria and their methodology, which we have reviewed, and we have found a few differences from current criteria in these, such as the functional capability of target pipe following a pipe-to-pipe impact, detectability for through-wall cracks, which I believe we talked somewhat about yesterday with Oyster Creek, and the criterion result for the pipe loop load formulation.

These have been discussed between the licensee's contractor and the Staff's technical reviewers, and I believe that these will probably be addressed in the licensee's final report.

MR. SIESS: Now, these are the questions about how big a pipe can damage another pipe and the jet impingement and the 40 percent of the ultimate strain question as to whether that will impede flow.

MR. CWALINA: Correct.

MR. SIESS: Those are being addressed.

MR. CWALINA: Yes, they have been discussed with the licensee's contractor.

MR. WARD: Could I ask you a question about the text of the draft integrated assessment, page 417?

MR. CWALINA: Is it Topic III-5.A?

MR. SIESS: Yes, this is Topic III-5.A, page 417 of the draft, Item 472.

MR. WARD: Yes, the second paragraph from the bottom on 417. It says, the last part of it, that the ultimate strain reached at the point of load application was a global strain because the beam model was used for analysis. It was not a global strain? Is that what that means? I guess I don't understand what that paragraph is saying.

MR. CWALINA: I think we are using -- since a beam model was used, it came out a global strain instead of a uniform strain. We want to demonstrate that the global strain and the -- unfortunately, my reviewer is not here today.

MR. SIESS: I know what a uniform -- no, I don't know what any of them mean. I thought from that and the preceding paragraph that if you just hit it locally and put a dent in the pipe with 45 percent of ultimate strain, that was one thing, but if you looked at bending and if you got to 45 percent of ultimate in bending, there was a serious question as to whether you still have the cross-section. Is that the kind of issue it was?

MR. SMITH: That is the kind of issue it was.

MR. SIESS: It wasn't just assuming local impact. The local impact was assumed to bend the pipe and it was 45 percent strain in general bending and not 45 percent strain under the missile location. And the staff had for the first case not too much concern about the cross-sectional reduction, and for the other one they did. I think that is what was meant by global.

One whole side of the pipe was up to 45 percent of the strain rather than the local area under the impact powers.

To take care of that problem, instead of a shell element analysis we are also doing a beam analysis, so we are showing both analyses, the beam analysis being the original, and the shell analysis as additional information.

MR. CATTON: Is compartment flooding looked at as well?

MR. SIESS: I didn't hear you, Ivan.

MR. CATTON: Is comparatment flooding looked at as well? When you break the pipe, where does the water go?

MR. SIESS: This is inside containment so it is not a compartment, but the question is still valid.

MR. RUSSELL: For a high energy line break inside containment, you are talking about a loss of coolant accident which would end up going through the downcomers into the torus.

MR. SIESS: What about a break outside containment?

MR. RUSSELL: This is pipe breaks inside containment. For pipe breaks outside containment, we did look at the effects of flooding from those breaks and the effect of failure of nonseismically-qualified pipe.

MR. CATTON: Okay.

MR. RUSSELL: That is a different topic review.

MR. WARD: While I have you interrupted, for some reason you are talking about detecting through-wall cracks, and you say you want to detect cracks where the length was twice the wall thickness. Yesterday we seemed to be talking about for a time the wall thickness.

MR. CWALINA: Yesterday we were talking about pipe breaks outside containment. I am not sure whether the criteria is different or not.

MR. RUSSELL: Is this the twice wall thickness based upon in-service inspection or is this the through-wall leakage?

MR. CWALINA: It is through-wall.

MR. WARD: We are talking about through-wall leakage.

MR. SIESS: This is detectability requirements.

MR. SIESS: This is detectability by leak detection, not by ABT, I hope.

MR. CWALINA: That's correct.

MR. SIESS: I don't think any ABT will detect a crack through wall, but it still seems inconsistent. You were talking about the leak detection capability for a 4T crack yesterday.

MR. RUSSELL: The 4T crack we were using yesterday was based upon the licensee's analysis of margin to failure. We will have to look into it to find out if that is the size crack proposed by the licensee or whether there is an inconsistency.

MR. CWALINA: The 2T crack was part of the criteria we sent to the licensee along with a topic evaluation, I believe, back around March or so.

MR. SMITH: That is correct, and we have never accepted the 2T crack with our specific analysis, and we will be proposing a specific crack size.

MR. SIESS: This is a leak before break concept, and it gets back to you want a big crack so you can detect it, and yet you don't want it big enough to go to rupture. I ended up yesterday somewhat confused. I guess from the state of my general knowledge I am not likely to end up a whole lot better today. Do you think it would be possible to get your expert on that to write up two or three pages trying to trace the reasoning through this thing?

MR. RUSSELL: We can do that. I might direct you that the approach is summarized on the Palisades docket as an enclosure to our safety evaluation on pipe breaks inside containment. It is in Enclosure 2 of that safety evaluation. It is about eight pages long. We can shorten that somewhat. It should be available. Possibly Herman can get it.

MR. SIESS: Palisades.

MR. RUSSELL: Topic III-5.A.

MR. SIESS: But I didn't get three black notebooks on Palisades, did I? I got them on Ginna.

MR. RUSSELL: The date of the safety evaluation report can be provided.

MR. SIESS: Someone write it down and give it to Herman, and we will try to get copies of it. I figured I could understand three better than eight. This is essentially the same kind of issue we talked about yesterday.

MR. RUSSELL: That's correct.

MR. SIESS: Are the cracks big enough to be detected by your leakage of monitoring system and yet not big enough it will propagate to fail under a seismic event?

MR. CWALINA: We will get to that again on Topic V-5, which is leak detection capability.

MR. SIESS: But leak detection satisfies you if you can prove it will work.

MR. RUSSELL: (Nods affirmatively.)

MR. CWALINA: Topic VI-7.C(1), which was the electrical implementation and control rereviews. There were several open items on that, such as battery charger faults can be transferred to redundant AC sources. Diesel generator 2/3 control system faults can be transferred to redundant DC sources. The interconnection between redundant divisions could transfer a fault from one DC system to another DC system, and the licensee is committed to perform a short circuit analysis to verify their protective relaying is adequate to prevent that from happening.

A similar difference would be Class 1E sources which may not be adequately isolated from non-Class 1E loads. Again they committed to do source term analysis to resolve that issue.

MR. SIESS: Okay.

MR. CWALINA: Topic VIII-3.A, station battery capacity test requirements. We found that the test program does not meet the Regulatory Guide 1.129 recommendations. The licensee is now deriving further information. It is their contention that their existing battery test program actually exceeds the requirements of Regulatory Guide 1.129. The question was on the battery discharge test.

MR. SIESS: Is this a tech spec item? Is this in the tech specs?

MR. CWALINA: Yes, it is.

MR. REAGAN: (Nods affirmatively.)

MR. SIESS: It seems to me that from the fact the licensee is trying to demonstrate this, that either his procedures are not understandable or Reg Guide 1.129 is not understandable. So let me summarize the difference. The licensee currently does a test at a frequency comparable to that of a service test, and his position is that that service test that he performs is a severe enough loading condition on the battery that it exceeds or is comparable to the discharge test, and therefore the test that he performs more frequently meets the intent of both the service test and the discharge test, the discharge test being, one, to identify whether you have a defective cell, what is the overall battery capacity: is it 80 percent or greater. That information on the discharge profile that is used or their tests as compared to a discharge test and whether that information is in fact equivalent has not yet been provided.

MR. SIESS: Is there no question in anybody's mind as to what the intent of Reg Guide 1.129 is?

MR. RUSSELL: I don't believe so, no.

MR. SIESS: Okay.

MR. CWALINA: The following is a list of

topics requiring hardware backfits. The licensee's categories they put up earlier and my categories may be slightly different, but I think the resolution seems to be the same. The first is Topic VI-4, containment isolation system. There are branch lines which contain the single isolation valve and a threaded cap stop. It is the Staff's position that a threaded cap stop does not meet the current requirements. They are not leak testable.

MR. SIESS: Why would you have a line with a threaded cap on it? Do you have occasion to go in there and take the cap off, hook something on, open the valve and use it?

MR. ROMBERG: Those are mainly local leak break test caps.

MR. RUSSELL: This is different. You have three lines, I believe it is, where there was a single isolation valve. I believe one was a torus drain line. Another was off a branch line on supply to the LPCI, but there was a total of only three. There were only three instances in the review where we found there were only single isolation valves with valve caps. The position acceptable to the Staff is a cap is acceptable if it is leak tested; however, there is no test line between a valve and a cap. So our position --

MR. SIESS: If you put in a test line, you have to put two valves on it.

MR. RUSSELL: It would be more complicated, so the position is either seal weld a test cap since you are not using it frequently or take that off and put another valve on it and leak check it.

MR. SIESS: If you seal weld that, if you go in -- I assume this is a Type B leak test, a penetration leak test.

MR. RUSSELL: It would be a Type C test.

MR. SIESS: You would have to grind that weld off?

MR. RUSSELL: If it is seal welded, it would not be required to be tested.

MR. SIESS: This is a line to be used for a leak test.

MR. RUSSELL: No, there is not a test tee between them. It is an inch and a half pipe coming out with a valve in it, a cap in it, and no other penetration.

MR. SIESS: And I ask what the heck that line is good for. Why don't you take it off of the pipe and weld the pipe closed? The line must be there for some reason.

MR. GRIMES: Dr. Siess, the first example Bill cited, the torus drain line, is used to drain the torus when they are going for maintenance.

MR. SIESS: Then that means sometimes it is used.

MR. GRIMES: That's correct.

MR. SIESS: Then when you want to use it, what do you do with the cap sealed onto it?

MR. FITZSIMMONS: Cut it off.

MR. SIESS: Grind the weld off, unscrew the cap, and when you are through, you have to weld it.

MR. RUSSELL: Another acceptable approach would be to install a valve in lieu of the cap and then test the valves and manually close them and lock them.

MR. SIESS: This pipe leads outside containment?

MR. RUSSELL: Yes, it goes to the reactor building. One was off the torus. There were only a total of three. These were atypical of what we saw on all of the rest of the lines.

MR. SIESS: What did the rest of the line have, two valves?

MR. RUSSELL: Two valves with a test tee in between, and in some cases the test tees had two valves on them with a cap on the test tee.

MR. SIESS: There must be somewhere --

MR. RUSSELL: Generally the configuration was you had a valve which was closest to the containment and a tee coming off after that that came off to a a test tee for doing a leak check between the two.

MR. SIESS: One valve plus the other valve would be two valves.

MR. RUSSELL: Yes, and the position would be shut and lock the valve closest to the containment, lock the test tee upstream valve, and lock the valve going to the drain. So that you would have two manual valves, both would be locked, and the test tee is generally a much smaller valve, only for the purpose of doing the tight sealing test. Current criteria and the current codes would permit the use of pipe caps up to 2 inches in diameter if those caps are leak checked.

MR. SIESS: How do you test the space between that valve -- you have the line coming here with a valve here, a valve here, a test tee coming off here and a valve. How do you test it?

MR. RUSSELL: It is always a Catch-22 to test the test tee valve, the position, is it small enough, and it is not addressed. You can't address all of them in any closed boundary. You have to have one to put your test signal in.

MR. SIESS: Catch-22. If you get them small enough, you can't test them, so you just keep working your way down. I know how we got there, but when I'm there, it seems sort of ridiculous.

MR. RUSSELL: That is Appendix J, Type C testing.

MR. SIESS: How is the revision of Appendix J coming along?

MR. RUSSELL: That's not being handled by SEP.

MR. SIESS: I wonder if they are doing a PRA on it.

[Laughter.]

MR. CWALINA: In Topic VI-4, which is containment leak testing, this topic was reviewed independent of the SEP program.

MR. SIESS: VI-6?

MR. CWALINA: Right, as a part of the Appendix J program, and in this case Appendix J did not approve the licensee's request for exemption on two items, which are the reactor building close cooling water system and the containment air lock.

MR. SIESS: Containment is the containment building?

MR. CWALINA: Right.

MR. SIESS: It is kept at a slight negative pressure?

MR. RUSSELL: No, no, this is actually the access to the drywell.

MR. SIESS: This is the drywell.

MR. RUSSELL: Yes.

MR. SIESS: And that has a single closure on it?

MR. RAUSCH: No, it has a double closure, and the doors have a type of seal they can press on accident pressure.

MR. SIESS: You have an actual lock?

MR. RAUSCH: Yes. This is a difficult issue because the appendix, when tested at accident pressure PA, I believe around 48 pounds, the door can provide in excess of 48 pounds in the proper accidet direction but you can't test it at 48 between the two doors because the inner door would be pushing backwards against its hinges.

MR. SIESS: You would have to have a strong back on it.

MR. RAUSCH: We have a strong back. We can do it at 8 or 10 pounds.

MR. SIESS: How do you get out, then?

MR. RAUSCH: Take the strong back out.

MR. SIESS: And you have to come out the air lock.

MR. RAUSCH: Yes.

MR. SIESS: And the requirement says every time you use it you have to test it?

MR. RAUSCH: That is one of the problems we have, but the real problem we have is doing it at accident pressure. We are looking at ways of doing something like that.

MR. SIESS: PWRs have had similar kind of problems for years, and there has been a procedure for PWRs, I thought, that let you test the seal on the door.

MR. RAUSCH: We don't have testable seals. We have the type of seal that you look at it and it is very obvious it is going to work.

MR. SIESS: A lot of PWRs don't have because they obviously don't work about half the time.

MR. RAUSCH: We have been trying to argue, on the basis of our past performance, which is very good, that the more the pressure in the containment, the more the door will seal. The seal could have minor flaws in it and it would still seal. So we are proposing things like visual inspections. It has not been finally resolved.

MR. SIESS: Isn't there a requirement, or did it get changed, that you have to test the door every time you use it? Has that position changed?

MR. GRIMES: Dr. Siess, that position has changed. That was the one and only modification to Appendix J that has been accomplished in the last seven years, and that was to eliminate the leak test after each use and make it within 72 hours following a use, and it gets real complicated about how many times you use it in between. But the issue has been around and it has not yet been resolved for a lot of plants. Some plants have gone in and carved out their door and put in testable seals for the within-72-hour test.

MR. SIESS: Because otherwise you would be testing every 72 hours. If you had to put a strong back on it to test it, you would have to come out through the door.

MR. GRIMES: The procedure has been accepted so that as long as you perform the test within the 72 hours, you can use the strong back and then reopen and close the door.

MR. ROMBERG: Dwayne Romberg, Northwest Utilities. The 72-hour test is just a 10 pound test, which is relatively easy to do.

MR. SIESS: The tool pressure test you have to make is how often?

MR. RAUSCH: We are being requested to do it -- can anyone recall? Was it six months or every refueling outage?

MR. GRIMES: Six months.

MR. RAUSCH: That is clearly impossible. We can't even do a full pressure test.

MR. SIESS: How does Dresden 2 differ from other BWRs, or do they not meet this requirement either?

MR. GRIMES: It is relatively common. All the BWRs have a similar air lock design.

MR. RAUSCH: Dr. Siess, we have proposed a way of doing it during integrated containment test. I am optimistic in that we haven't heard anything from the Staff for a while. I think it is every three years we do a full integrated containment leak rate test, and at that point we are looking at ways of valving such that we are separately subjecting the inner door and then the second door to full accident pressure, and that at least provides an assurance that the door is designed to do that.

MR. SIESS: What do you do in the SEP when you hit something like this that is generic to all BWRs, or at least all with the MARK I containments? MARK II probably has a different kind of problem.

MR. RUSSELL: You have touched on one that SEP has not been able to do much with, SEP Branch and SEP review. It is a multi-plant generic item that was being conducted by the staff because it applied to all plants and it was a regulation, and the determination of granting relief from the regulation and the exemption was being handled generically. In this case what we are coordinating or attempting to coordinate is that if there are requirements flowing from Appendix J as a result of denial of exemptions, we would look at that as to how it would affect other SEP issues, but we are not questioning the merits of whether an exemption should be granted or not granted.

MR. SIESS: It seems to me you ought to be able to identify what is a generic issue. Now, it is not generic in the sense that it is a new item that affects the public health and safety that the USI items, but it is a generic problem in that we have a requirement in the rules, Appendix J, that is not being met and probably cannot be met. I suspect it won't come out too terribly low in a PRA because it is a potential leak source. It isn't too small. But you ought to have some way of identifying this as a generic issue and say, look, solving it on these three plants is difficult but it applies to a number of plants, and why don't we get together and try to figure out what to do about it.

MR. RUSSELL: That is why we didn't solve it on these three plants.

MR. SIESS: What are you going to do? How are you going to end up on these three plants on this item?

MR. GRIMES: The exemption request is being dealt with outside the scope of SEP.

MR. SIESS: Do they have an exemption request in?

MR. GRIMES: That's correct.

MR. SIESS: And you won't make a judgment on it.

MR. RUSSELL: The SEP Branch did not review the merits of that exemption request; it was done by other parts of the Staff, and it was denied.

MR. SIESS: I see the resolution is the licensee will provide for leak test.

MR. RUSSELL: That's because once the exemption is denied, he is required to be in compliance with the regulation.

MR. O'CONNOR: Dr. Siess, Paul O'Connor. I am the project manager for Dresden. The request for exemption was denied. It was a multiple exemption request on Appendix J, and we denied two of nine, I believe, requested items and established what we believe is a mechanism for Commonwealth to come back with an additional exemption request for the denied item relating to the air lock testing.

We did grant some form of relief relating to air lock testing by allowing the six-month requirement to be extended to 12 months. I believe it was to 18 months if the air lock was not open, and of course the air locks are not open that frequently on BWRs.

MR. SIESS: What was the situation for Oyster Creek? It wasn't an issue? What do they do?

MR. GRIMES: We don't recall because the exemption request had been reviewed outside of SEP. I don't know if Oyster Creek requested an exemption from the air lock test.

MR. SIESS: If Oyster Creek didn't request an exemption, do they meet the requirement?

MR. GRIMES: If they didn't have to request an exemption, then they would have met the new Appendix J requirement for air lock testing.

MR. SIESS: And no one knows how they meet it?

MR. GRIMES: No, sir. A lot of the plants dealt with the air lock issue in different forms. As I previously mentioned, some plants have gone back and installed testable seals.

MR. SIESS: What does Millstone have?

MR. ROMBERG: Millstone was able to meet the 43-pound test.

MR. SIESS: You can meet the 43-pound test with a strong back?

MR. ROMBERG: We could not using a strong back, so we went back to Chicago Bridge and Iron who designed and built our containment, and they designed for us strong backs to meet the test.

MR. SIESS: You have a 43-pound pressure. What does Dresden 2 have?

MR. RAUSCH: I believe 48 is the testing.

MR. SIESS: CBI can't design you a strong back?

MR. RAUSCH: I am sure something could be designed. We have taken the position so far that it is just not necessary and there are equivalent ways of demonstrating full accident pressure without a strong back, and that is under review right now.

MR. SIESS: Your seals are different from the kinds of seals we see on PWRs that leak almost every time?

MR. RAUSCH: I believe so.

[Laughter.]

MR. SIESS: I mean people are going in and out of PWRs all of the time. They are not going in and out of inert drywells and they bump the seal and bang them and --

MR. RAUSCH: You would bump into the steel shell before you would bump in the seal carrying tools.

MR. SIESS: All right. I think I understand the issue. Next item.

MR. CWALINA: Topic VII-3, systems required for safe shutdown. We found the shutdown cooling system temperature interlocks are not tested. The shutdown cooling system is designed for full reactor pressure but not full reactor temperature, and therefore we will require testing of the temperature on the temperature interlocks, and the licensee has committed to provide for this testing.

MR. SIESS: Okay.

MR. FITZSIMMONS: Excuse me. Did we find out how that was handled in Oyster Creek?

MR. RUSSELL: The safety evaluation on that issue was issued in March, and the relief from exemption for those requested -- and I don't know whether there was a request for exemption on the type B testing for air locks or not.

MR. KNUBLE: Yes. this is Jim Knuble.

First of all, pressure is a lot different. We test up to 35 pounds, and I am not really sure exactly how we meet that requirement, if we have tested the seals or what. I do know it was resolved during a topic discussion.

MR. FITZSIMMONS: And it wasn't a point of contention at all?

MR. KNUBLE: No.

MR. SIESS: Why is this under a hardware backfit list?

MR. CWALINA: Which topic?

MR. SIESS: The one you have up there.

MR. CWALINA: The one I have up here?

MR. SIESS: Yes. Aren't we in hardware backfits?

MR. CWALINA: Yes. I was under the impression the Licensee would have to install some sort of test connection in there, and apparently the Licensee says they can do it procedurally. So it's just a difference of opinion or a misunderstanding.

MR. SIESS: We can get it moved eventually.

What happened to 23.B.1?

MR. CWALINA: 23.B.1, the flooding potential protection requirements?

MR. SIESS: Yes.

MR. CWALINA: That was handled yesterday with Oyster Creek, with essentially the same result. The Licensee is going to --

MR. SIESS: All right. This list doesn't have Oyster Creek.

MR. RUSSELL: That's correct.

MR. SIESS: Oh, okay. I want to talk briefly about that situation.

MR. RUSSELL: 23.B.1.

MR. SIESS: That is site-related?

MR. RUSSELL: That is correct. In this case, as the Licensee mentioned earlier, there are a number of ways of making up to the isolation condenser. One of those involves using a firehose connection very near the isolation condenser, within a few feet. And the proposal is to use a portable pump which would be able to take a suction inside a building, to provide makeup to it, which is very similar to the Sequoyah approach for a riverine site providing coolant. They would allow the torus and the drywell to flood.

MR. SIESS: Your draft is very confusing there. On section 412 it says, "It is the Staff's position that the Licensee provide for protection of a plant site for all expected flooding levels." That to me sounds like the position is to require physical protection.

It goes on to say, "The protection features should be addressed in plant emergency procedures, and these procedures are discussed in 414." And 414 turns out to be essentially procedural: Let it flood, we will put in another pump to take care of it. So that particular statement there is misleading, and I remembered it and not the other. Okay, I am satisfied.

You don't necessarily want them to protect the plant. You want safe shutdown capability in the event of a flood.

MR. RUSSELL: That is correct.

MR. CWALINA: The following items are items of procedural backfits.

MR. SIESS: Take the one we just looked at and add it to that.

MR. CWALINA: Right.

Topic 67.C.1, which is the electrical instrumentation and control re-reviews. We have found there are no administrative controls to verify correct positioning of disconnect links between redundant divisions. Apparently during maintenance activities they go in and close these disconnect links, which can cause a path between redundant divisions. And what we are asking is they put some kind of administrative controls and verify that those disconnect links are open during operation.

MR. SIESS: And the status is the Licensee has not responded. What significance might we attach to that at this stage of the game?

MR. SMITH: We haven't had chapter 4 and discussions long enough to respond yet.

MR. SIESS: All right. And that's not addressed in your earlier presentation, is it?

MR. SMITH: No, sir.

MR. SIESS: You didn't have it at that time.

MR. RUSSELL: I might point out, this is a situation where you have a breaker and a disconnect between the redundant divisions. The breaker could be open if the disconnect is closed. Then you could have the potential for a breaker failure compromising the redundancy of the divisions.

And what we would like to do is make sure the disconnect is open and the breaker is open, so that you have independence of the redundant divisions, and that that be administratively controlled such that it is like a jumper checklist. If you put jumpers in when you are testing, you verify that they are removed. If you close that breaker during maintenance, you verify it's open after you are done with that. And that administrative control would be appropriate.

MR. SIESS: I would like a little discussion of the last item on that one, about tech spec limits on the time during which the swing diesel control power could be obtained from Unit 3.

MR. SCHOLL: My name is Raymond Scholl and I am with the SEP.

The concern that we have with the design of Dresden Units 2 and 3 has to do with the way that power supplies are assigned to redundant divisions. It is a little bit difficult to explain, but I will try by telling you basically that the Unit 2 and the Unit 3 diesel generators are both assigned to the same division and to separate units, and that the swing diesel therefore is the second division for both units.

A similar sort of situation would exist where you are sharing the batteries between the units at a 125-volt level. You have a battery in each unit, but that battery also provides power to the other unit to control or provide controls for the other division.

Because the diesel generator 2-3 is on one division, when it is picked up it is swung over to the other battery, it is now in a situation where you have a diesel in one division supplying DC control power from the opposite division.

MR. SIESS: Now, in the writeup on this it says the standard tech spec limit, which is two hours as opposed to seven days, the STS limits, which are based upon generic risk estimates. Could someone identify? Does that mean a PRA, and is it really a risk estimate or a reliability estimate? That is, was it carried out to consequences or was it looking at reliability of certain systems?

MR. RUSSELL: There was not a risk study performed. You recall, there was a generic issue for looking at equipment outage time and what times in the standard technical specifications were the optimum times for various scenarios. It was a category A item.

Generally, the standard tech specs have utilized seven days. Now, how that seven days was arrived at, whether that is an optimum, whether it should be six or nine --

MR. SIESS: Standard tech specs use two hours.

MR. RUSSELL: For a diesel being out of service, it could be seven days. For both batteries being out or loss of a division, it varies.

MR. SIESS: It says here, "A failed battery system be restored to operable status within two hours."

MR. RUSSELL: Correct.

MR. SIESS: And in this case we have a failed battery system in Unit 2, and you would use the batteries in Unit 3 to power the swing diesel.

MR. RUSSELL: Control power for the swing diesel.

MR. SIESS: The present tech specs would let them operate with a failed battery system in Unit 2 for seven days?

MR. SCHOLL: That is correct.

MR. FARRAR: Denny Farrar for Commonwealth Edison.

Dr. Siess, it seems inconsistent to us to require a two-hour limit on the time that the control power for diesel can be supplied from the other unit, and yet let us have a seven-day clock on the failure of the diesel itself.

MR. SIESS: That sounds reasonable. Of course, the two-hour limit that is referenced in what I am reading is on a failed battery system, which presumably supplies various things, right, not just the diesel control power?

MR. SCHOLL: That is correct.

MR. SIESS: Why is this issue, then, related to the diesel control power and not to the battery system itself? Does it meet the standard tech specs of two hours for a failed battery system?

MR. SCHOLL: No, sir, it does not meet the tech spec for a failed battery system.

MR. SIESS: Why is it tied to a diesel instead of the battery?

MR. SCHOLL: That's the way we discovered it, concern about survivability of batteries where you may switch a fault from the 2/3 control system from one battery to the other. That led down the line of discovery.

MR. SIESS: You see, if the limit is on a battery system which supplies other things in the diesel, I guess I could see some reason for having a two-hour limit on a battery system and a seven-day limit on a diesel. The point you raised is that it is inconsistent, and really what you are addressing here is the limit on the battery, but you are putting it in the context of the diesel, which I think is confusing.

It is the battery system you are concerned about and not just its providing control power to the swing diesel.

MR. SCHOLL: Yes, sir.

MR. RUSSELL: It is also the fact that when you are getting control power from the opposite division there is an intertie. If you take the battery away, that is the issue; then the two hours should apply. There is some merit.

MR. SIESS: Let me assume I had a completely independent control power source for the swing diesel.

MR. RUSSELL: It would be the same seven days for the diesel if you had a separate battery for diesel control power.

MR. SIESS: What would Dresden's tech spec say about the battery system that we are talking about here?

MR. RUSSELL: If it's separate?

MR. SIESS: Right now the diesel operates normally off of a Unit 2 battery system, right?

MR. RUSSELL: Correct.

MR. SIESS: If that battery system is out, the diesel gets its control power from a Unit 3 battery system, is that right?

MR. RUSSELL: Yes.

MR. SIESS: If the Unit 2 battery system goes out, how long can it stay out under the Dresden 2 tech specs now?

MR. RUSSELL: I believe the answer is seven days.

MR. SCHOLL: I don't remember, but I believe it is seven days.

MR. SIESS: That is the issue, isn't it?

MR. SCHOLL: Yes.

MR. SIESS: That issue would make sense, because that battery system powers other things besides the diesel. Now let's look at the battery system I postulated that is being dedicated to the swing diesel. That battery system, you are allowed to be out for seven days, aren't you? So it's not because it's powering the diesel you're worrying about seven days; it's because it's powering other things, isn't it?

MR. RUSSELL: There is a very subtle difference between the two. Assuming both batteries are available, during the time you have control power on the opposite side you have an interconnection between DC control power on one division and the other division through the diesel.

Now, that interconnection and the potential for faulting both is the issue that was identified, how we led to this point.

MR. SIESS: Let me try something else. The battery system, the Dresden 2 battery system, that is providing control power to the swing diesel, right?

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: Also supplies control power to other things.

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: That battery could be out for seven days?

MR. RUSSELL: That's correct.

MR. SIESS: Where do you get control power for Dresden Unit 2, from the Unit 3 batteries?

MR. SCHOLL: There is a so-called reserve distribution bus which receives power from the battery in the other unit.

MR. SIESS: So you get it from the other unit.

MR. SCHOLL: Yes.

MR. SIESS: Is that acceptable for seven days?

MR. SCHOLL: In my opinion, no, sir.

MR. SIESS: It seems to me that issue makes more sense than tieing it to the diesel, which you can allow to be out for seven days.

MR. RUSSELL: (Nods affirmatively.

MR. SIESS: I think it would make more sense if it was addressed that way. It seems to me that how long the battery for Unit 2 can be out should be an independent issue in terms of the standard tech spec requirement, not necessarily tied to the diesel, which for some reason generic risk estimates allow to be out for seven days. Do you understand?

MR. RUSSELL: Yes, I do.

MR. SIESS: And I understand the issue in terms of the Dresden 2 battery system outside of the diesel generator control, and I understand the interaction part you are concerned with. You would rather not have the plants operating interconnected for seven days.

Do you understand it?

MR. WARD: Yes.

MR. SIESS: Okay.

MR. CWALINA: Topic 6.10.B, which is shared systems between the plants. We found there are no procedures preventing parallel operation of the shared battery systems. Again, it's a similar issue.

MR. SIESS: And this is something that could be fixed with procedures?

MR. CWALINA: Yes. We want to prevent parallel operation during power operation.

MR. SIESS: What is the danger from parallel operation?

MR. CWALINA: I believe it is -- I will let Ray answer that.

MR. SCHOLL: The situation under which the plant would operate the 125-volt batteries in parallel is part of their ground fault protection scheme. As part of their ground fault protection scheme, you end up in a situation where you are transferring DC buses in one unit off of one battery onto the other battery. If you are already in a situation where a ground fault exists and you are in danger, you are worried about using the DC system.

You are now running the risk of taking out both battery systems from the same fault when you double up on the available fault current. In addition, our SER points out that some of the non-safety systems which receive power from the reserve bus can create a series of simultaneous transients if you lose power to the bus.

An example of the sort of problems that show up is you lose the ability to trip the recirculation pump motor generator sets. There's a list of items involved in these transients caused by a loss of the bus.

MR. SIESS: I understand this is something that Commonwealth just got recently and hasn't had a chance to address?

MR. RUSSELL: It's an issue we've been discussing. I believe it is only applicable to the 125-volt batteries. The 250 s are not parallel. It was looked at in the PRA study and it was determined that the period of time which they are actually in parallel, because you are just paralleling across to isolate where a ground may be, rather than -- and you do that to assure you don't have to shut down, by doing a dead bus transfer.

We feel there are other mechanisms you can use for ground isolation without having to compromise the independence of the DC system during a time when you have a known fault you are trying to isolate.

MR. SIESS: This is a possible hardware backfit.

MR. RUSSELL: That would be either a hardware backfit to come up with a different detection scheme identifying the grounds, or it could involve separate batteries so you could transfer the loads onto the battery for ground isolation, rather than compromising redundancy between divisions.

There are a number of schemes which could resolve it and there may be different judgments as to which is the preferred scheme.

MR. SIESS: All right.

MR. CWALINA: The next issue is, the Staff found that the shared diesel generator can be placed in bypass mode during operation. This was addressed by the Licensee earlier in their presentation. They have modified their operating procedures to require a normal-normal positioning of the diesel generator.

MR. SIESS: And this is in the wrong category?

MR. CWALINA: It's a procedural modification they have already made.

MR. SIESS: Aren't we in hardware modifications?

MR. CWALINA: No, these are all the procedural modifications.

MR. SIESS: Then the previous one might end up with a hardware modification?

MR. CWALINA: It may end up that way or it may be done procedurally.

MR. SIESS: Okay.

MR. CWALINA: The last one in this category is systems required for safe shutdown. Procedures for achieving cold shutdown from outside the control room do not exist. The Licensee has modified procedures this past April so they can achieve and maintain a hot shutdown from outside the control room. As part of their fire protection review, they have committed to provide procedures for achieving a cold shutdown.

MR. SIESS: Yesterday someone was going to explain to me the difference between hot shutdown and cold shutdown for a boiler. Who was going to do that?

MR. GRIMES: We couldn't find any volunteers.

MR. SIESS: What are the words? The words are in the GDC, aren't they?

MR. RUSSELL: They are in Reg Guide 1.139.

MR. SIESS: Well, yes.

MR. RUSSELL: On shutdown systems. And it is 212 degrees and atmospheric pressure.

MR. SIESS: For what?

MR. RUSSELL: That is the point we stop the review for cold shutdown in that procedure review. We don't require a boiler to go on shutdown cooling to reduce it below 212.

MR. SIESS: So 212 is cold shutdown, at

atmospheric?

MR. RUSSELL: Yes, from the standpoint of looking at the systems. And for a PWR, we consider that 180, which is obviously --

MR. SIESS: What is hot shutdown for a boiler?

MR. RUSSELL: Anything above 212.

MR. SIESS: Above 212?

MR. RUSSELL: And pressurized.

MR. SIESS: Depressurized?

MR. RUSSELL: No. It would have to follow the boiling curves, saturation pressure.

MR. SIESS: So that means rods in and that's all, right, hot shutdown?

MR. WARD: So it is just whether it is pressurized or not.

MR. RUSSELL: Yes.

MR. SIESS: Okay. I didn't get it. Hot shutdown is no pressure. Okay, I see. It is depressurized, but any temperature.

MR. RUSSELL: No, no. Cold shutdown is 212 and depressurized.

MR. SIESS: All right, start over. What's hot shutdown?

MR. RUSSELL: It's other than depressurized.

If you are at 250 degrees, you have some residual pressure associated with that because you are at saturation.

MR. SIESS: And the difference between hot shutdown and operating is power level?

MR. RUSSELL: Yes.

MR. SIESS: So when I said rods in, it's hot shutdown.

MR. RUSSELL: We would have to get the definition of modes. I believe it is one through five.

MR. RAUSCH: There aren't even tech specs like that.

MR. RUSSELL: I'm trying to compare this with the standard tech spec definitions used now.

MR. SIESS: Hot shutdown means you have power down. Pressure and temperature can be anywhere above atmospheric and 212?

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: So reactor shutdown in terms of activity --

MR. RUSSELL: It's one of the unique aspects of a boiler, because it is designed to boil, that you have so many different ways of making up to it that you can come down and depressurize.

MR. SIESS: Hot shutdown on a PWR?

MR. RUSSELL: 350.

MR. SIESS: There is temperature limit there?

MR. RUSSELL: Yes.

MR. SIESS: You can do that. Okay. But to achieve and maintain hot shutdown means you can get the rods in and turn the power off down to decay heat level and you can take decay heat out?

MR. RUSSELL: That's correct.

MR. SIESS: And any level that is convenient, once you get it down to zero pressure and 212, you call it cold shutdown.

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: Okay.

MR. CWALINA: The last slide is those issues where the Licensee disagrees with the Staff. I didn't provide individual slides on these. They were discussed yesterday during the Oyster Creek review. I will give you a brief rundown on what the disagreements are.

Topic 3.6. As Neal Smith mentioned earlier, we have requested further analysis on a couple of mechanical components involved in our review. The disagreement now lies with who is going to do the analysis. We have requested the Licensee to do the analysis, and it is their position that is our responsibility.

MR. SIESS: 3.6 is seismic? That is components, you say?

MR. CWALINA: Yes, mechanical components.

MR. SIESS: All right. What is 5.5?

MR. CWALINA: 5.5 is leakage detection. This is not necessarily a disagreement between us and the Licensee. They have agreed to look at leakage detection in conjunction with their pipe break inside containment review.

The results of that review and our review may lead to disagreements in terms of what is necessary for leakage detection.

MR. SIESS: How does that compare with the Oyster Creek situation? Does Dresden have three methods of leak detection?

MR. CWALINA: Yes. They have sump level monitoring and they have the airborne particulate and gaseous monitors.

MR. SIESS: And the airborne monitors work?

MR. CWALINA: (Nods affirmatively.)

MR. SIESS: In the high heat and humidity?

MR. CWALINA: Yes.

MR. SIESS: But they don't for Oyster Creek. Is it a different system?

MR. RUSSELL: I can't address that. The two

Licensees would have to talk about the difference in systems.

MR. KNUBLE: We have not compared notes on the system.

MR. WARD: I guess I am --

MR. SIESS: I thought you were reviewing these in a coordinated fashion.

MR. WARD: I am a little puzzled by that. The reg guide -- you say the reg guide requires the ability to detect 1 gpm within an hour?

MR. RUSSELL: Correct.

MR. WARD: And I think what Mr. Romberg said yesterday was that none of the three methods are capable of doing that.

MR. RUSSELL: That is correct.

MR. CWALINA: That is correct.

MR. RUSSELL: What we have agreed to look at is what sensitivity is necessary, based upon consideration of pipe breaks inside containment. Once we reach agreement on what sensitivity is necessary, there may or may not be modifications to the existing system at Dresden.

MR. WARD: Would there be a modification of the reg guide?

MR. RUSSELL: The agreement to look at it and determine on a plant specific basis what is the appropriate sensitivity is in fact a modification of the reg guide, rather than using an arbitrary one.

MR. WARD: Well, that's not quite -- I agree, a reg guide is a guide. But if it isn't possible to meet the guide --

MR. RUSSELL: It is possible. There are plants that do meet the guide, boiling water reactors which do meet it, in the CE system.

MR. SIESS: In the CE system?

MR. RUSSELL: LaSalle.

MR. SIESS: Oh.

MR. RUSSELL: It is just newer.

MR. SIESS: The last two items are tech spec STS iodine levels.

MR. CWALINA: Right, and that is essentially the same as Oyster Creek.

MR. WARD: Can I go back to this one again, the Reg Guide 1.45. The text in your chapter 4 here says that the leakage detection systems be operable following a seismic event. I don't know the reg guide. Does the reg guide say SSE?

MR. RUSSELL: Yes, it does. It says one of the three qualified to the level of the SSE, the other qualified to the level of OBE.

MR. WARD: That's right, I remember. Thank you.

MR. SIESS: In 15.16, bringing Dresden to existing tech spec limits to reactivity, what do you calculate for the dose?

MR. CWALINA: I'm not sure of the exact numbers, but it's significantly over 10 CFR Part 100, using their tech specs.

MR. SIESS: I'm not sure any more what anyone means by "significantly over".

MR. CWALINA: In the thousands of rems.

MR. SIESS: With the tech spec SES levels, what do you have there?

MR. CWALINA: About 140, 138 to 140. They are better off than the Millstone and Oyster Creek.

MR. SIESS: 138 to 140? That is within the limits.

MR. CWALINA: With the standard tech spec, it is within the limit.

MR. GRIMES: Within the limit of Part 100, but it exceeds the small fraction as required by the standard review plan, so they don't meet current criteria.

MR. SIESS: Okay. It would be 130 to 140, but for this it's a small fraction, and a fraction is defined as what?

MR. CWALINA: Ten percent.

MR. SIESS: What did Oyster Creek get down to on that?

MR. GRIMES: 470 rem with a standard tech spec.

MR. SIESS: So this is quite a bit less than that. Is the Part 100 limit justified by any PRA now, the small fraction versus the full 300?

MR. RUSSELL: Not that I am aware of.

MR. CWALINA: I believe the small fraction came out; as the event frequency increases, it is the Staff's position that the consequence should decrease.

MR. SIESS: Yes. There are more small pipes than there are large ones. I think they are much less likely to fail. I don't think that got into it.

What is the Licensee's position? Where do you operate in relation to your existing tech specs and the standard tech specs?

MR. RAUSCH: I believe we operated within the standard tech specs.

MR. SIESS: Do you have any strong objections to going to the standard tech spec limit?

MR. RAUSCH: Yes. We've had discussions with the Staff outside these meetings. We are just getting started discussing it. In general, we often have disagreement with STS wording. In this case, there's not one limit they are asking us to meet; there are six pages of actions involved.

I think we can attain reasonable agreement on setting both a limit and actions. But if we don't, it is a very sticky issue for us.

MR. SIESS: Who wrote the standard tech specs?

MR. RUSSELL: The Staff.

MR. RAUSCH: We are experiencing problems with the standard tech specs in LaSalle right now, and we just know from experience in our operating plants that you can't necessarily do all of these action statements and run your unit the way it's designed to run. In this particular case on the iodine limits, we may be getting in cases where we would be sampling so often we can't anywhere in power.

MR. SIESS: If it's a generic enough issue, why don't the BWR operators-owners get together and try to work on it as a generic issue?

MR. RAUSCH: They have tried to get together for the near-term licensing plants, and I can't think of a good word to describe how difficult it is to try to change the Staff's mind when you want to get a license for your plant.

MR. SIESS: How about the licensed plants?

MR. RAUSCH: The licensed plants, if it came down that far, we would tell them they would have to order the tech spec amendment, and if we disliked it badly enough we would request hearings. I don't suspect it would come to that.

MR. SIESS: Because you have five BWR's with full term licenses, and there are a lot of other full term licensed BWR's, and they can get together and bargain on a different level. I admit it is difficult when you are trying to get a license to argue.

MR. RAUSCH: We have been fairly successful in our mind, and a lot depends upon the coordination of the project managers, which has been very good. But occasionally issues arise where we just have to take a stance.

And in this case, I don't think we will have disagreement on some of the action statements. I'm not sure if we are ready to agree on the actual limits. We may want to do some calculations ourselves.

But a good example on this one is, if you want to change power more than 15 percent per hour you would be required to take a sample. Our chemistry procedures require steady state operation to take a sample. There is a conflict right there. That says, if you are going to try to change your reactor by more than 15 percent per hour you have to stop every time you do it.

And we are reaching -- our grid is becoming unique in a large percentage of nuclear units. We can't baseload all of them any more once they go on line, so we will have to load follow, and standard tech specs were not written with that in mind.

MR. SIESS: An interesting point.

MR. RAUSCH: The same with the two-hour battery restriction. The standard tech specs we see are for BWR-4's and 6's. We are a BWR-3. The same wording is often applicable, but you don't necessarily have the same type of redundancy and the same type of plant layouts.

MR. SIESS: Okay. Does that conclude the Staff's presentation?

MR. RUSSELL: It does.

MR. SIESS: How many items did we not cover because they were on the Oyster Creek list? You don't have a slide that shows what's on there?

MR. RUSSELL: No.

MR. SIESS: Maybe when we meet again on this.

MR. RUSSELL: We will have a summary slide which will show which issues are common on all three plants.

MR. SIESS: And we can have that sort of as a reference. I think we understand the picture from what we looked at yesterday, but it is just getting the right perspective that is a little hard sometimes. All right.

MR. WARD: I have a couple of questions I want to ask. I had a little trouble with my bookkeeping here.

MR. SIESS: Give us a page number.

MR. WARD: One of these is on an item which is resolved. This is the 3.10.A, the thermal overload protection. And I guess --

MR. SIESS: Give us a page number, Dave.

MR. WARD: Page 4-26 of your chapter 4.

I guess the case here at Dresden, and presumably Oyster Creek, was because there wasn't any backfit required. But this is the issue where you may or may not require bypassing thermal overload protection for certain motors, and theoretically you improve the unavailability, decrease the unavailability, by doing this.

But I guess the question -- I wish Lipinski was here -- the question I have is, if you put in a kind of a complicated system that bypasses the thermal overloads of certain pieces of equipment at certain times, are you really -- have people looked at the reliability of the overall system or not, so that the claim that the unavailability is reduced is really a valid one?

It is sort of the issue of complicating circuits in order to increase reliability.

MR. RUSSELL: The approach that has been taken is to, I believe -- and Ray, speak up if I miss the point -- is to look at the settings of the thermal overloads and look at how they would function. And that approach is the one the Staff preferred over bypassing the thermal overload.

The other aspect is that for environmental effects, those aspects are being looked at for equipment qualification. For instance, if the thermal overload were in a motor control center that is exposed to a harsh environment, which we do have in some of the PWR's -- I'm not aware of any BWR's that have that, but there are actually some PWR's that have motor control centers inside containment.

The thermal overloads in that environment, because of the potential for increasing temperature, may not be appropriate. So that we are looking at that aspect of it as a part of the equipment qualification for the environmental effects of temperature.

And then we are looking at the actual settings and the design with respect to the thermal overloads for load interruption as that relates to the limit torque valves, where you have the bypasses around the torque switch. The problem was identified, as I recall, back in the early to middle seventies, with poor reliability of limit torque valves.

At Dresden there was a review of this, and some of the documentation was done by the station and was not available to the Staff. We were not aware that all of the torque switches were bypassed during the first ten percent of travel.

MR. SIESS: That is another issue.

MR. RUSSELL: That is another issue that was related.

MR. SIESS: Bill, the statement in chapter 4 does not read like what you said. You said your preference was the adequacy of the set points for the unbypassed.

MR. RUSSELL: We accept either. My personal preference is to evaluate the adequacy of the existing thermal overloads, rather than to bypass them.

MR. SIESS: The statement says -- it should have an "either" in it, so that you know it is an either-or statement. But the "either" has been omitted. That is a rhetorical argument.

MR. RUSSELL: I believe, however, that the reg guide proposes that you bypass. It doesn't have the either-or. As a part of the SEP review, we have accepted the review. Is that correct, Rick?

MR. SCHOLL: I believe the reg guide requires the demonstration of adequacy or.

MR. RUSSELL: It is an either-or?

MR. SCHOLL: It is an "or".

MR. SIESS: Does that take care of that, Dave?

MR. WARD: What does the Licensee think about the reliability of providing circuits to bypass thermal overloads under certain situations? Are you really improving the reliability of this system?

MR. FELL: I can't comment about bypassing thermal overloads, but what we did after all the valve failures we had in 1973 is, we bypassed the torque switches. We reviewed the thermal overload settings and in some cases we replaced the limit torque operators. I think the change there, in 1973 we had 19 reportable occurrences on limit torque valve failures and we generally average maybe one to two a year now, and I don't think any thermal overloads have been bypassed.

MR. SIESS: You bypass only for accident conditions, is that it?

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: It is an automatic bypass that has to do a lot of relays and such?

MR. FARRAR: But that's just torque switches. I don't think thermal overloads are bypassed.

MR. SIESS: But the proposal was to bypass thermal overloads.

MR. FARRAR: And we chose to evaluate the set point accuracy.

MR. SIESS: Have you ever tried to evaluate the reliability of the bypass system?

MR. FARRAR: Not that I am aware of.

MR. SIESS: Everything you put in the plant is likely to fail you at some rate, and the more things you put in there the more likely you will be to get something that doesn't work right. I think that is the point Mr. Ward is trying to make.

MR. FARRAR: I can't in my memory recall any failures of MOV's over the last seven years due to the bypass of the torque switch.

MR. SCHOLL: May I? Part of the problem we are dealing with here, part of Dr. Ward's question has to do with the historical nature of the problems with the use of thermal overloads, without questioning the particular plant they are in.

The thermal overloads by their nature and design are: one, dependent upon the temperature of the equipment they are in; two, they have a fairly wide band of repeatability. They're being used in this case to protect intermittent duty motors as compared to continuous duty motors. Their thermal characteristics are not really well matched for use with intermittent duty motors. The motors may develop hot spot temperatures and retain higher temperatures higher than the thermal overloads do.

So that the tack that has been taken is to use fairly large thermal overloads, to get away from the problem of spurious tripping at high temperature conditions. The Staff felt they were unreliable enough that they tried to get together with manufacturers and get more information on repeatability of the thermal overloads, and the Staff was not successful.

So the Staff took a very conservative approach way back in the early part of the seventies and arbitrarily said, under emergency conditions bypass them, and we won't have to worry about the methods used.

MR. SIESS: Does that imply a conclusion that the thermal overloads themselves are so unreliable that the bypass system has got to be more reliable than they are?

MR. SCHOLL: Yes, sir.

MR. SIESS: Okay. That is an interesting conclusion.

MR. WARD: Yes. Let's see. One other question. On page 4-31 -- and it may be I don't understand this, but it looks like you are talking about pressure relief on the reactor water cleanup system, and I think what it is saying is, if the pressure control valve fails open you can put 1300 gpm into the system, but that is okay because you have relief capacity of 1300 gpm.

MR. RUSSELL: That's correct. That is the issue we discussed yesterday with the three diverse isolation valves being controlled by one pressure switch, and if the pressure reducing valve fails in this case it would discharge back to the hotwell. On Oyster Creek it would discharge to the torus.

MR. WARD: This is literally 1300 and 1300 relief capacity, is that correct? There's no margin there?

MR. SIESS: It is 1360.

MR. WARD: They have another 40 there.

MR. SMITH: Plus the system itself usually has 540 normal flow through it. So the maximum flow you can push through that valve is 1300 gpm, and it normally is taking 600. So that leaves you with 700, really, for relief. So if it starts to all go that way, you still have the pumps sucking.

MR. WARD: All right. That is not very clear to me.

MR. RUSSELL: On the high pressure signal, the pump tripped and now you have the isolation. Now we are proposing, what if the pressure switch to close the valve fails. I'm not sure the pump will continue to run and discharge back on the suction side, because you have a check valve.

MR. SMITH: Once the pump is tripped, you have an automatic isolation and the 1300 gpm disappears.

MR. SIESS: I don't understand the argument going on in view of the statement that backfitting is not required. Are you arguing why it isn't required?

MR. RUSSELL: Yes.

MR. SIESS: Okay.

MR. RUSSELL: We agree it is not required, but we have different perceptions on why it is not required.

MR. WARD: Are they both right, one or

neither?

MR. SIESS: If they are both right, I was going to say I get some comfort from it.

MR. RUSSELL: I think the other thing that needs to be recognized is, even if this water is discharging back to the hotwell, there are other isolation signals which would isolate, for instance a containment isolation signal, if the event progressed to the point where you got a low water level. Reactor trip on low water level and a containment isolation signal to the containment isolation valve would terminate the event.

So there are other aspects of the event that are even beyond the capability of the relief valve for a a short period of time.

MR. SIESS: Any other items?

MR. WARD: No.

MR. SIESS: Anybody else?

(No response.)

MR. SIESS: Anybody else?

(No response.)

MR. SIESS: Does the Licensee have any more remarks they want to add? I think you said you covered them at the beginning.

MR. RAUSCH: We more or less covered them in the beginning. We didn't say too much about phase three yesterday, but we tend to agree with Oyster Creek's comments about phase three.

MR. SIESS: Do you have any changes to make in those you submitted earlier?

MR. RAUSCH: The comments we submitted?

MR. SIESS: Yes, on page 3. You did respond to Staff.

MR. RAUSCH: That's right. We made written comments. We don't really wish to change them. The tone of comments like that, it's difficult to describe. In our case, we really don't feel like there was that much uncovered that wouldn't have been uncovered by some other areas.

We do feel very strongly this is a good example of the type of process we would like to see more often, the integration process, although it really wasn't -- it looked like an integration. We also believe it is still topic by topic resolution. It is certainly a real big step in the right direction.

MR. SIESS: I haven't heard anyone who disagrees with that yet.

As far as Subcommittee remarks to Licensee, I don't think we have much to say now. We will have another meeting to complete our review and prepare things for the full Committee.

The tentative schedule, if we can get people, would be for a meeting on November 30th, and try to cover both you and Millstone, probably with most attention on the open items and some getting our feel together on the picture. And some may be settled by then and the lines more clearly drawn, and at that time we could give you better advice on what kind of presentation we want at the full Committee meeting.

MR. RUSSELL: We would also be prepared at that time to discuss what was done in the PRA. We will have some Millstone IREP available and the risk portions.

MR. SIESS: I would think at the next meeting we would probably concentrate on open items, plant unique items for Dresden and Millstone, and spend somewhat more time on the Millstone PRA since that will be our best chance to get a crack at it, with Millstone there.

Okay. Let's see, that PRA was made by Northeast?

MR. RUSSELL: No, this was an IREP plant.

MR. SIESS: I am sorry.

MR. RUSSELL: It was a plant review supported by Licensees.

MR. SIESS: And who made it? Was this an industry group, a team?

MR. RUSSELL: It was Sandia, with support from SAI, with support from the Licensee and Research and Licensing Staff.

MR. SIESS: Well, it is 11:00 o'clock. I think we will take a break and get started on the Millstone. And this calls for lunch at around 11:45. We will make it somewhere in that neighborhood.

(Recess.)

MR. SIESS: Okay. We will start off with a few words from Northeast Nuclear.

MR. KACICH: Richard Kacich from Northeast Utilities.

Before we get into a presentation on the plant description, I thought we would take a minute to identify who we have here from Northeast. On my left is Mike Bain, who works in our licensing group, who has the day to day responsibility for all of the SEP topics; Wayne Romberg, who is the operations supervisor at Millstone 1. You have heard from him several times during the course of the day. Also available is our NRC resident inspector, Tom Shedlowski, in the back of the room.

We have two brief presentations prepared, one on plant description that Wayne can give, and we also have some summary remarks, an overview similar to what we have heard from Commonwealth, which we can do after the plant description or at the end of the topic discussion, whichever you prefer.

MR. SIESS: However you wish. Do it at the beginning. I don't think we will run late, but it might be better to get it in at the beginning.

MR. KACICH: Very good. With that, I will turn it over to Wayne to discuss the plant description.

MR. ROMBERG: Thank you, Rick.

As Rick said, my name is Wayne Romberg. I am the operations supervisor on Millstone 1. I have held that position for about four years. Before that I was working with SEP as the engineering supervisor. I got out of that pretty quickly.

(Laughter.)

MR. ROMBERG: On the vugraph we have a slide showing the Mickey Mouse of the Millstone 1 facility. I won't give you a detailed drawing. I think you are familiar with the basic BWR-3. We are a lot like Dresden 2, a little older in vintage. There are some discrete differences. We are a little like Oyster Creek.

We are designed for 2,011 megawatts thermal, 680 megawatts electric. It's a BWR-3 with a Mark I containment. It was a turnkey plant built by Ebasco under GE.

It is one of three plants on that same site. The other two plants are pressurized water plants. One of them is Combustion Engineering. It is running. And the third will be a Westinghouse unit. It is under construction, due to run in '86.

MR. SIESS: You believe in diversity, don't you?

MR. ROMBERG: It does have its better points.

There is one common system between the various plants. That is the fire water system. There is a common header that runs around the plants. There are fire pumps from various plants. All are power driven; individual plants that feed the common fire water header.

There are other systems that are crosstie-able, including plant to air, some makeup water systems, et cetera. We have other discrete differences I want to talk about.

We are different than say Dresden 2, which is probably our closest sister plant. We do not have a steam-driven high pressure injection system. Our high pressure injection is off feedwater and it has an emergency power supply gas turbine adequate to drive the system. Other emergency power supplies are a standard diesel, and we have the normal standard BWR-3 type system.

We were one of the IREP plants. That study came out pretty good and I think that will be talked about another time.

We have 100 percent bypass capability on the plant, and we also have the ability to ride out full load reject if we lost a transmission line, and that works. We proved that recently. We rode a full load reject and got tripped on another system, an ATWS system.

As far as cooling down, one of the things I will note, our normal practice for cooling the plant down is different from most. We have a shutdown cooling system, pretty standard in plants. We don't use that normally to cool the plant down. We normally drag steam from the reactor and take it all the way down to 106 degrees by dragging steam. I think that makes us unique.

That's a practice we started a couple of years ago. It works very well. It solves a lot of problems.

MR. CATTON: What do you mean by "dragging steam"?

MR. ROMBERG: We cool down using steam going into the main condenser, and we are able to maintain vacuum with auxiliary equipment. And we can actually pull the reactor down to about 150 degrees just by boiling water in the vessel.

MR. CATTON: Okay.

MR. FITZSIMMONS: You go sub-atmospheric.

MR. ROMBERG: Yes. It works very well. I would highly recommend it to anyone who can do it.

Next slide.

We started construction in May of 1966. Initial critical was 1970. We went commercial later that year in December; 100 percent power right after the first of the year. We applied for a full-term operating license. We don't hold it at the present time. We are hoping this SEP project will get it.

The major outages. The first refueling was a long one. We had some problems. There was a chloride intrusion incident that was a part of that outage, so we had some problems there. I will not dwell on that.

You can see the outages varied in length. We discovered a feedwater sparger problem for the industry. After that we got our act together and had some fast outages there that went very well.

Our seventh outage was 197 days. That was our ten-year ISI outage. We did a tremendous amount of ISI work. We did find some suspected pipe cracking problems. We did replace a lot of pipe with new material.

And coming out of that outage we had the unfortunate occurrence of a water induction incident on the turbine, possibly related to the long outage. A lot of our controls filled up with rust. We checked out the equipment during the outage, but due to the long delay time we felt that generated some problems in retrospect.

Right now we are in our eighth refueling outage. It should go 70 days. It's on schedule and going quite well. This should finish up the rest of our torus work modifications. We are still doing a lot of 79-14 items for hangers, seismic qualifications and so on.

Next slide.

MR. SIESS: What kind of condenser tubing do you have?

MR. ROMBERG: Right now we have 70-30 copper-nickel. We started out with aluminum-bronze, which didn't work out very well. We will probably be going to titanium some time in the next four or five years.

Some performance statistics. You look at our overall capacity factor for the unit. In spite of some of the big problems we've had, it still runs about 63 percent; availability, 71.9. As you can see, depending on the problems we have had, we have had some very good years and some very bad years.

Last year we were pretty proud of the record we had. In spite of losing about ten percent due to turbine inefficiencies because we lost the 14 stage buckets on both low pressure sections, we still ran 79.5. It would have been close to 90 percent without that. So the unit has been running pretty well.

That concludes my presentation. If there are any questions, I will address them.

MR. SIESS: I guess there are none. Thank you.

MR. KACICH: We can get into the overview of the SEP's at this time. There are some copies of the overview if anyone needs them.

MR. SIESS: Are there additional vugraphs for the one we just saw?

MR. KACICH: Yes, sir.

MR. SIESS: From you or from the Staff?

MR. KACICH: From Northeast.

We have submitted two letters thus far

discussing our views about SEP in general. Those were a letter of July 30th addressed to Mr. Crutchfield, and then a letter that the SEP owners group submitted to Mr. Eisenhut on October the 7th. A lot of the remarks I have are paraphrasing the remarks we made in those letters.

I will also mention, a lot of the remarks I had prepared Monday have essentially been covered in other presentations made today and in the general discussion we've had, and I will try not to dwell on those points.

The first vugraph is by way of introduction. I think it is worth noting there are a few elements of phase two conducted differently from the original plans. First, it was indicated originally to be largely an NRC Staff program versus a Licensee program. We were advised in the beginning that there was to be some protection from what I have termed interim backfits unless there was an immediate safety problem. And third, there was an indication we would be excluded from some selected other NRC initiatives. I think as it has turned out the only item falling into that category was the deferral of the FSAR update for the SEP plants.

The fourth item I have up there is more or less a footnote, that this program was not formalized in regulations.

My purpose in presenting this vugraph is just to refresh everyone's memory on what the objectives originally were of SEP. Those were to create a documentation base, to provide for the capability of integrated and balanced backfitting decisions, to identify any immediate safety concerns, to reassess the safety adequacy of the SEP facilities, and to efficiently use the available resources, both industry's and NRC's.

A sixth objective that I have identified up there is also to improve the basis for POL conversions, and I intend to refer back to this slide towards the end of the presentation.

Also, in the interest of a little bit of history, I have covered what I have called some of the stages of SEP phase two, the first one being it was largely an NRC program for a duration of approximately three years. There was not a whole lot of progress made in this time due to what we subsequently found to be a lack of documented documentation on the individual safety topics, a rather large turnover of NRC Staff personnel in the branch, and of course the TMI accident which intervened.

The second stage I have termed the lead plant approach that I have described previously. The NRC proposed it and in a period two or three months later the SEP Licensees responded with what we term the lead topic approach, which we have been in approximately two years thus far.

I would characterize the actual program as a hybrid of the lead plant and the lead topic, in that most of the plants have been able to share information on the individual topics as we have gone through them, but the plants are being taken through integrated assessment in sequence, obviously, and not all at one time.

Note that the increased Licensee involvement during the last couple of years I think has been a key factor in accelerated progress, and I think the Licensees have benefited significantly by evaluating the topics concurrently where that was possible and sharing information.

In terms of what has happened as a result of SEP at Millstone thus far, we have a brief synopsis of the modifications that we have eithe completed or committed to thus far. The first one is the seismic anchorage of electrical equipment. That is common to virtually all of the plants.

Some relatively small seismic structural modifications relating to some bracing in our turbine building, some new battery racks, modifications to the gas turbine generator protective trips, a revised battery testing program, an in-service inspection program for water control structures, some locking devices and isolation valves, and various technical specifications and procedure changes -- again, common to a lot of the facilities.

The next vugraph describes some of our general observations on phase two. The first one is that relative to our original expectations it was a rather large resource expenditure, approximately -- there is a typo; that is 30,000 man-hours and not dollars, or approximately 15 man-years of internal resources. Our consultant costs were approximately one million dollars thus far, almost exclusively in the seismic area, and the hardware modifications we have implemented thus far are approximately one and one-half million dollars, again almost exclusively on seismic issues.

MR. SIESS: On your man-hours, what proportion of those were expended before you got into the lead topic phase of this thing?

MR. KACICH: As an estimate, I would say approximately 30 percent, just in the process of keeping book, if you will, and maintaining the status of things, even if it wasn't progressing a lot. There was probably more nonproductive time spent during that interval, if you would, but an estimate of 30 percent.

MR. SIESS: If it started out with the lead topic approach, you probably wouldn't have reduced it by a third, but you would have reduced it somewhat, right?

MR. KACICH: Yes, sir, that is correct.

The second item I have noted, the schedule was extended. I don't want to dwell on that. I think the TMI incident has as much to do with that as anything.

The third item was, the integration concept was limited to the applicable SEP topics for our facility. And Dr. Siess, as you have noted earlier, I think we could have gained substantially more out of the integration concept had there been a mechanism available to incorporate other ongoing backfit programs and other regulatory initiatives into this.

Integration is a very positive element of SEP as we see it and we would like to see it expanded further.

MR. SIESS: Yesterday Mr. Russell, in trying to define what he meant by "integrated", suggested that really the integration was done by the Licensee in integrating the fixes, rather than by the Staff in integrating the assessment. Do you picture it the same way?

MR. KACICH: Generally, we do. One difficulty that I think we have had is, when we try to integrate say an Appendix R backfit or an environmental qualification backfit into SEP, if we take it to the Chemical Engineering Branch they're really not too interested in SEP. If we take it to SEP, they're not interested in Appendix R problems. So it was difficult to find a person in the Phillips Building, if you will, who we could find interested in terms of that was their charter, to address all of these things at once.

The fourth item I have up there, we characterize, like other Licensees, as strong project management. We generally found if we could advance sound technical reasons to justify deviations from SEP criteria, the SEP Branch was generally willing to listen to those.

The next three items are logical outgrowths of what happens with strong project management. Generally, we found the judgments were based upon nuclear safety concerns and not SRP criteria. We found an opportunity to identify plant unique features and I think in general the SEP plants probably have more unique or one of a kind designs than other facilities, and that is a more important element for the Staff.

There were provisions for us to utilize our knowledge of the plant to implement integration. As I mentioned, it was programmatically limited to SEP issues now, and that was one of the major lessons learned from our viewpoing on the program.

Going back to the slide on the original SEP objectives, I am going to try to answer those from our viewpoint. The first one, do we create a documentation base? I think the answer is generally yes, we did. Not in every instance was all available documentation referenced in the SER's published by the staff, but I think clearly the documentation is much more retrievable than it was in the beginning of SEP, and therefore I would characterize it that we did meet this objective.

The second one, did we provide the capability for integrated and balanced backfitting decisions. Again, in the context of SEP issues only, I think that is being met. We are still working on it for a number of other issues, but I am optimistic that we will be able to put the concept to use.

Do I identify any immediate safety concerns? I don't think there were actually that many to find, but I think the process was available to do that. The one item that does come to mind similar to the other units is the seismic anchorage issue. Did we reassess the safety adequacy of the program? The answer I have on the vu-graph is partially met, and I think this is the most difficult one to answer. I would certainly characterize it as a thorough evaluation for the topics we addressed, but from the list of all of the issues that are out there, I think there are a lot of topics.

One reason I used the word "partially" is, the topic selection process took place generally in the 1977 time frame, and I think our collective knowledge about what issues are important has advanced to some degree during that period of time, so if we were to reselect topics, I think we would come up with some different ones right now.

As has been noted earlier during the course of the last day and a half, some of the more important or issues that have gotten a lot of attention, such as the TMI items and the unresolved safety issues, were deleted from SEP and not directly considered. There were a lot of other programs, including emergency preparedness upgrades and Appendix R and environmental qualifications that certainly commanded a lot of attention during the same period of time.

It is also, I think, worth noting that as the only SEP Phase 2 and IREP plant that the IREP had the same objective as SEP, and we would certainly try to incorporate that body of knowledge into the SEP integrated assessment, but it has already been noted that it didn't consider the external phenomena, and certainly the committee is well aware of the impact those issues have had on the conduct of Phase 2.

Another factor that adds to my characterization of this objective as partially met is that a comparison of the backfitting costs that had resulted from SEP as compared with backfits for any and all other reasons, when it was originally built, Millstone 1 cost approximately $100 million. To date, on backfits so far we have spent approximately $173 million.

We mentioned earlier that the direct SEP hardware backfit costs have been only $1.5 million, so certainly we were doing a lot of other things. A very high percentage of that $173 million was spent during the period of time the SEP was ongoing. That is not to say that a lot of the moneys that were spent were excluded from the evaluation process. Certainly if we knew about it we would try to take advantage of it.

But all of this information, for me it is hard to digest, to see where it all flushes out, but those are the reasons we have characterized it as partially met.

MR. SIESS: Let me ask you and Bill Russell a couple of questions about the items included in the SEP and those that were not included. You said you thought if you were making the selection now that the Phase 1 selection which ended up with 137 items, there would be some differences now. Obviously, there would be some we would leave out, I think, after the experience. Are there any you would have added or think you would have added if you were doing it now that weren't in the 137?

MR. CASSEN: Personally, I am not aware of any new issues that are not being addressed in some regulatory arena, if you will. It is more a question of trying to identify which ones are sufficiently advanced in terms of identifying a generic plan of attack such that they would be amenable to doing an integrated assessment for a given facility.

MR. SIESS: Let me address another question to Mr. Russell. Of the items that were eliminated because they were covered by USI, if there was an SEP item covered by USI, you took the SEP item out.

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: Are there any other USI items that were not in the original 137 list somewhere?

MR. RUSSELL: Yes, there are. For example, station blackout, seismic qualification of electrical permit. The USI's which have come out since about 1979, you recall the process that we went through to identify the USI's was looking at the ongoing generic issues, and in '77 we defined the SEP topics. There were many generic issues ongoing. For instance, water hammer, et cetera.

So, there is a subset of new USI's which we added during the SEP process.

MR. SIESS: And these were things that were not picked up in Phase 1?

MR. RUSSELL: That is correct. They were defined after Phase 1 was over.

MR. SIESS: Phase 1 then didn't do that great a job of selecting what were the most important items, because we found some later.

MR. RUSSELL: Well, at any given point in time, you can only screen those items you know about. If other issues come up later, you have to add them.

MR. SIESS: I am not sure a station blackout wasn't around, kicking around on the ACRS's list of generic items back in '75 or '70 or maybe even '65. Were items like station blackout in the original list?

MR. RUSSELL: Station blackout was not. The approach was one of looking at reliability of on-site and off-site power, a GDC 17 type review. It was not looked at from the design basis of loss of all AC power.

MR. SIESS: Okay. TMI items are in somewhat the same category. You thought of a lot of things after TMI that wouldn't have been on anybody's list, human factors and a few others.

MR. CASSEN: The last question I have on the vu-graph is, did we improve the basis for POL conversions. The answer I have listed is, an improvement has been achieved, but a question remains regarding how extensive a basis is needed. Dr. Siess, you noted earlier that Dresden 3 and Dresden 2 are essentially identical units, and one has an F2 OL and one a POL, and we have not, at least officially, been advised as to what process the staff has in mind in terms of the documentation process associated with a POL conversion.

I guess I am not really too convinced what technical questions need to be addressed, given that the plant has been operating quite satisfactorily for a dozen years, and as a POL licensee, we are not really exempted from anything, so it doesn't seem as though there is a whole lot of safety benefit to be derived from an extensive documentation path.

MR. SIESS: That is an interesting point. It has been so long since the staff did a conversion that they would probably have to start all over thinking about what they are doing, but I think the ACRS went through a number of full-term license applications, and they were considered rather cursorily, chiefly because the plant was only two or three years old.

MR. CASSEN: Interestingly, in our facility, Haddam Neck started proceedings a couple of years prior to Millstone, and it was issued an F2 OL in '74.

MR. SIESS: I recall that. I was subcommittee chairman.

MR. CASSEN: I wasn't around.

MR. SIESS: That was one I had in mind. They have done some upgrading, as I recall. We did a power increase on Haddam Neck, and I am not sure which one, but they put some new diesels in. They got them from someone else, or they gave their old ones to someone.

MR. CASSEN: Yankee Rowe. I think we sold them.

MR. SIESS: And there have been some changes made, but except for reviewing those changes, it really wasn't a big deal.

MR. CASSEN: Yes. Again, I'm not sure what the staff's proposed process entails. I am just making the observation that it doesn't seem as though there would be much to be gained from a safety standpoint in going through any exhaustive review process.

MR. SIESS: Certainly not on top of the SEP, but absent the SEP it is hard to visualize. I don't think anyone has ever done one on a ten-year-old plant, and I have a suspicion that the ACRS would take that opportunity to do a ten-year review, which it obviously would not do with a POL coming up after two or three years.

MR. WARD: You didn't ask Mr. Russell to answer the question of whether if you were making up a list of items today, the 137 items, are there some you would add.

MR. SIESS: I didn't because I didn't think he added them in his Phase 3 list. He took some out, but he didn't add any in.

MR. RUSSELL: It depends upon what the objective of a Phase 3 review is. If it is to integrate additional issues into Phase 3, then the list would be somewhat different. If it is to address those issues which are already not being addressed in other forums to avoid duplication, which is part of the reason for deleting the TMI and the USI items, then I believe the list we have identified as a candidate for Phase 3 is what we have learned from the current list of SEP topics, starting with 137 and deleting 24 TMI-USI items, and looking at the approximately 90 or so plant-specific reviews that have been done.

We come down with something on the order of 35 to 40 topics that we think, based on experience to date, merit review. That is still going on, but it includes such things as flooding, seismic, and safe shutdown reviews. Those are issues which we don't feel are being addressed in other regulatory forums at this time.

Now, that is a partial answer. If one were to include other issues and look at the entire menu of issues that are facing a licensee, I think you would have a somewhat different list.

MR. SIESS: The USI items are all A items, aren't they?

MR. RUSSELL: Yes. You have multi-plant generic items.

MR. SIESS: How many of the USI B and C items would have been on your list?

(Pause.)

MR. SIESS: Or have you ever looked at it?

MR. RUSSELL: Some were. For instance, the one on the reactor coolant pump overspeed during LOCA is one of the generic issues that we looked at and determined was acceptable.

MR. SIESS: That is a P USI?

MR. RUSSELL: All USI's are A's. Generic activities were A, B, C, and D. It depends upon which list.

MR. SIESS: Have you ever looked at that list to see how many of those you had in the 137?

MR. RUSSELL: We have, and they are identified in NUREG-0485, with a G for generic issue.

MR. SIESS: And 0485 was what, the --

MR. RUSSELL: If you take the 137 by 13, you get 1,370, and I think there was something on the order of 300 generic out of that total, something on the order of 20 percent of the issues.

MR. SIESS: But when you made up your list out of Phase 1, you had all of those generic item potentials, didn't you?

MR. RUSSELL: That's correct. There were over 800 issues initially screened.

MR. SIESS: That included all of those generic items and all of our generic items?

MR. RUSSELL: It included everybody's list.

MR. SIESS: Any other questions or comments to the licensee?

(No response.)

MR. SIESS: Well, gentlemen, by coincidence, 1 11:45.

MR. CASSEN: Excuse me, Dr. Siess. I have one additional vu-graph, if you will let me.

MR. SIESS: Oh, I am sorry.

(General laughter.)

MR. CASSEN: This is my punch line.

MR. SIESS: All right.

MR. CASSEN: I have listed in the way of conclusions, incorporate the positive elements of Phase 2 into the regulatory process in general. In some respects, it duplicates what we talked about earlier, but the first one, the SRP is only a starting point in our minds. If you do an evaluation and you find you made it, fine. If you find that you do not, that doesn't necessarily trigger a signal for starting a backfit process, as it seems to in other arms of the agency, but rather, it means you should look further.

The second one was strong project management, and again, what we would like to see, I think, if it would be possible to achieve, and I think it is a rather difficult task, would be a way that the integration process for backfitting could recognize all plant modifications, whether they are initiatives of the NRC or whether they are modifications that are voluntary by the licensee and done for other reasons, and it would certainly not be limited to the SEP topics only. Similar to the letters we have sent in thus far, I don't think we are in a position to provide a firm recommendation on whether there should or should not be a Phase 3. I think it depends quite heavily on how the program is structured.

I just have one other observation on the bottom, which would be that if there is to be another program, I think it would be worthwhile to formalize it by regulation.

MR. SIESS: Some of the things you propose there are very logical. Have you given any thought to whether you think they are possible?

MR. CASSEN: I certainly have given it some thought, and as I mentioned previously, I think that job would be very difficult, because at any given plant at any given time, I think the state of whether a licensee is fully prepared to get to the implementation stage of a given backfit and how the timing of it compares with the perceived urgency, both on the part of the staff and the licensee, and how it compares with refueling outages and a whole lot of other factors, makes that job very difficult, but I don't see any way to do it other than to have a focal point within the agency for the licensee to go to to try to explain in as much detail as possible the bases for whatever actions are proposed.

MR. SIESS: There are two aspects of what I think is implied by strong project management, going back to a couple of other slides. One is that the judgments were made on safety and not on SRP's as to whether a backfit was required, and I think the other aspect you have in mind is, there has been some careful consideration and flexibility in setting schedules for doing things, letting you come up with answers.

MR. CASSEN: Yes, sir.

MR. SIESS: The first, that basis for making judgments as to whether backfits are required could really be formalized by strict adherence to 50.109. I think that that pretty well characterizes the attitude that has been taken by the SEP branch in backfits. Can we demonstrate a substantial improvement in protection? Not whether the SRP says it should be done, or the Reg. Guide does. Can we justify substantial improvement in protection? And by simply taking that literal interpretation of the backfitting rule, they come to judgments based upon whether it will improve safety or not.

The mechanism exists for that. It just hasn't been applied anywhere except in the SEP branch, as far as I know.

Now, the other part of more reasonable integrated solutions, integrated solutions, integrated fixes will be very difficult, because somehow there has to be one person. As you said earlier, you can't go to a project manager on Appendix R and a project somebody else on 209 and someone else on a USI item and get any coordinated response. I guess you have a project manager at your plant with the authority to set those schedules, and I thought CRGR had proposed something like that on, for example, the control room backfit problems, that the project manager would work out a schedule with the licensee. That is again, I think, only on that item.

MR. CASSEN: Sir, I would agree with the observations you have just made in general. I think that if you look at the 50.109 language and how it has been handled over the years, I would be of the opinion that would be preferable to institutionalize or formalize some of the ways of evaluating the merits of any given backfit rather than being as dependent upon perhaps the personalities of some key individuals. Those would be among the reasons why I would advance that. I think a bit more explicit backfitting rules might be helpful.

MR. SIESS: But you didn't like the one that was just proposed, or are you familiar with it?

MR. CASSEN: Your statement is correct. I think we could come up with something better from our viewpoint.

MR. SIESS: Have you ever had a backfit

required by invoking 50.109?

MR. CASSEN: Not to my knowledge. That would go for three operating plants.

MR. SIESS: Actually, the CRGR approach to generic type backfits isn't too far different from what the SEP program has done.

MR. CASSEN: Yes, sir.

MR. SIESS: It is the individual plant backfits that don't get caught in that system.

MR. CASSEN: Right.

MR. SIESS: And there are too many other ways to backfit without using 50.109.

MR. CASSEN: I think the trend in the agency is going in that direction, but still in the relative short term, perhaps the next two or three fueling outages, we still have a rather large stack of backfits to take care of, and we would like to see a more formalized means of assuring that these kinds of considerations will be heard in Washington.

MR. SIESS: Somebody not too long ago came down with about a three-year schedule for doing a lot of things, scheduling them over different refueling outages. I can't remember who did it. Did you do it?

MR. RUSSELL: Oyster Creek. We have had several meetings with them on their scheduling for the next couple of refueling outages. There were meetings in Washington, and some of the SEP issues I know we deferred to the second refueling outage. There were other things they requested relief on.

MR. KNUBLE: I would like to comment on that. In our last letter that we submitted, we gave a lot of credit to the SEP branch for doing that integration on a schedule basis. Our complaint is, we can change the SEP items by negotiating with them. What we can't change is Appendix R, emergency planning, and all of the other items.

MR. SIESS: I think that is a general complaint. Why can't everybody be as reasonable as SEP? I don't know. I'm not quite sure I know how SEP gets that reasonable.

(General laughter.)

MR. SIESS: And I am using the word "reasonable," I think, correctly. Now, IE came up with this report a while back that essentially led to CRGR's. People have got too many things to do, and they can't do them, but CRGR only takes care of the multi-plant requirements, the generic issues, and I don't think NRC has figured out, and I don't think they can figure out a way that each individual decision is going to be run through something like CRGR. There are just too many of them.

MR. CASSEN: I think another observation is that CRGR, at least as I understand it, is not as a matter of practice going back and looking at the existing regulations or requirements, and those are the ones we have the short-term problems with.

MR. SIESS: I think it is in its charter somewhere, but I don't think they have time to do it over the next couple of years.

MR. RAUSCH: A very brief observation. I think the goals we have been stating here are going to be even more difficult because of another item going on that a lot of people are aware of, and that is the decentralization. I shouldn't say decentralization, the regionalization. Excuse me.

(General laughter.)

MR. SIESS: I am not sure how that is different from decentralization.

MR. RAUSCH: But that is going to be extremely difficult. We have already had problems in our region in working out acceptable schedules on some extremely major items, namely, 7914.

MR. SIESS: Why does it make it more difficult?

MR. RAUSCH: Because the project management people will be looking at 90 percent of what you are doing in numbers of issues, yet as far as number of man hours at the site the region may be looking at over half. They may be responsible through the I&E organization for implementation of the bulletins, for example, and the bulletins are still coming. They aren't going to be very often, but when they come, they will be big.

MR. SIESS: Won't under the new system the regions handle some of the things that have been handled in Washington?

MR. RAUSCH: That's right. That is my point.

MR. SIESS: The regions are not I&E any more. They are going to be branches of everything.

MR. RAUSCH: Right, and it is going to be a split, and it may take ten years until it is finally defined, but that very split, and even the fact that it is split, will make this more difficult.

MR. SIESS: If you had a project manager working out of the region with some authority over everything you were doing --

MR. RAUSCH: That would still work.

MR. SIESS: -- to do what was done on SEP for everything, to be responsible for what you were doing in your schedule, and to work it out.

MR. RAUSCH: But the opposite will happen. I don't think -- It will be split somewhere along the line with highly technical and diverse issues residing in Washington, Bethesda, and the more implementation and audit type functions, the ones explicitly spelled out in NRC procedure manuals, will reside in the region, and unfortunately, a lot of those issues are going to be very difficult.

MR. SIESS: I am afraid I can't disagree with you. I was going to ask the question about regionalization, and I was sort of afraid to open that issue. I don't think anyone knows how it is going to work. Some of the regions aren't as close to the plants as Washington.

Anything else?

(No response.)

MR. SIESS: Would you like to go to lunch now? We will come back and get into this list.

Be back at 1:00 o'clock.

(Whereupon, the subcommittee was recessed, to reconvene at 1:00 p.m. of the same day.)

AFTERNOON SESSION

[1:00 p.m.]

MR. SIESS: SEP Staff, Millstone Unit 1.

MR. PERSINKO: My name is Drew Persinko. I am the integrated assessment PM for Millstone. We will start, I guess, with slides.

MR. SIESS: Don't start at the beginning.

MR. PERSINKO: Pardon?

MR. SIESS: I said don't start at the beginning. Just to be sure, there are 137 at the top.

MR. PERSINKO: That is a breakdown of the topics as applied to Millstone.

MR. SIESS: You got it down to 27.

MR. PERSINKO: The top are topics. The 38 topics are 86 issues: 59 were similar to Millstone and 27 were plant specific.

The next topic is a cross-reference between Millstone and Oyster. All of the topics on the left are Millstone. And where it said "covered in Oyster Creek," that is the appropriate section in Oyster Creek's report.

MR. SIESS: Let's leave that one up for just a second. This is everything, right?

MR. PERSINKO: This is everything from Millstone, the topic and the section. It also shows the corresponding section for Oyster Cre .

MR. SIESS: You are just going to go through the ones that are different?

MR. PERSINKO: Yes.

MR. SIESS: That will be the ones that have a blank after "section"?

MR. PERSINKO: Yes.

MR. SIESS: Okay.

MR. RUSSELL: You may want to also talk about the ones in disagreement.

MR. PERSINKO: The disagreement you see here is the Oyster Creek disagreement. At the end of all the slides I have, I reiterate the ones that Millstone has disagreements with.

MR. SIESS: Okay, that's good.

MR. PERSINKO: Do you want to see that list again?

MR. SIESS: Only if there is an oddball in it that you would like to point out.

MR. PERSINKO: No, none that I know of.

MR. SIESS: Okay. The same way with the USI/PMI list.

MR. PERSINKO: Would you like to see that list?

MR. SIESS: No oddballs in there?

MR. PERSINKO: None that I know of.

MR. SIESS: All right, let's go on.

MR. PERSINKO: Here is the breakdown we will be using, the same as before.

MR. RUSSELL: Do you want to talk about any found acceptable on an equivalent basis as compared to meeting current criteria?

MR. SIESS: Are there any in there different from any of the others that were found? Are there some that were at issue in either Oyster Creek or Dresden that were found acceptable at Millstone?

MR. RUSSELL: I don't believe there any unique. Possible fuel storage.

MR. PERSINKO: Fuel storage was equivalent just because --

MR. SIESS: That wasn't --

MR. RUSSELL: This is one not reviewed on the other too, but it is not --

MR. PERSINKO: I believe the issue there in the topic was it was a piping system but was not of the correct quality, I believe, but it was found okay in the topic, and that is the only reason we put "equivalent" there.

MR. SIESS: Okay, let's go on, then, to the integrated assessment items. All right, let's start off with the no backfit topics again.

I think the point I need to make is we are concerned with the items you found acceptable, but I think we have sampled enough of those on enough plants now that I feel confident in your assessments there. I don't think we found one where we disagreed with you. Okay.

MR. PERSINKO: Would you like to go through them?

MR. SIESS: All right. Not requiring backfit. That is not a very long list. Let's just take them sheet by sheet and put them up there. The diesel fuel pump is the only thing that PMH --

MR. RUSSELL: The only thing that was needed to provide onsite power.

MR. SIESS: This is where I get mixed up, because you don't have the items here that were Oyster Creek.

MR. RUSSELL: That's correct.

MR. SIESS: What is the situation in general, the flood level here. PMH is your flood, or do you have a local precipitation?

MR. PERSINKO: There is also some local precipitation noted but I didn't specifically make a slide for it because we discussed local precipitation for Oyster.

MR. SIESS: Same thing? Scuppers do the job?

MR. PERSINKO: Scuppers was the problem there.

MR. SIESS: For PMH flood, you don't have the situation you have at Oyster where you think everything could be taken out. It is more like Dresden where you do have some trains left to shut down?

MR. RUSSELL: That's correct, that's what we have identified and that was the reason.

MR. SIESS: This is the one item that was susceptible?

MR. RUSSELL: As I recall, these transfer pumps were previously raised, and the question becomes one of how high do you raise them? And there was only a one foot, 3 inch difference.

MR. SIESS: You see, what is confusing is you say these are only the differences from Oyster Creek. Oyster Creek has a big problem on floods right now.

MR. PERSINKO: There is another issue related to PMH on Millstone. It shows up in a later area where the licensee will look at other effects from the PMH.

MR. SIESS: What about the tornado at Millstone?

MR. PERSINKO: It was similar to Oyster Creek. The stack was a problem.

MR. SIESS: What about all of those pumps? Is there a requirement that they have to fix up one system to be tornado resistant for safe shutdown?

MR. PERSINKO: Yes.

MR. RUSSELL: We have taken a similar position, yes.

MR. SIESS: All right, similar to Oyster Creek.

MR. PERSINKO: This was the effects of moderate energy piping related to internal flooding. Northeast has provided some information on that. Staff viewed it and found that the question of internal flooding was found acceptable as stated here.

MR. SIESS: Here you have addressed the corner rooms. That has the ECCS pumps, right, the corner rooms?

MR. PERSINKO: Yes, sir.

MR. SIESS: I remember that was looked at in connection with LOCAs years ago.

Okay, any questions?

[No response.]

MR. SIESS: Onward. Now, these are seismic design considerations over and beyond those for Oyster Creek.

MR. PERSINKO: Yes.

MR. SIESS: Those tend to get fairly specific on the other plants. What was the situation on Oyster Creek, Chris?

MR. GRIMES: On Oyster Creek there were a number of issues common to all three, like qualification of cable trays, the electrical system --

MR. SIESS: Function.

MR. GRIMES: Right. There were some identified in terms of mechanical components or piping that were similar, and we grouped all of those together under Oyster Creek. These are the only ones that didn't fit under those general groups.

MR. SIESS: Okay. I think when we go over this next time, we had better have all of the items, and then you can tell us which ones are like others. You can have a classification list.

MR. GRIMES: For each of the plants, you would like the specific issues addressed in all three plants?

MR. SIESS: Well, for the two. We will only have two next time. I think we ought to have a list of all of the issues and then a note that tells us which ones are the same as Oyster Creek or where Dresden and Millstone are the same, or otherwise it is difficult to keep track of all of these.

MR. WARD: We still promise you an integrated review.

[Laughter.]

MR. SIESS: Yes, they are all in your Chapter 4, and when we have read that through, I may decide a different way of presenting this; but I guess tentatively just plan on giving us the whole thing.

MR. GRIMES: All right.

MR. SIESS: Is this the only plant, is this the integrity of the valve or what it does to the piping?

MR. PERSINKO: The piping was reviewed and found okay. It was the integrity of the valve itself.

MR. SIESS: Okay. Twenty hours. Okay. It says the gas turbine generator could provide emergency power. I got the impression from what the licensee said that the gas turbine generator powered the HPCI pumps?

MR. BAIN: The feedwater cooling and ejection pumps.

MR. SIESS: Which are your --

MR. ROMBERG: It is the normal feedwater train powered from the gas power emergency.

MR. SIESS: That's your high pressure injection?

MR. ROMBERG: That is our high power injection.

MR. SIESS: You can also use the gas turbine to power the station service and cooling water pumps?

MR. ROMBERG: That is correct.

MR. SIESS: In addition to the other pumps?

MR. ROMBERG: Yes. We can carry most station shutdown loads on a gas turbine. It is a big machine.

MR. WARD: What is its rating?

MR. ROMBERG: Ten megawatts normally. I think we can go up more than that if we want to.

MR. SIESS: What size is your diesel?

MR. ROMBERG: One diesel is 3 megawatts. We have got a 10 megawatt jet.

MR. SIESS: Does the gas turbine run all of the time?

MR. ROMBERG: No, it does not. It is emergency power supply. It is tested.

MR. SIESS: Okay.

MR. WARD: Is that a Pratt Whitney?

MR. ROMBERG: General Electric.

MR. WARD: Sorry.

MR. SIESS: It is a turnkey plant; you forget.

MR. WARD: I was thinking of the geography.

[Laughter.]

MR. SIESS: I thought on this issue when we were talking to Oyster Creek, somebody said that the problem was that this was 110 percent of power instead of 102.

MR. GRIMES: Dr. Siess, that was 15.1 on the feedater control.

MR. SIESS: Okay, I'm sorry. Yes. I'm not sure what a PRA would tell you about exceeding MCPR.

There are an awful lot of places where a PRA won't help you make a decision, aren't there? Those were no backfits of any kind. Now we have additional information items. Let's take them item by item.

MR. PERSINKO: Here is your PMH again.

MR. SIESS: That is 3.3 feet above the floodwall?

MR. PERSINKO: Yes.

MR. SIESS: Once it gets over the floodwall, what is the plant protected to?

MR. PERSINKO: The plant, as far as I know, is protected to 19 feet.

MR. BAIN: Yes, the floodwalls provide protection up to 19 feet, and I believe the still water elevation actually comes below that level. It is just the overtopping of the waves.

MR. SIESS: This question was, if for some reason I dumped the water over the floodwall --

MR. ROMBERG: I think there is misconception here. We don't have a floodwall that is separate. We have floodgates at various plant locations. We are using the plant structure.

MR. SIESS: What is the plant grade?

MR. ROMBERG: 14.6.

MR. SIESS: What is the lowest sill?

MR. ROMBERG: 14.6, and we have floodwalls or we have floodgates that bring it up to 19.0.

MR. SIESS: Do you mean in the individual doors?

MR. ROMBERG: That is correct.

MR. SIESS: Oh, okay.

MR. PERSINKO: It is concrete up to 19 feet, I believe, and above that it is a siding type of structure.

MR. HERMANN: There are installed watertight doors.

MR. ROMBERG: Yes, the watertight doors match that.

MR. SIESS: I didn't want to see a plant at zero and once the water got over it there was 19 feet of water in the plant.

MR. ROMBERG: No.

MR. SIESS: When will you have these evaluations?

MR. BAIN: I'm not sure of the schedule. I believe they are split into two parts. I believe the effects of the water leaking in is sometime the middle of next year, I think we are looking at. We are looking at a December date for evaluating the effects of a surge inside the intake structure.

MR. SIESS: Was there a hurricane considered when the plant was designed?

MR. BAIN: Yes. The flood protection that currently exists has been there since the plant began.

MR. SIESS: But it wasn't based on a PMH. It was probably based upon some historical level.

MR. BAIN: No, I think it was a PMH. The methodology may have changed slightly, but I think the term "probable maximum hurricane" was actually used. I have seen that in the amendment to the FSAR which describes the flood protection.

MR. SIESS: Do you know, Bill, whether the calculation has changed?

MR. RUSSELL: I really can't answer the question. I don't know.

MR. SIESS: Since the 18-foot still water level, they would have been protected, and I'm not sure they always considered wave runoff.

MR. BAIN: I believe that is the change. The waves weren't considered before.

MR. SIESS: Has anyone ever tried to figure how much water you can really get in there of each wave? It's not like the water is coming up here (indicating) and rolling in, but these walls are right outside your doors, right at your doors; right?

MR. ROMBERG: The floodgates are right at the doors, yes.

MR. SIESS: I can see why it will take a little while to figure that, too. That is a new one. I haven't seen that one since Zimmer -- I mean Bailey.

MR. WARD: Let's see, what's the --

MR. SIESS: I thought you were sitting on an old quarry.

MR. BAIN: [Nods affirmatively.]

MR. SIESS: What are the piles doing there?

MR. BAIN: There are some structures that weren't carried all the way down to rock.

MR. SIESS: How far down is the rock?

MR. ROMBERG: It depends on where you are. There are places where the rock comes to the surface. There are other places where there is intervening sand between the rock and the granite.

MR. SIESS: And you have H-piles down to the rock?

MR. ROMBERG: Is some locations that was done. In some cases the piles were driven to a certain depth and left that way. They were not actually driven to refusal. So you might say we have a mish-mash.

MR. SIESS: Not in sand. They weren't H-piles then.

MR. ROMBERG: I don't know the exact. I know there were places they weren't driven to refusal. They were in the overbearing strata.

MR. SIESS: There are also a lot of friction piles here.

Dave, do you have a question?

MR. WARD: Yes. Just for my benefit, what is the safety implication of the turbine building? I mean what safety-grade equipment is in the turbine building that is being considered?

MR. BAIN: A good bit of the emergency switch gear, the station batteries, the diesel generator, the feedwater coolant injection system, the day tank.

MR. SIESS: As I recall, there are two issues associated with the piles. One has to do with actual settlement, and the other has to do with the attachment at the top of the pile to the foundation of the structure and how much embedment the pile top has and whether it can carry the water load. There is no question of liquefaction, I assume. I don't see it here.

MR. RUSSELL: In the seismic evaluation that was done on III-6, it was not identified in the problem.

MR. PERSINKO: No, that is not the question. I would like to point out I don't have III-7.B listed since it was similar to Oyster's, but I would like to point out --

MR. SIESS: What is III-7.B?

MR. PERSINKO: The structural design cone topic. I don't have that topic listed since it is similar to Oyster's. However, I would like to point out that Northeast has taken a different approach, in a way, in that there are a number of structural issues along the way and they have chosen to put them in the III-7.B topic and address them in one place.

MR. SIESS: That sounds like the Ginna coordinated review.

MR. RUSSELL: It is an integrated structural review.

MR. SIESS: That makes sense.

MR. PERSINKO: This is a continuation, I believe.

MR. SIESS: Yes, that is a continuation.

MR. PERSINKO: There is a question as to the supporting material underneath the buried lines.

MR. SIESS: In this item the locations at which pipe break must be assumed, is this defined somewhere?

MR. RUSSELL: This is in the approach that was used on SEP. It can either be a mechanistic approach: that is, based upon stress, take the end points and the two points in between on the piping, similar to a current standard review plan approach or a systems-type approach and look where interactions can occur between piping and adjacent components on a systems basis.

MR. SIESS: Spence Bush had a comment in his letter. Was he referring to this item?

MR. RUSSELL: He was. That was based upon the Palisades review we sent in the documentation after that, reviewed it, and he considered the approach we were taking on pipe breaks to be more realistic than that of the standard review plan.

MR. SIESS: Thank you. Onward. Pipe break outside containment.

[Pause.]

Is this stuff on jet expansion and jet impingement based on experiments?

MR. HERMANN: I believe what the Staff did to look at this, basically, was use the SRB cookbook.

MR. SIESS: Even the SRB, what is it based upon?

MR. GRIMES: I believe all of the jet expansion models are developed from first principles and then adjusted for experimental data, a lot like the quencher work that was done in MARK I.

MR. CATTON: So it is empirical, is what you are saying.

MR. GRIMES: [Nods affirmatively.]

MR. CATTON: Does it include jet impingement on an edge of something and the vibration problems that result, or is it just Rho V^2 impact?

MR. GRIMES: It is RHO V^2 impact on cross-sections of pipes.

MR. CATTON: So if you happen to hit a piece of equipment and tip the edge of it, you would miss that in your review because that would be a vibration problem, that would tear it loose rather than just knocking it off.

MR. GRIMES: Yes, that is true.

MR. CATTON: I have asked that question a number of times and the answer is always the same: yes, it is true.

MR. SIESS: You are not asking the right question. Ask them if they have considered it.

MR. CATTON: Do you consider it?

MR. GRIMES: As far as I know, it is not considered.

MR. CATTON: I think that is perhaps more important than direct impingement. Direct impingement you can easily see will occur. This can be indirect and just as damaging.

MR. SIESS: Does it have to hit at a certain particular spot?

MR. CATTON: No, it is the kind of thing that turns up everywhere. If you have flow over something, you get a certain frequency in vibration and you get it everywhere, and I find this particular aspect of jet impingement is totally ignored.

MR. HERMANN: Let me comment a little bit on that. I think most of the SEP plants that have looked at this haven't really been that sophisticated in terms of evaluating loads. Correct me if I am wrong. I believe most of them have basically taken a cone angle, where something can be in the cone, and if it is in the cone, they consider it to be gone for purpose of the equipment functioning. So I guess from that aspect, a little bit of your concern might be addressed.

MR. CATTON: If you are just outside the cone or if this thing hits a wall somewhere and you are a little distance on either side of it, you can still get pretty large impact from this jet.

MR. HERMANN: My only comment is it is a pretty big conservative cone.

MR. SIESS: I was going to say I suspect the cone is conservatively sized.

MR. CATTON: I don't know that, but it may be.

MR. SIESS: Every once in a while we find the

Staff doing something that isn't conservative.

[Laughter.]

MR. HERMANN: I believe if you took very large flows and tried to open the flows and get these cone sides out of them, you couldn't get near them.

MR. CATTON: I visited the HDR reactor in Germany a number of years ago, and inside of it was tore all to hell, and it didn't matter whether the stuff was anywhere near the cone or not. It could be in the next room just because of the flow through the doorway and as it expanded it through the doorway it would vibrate something loose. There were pipes that came through concrete walls that were shaken loose, and they were some distance away. So I think this whole area has not been properly looked at.

MR. RUSSELL: That is the whole issue of low-induced vibration and the problem we are having with the Westinghouse steam generators.

MR. CATTON: But you have them in places other than in steam generators, and I think they should be looked at.

MR. SIESS: What is the solution to that, Ivan, other than guard pipe? I mean after what you said about HDR, it sounded like darned near the only solution would be not to let the pipe break.

MR. HERMANN: I am not sure you should extrapolate the European pipe to ours.

MR. CATTON: And you can't really extrapolate the HDR. I think it is a matter of when you are in the plant and you look at the places you might have a pipe break, you have to ask yourself if there is anything else around here that might get in trouble, and if there is, you carry it to the next step, and I just don't think that is done.

MR. RUSSELL: That is the approach that we are using on SEP as compared to specifying breaks on a stress criteria and looking at end points. We accept either method, but most have used the systems approach and then tried to show there is some separation. There are some areas where it is not.

MR. SIESS: There might be a difference in definition of "around" here because you are talking about a cone and a break location in the cone, and I think what Catton is implying is that if it is anywhere in the neighborhood and enough water comes out fast enough, it could cause damage.

MR. CATTON: That's right. You can do things like stiffen it up and do all sorts of things to protect it if you think it is going to happen.

MR. SIESS: You can get too mechanistic.

MR. RUSSELL: In general we would use other alternatives than stiffening the thing up and putting braces in.

MR. CATTON: I mean if you have a piece of pipe setting out there that the flow will go over, it is the same problem as the steam generator. If you think about it beforehand, you don't have a problem.

MR. RUSSELL: My comment was more directed toward staying away from pipe restraints and things inside the containment, or even outside where for other reasons it is not practical to put those restraints in. It may be the loads imposing the restraints are greater than the structure can accommodate.

MR. HERMANN: I believe Dr. Bush made a comment earlier about some concerns he might have about overstiffening pipe systems, too.

MR. SIESS: Oh, yes, we are always concerned about that. But we are also concerned about a pipe break wiping out too much essential equipment. I think the point Dr. Catton is making is that too restricted a mechanistic view of that jet may overlook some interactions that could take place.

MR. CATTON: That is right. It is a less mechanistic basis.

MR. HERMANN: I wouldn't say it is

categorically the case that things are that well separated. I think in a large number of cases, when there is separation it was separation like it was on the other side kind of separation rather than the five feet away kind of separation.

MR. CATTON: I really just raised the subject because I would like people to be more aware of it. I think if you are aware of it, you do something about it.

MR. GRIMES: As far as I know, there is something in research activities related to applying HDR types of test data, and some of the French test data on jet expansion to the models to look at vibration effects. Right now they are simple Rho V^2 force cookbook solutions. And to the best of my knowledge, in the work done on MARK I and related work, we have never seen an instance where the vibration dominated. For short-term effects like a LOCA, you wouldn't expect the plant to go through as many LOCAs as HDR did. You wouldn't expect a plant to continue to operate with a free jet in the containment impinging on things. The steam generator tube forced vibration and related kinds of failures are more long-term effects, but eventually the models are going to reflect the kinds of experimental data on free vibration.

MR. CATTON: Who is doing the work at RAS?

MR. GRIMES: I haven't the faintest idea, but I see the reports come through the standard distribution. That is why I said somebody is doing something but I can't recognize who the somebody is.

MR. CATTON: I will find out.

MR. SIESS: Let's go on, then. A good example of lack of integration is you have the same item twice, half on, half not. I guess if we get them separated in these categories, that will happen.

MR. RUSSELL: On the previous slide, the issue of valve integrity was left open and pipe integrity was closed off. It was repeated in the valve integrity issue.

MR. SIESS: Yes. You concluded that the pipe stresses are acceptable but you are not sure about the valve.

MR. RUSSELL: Correct.

MR. SIESS: All right. That is why you answered what you did when I asked about the pipe. I am sorry.

MR. RUSSELL: Correct.

MR. SIESS: The pipe is okay but the valve may not be. Anchorage on some electrical equipment. Okay, any questions?

MR. PERSINKO: This was just a lack of

information on two lines.

MR. SIESS: Are those pumps down in the bottom?

MR. BAIN: [Nods affirmatively.]

MR. PERSINKO: I believe so.

MR. BAIN: Yes, they are.

MR. SIESS: Is that an item we see also under ventilation.

MR. GRIMES: I think the ventilation section referred back to this section. We weren't necessarily consistent in which spot we put it.

MR. SIESS: Okay. How do we get this far down the pike on these reviews without having sufficient information? Did you just get around to these items late in the review?

MR. RUSSELL: This is one completed earlier in the review. I think it is still open because the licensee has not proposed a resolution to us yes.

MR. SIESS: It says he hasn't provided the required information. This is ventilation systems.

MR. RUSSELL: Excuse me. I had flipped to the next page.

MR. SIESS: Yes, you got ahead of me.

MR. HERMANN: I believe your statement is accurate. This was one of the later reviews.

MR. GRIMES: In addition, there was a

consideration of prioritization of resources to provide information, and some of the little stuff, by virtue of putting resources into the biggies, got left behind.

MR. SIESS: What is FWCI?

MR. ROMBERG: Feedwater coolant injection. That is our high pressure injection system.

MR. SIESS: Okay. We are down to the next list of topics. Let's see. That last list was additional information for analysis at some other time?

MR. PERSINKO: Yes.

MR. SIESS: And this list --

MR. PERSINKO: Is modifications and hardware backfits.

MR. SIESS: All right, let's just go into the items.

MR. PERSINKO: What you see relates to the gas turbine generator. The licensee has reviewed the trips and has proposed to modify the current trip systems on the generator and gas turbine.

MR. SIESS: Has the licensee looked at this in the light of the need for the onsite power from the gas turbine generator in the time frame that would be associated with station blackouts, whether this would have any detrimental effect on that? If these trips were bypassed and you tried to start it up, could you damage it in such a way you couldn't get it started the next hour?

MR. ROMBERG: I don't think --

MR. SIESS: Do you understand what I am saying?

MR. ROMBERG: I understand what you're saying. I don't think we have looked at that real hard yet. The problem certainly exists. It's just not the way we have been looking at these things in the past.

MR. SIESS: Because our whole approach to onsite power has been a quick start to take care of the LOCA, and we didn't want anything keeping it from starting. And we assumed that if it started it would at least run for a while.

Now, if we needed it for a station blackout situation we have plenty of time to get it started. We would hate to start it up and damage it in such a way that -- we wouldn't mind it tripping out if we could fix it.

MR. ROMBERG: That is essentially where we were before we reviewed this item. All of the trips were there. In fact, they still are. We haven't done the modifications yet.

MR. SIESS: These are all of your trips?

MR. ROMBERG: All of the trips are still there.

MR. BAIN: I believe the way the logic will be when these trips are bypassed is, it will require a coincidence of a low level and a high drywell pressure signal, an accident signal.

MR. SIESS: You would only bypass them for an accident signal.

MR. BAIN: Right.

MR. SIESS: That would solve the problem.

MR. RUSSELL: The other aspect, Dr. Siess, when we went through these we looked at those trips related to the integrity of the machinery, for example, high speed. You don't want the gas turbine to fall apart. You couldn't use it again.

MR. SIESS: There are usually two you will leave in.

MR. RUSSELL: There are more, because of the uniqueness of the gas turbine or the generator. We follow the same philosophy. If you have high differential current on the generator, you have substantial problem with the generator itself, and that type of trip would not be bypassed. But others which may not be indicative of a serious mechanical problem that would lead to destruction of the machine, but may be a longer term problem, that was the philosophy used on the Staff's part in looking at the Licensee's proposal.

MR. SIESS: That's good.

MR. HERMANN: I think you will see that more in the second part on the operation.

MR. PERSINKO: There's a part of this we put under procedural that will come up later, relating to the gas turbine.

MR. SIESS: Okay, I see at the bottom of the page where you have looked at those things, yes. That's very good.

MR. PERSINKO: This is a continuation. This relates to the generator portion.

MR. SIESS: That is a generator, so it would be just like diesel.

MR. PERSINKO: Yes.

MR. SIESS: Do you have any questions?

MR. WARD: (Nods negatively.)

MR. SIESS: Okay. Procedural, et cetera.

MR. PERSINKO: We are back to the gas turbine again.

(Laughter.)

If you look in chapter 4, there is a list of the LER's that were generated on gas turbine failures. If you would notice, a number of them are related to what we considered poor maintenance practice or an improvement in maintenance could be done, and that is why we required this.

There were a number of items lately, such as rust in the lines, rust in the tanks, which possibly could have been avoided had there been a preventative maintenance program in effect. You may want to talk more about this.

MR. ROMBERG: I would like to elaborate on that a little. If you look back on our operating record for the gas turbine, the first six or seven years weren't real bright. We had a lot of problems on the unit associated with being one of a kind. General Electric put this together kind of on a shoestring. They told us it was great, but we had a lot of problems.

The biggest single thing was speed switches. These are essentially a tank generator that generates an overspeed condition and it trips the machine to keep it from flying apart. We would get spurious speed switch trips due to problems in that particular unit. We have since replaced that unit with a state of the art device and that problem has been completely eliminated.

Since we did that, we have had about two years of almost flawless operation of the jet until the most recent problem where we ended up with some rust in the air receiver and the carbon steel piping associated with that, which we didn't really expect to have a problm there, but we did. We have since replaced that piping with stainless steel. We have sand-blasted and coated the inside of the receiver with an epoxy coating. We have also added some additional filtering equipment to that line to prevent rust from getting into the air start motor, actually the air start solenoid regulator.

We feel we have a good handle on the jet problems. I think you will see the future reliability looking more like the last two years, with the exception of the most recent rust problems.

MR. SIESS: What is your response to this requirement for a preventive maintenance program?

MR. ROMBERG: We have a good preventive maintenance program in place right now. Obviously, there were some things that weren't in the program because we didn't suspect that they would be a problem. But every refueling outage we tear the jet down, go through it with a fine-tooth comb with the vendor. And as a result of that sort of thing, we have not had continuing generic problems.

If we find a generic problem, we have licked it. And we are getting high level of competence.

What about the other item? Oh, I'm sorry.

MR. RUSSELL: As I recall, there was also an

LER.

MR. SIESS: You just can't get away from that diesel generator up there, huh?

(Laughter.)

MR. RUSSELL: It seems there was also an item that had to do with corrosion of some electrical component leads that caused a false trip, which we felt also fell in the category of preventative maintenance or protection of the equipment. So there were a number of them, I think five or six different events in the last two years, which was a significant change from previous experience. And we thought that should be looked at on an overall basis and re-evaluate the maintenance program to see if the program would address and pick up these types of things in the future.

MR. SIESS: Well, things are getting a little older now.

MR. ROMBERG: Part of the problem is, the original design had the electrical cabinets out there. They are essentially open air-cooled, and we have a salty environment out there. So we are looking at a different practice in that area.

Either we've got to go through with a fine-tooth comb on all the electrical regulators and so on, or we have to provide a controlled environment with maybe an air conditioner in sort of an airproof room. And we are still addressing that. For now I think we have that problem under control.

We had a case where I think a potentiometer which was made out of a ferritic material essentially rusted through and the lead broke. That was kind of an isolated case. We are looking at that because generically there could be some problems in that area.

MR. PERSINKO: In chapter 4 there's a list of all the LER's related to the gas turbine with a description of what the occurrence was.

MR. SIESS: Okay. Let's go forward.

Before we get to the next list, which is not very long, you heard Commonwealth Edison say all the fixes they were making on Dresden 2 they were also making on three other almost identical plants. Now, your other two units are by no means identical. But some of these things do have a generic implication and some I think would carry over to the PWR.

Are you looking at Units 2 and 3 in view of the kinds of things that have been brought out here at all?

MR. [illegible]OMBERG: Do you want to address that?

MR. BAIN: I think I can address that partially. One of our other operating units is Haddam

Neck, which is currently being reviewed on the same issue. Millstone 3 is under construction. We have to live now with the new criteria anyway.

Millstone 2 is a much newer vintage. I believe it started operation late in '75, and by virtue of that it did comply with a lot more of the regulations. I guess eventually, some years down the road if there is a continuation of the SEP, Millstone 2 would eventually get into that also.

MR. SIESS: But you haven't found anything on Millstone 1 for which you can see a comparable need on, say, Unit 2?

MR. RUSSELL: The stack.

MR. BAIN: Right.

(Laughter.)

MR. BAIN: We have one issue that is common. We have a rather tall stack which could potentially fail.

MR. SIESS: But you don't have a stack on Unit 2?

MR. BAIN: No, but it could fall in the same area.

MR. SIESS: It could fall in the same area, but there's nothing wrong with Unit 2?

MR. BAIN: It couldn't fall on both at the same time.

(Laughter.)

MR. KACICH: I think it's safe to say there's a sufficiently different vintage of the unit, and given the fact that it is a PWR, we haven't come across any finding in SEP that would want to make us look at Millstone 2.

MR. SIESS: And the recent changes in criteria have been TMI-related?

MR. RUSSELL: There's one I might mention for them to consider. It has to do with batteries and battery surveillance in the control room. That has come out high in each unit, depending upon which kind of indication is available in the control room in Millstone 2 and what kind of battery testing is performed in Millstone 2.

And I don't know what the vintage is as to when we started picking up such things as battery current and voltage and breaker supervision in the control rooms, whether that was picked up on Millstone 2 or not. It's clearly an issue that would be applicable across the board on units based upon their DC power.

MR. SIESS: Yes. Is that going to get caught in the DC power 666 if it goes through?

MR. RUSSELL: That's correct.

MR. KACICH: One additional piece of information relating to that is, Millstone 2, if I am not mistaken, was the first plant, or at least the first Combustion plant, to adopt standard technical specifications. So there is a much more rigorous testing program for the batteries than we certainly had on our older units.

And we did have some difficulties, some real world difficulties with our batteries, if you will, that resulted in our taking a very hard look at it. So I can't say for sure whether or not we have incorporated all the lessons to be learned. But I agree with this point.

MR. SIESS: Okay, let's see where we have disagreements.

MR. PERSINKO: I will go one out of order and save the disagreements, and I will say the first one has not responded.

MR. SIESS: You don't have individual sheets on that?

MR. PERSINKO: No, I just listed the topic and we can discuss it, I thought.

MR. SIESS: Let's see. We had a containment isolation item.

MR. PERSINKO: Yes, we did. That was lacking valves closed. NUECO has agreed to do that. This is a request for a second isolation valve. They are tester drain lines. Their tester drain line is between the containment drywell and the first isolation valve, so there is only one valve on those lines.

MR. SIESS: The line comes out and it's a branch line off of it with one valve?

MR. PERSINKO: Correct.

MR. SIESS: Not even a threaded cap?

MR. PERSINKO: I couldn't tell there was. I saw one valve on the drawings.

MR. SIESS: So this is in the same category as Dresden?

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: And you haven't had a response from the Licensee. Did you recently send it to him?

MR. PERSINKO: Yes.

MR. RUSSELL: Do you recall how many there were? Was there only one?

MR. PERSINKO: There was more than one. I've forgotten how many, but there were more than one. It wasn't a large number, I would guess on the order of four or five, four.

MR. SIESS: The other item is the one Mr. Russell just mentioned.

MR. PERSINKO: Correct. We are requesting a battery current alarm indication in the control room.

MR. BAIN: I think one recent development is, we can now commit to install the indications being looked for. We have responded.

(Laughter.)

MR. SIESS: It doesn't count until it's in a letter that's been notarized.

Now, there are three areas of disagreement: response time testing, okay?

MR. PERSINKO: First of all, XV-16 and 18 are the same ones you discussed previously on standard tech specs on iodine. So that has been discussed.

The 6.10.A relates to Staff requesting standard tech specs on testing of the reactor trip system, the reactor protection system. There are a number of channel checks and calibration checks that are currently done, but the tech specs that are currently in place allow a higher frequency than the standard tech spec. So the Staff is requesting that standard tech specs be adopted.

I guess I ought to point out one area there. The tech specs are currently agreement standard tech specs, but they were installed quite a long time ago and it allows in the future a change to the tech specs based upon testing and adequacy of testing.

MR. BAIN: There's a provision that's based on a number of exposure hours for a certain instrument, which is dependent upon the number of identical components, the number of times you test it, and the acceptable level of failures you can have. Once you reach a certain level of what is called exposure hours, the tech specs allow you to reduce the frequency from monthly to quarterly.

Presently, it's all done monthly, which corresponds with the standard tech spec frequency. We have not in the past deviated from that frequency and we've no immediate plans to. We would like to retain the option if we can justify it. We would hate to get rid of that clause in the tech specs if we can justify it in the future, because it might be awfully hard to get back.

(Laughter.)

MR. BAIN: We have made the commitment that if at some time in the future we do decide to change the frequency of testing, we would notify the NRC of our plans along with justification for that.

MR. SIESS: Is this position on the record now?

MR. RUSSELL: Yes, it is.

MR. PERSINKO: Not the last thing he just said, I guess.

MR. RUSSELL: The basis for the difference is on the record. The fact that they don't want to change their tech spec is.

MR. SIESS: You have heard the arguments and you still want them to change the tech specs?

MR. RUSSELL: As additional background, the limited PRA that was done was done based upon the plant procedures in place now, the assumption being if the procedures say to test monthly that's what's done. So in looking at the availability or reliability of the trip system, that was done based upon monthly testing.

There has not been an evaluation done of what is the difference between quarterly testing and monthly testing, which in reliability analyses would be fairly straightforward to do. Therefore, we are not sure that the existing kickout clause which would allow one to go to quarterly testing has been sufficiently justified, and the analysis that has been done is one which would assume a continuation of monthly testing.

So the Staff position is, absent at this point a showing of a basis for permitting testing at a longer interval, the testing should be done monthly, which is part of the analysis basis that was used in the

Millstone IREP which was done as far as the availability or the reliability of the various trip systems.

MR. SIESS: Now, Bill.

MR. WARD: Wait a minute. Isn't relaxing the permission in an existing tech spec to relax the testing interval, isn't that based upon some performance of the equipment?

MR. BAIN: Yes.

MR. WARD: Well, is that the performance as used in the PRA or is it some lower performance?

MR. RUSSELL: The performance level in a PRA is based upon generic performance data. That was either WASH-1400 or an extrapolation of WASH-1400 for various types of components, not on specific components.

MR. WARD: But it seems possible --

MR. RUSSELL: It is possible.

MR. WARD: -- that the reason it looks good to relax it is because the performance is better than the generic set of data might indicate.

MR. RUSSELL: That is a possibility, yes. Were that to be made and those arguments to be made, I think it would be appropriate for those arguments to be broughot forward and reviewed, rather than allowing that to occur without the involvement of the Staff. And that is why we feel it would be appropriate to have the testing frequency in the technical specifications be consistent with the testing frequency assumed in all of the analyses that were done, which was based upon the monthly tests, which is in fact the test being performed.

MR. SIESS: I am looking at chapter 4 --

MR. RUSSELL: In other words, because it might be hard to prove in the future doesn't mean it shouldn't be proved in the future, or it might be hard to get it back. That might mean there is a question to the validity of moving forward.

MR. SIESS: I'm looking at chapter 4 and it addresses three different items here: test frequency, channel functional test frequency, and response time test. Under response time testing, which appears on the slide --

MR. PERSINKO: No. Response time testing was handled in Oyster Creek.

MR. SIESS: It says "including response time testing".

MR. RUSSELL: That is the topic title.

MR. SIESS: Oh, that is the topic title.

MR. RUSSELL: And we did not have an issue or propose there be a backfit for response time testing.

MR. SIESS: Of the three items here, response time testing you see no need for in view of the PRA?

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: For test frequency, that 4.24 one addresses the APRM that is unique at the Millstone, but you think is important to safety and therefore you want it tested as frequently as the other APRM. This is the APRM channel reduced high flux.

And then for the channel functional test frequency, you list a whole group of them where you want monthly instead of quarterly.

MR. RUSSELL: And monthly is what they're actually performing.

MR. SIESS: And monthly is what they're actually performing, but the tech specs don't require it.

MR. RUSSELL: That's correct.

MR. SIESS: And if the tech specs don't require it, you could still accept the fact that they are doing it, right?

MR. RUSSELL: Right.

MR. SIESS: The PRA you say was based on monthly testing.

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: And no one has run it through to see what change in risk quarterly testing would produce?

MR. RUSSELL: Or change in reliability or availability.

MR. SIESS: Yes. If that were done and it showed no change in reliability or risk, would you still want to require the tech spec change?

MR. RUSSELL: No, I would not reject a priori an argument that could be made to say something other than what is being done now is unacceptable. We would be willing to consider that basis if that basis were provided.

MR. SIESS: I was talking earlier about the backfit requirement. Do you feel you have to meet the backfit requirement for a tech spec change, or can that be imposed under a different part of the law?

MR. RUSSELL: That comes under 10 CFR 50.36, and the Staff has the ability to require at any time technical specifications which are comparable to that which would be issued for a new plant.

MR. SIESS: Okay. So --

MR. RUSSELL: That would not necessarily have to come under 50.109.

MR. SIESS: There is an implied substantial increase in protection or the NRC wouldn't require it for a new plant. But you wouldn't have to prove it.

MR. RUSSELL: There are some differences between what is in the technical specifications now and what is explicitly addressed in 50.36, some of the comments that have come up on surveillance and other issues which cannot be directly related to a limiting condition for operation or a limiting safety system setting.

It may also be that the entire approach toward surveillance, whether it is monthly or quarterly, will be taken out of the technical specifications, we will take all surveillance out and put it into a separate document. The current approach right now would include specification of surveillance for the reactor protective system and how frequently it is tested, and that surveillance period is important to availability and reliability of that system.

MR. SIESS: As I recall, testing is not an unmixed blessing. There have been transients caused by testing.

MR. RUSSELL: Right.

MR. SIESS: So it would be nice, I think, if there were some way of estimating the contribution to risk of testing as well as less frequent testing.

MR. RUSSELL: Also, the question of restoration of equipment from its test mode back to its operating mode.

MR. SIESS: Yes. That is more true of equipment than it would be of instrument channels.

MR. WARD: Oh, I don't know about that.

MR. RUSSELL: No, I have personally witnessed several very interesting instrument channel events where it didn't get put from test back to normal and you had a spurious test signal in.

MR. SIESS: And I remember something happened at Zion where they put in a whole bunch of spurious testing signals that loused up things in general for a while.

MR. CATTON: That is a maintenance function, isn't it?

MR. RUSSELL: That is a restoration from maintenance or test, and the potential for operator error during that time --

MR. CATTON: Is very high.

MR. RUSSELL: That is why you have jumper logs for when you put jumpers into instruments. You put them in and take them out.

MR. WARD: Do you know if any of the PRA's try to account for that sort of thing, that sort of error?

MR. CATTON: I don't think they separate them out. They just throw in a number for human error, but they don't split it.

MR. WARD: Research had a program on optimum (Indicating).

MR. RUSSELL: The one that was probably most significant, at least in near-term memory, was the Arkansas Nuclear 1 event where all of the instrument inverters were set by the same individual and had some wrong relays and ended up losing three out of four, and you had injection and recirculation simultaneously. It was an abnormal occurrence about three years ago, the common mode of the same operator doing the same alignment on the same piece of gear.

MR. SIESS: The last two items up there, 16 and 18, the words in chapter 4 are essentially identical to the ones on Dresden. And I can't remember back to Millstone. Are the numbers similar?

MR. PERSINKO: Yes. 370 was the number on 15.16.

MR. GRIMES: I think so.

MR. PERSINKO: It was the same.

MR. GRIMES: Standard tech specs.

MR. SIESS: Up in the thousands?

MR. PERSINKO: Without standard tech specs, I believe. With standard tech specs --

MR. SIESS: 370 or so?

MR. PERSINKO: 300 or so.

MR. SIESS: And for 18, comparable to the second figure?

MR. PERSINKO: Yes. It is a question again of, I believe, total iodine is assumed to be -- the iodine level in the tech spec is assumed to be total iodine-131.

MR. SIESS: Do we have the same situation with Millstone we heard about the others, your actual activity is down around the standard tech spec level? You don't make an isotopic determination; you measure gross; is that one of the problems here?

MR. HERMANN: No. They measure isotopic. But the way the doses are calculated, it is assumed that they don't.

MR. GRIMES: They don't have a two-tiered tech spec. They do have the capability to adhere to one by the techniques they use to measure iodine.

MR. HERMANN: And practice --

MR. SIESS: I thought the position was, if they don't measure it you assume it is all.

MR. GRIMES: If they aren't tech spec'ed to an isotopic iodine level, then the Staff's analysis assumed it was all 131.

MR. SIESS: Yes. And the Staff has no basis for assuming it's not all 131.

MR. GRIMES: That's correct.

MR. SIESS: Because the tech specs don't require an isotopic analysis.

MR. GRIMES: (Nods affirmatively.)

MR. SIESS: I wish I had so much faith in words.

MR. WARD: The calculation must assume the same meteorology for each site, is that right?

MR. RUSSELL: No, that is site specific.

MR. GRIMES: That is site specific. There is a topic --

MR. WARD: But you still come out with the same number, about, for each site.

MR. SIESS: No.

MR. BAIN: I would like to take it just a couple of moments, if I could. I've got a few more moments I would like to use.

MR. SIESS: I can assume, I think, that you don't want to do this.

MR. BAIN: A very good assumption, yes.

(Laughter.)

MR. RUSSELL: We have looked at, I believe, the last year or two years of data that they have been collecting and have determined, at least from our standpoint, if they have fuel performance similar to what they have had in the recent past that this would not be an operational restriction on the facility.

MR. HERMANN: This is a maintenance of operational flexibility issue.

MR. BAIN: My comments on this issue are going to have to be limited to the issue on the steam line break, because I don't think we can comment on the failure of small lines topic. We haven't seen the analysis. We can't verify the numbers are either right or wrong.

Just as a matter of comparison, the position the Staff has taken on the steam line break issue is, we should implement the BWR standard tech spec limits for iodine in terms of a dose equivalent of iodine-131. I have our present technical specification down here, which is just in terms of gross iodine activity, which is 20 microcuries per milliliter.

I took a look at the General Electric standard technical specifications for boiling water reactors, and the basis for the specific activity is to limit the dose consequences resulting from steam line breaks outside containment. It also acknowledges that the .2 microcuries per gram limit is kind of a generic number and you can take site specific considerations into account and end up with a higher number if justified, which I think we would have a good case for here. We do have site specific meteorology.

MR. RUSSELL: Recall back, though, in the Staff's evaluation if we assume the generic number, we argued in most cases that was sufficient and you did not have to go to a lower value based upon other conservatisms in the calculation. And we did use site specific meteorology, boundaries, et cetera, in the analysis.

We would argue that even though you calculated, for example, 370, it would not be appropriate to go less than .2 to get that down to a lower number.

MR. GRIMES: And in fact, the analysis done in accordance with the standard review plan would exceed Part 100, and to get it down to a small fraction would require that it come down another factor of ten on top of the factor of 100 they have already got, which would end up with a limiting iodine specification 1,000 times below their present specification.

MR. SIESS: Just a minute. I have gotten lost. Millstone is arguing that site specific meteorology, site boundary location, can bring this down.

MR. RUSSELL: But our answer is, that is what we used already in the Staff's evaluation.

MR. BAIN: I think the difference is, the Staff is basing their position on a different analysis. They are basing it on the failure of small lines. And all I am saying is, the only thing we have to go on is the analysis for the steam line break, because we haven't been sent the other analysis to comment on.

MR. SIESS: All right, let's comment on the steam line break. How many rem are you getting for the steam line break?

MR. PERSINKO: I don't remember. It was a large number. It was like four times. I don't recall. It was a very large number, because it assumed that the 20 was iodine-131.

MR. SIESS: So you are getting 20 times Part 100, 10 times Part 100?

MR. PERSINKO: Something like that.

MR. SIESS: And you used the actual site boundary? This is 30-day LPZ dose, right?

MR. GRIMES: The two-hour.

MR. SIESS: Two-hour at the site boundary, I'm sorry. And the meteorology you used?

MR. GRIMES: Was established in topic two --

MR. RUSSELL: It is five percent site specific chi over Q values.

MR. SIESS: What was the first thing you said?

MR. RUSSELL: Five percent meteorology.

MR. SIESS: The Licensee will try to say, using the same source term you can get this down by a factor of ten or so. You see, in a main steam line break you are allowed Part 100, aren't you, on a fraction?

MR. FELL: That is main steam.

MR. SIESS: And that is the one we are looking at now.

MR. FELL: The analysis used here --

MR. SIESS: Get a microphone.

I am just trying to see. I don't see how you can bring it down using site specific meteorology if the Staff has already used it. And it seems to me that the big difference is the Staff is assuming that all of your iodine is 131, and how much iodine are you assuming compared to the standard tech spec value? You are assuming their value?

MR. RUSSELL: The two analyses were done with their value, which was 20 microcuries per milliliter, and the standard tech spec value, which is 20 microcuries per gram, and milliliters and grams are comparable.

MR. GRIMES: The difference was, for the 20 microcuries it was all iodine-131 and the standard tech spec value was .2 microcuries per gram dose equivalent iodine-131. So it is isotopic.

MR. SIESS: How much difference will that make?

MR. GRIMES: About a factor of -- well, it is -- 20 to .2 is 100, and then the iodine-131 constitutes around ten percent of the total iodine.

MR. SIESS: So it is a factor of 1,000.

MR. GRIMES: Yes, it is about a factor of 1,000.

MR. SIESS: They said they are not operating at 20, that is what they're allowed. They say they are operating at closer to .2 gross. Is that right?

MR. BAIN: Actually, where we normally operate is less than .2. We did provide some information to back that up.

MR. SIESS: So there is a factor of 100 between what their tech spec, their -- it's not a tech spec, is it?

MR. RUSSELL: 20 is their tech spec.

MR. SIESS: So a factor of 100 between their tech spec and the standard tech spec.

MR. RUSSELL: That's correct.

MR. SIESS: With another factor of 10 because they don't require isotopic evaluation and you assume then it isn't. So a factor of 1,000 is pretty clear. It is just in the numbers.

MR. SIESS: And in a very narrow view, which I think is not correct, if they adopted the standard tech specs it wouldn't change how much iodine they had in the primary coolant, but it would change your calculation by a factor of 1,000 because now it's in the standard tech specs.

MR. RUSSELL: Right. One observation: The purpose of a limiting condition for operation is to identify a point where you do not exceed that point without taking some corrective action. The present technical specification of 20 microcuries per gram of gross iodine is in fact not a limit on operation of the facility. Long before they reach that point, they will be taking action to find out why they had poor quality fuel and all of this activity in the primary.

The situation that exists here is that they have -- and prior to a discussion earlier, I was under the impression they would be limited by offgas activity, which is typical for a BWR, rather tha coolant activity. They have augmented their offgas system and they may be able to operate with higher levels of coolant activity than the .2 microcuries per gram.

That does not appear to be appropriate based upon what we are doing with other plants, and even though we calculate in a conservative fashion the offsite dose due to accidents not involving fuel failures -- that is, just release of the activity -- that is a conservative analysis, but it is a deterministic analysis, just as an ECCS analysis for Appendix K is a conservative analysis.

It is a deterministic basis by which we determine an acceptable value. We have argued -- or the position we have taken is that by reaching or going to the .2 microcurie per gram level, that is sufficient. That would still not result in a calculated dose which is a small fraction of Part 100.

MR. SIESS: That is a small line break, now, you are talking about.

MR. RUSSELL: For both. These are both accidents which do not involve degradation of the core. We use a small fraction of Part 100.

MR. SIESS: I have never heard what your dose calculation is.

MR. RUSSELL: For a steam line break outside --

MR. SIESS: I have never gotten a number from you from what dose you calculated. But it ought to be a factor of 1,000 less.

MR. KACICH: We will give you one we calculated.

MR. SIESS: It seems to me if he was talking about even 1,000 rem, that comes down to one, which is certainly a small fraction of 300.

MR. GRIMES: Dr. Siess, in the Staff's calculation the limiting case was the small line break, and I have a fair handle on those figures. I don't for the steam line break.

MR. SIESS: Then there's not much point in continuing this discussion.

MR. GRIMES: I would like to add, in recent licensing discussions where I was involved in establishing primary reactivity for a PWR, it was the Staff's position that even though for a standard plant design they could demonstrate four microcuries per gram would fit in an envelope of sites, the Staff required they use one microcurie per gram as a measure of core degradation, and supported that with a statement that the French require .1 microcuries per gram for a similar design as a measure of degraded core conditions.

So there are two sides to the argument. One is doing an offsite dose calculation, and the other is as an indicator of core degradation.

MR. SIESS: But one is supported by regulation and the other isn't, too.

MR. GRIMES: 10 CFR 100 is a siting

guideline.

MR. SIESS: It happens to be in the regulations, though, and also in a couple of reg guides and in the standard review plan. I don't know how to relate that to this. The standard tech specs are two-tenths of a microcurie per gram, and you are talking about what number from the French?

MR. GRIMES: For PWR's the equivalent number is one microcurie per gram.

MR. SIESS: I don't know what it would be here. I can't get a handle on the numbers. But it seems to me not unreasonable that if they adopted the tech specs and you made the calculations assuming it was .2 and 10 percent of that was 131, you would bring them down by a factor of about 1,000.

And it seems to me that unless you give them 10,000, even if you give them a 10,000 rem amount -- now, there must be some reason they don't to go down to standard tech specs. I haven't heard anyone yet who was happy about it, for a number of reasons which we discussed a little bit with Commonwealth Edison.

I see something here that says Millstone 1 would accept a tech spec limit of 2.474 --

MR. BAIN: 2.5.

(Laughter.)

MR. SIESS: I will buy that. Microcuries per gram dose equivalent iodine-131. Now, dose equivalent means what, about a factor of ten in there? What does that come out to on gross, or is the two-tenths on dose equivalent?

MR. GRIMES: The 131 is approximately ten percent of gross.

MR. SIESS: Oh, I'm sorry. The two-tenths microcuries per gram is the dose equivalent.

MR. GRIMES: (Nods affirmatively.)

MR. SIESS: Which will allow you what, ten times that much?

MR. RUSSELL: Up to.

MR. GRIMES: Yes, about a factor of two gross. It would be about two microcuries per gram.

MR. SIESS: And they are operating now with an allowable 20 on dose equivalent or gross?

MR. GRIMES: Gross.

MR. SIESS: 20 on gross is equivalent to about what on dose equivalent?

MR. GRIMES: Two.

MR. SIESS: Two.

MR. RUSSELL: And they want to go to 2.5.

MR. SIESS: They want to go up?

MR. RUSSELL: They are arguing 2.5 gross

iodine.

MR. GRIMES: No, they are arguing 2.5 dose equivalent.

MR. SIESS: It is 2.5 dose equivalent. They want to go from 2 to 2.5.

MR. RUSSELL: They would like to relax their tech spec even further.

MR. GRIMES: They want a factor of ten higher.

MR. SIESS: You want a factor of ten higher than your present tech specs?

MR. GRIMES: No, a factor of ten higher than the present tech spec.

MR. SIESS: And the present tech spec in terms of dose equivalent iodine is 20, then?

MR. GRIMES: Yes. They want to split the difference. They want to eat a factor of ten and they will give a factor of ten.

(Laughter.)

MR. SIESS: If all of this was dose equivalent, then I was wrong. There is only 100 difference between your calculation and tech specs.

MR. RUSSELL: (Nods affirmatively.)

MR. SIESS: And if you were at 1,000 before, that would still get you down to 10. I would like to know what those numbers are. I will get these on a comfortable basis. But they are willing to go from 20 down to 2-1/2, and you would like for them to go to two-tenths. That is about a logarithmic mean, a geometric mean.

MR. BAIN: There's a good comparison you can make. If you take what is listed under "normal operating", that would be the dose equivalent iodine-131 you would get if you take our normal operating ratio and you would ratio that up to the maximum tech spec limit for gross iodine, and that would give you a resulting thyroid dose of 4.1 man-rem.

We think that is justified, but we can certainly see the need to have a tech spec in terms of a gross equivalence of iodine. So that we have several different dose calculations here depending on the isotopic mix you assume from a number of different sources.

And just the one we traditionally do, dose consequence analysis by our Appendix R, that's where the 2.5 number comes from. It gives you a resulting thyroid dose from a steam line break of 13.5 rems. That is less than half of the small fraction guidelines and a factor of 20 or 25 below Part 100 guidelines.

MR. RUSSELL: Was that done using 5 percent or

50 percent meteorology?

MR. BAIN: That was done using your assumptions from your SER in the steam line break. We had numbers about two rem lower, but we gave them to you.

MR. SIESS: Let's look at that table and let me figure it out. In the first column of numbers is microcuries per gram of dose equivalent iodine-131 and 20 microcuries per gram of gross iodine; is that what it is?

MR. BAIN: Right. That would be the microcuries per gram of dose equivalent iodine-131 if we were at our present tech spec limit for gross iodine of 20 microcuries per gram.

MR. SIESS: All right. And that is not 10 to one; that is 14. Let's see. Chris said it was ten percent.

MR. BAIN: Our operational history has been about seven to eight percent, something in that range. It varies.

MR. SIESS: But this is half of that, or is this the ratio? I don't understand what that number is in that column.

MR. FITZSIMMONS: That is microcuries per gram.

MR. SIESS: That is microcuries per gram?

MR. BAIN: Right. If we were at our present tech spec limit of 20 microcuries per gram gross iodine, based upon our operating history we would have .7338 microcuries per gram dose equivalent iodine-131.

MR. SIESS: Which is one-thirtieth. About 3-1/2 percent, then, is the ratio of dose equivalent to gross, and that doesn't gibe with what this --

MR. RUSSELL: Because the ratios are a function of what are the rates of releases into the coolant, what has been the power history, the burnup on iodine.

MR. SIESS: What is the next number? 1564, 1.564. What is that?

MR. BAIN: That is assuming the isotopic mix given in NUREG-0016, which is gaseous effluents from BWR's.

MR. SIESS: And 2.474 is including an isotopic mix you used in Appendix I?

MR. BAIN: Right.

MR. SIESS: And I don't know how TID-14844 got in there. That is a --

MR. RUSSELL: Core melt.

MR. SIESS: -- core melt figure.

MR. GRIMES: But we believe this is a moot comparison, since using standard review plan assumptions for a small line break, we are calculating approximately -- do you have the number?

MR. PERSINKO: Over 300, 370.

MR. GRIMES: That was dose equivalent. Put another 100 on top of that, so it's approximately 3,000 rem for their present tech spec.

MR. SIESS: And with the present tech spec you are still getting 300 or 400?

MR. GRIMES: Yes, sir.

MR. SIESS: And you make it clear in item 18 that the other one governs?

MR. GRIMES: (Nods affirmatively.)

MR. SIESS: So I think that if the Licensee wants to address the Staff arguments on this they have to somehow address them on this same basis, because according to the Staff's calculations you could do a lot to fix the main steam line break and you would still have a problem with a small line break. So --

MR. BAIN: That's true. This is the only issue we were prepared to respond on because it's the only one we have been given.

MR. SIESS: Because I look at the small line break and leaving PRA out of this and forgetting about core melts being the main thing to worry about and let's just go worry about something that is several thousand times worse than TMI in terms of -- well, it is doses for the public.

MR. WARD: That wasn't the problem at TMI.

MR. SIESS: No, but this would scare them even more.

If the Staff is willing to accept the figure I would say substantially above Part 100, as opposed to the ten percent of Part 100, as acceptable in terms of backfit and some possible risk requirements -- and I can anticipate some people having a problem with even that. But it would be helpful, I think, if you want to look at it.

Try to get it on the same basis. Either get their numbers for the steam line break or try to get their numbers for the small line break to compare somehow. And we will continue that discussion next time.

MR. RUSSELL: The only concern I have is artificially high numbers. We are talking about some rather large numbers. If you make assumptions of 20 microcuries per gram, and the realism of that number -- that is not the approach that was taken when you really look at the situation.

We have argued that going to a standard tech spec number would be sufficient. From that standpoint, it would not be appropriate either for the small line break or it would not be appropriate to put in flow-restricting orifices or some other hydro modification. Recognizing the conservatism in the calculation, it would not be appropriate to go below the types of numbers currently used on new plants today.

MR. SIESS: I understand the Staff's position and I think I understand how they arrived at it. Current criteria are -- I think you said deterministic. Maybe "arbitrary" is a better word for it. They are trying to do more than one thing with the current criteria.

MR. RUSSELL: That's correct.

MR. SIESS: We haven't gotten into it, but I gather that, as I said earlier, the Staff would have no problem if you simply adopted the standard tech spec. I don't know whether you would have by adopting them, whether it would affect your operation. Commonwealth doesn't like some of the other six pages, and presumably whether this part affects your operation or some of the other things that go along with it I don't know.

But I think we could explore that a little bit more with you the next time we meet and decide what kind of presentation ought to be made on this to the full

Committee. I think the standard tech specs and some of the concerns people have expressed may have some implications beyond the SEP, and the Committee ought to be informed about it.

MR. RUSSELL: You are right, Dr. Siess. We did not review other than the limit itself, as far as reviewing the action statements and what the implications were for some of the action statements upon plant operations. We only looked at what the plant history had been for the last couple of years as far as what the actual activity has been versus what the activity level would be associated with standard technical specifications, and concluded that that would not by itself be a limitation on operation.

But since iodine is related to power level and rate of change of power, there may be other aspects of the action statements we would need to look at ourselves.

MR. SIESS: I think the full Committee needs to look at some of these issues that come up in a broader context. I think we have some interest in the SEP as such because it is a very important program, although I don't think anyone has had that much concern about the group one SEP plants, or maybe, for that matter, some of the group two.

But as things come up that have broader implications, I think we need to explore them and get the Committee informed. It may not affect what they think ought to be done on a particular plant, but it may have some influence later on.

So I think we would like to explore this with you further at the next meeting, simply -- not that we will settle anything, but so we can get the issues defined in such a way that we can get them presented to the full Committee, which won't have as much time as we have here, of course.

The trouble is, I could get you to sharpen up the issues for the full Committee, but then there will be 15 people there, which will fuzzy them up a little bit. I get them sharpened up to where I think all of the questions are answered and then there will be 13 additional questions come up. But after 14 years, I haven't figured out how to avoid that.

MR. WARD: Let me ask for a clarification, the basis being a small fraction of the 10 CFR guidelines. Is that for both cases, both the main steam line and the small line breaks?

MR. GRIMES: I believe that is correct for a steam line break outside of containment or for a small line break outside containment.

MR. RUSSELL: A steam line break inside is a LOCA.

MR. PERSINKO: Yes, it is both.

MR. GRIMES: An isolatable break, except for instrument lines where the break is chosen in the worst location.

MR. SIESS: Well, gentlemen, we have substantially reached the end of the agenda. I think the Licensee made his closing remarks in the beginning.

MR. KACICH: If I could just take one additional minute to respond.

MR. SIESS: Sure.

MR. KACICH: I don't want to place too much emphasis on these two items we have been discussing as areas of disagreement, because I think in the overall context of SEP they really aren't that overwhelming.

MR. SIESS: (Nods negatively.)

MR. KACICH: But just so it is clear as to our position with respect to this question, the only SER we have in-house right now on topic 15.16 on small lines says everything is fine. And we have heard today and we are aware that the Staff is going to be revising it for the reasons outlined.

But we were unable to prepare any response to that because we didn't have any other evaluation. That is why our points were limited.

MR. SIESS: Yes, I understand that.

MR. KACICH: All right.

MR. SIESS: The issue is an interesting one, because Part 100 has bothered a lot of people for a long time, even for the LOCA. It is an arbitrary source term with some pretty high-powered meteorology and an arbitrary dose.

I think most of us have felt it was intended to do things other than what it said it was doing, and no one really wanted to change it because it had done a fair job of siting, except that it wasn't much help in siting for core melts. The population center distance didn't do a lot of good about keeping you away from New York City and places like that, or Chicago, as the case may be.

And I think it is an interesting issue in the way the Staff is approaching it here, and the relation of what you do and what the tech specs say and why the tech specs say certain things, the point you were bringing out about fuel damage. We have been interested in detecting fuel damage as an issue for a long time.

So I think it is something the Committee will be interested in hearing. And since you don't have much else in controversy, we might as well spend some time on that.

(Laughter.)

MR. SIESS: The major part of our review of the SEP has been to look at how the Staff is making decisions and judgments, to test out the criteria. And we haven't had that much interplay with the Licensees except on issues in controversy and what they thought of the general program. So I think this is something we will want to take up, and after the next meeting I will try to figure out how we can get you and Commonwealth to address the problems.

MR. RUSSELL: Do you want to review this issue, then, when it comes up on Oyster Creek next Thursday, or hold on this issue until it comes up on Millstone and Dresden in December?

MR. SIESS: I think we have got to bring it up for Oyster Creek, because it is one of the issues. And what I think I will do is, if the Committee has a problem with it, to tell them we can defer it until we have a chance to look at it on the next two plants. If they want to tackle it and settle it next week, we won't have to worry about it.

But I think each Licensee may have a little different approach to what the problem is and maybe they ought to hear it from more than one person. But the

Committee will have to be reasonably evenhanded about the two plants. I can't see any difference from the meteorology and the exclusion boundaries. I don't think there is enough difference to make any difference. It is just driven completely by the source term and isotopic content.

You heard what I told Commonwealth about the next meeting the Subcommittee will have. We will have to spend some more time on these things. We will want to look at the review of planned operations that would be in the SER or whatever you call it. When we get it, there may be a few other things in there.

We will have the PRA before that meeting, will we not?

MR. RUSSELL: Yes.

MR. SIESS: And we will have had a chance to look at that a little bit. So we will have a number of other things to cover on these two plants besides these two items, and we will try to go over and get them organized in our minds and how they relate to each other. And it will help us try to figure out what to do at the full Committee meeting, because I want to get the two of you together in December.

MR. RAUSCH: Just a real quick clarification. You expect to have reviewed in some detail the operating history report?

MR. SIESS: I don't know it will be in more detail, but the Committee members will have had a chance to see it and ask questions about it. We try to anticipate questions that will come up in the full Committee. Some people on the full Committee pick up various items out of the operating report that they are interested in and want to talk about. If the Subcommittee can pick some of those up in advance and cover them, sometimes I can turn the full Committee off and not spend a lot of time because one member has something we have already looked at.

MR. RAUSCH: What type of date are we looking for for the full Committee for Dresden and Millstone?

MR. SIESS: I am hoping to schedule it for December.

MR. RAUSCH: No date yet?

MR. WARD: Yes. It will be that first --

MR. SIESS: It will be Thursday or Friday.

MR. WARD: It will be December 9th or 10th.

MR. SIESS: If the consultants have any comments they would like to get down in writing, I would be pleased to get them from you, either specific or more general comments on the SEP as a whole or on these three particular plants. Now, I think you know the kind of comments the Committee has made in the past. If you have nothing to say, we won't bug you.

Anything else, gentlemen?

(No response.)

MR. SIESS: The meeting is adjourned.

(Whereupon, at 2:40 p.m., the meeting was adjourned.)

* * *

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

____

in the matter of: ACRS/Subcommittee on Systematic Evaluation Programs

Date of Proceeding: October 27, 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.

Sharon Filipour

Official Reporter (Typed)

Sharon Filipour

Official Reporter (Signature)

COMMONWEALTH EDISON COMPANY

DRESDEN UNIT 2

TYPE: GE BWR-3

RATED THERMAL POWER: 2527 MWt

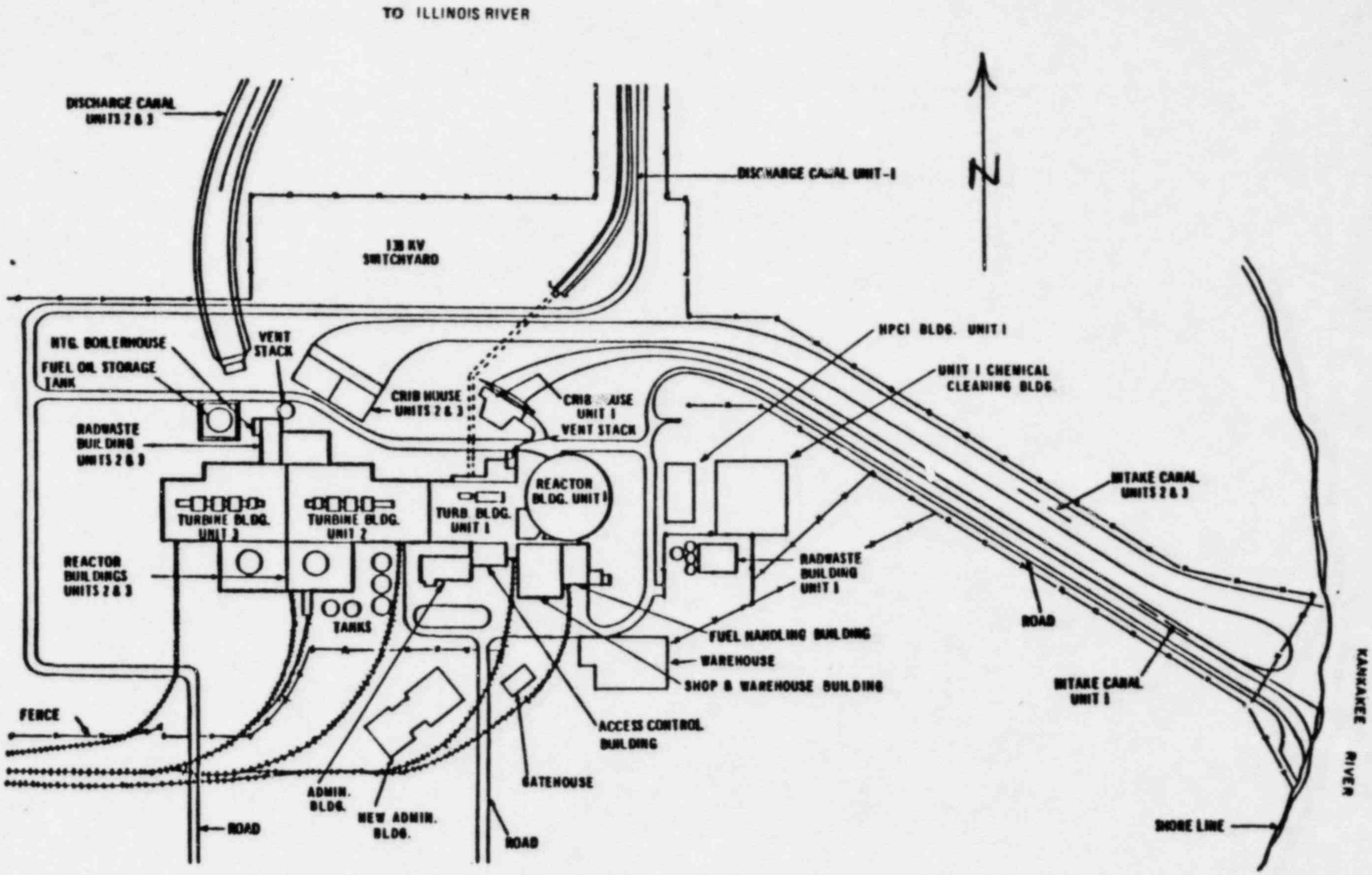
RATED ELECTRICAL OUTPUT: 834 MWE GROSS

COOLING MODE: ONCE THROUGH KANKAKEE/ILLINOIS RIVER;
AFTER 1971 COOLING LAKE

HISTORY:

HISTORY:	JANUARY 1966	CONSTRUCTION PERMIT ISSUANCE
	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

5309N


TO ILLINOIS RIVER
DISCHARGE CANAL UNITS 2 & 3
DISCHARGE CANAL UNIT-1
N
138 KV SWITCHYARD
HTG. BOILERHOUSE
FUEL OIL STORAGE TANK
VENT STACK
CRIB HOUSE UNITS 2 & 3
CRIB HOUSE UNIT 1
VENT STACK
HPCI BLDG. UNIT 1
UNIT 1 CHEMICAL CLEANING BLDG.
RADWASTE BUILDING UNITS 2 & 3
REACTOR BLDG. UNIT 1
INTAKE CANAL UNITS 2 & 3
TURBINE BLDG. UNIT 3
TURBINE BLDG. UNIT 2
TURB. BLDG. UNIT 1
REACTOR BUILDINGS UNITS 2 & 3
RADWASTE BUILDING UNIT 1
TANKS
ROAD
FUEL HANDLING BUILDING
WAREHOUSE
SHOP & WAREHOUSE BUILDING
INTAKE CANAL UNIT 1
KANKAKEE RIVER
FENCE
ACCESS CONTROL BUILDING
GATEHOUSE
ADMIN. BLDG.
NEW ADMIN. BLDG.
ROAD
ROAD
SHORE LINE

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

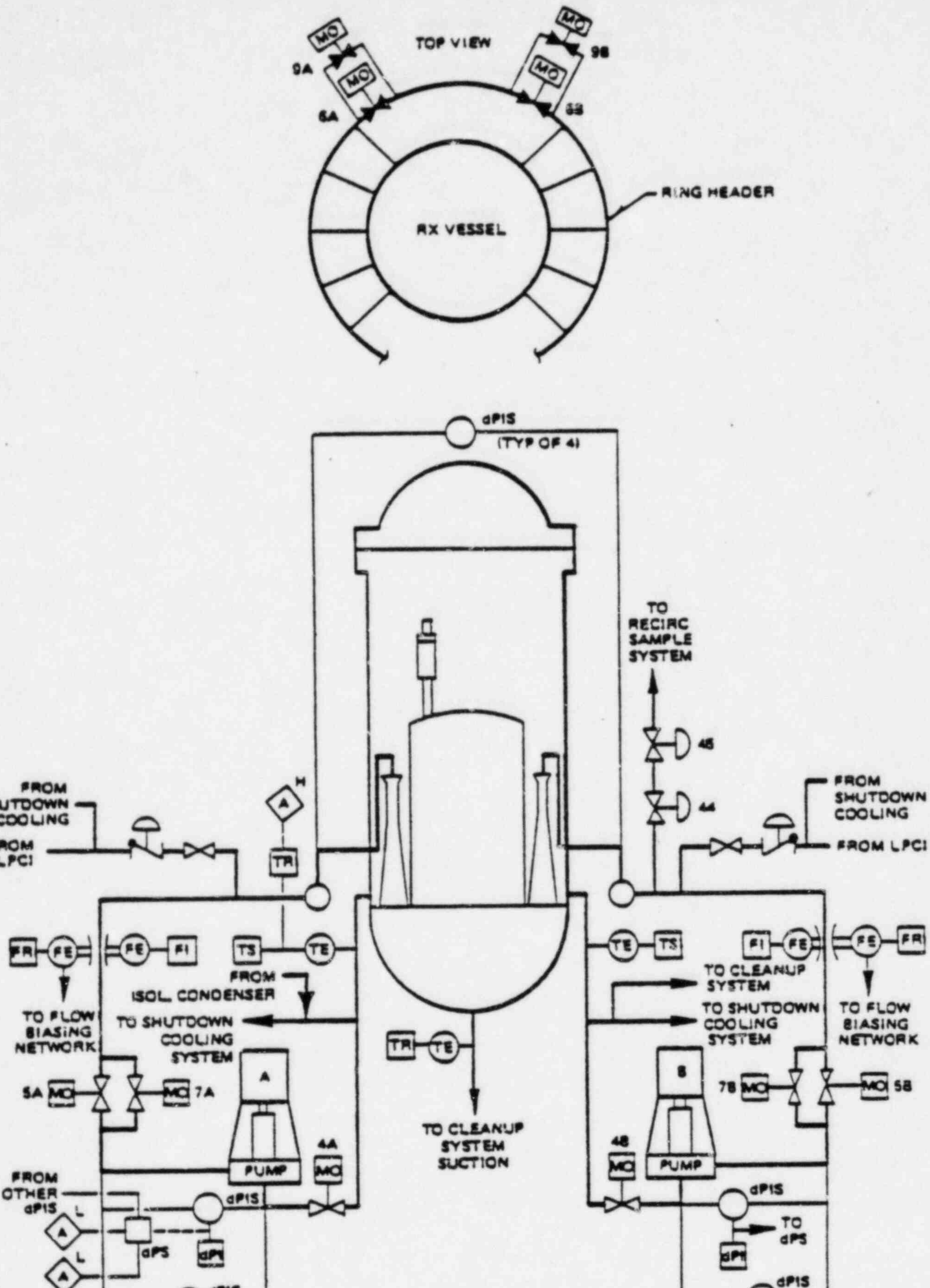
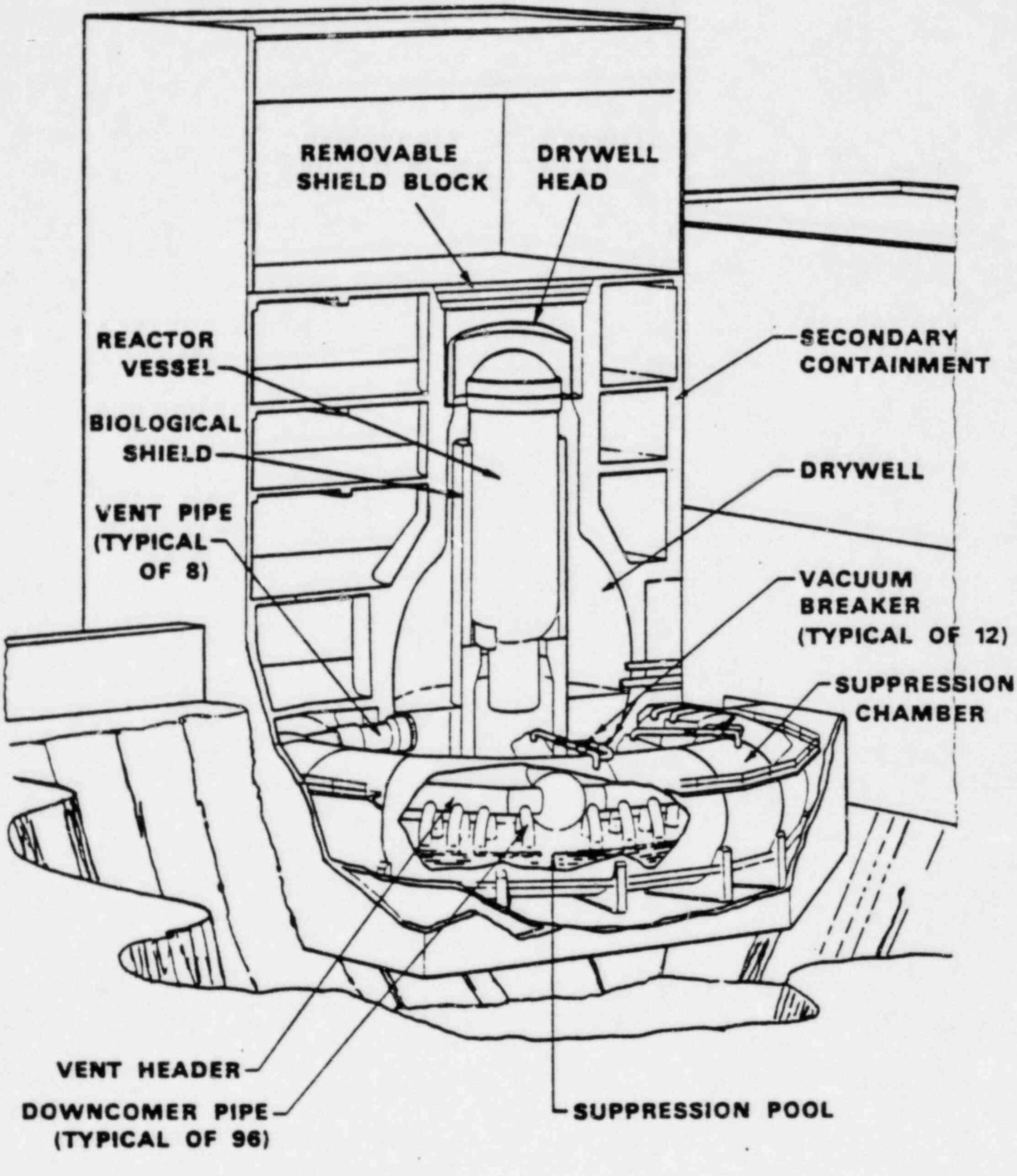


Figure 2. Recirculation System Schematic



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

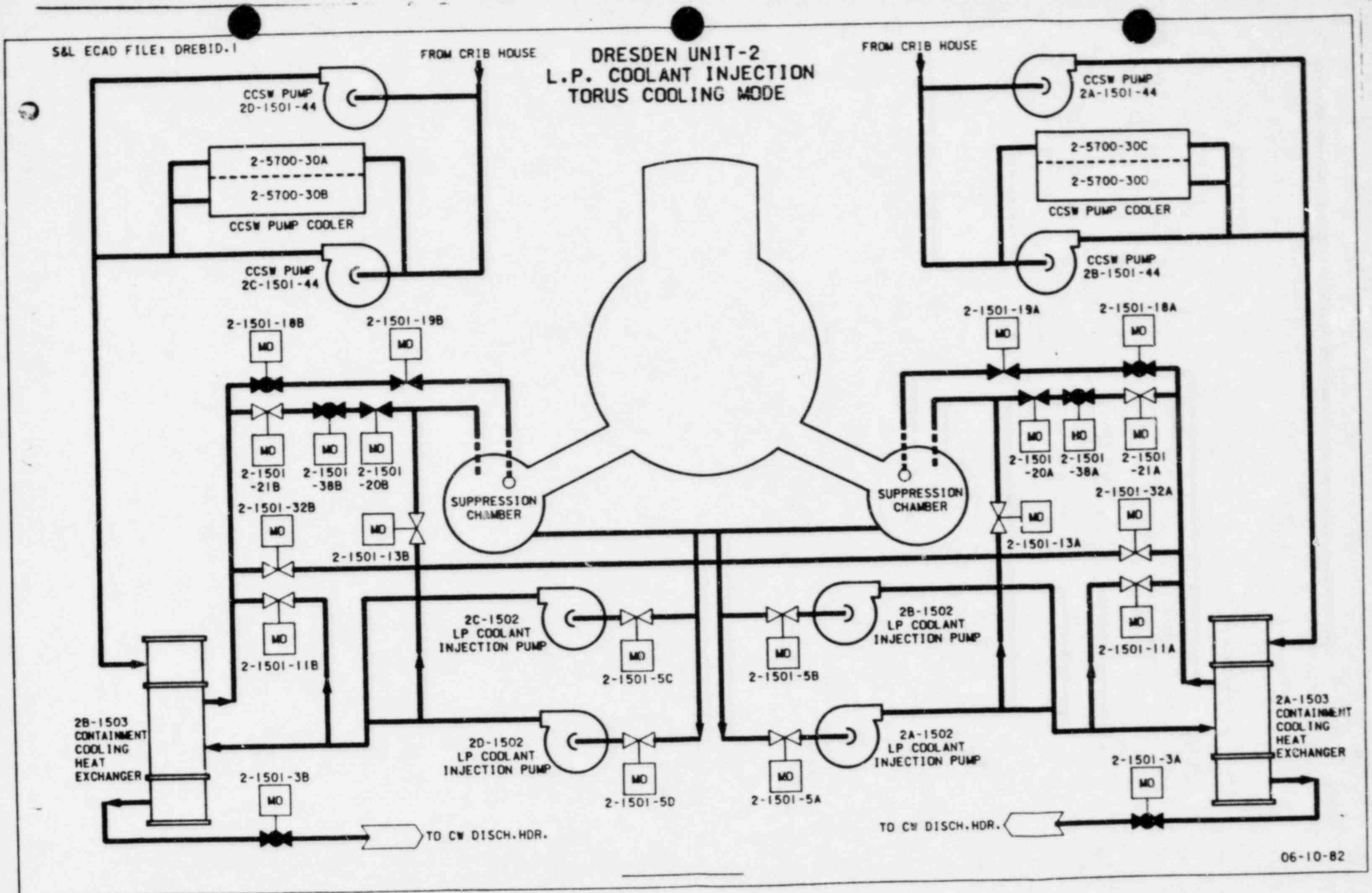
[1] Automatic start-up of the core spray and LPCI systems is initiated by: (1) reactor low-low water level and reactor low pressure, or (2) drywell high pressure.

[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.

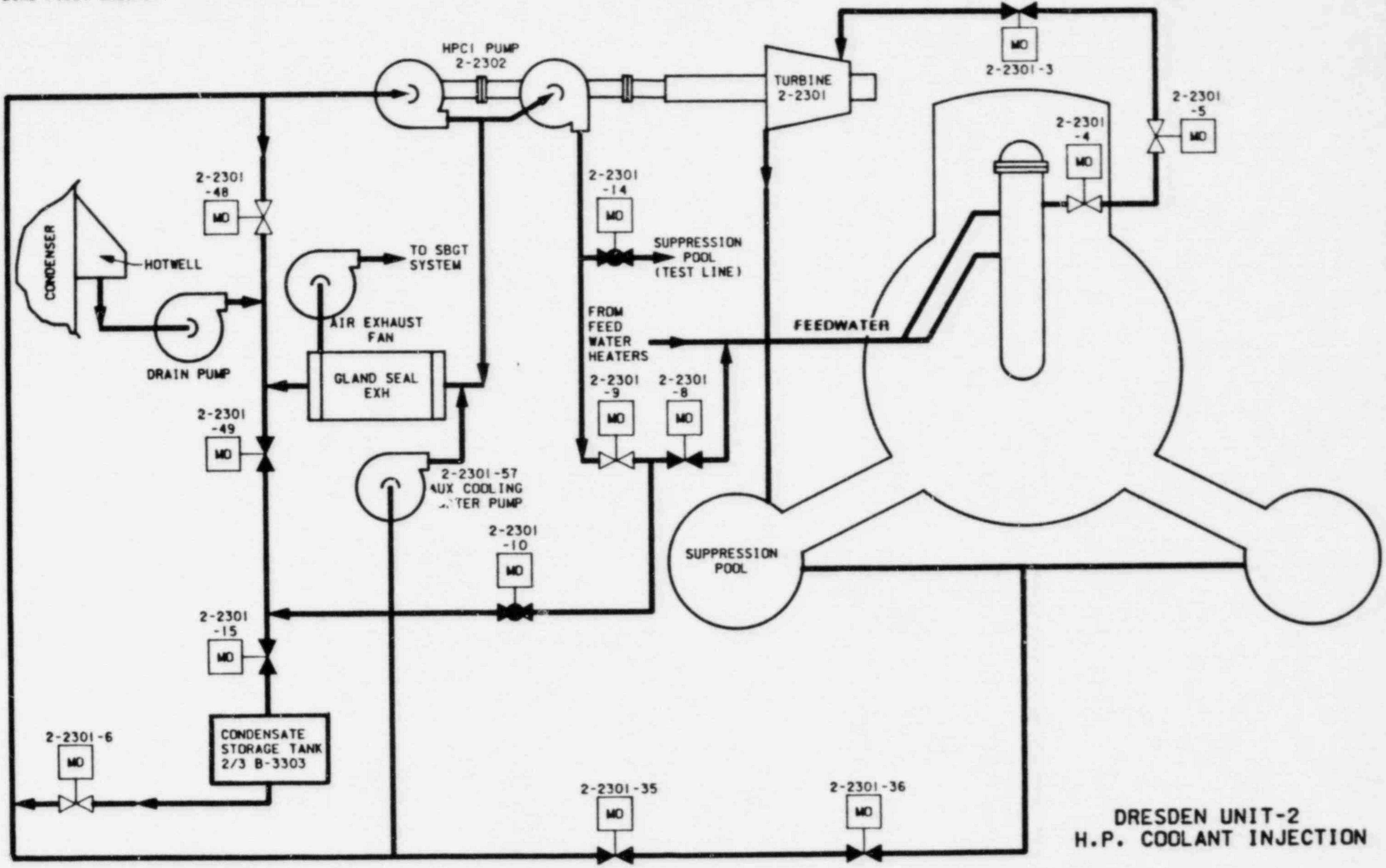
ADS - 4 Electromatic Relief Valves plus Target Rock Combined S/RV

- 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.



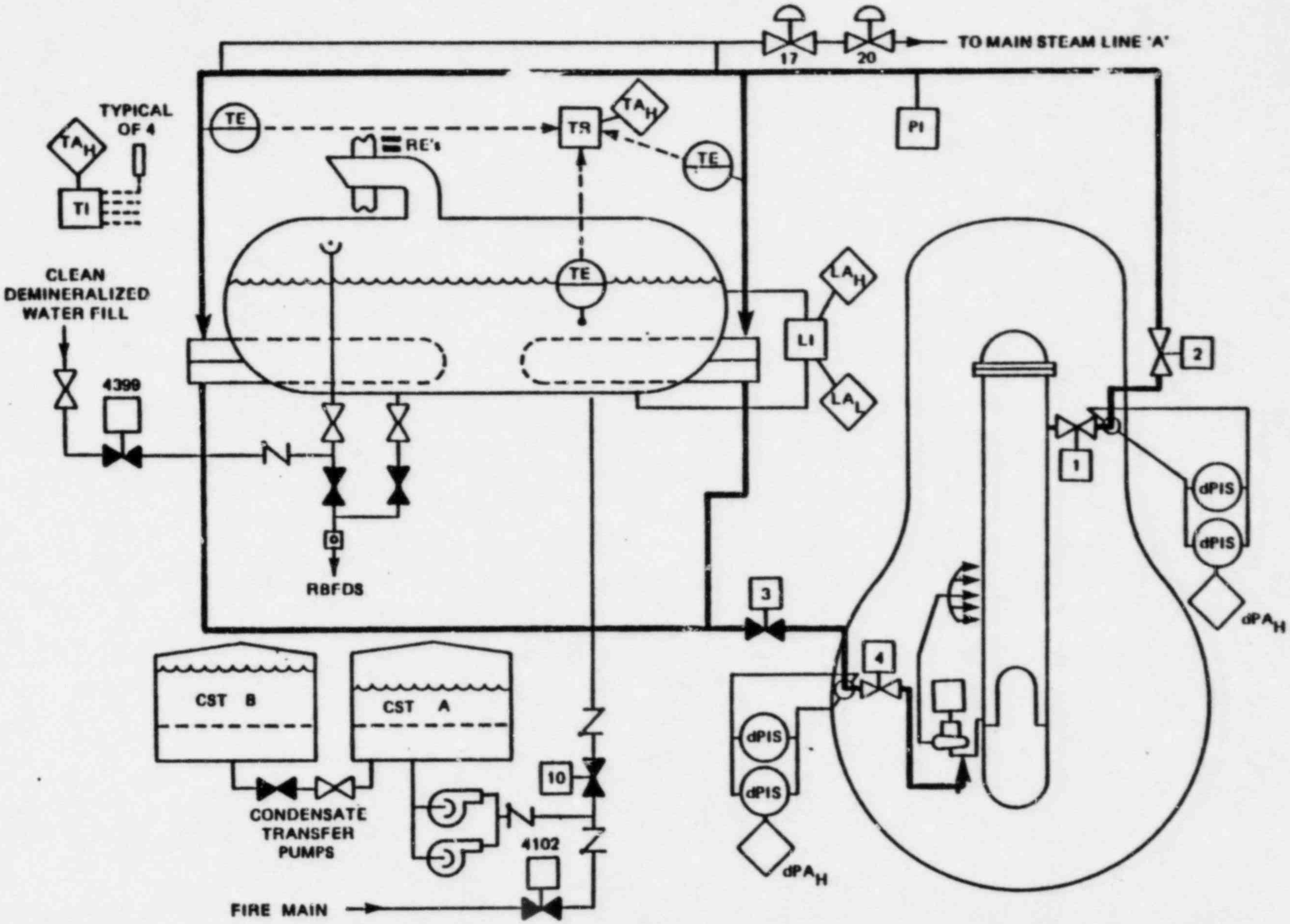
- Shown in Suppression Pool Water or Spray Cooling Mode
- LPCI Reflood Capability through Unbroken Recirculation Piping (Not Shown)
- Also can provide Drywell Spray Cooling (Not Shown)

S&L ECAD FILE: DREBID.1

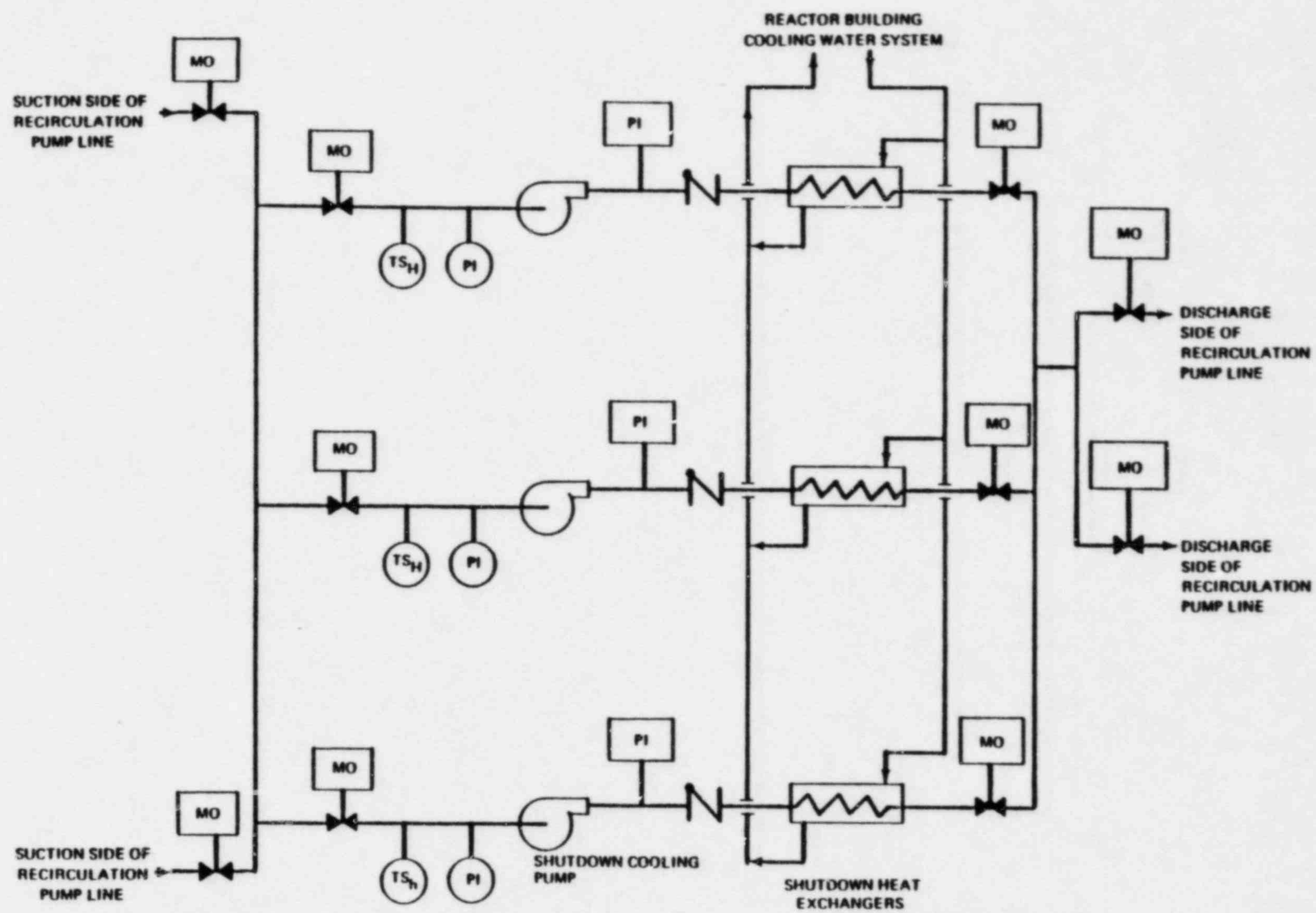


DRESDEN UNIT-2
H.P. COOLANT INJECTION

06-10-82



Isolation Condenser System



SHUTDOWN COOLING - PIPING DIAGRAM

COMMONWEALTH EDISON

SYSTEMATIC EVALUATION PROGRAM

DRESDEN 2

PURPOSE: NRC WAS TO REVIEW 11 NUCLEAR PLANTS (OLDEST PLANTS AND THOSE WITH POL'S) AGAINST SAFETY CONCERNS EXPRESSED IN THE STANDARD REVIEW PLAN. COMPLETION OF SEP IS TO FORM A DOCUMENTATION BASIS FOR SAFETY ASPECTS OF PLANT.

STARTED: NOVEMBER 1977 WITH 137 TOPICS

- 48 TOPICS DELETED - NOT APPLICABLE OR BEING RESOLVED GENERICALLY.

- 89 TOPICS REVIEWED DURING SEP

PRESENT STATUS

DRESDEN IS PRESENTLY IN THE INITIAL PHASES OF INTEGRATED ASSESSMENT. THE PRESENT TOPIC STATUS IS:

COMPLETE AGREEMENT	72	TOPICS
TENETENTIVE AGREEMENT PENDING CE SUBMITTED	7	TOPICS
CE PERFORMING STUDIES	4	TOPICS
MINOR CLEAN-UP ITEMS	2	TOPICS
NRC TO REVIEW CE SUBMITTAL	1	TOPICS
OPEN	3	TOPICS
TOTAL	89	TOPICS

RESULTS FROM TOPIC REVIEWS DONE TO DATE

COMMONWEALTH EDISON HAS:

MADE 4 MODIFICATIONS

COMMITTED 5 ADDITIONAL MODIFICATIONS

5 PROCEDURE CHANGES

5310N

EXPERIENCE TO DATE

COMMONWEALTH EDISON HAS SPENT APPROXIMATELY 2.6 MILLION DOLLARS FOR STUDIES TO SUPPORT THE SYSTEMATIC EVALUATION PROGRAM. THE MODIFICATIONS WHICH HAVE BEEN MADE TO DRESDEN 2 AS A RESULT OF SEP HAVE ALSO BEEN OR ARE BEING MADE AT DRESDEN 3 AND QUAD CITIES 1 AND 2, IF APPLICABLE.

MODIFICATIONS RESULTING FROM SEP HAVE COST COMMONWEALTH EDISON 1.3 MILLION DOLLARS.

COMMONWEALTH EDISON BELIEVES THE STRONG PROJECT MANAGEMENT OF MR. RUSSELL HAS CAUSED SEP TO MOVE FORWARD AND FOR THE STAFF TO MAKE REASONED JUDGMENTS.

COMMONWEALTH EDISON

DRESDEN

MODIFICATION MADE:

- ELECTRICAL EQUIPMENT ANCHORAGE
- NORMAL-BYPASS SWITCH TO NORMAL-NORMAL
- 125V D.C. DISCONNECT ADDED
- 125V D.C. BUS SEPARATION

MODIFICATIONS COMMITTED TO:

- BATTERY RACK SEISMIC UPGRADE
- DIESEL GENERATOR PROTECTIVE TRIP BYPASS
- ROOF PARAPETS TO PREVENT PONDED WATER ACCUMULATION
- ADDITIONAL D.C. SYSTEM MONITORING IN THE CONTROLROOM
- INSTALLATION OF REDUNDANT ISOLATION VALVES

PROCEDURES CHANGE COMMITTED TO:

- REVISE FLOOD PROCEDURES
- MODIFY SAFE SHUTDOWN PROCEDURES
- TEST SHUTDOWN COOLING INTERLOCKS
- INCLUDE MORE VALVES ON LOCKED CLOSED LIST
- MODIFY INSERVICE INSPECTION OF WATER CONTROL STRUCTURES

MAJOR ANALYSES

DRESDEN 2

1. MASS AND ENERGY RELEASE TO CONTAINMENT FOLLOWING STEAM LINE BREAK
2. CONTAINMENT LINER INTEGRITY ANALYSIS
3. CONTAINMENT ELECTRICAL PENETRATIONS FAULT STUDY.
4. SHORT CIRCUIT AND FAILURE ANALYSES OF CLASS IE SYSTEMS.
5. REACTOR PROTECTION SYSTEM ISOLATION DEVICES.

NRC

1. SEISMIC CAPABILITY OF STRUCTURES.
2. SEISMIC ANALYSIS OF VARIOUS PIPING SYSTEMS AND COMPONENTS.
3. ENGINEERED SAFETY FEATURES DESIGN.
4. VENTILATION SYSTEMS.
5. WIND AND TORNADO LOADINGS.
6. CODE CHANGES FOR STRUCTURES AND COMPONENTS.
7. ATMOSPHERIC TRANSPORT AND DIFFUSION CHARACTERISTICS.

OPEN ITEMS

TOPIC NO	TITLE
III-1	CLASSIFICATION OF STRUCTURES, COMPONENTS, AND SYSTEMS
III-2	WIND AND TORNADO LOADINGS
III-4.A	TORNADO MISSILES
III-5.A	EFFECTS OF PIPE BREAKS ON STRUCTURES, SYSTEMS AND COMPONENTS INSIDE CONTAINMENT
III-6	SEISMIC DESIGN CONSIDERATIONS
III-7.B	DESIGN CODES, DESIGN CRITERIA, LOAD COMBINATIONS, AND REACTOR CAVITY DESIGN CRITERIA
III-10.A	THERMAL-OVERLOAD PROTECTION FOR MOTORS OF MOTOR-OPERATED VALVES
VII-1.A	ISOLATION OF REACTOR PROTECTION SYSTEM FROM NON-SAFETY SYSTEMS, INCLUDING QUALIFICATION OF ISOLATION DEVICES
VIII-3.A	STATION BATTERY CAPACITY TEST REQUIREMENTS
XV-16	RADIOLOGICAL CONSEQUENCES OF FAILURE OF SMALL LINES CARRYING PRIMARY COOLANT OUTSIDE CONTAINMENT.

DRESDEN UNIT 2

TOTAL SEP TOPICS	137
TOPICS NOT APPLICABLE TO PLANT DESIGN	30
TOPICS DELETED DUE TO GENERIC REVIEW (USIs, TMIs, ETC.)	19
TOTAL TOPICS REVIEWED	88
TOPICS FOUND ACCEPTABLE	54
TOPICS CONSIDERED IN IA	34

TOPICS DELETED DUE TO GENERIC REVIEW

TOPICS NOT
APPLICABLE TO DRESDEN-2

SEP Topic No.	SEP title	Date of letter	Reason for deletion of topic
III-3.B	Structural and Other Consequences (e.g., Flooding of Safety-Related Equipment in Basements) of Failure of Underdrain Systems	11/16/79	Not applicable to site because site does not have a system whose function is to lower the groundwater table.
III-7.A	Inservice Inspection, Including Prestressed Concrete Containments with Either Grouted or Ungrouted Tendons	11/16/79	Not applicable to this unit's containment design.
III-7.C	Delamination of Prestressed Concrete Containment Structures	11/16/7[illegible]	Not applicable to this unit's containment design.
III-8.B	Control Rod Drive Mechanism Integrity	9/11/80	Review published as NUREG-0479, "Report on BWR Control Rod Drive Failures."
III-10.B	Pump Flywheel Integrity	11/16/79	Not applicable to BWRs.
V-1	Compliance With Codes and Standards	11/27/81	Reviewed under inservice inspection/inservice test program.
V-2	Applicability of Code Cases	11/16/79	Not applicable at this time; to be reviewed for any future modifications using references to Code Cases.
V-3	Overpressurization Protection	11/16/79	Not applicable to BWRs based on operating experience.
V-7	Reactor Coolant Pump Overspeed	11/16/79	Not applicable to BWRs.
V-8	Steam Generator Integrity	11/16/79	Not applicable to BWRs.
V-9	Reactor Core Isolation Cooling System (BWR)	11/16/79	Not applicable to this facility design.
VI-2.C	Ice Condenser Containment	11/16/79	Not applicable to this unit's containment design.

SEP Topic No.	SEP title	Date of letter	Reason for deletion of topic
VI-7.A.1	Emergency Core Cooling System Reevaluation to Account for Increased Reactor Vessel Upper-Head Temperature	11/16/79	Not applicable to BWRs.
VI-7.A.2	Upper Plenum Injection	11/16/79	Not applicable to BWRs.
VI-7.B	Engineered Safety Feature Switchover From Injection to Recirculation Mode (Automatic Emergency Core Cooling System Realignment)	11/16/79	Not applicable to BWRs.
VI-7.C.3	Effect of PWR Loop Isolation Valve Closure During a Loss-of-Coolant Accident on Emergency Core Cooling System Performance	11/16/79	Not applicable to BWRs.
VI-7.F	Accumulator Isolation Valves Power and Control System Design	11/16/79	Not applicable to BWRs.
VI-9	Main Steam Line Isolation Seal System (BWR)	11/16/79	Not applicable to this facility design.
VII-7	Acceptability of Swing Bus Design on BWR-4 Plants	11/16/79	Not applicable to this facility design.
IX-4	Boron Addition System (PWR)	11/16/79	Not applicable to BWRs.
X	Auxiliary Feedwater System	11/16/79	Not applicable to BWRs.
XI-1	Appendix I	12/4/81	Being resolved under generic activities A-02, "Appendix I," and B-35, "Confirmation of Appendix I Models." (See "Basis for Deletion" in Appendix A under Topic XI-1.)
XI-2	Radiological (Effluent and Process) Monitoring Systems	12/4/81	Being resolved under generic activities A-02, "Appendix I." (See "Basis for Deletion" in Appendix A under Topic XI-2.)

SEP Topic No.	SEP title	Date of letter	Reason for deletion of topic
XV-2	Spectrum of Steam System Piping Failures Inside and Outside Containment (PWR)	11/16/79	Not applicable to BWRs.
XV-6	Feedwater System Pipe Breaks Inside and Outside Containment (PWR)	11/16/79	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)	11/16/79	Not applicable to BWRs.
XV-12	Spectrum of Rod Ejection Accidents (PWR)	11/16/79	Not applicable to BWRs.
XV-17	Radiological Consequences of Steam Generator Tube Failure (PWR)	11/16/79	Not applicable to BWRs.
XV-23	Multiple Tube Failures in Steam Generators	11/16/79	Not applicable to BWRs.
XVI	Technical Specifications	11/05/80	Will be addressed after completion of the integrated assessment.

SEP Topic No.	SEP Title	TMI, USI, or SEP No.	TMI, USI, or SEP Title
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	Analysis of Hydrogen Control
		USI A-48	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	Safety Implications of Control Systems
		USI A-17	Systems Interactions in Nuclear Power Plants
VII-5	Instruments for Monitoring Radiation and Process Variables During Accidents	TMI II.F.1	Additional Accident Monitoring Instrumentation
		TMI II.F.2	Identification of and Recovery From Conditions Leading to Inadequate Core Cooling
		TMI II.F.3	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	Procedures for Verification of Correct Performance of Operating Activities
		TMI III.A.1	Improve Licensee Emergency Preparedness - Short-Term
		TMI III.A.2	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

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	Instrumentation for Monitoring Accident Conditions
		TMI III.A.1	Improve Licensee Emergency Preparedness - Short Term
II-2.D	Availability of Meteorological Data in the Control Room	TMI II.F.3	Instrumentation for Monitoring Accident Conditions
		TMI III.A.1	Improve Licensee Emergency Preparedness - Short Term
		TMI I.D.1	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	Fracture Toughness of Steam Generator and Reactor Coolant Pump Supports
		USI A-7	Mark I Containment Long-Term Program
		USI A-24	Environmental Qualification of Safety-Related Equipment
		USI A-46	Seismic Qualification of Equipment in Operating Plants
		SEP III-6	Seismic Design Considerations
		SEP V-1	Compliance With Codes and Standards (10 CFR Part 50, Section 50.55a)
III-11	Component Integrity	USI A-46	Seismic Qualification of Equipment in Operating Plants
		USI A-2	Asymmetric Blowdown Loads on Reactor Primary Coolant
		SEP III-6	Seismic Design Considerations
III-12	Environmental Qualification of Safety-Related Equipment	USI A-24	Qualification of Safety-Related Equipment
V-13	Waterhammer	USI A-1	Waterhammer
VI-2.A	Pressure-Suppression-Type BWR Containments	USI A-7	Mark I Containment Long-Term Program

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
II-4.E	DAM INTEGRITY
II-4.F	SETTLEMENT OF FOUNDATIONS AND BURIED EQUIPMENT
III-3.A*	EFFECTS OF HIGH WATER LEVEL ON STRUCTURES
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 PUMPS AND DISCHARGE VALVES
IV-1.A	OPERATION WITH LESS THAN ALL LOOPS IN SERVICE
IV-2	REACTIVITY CONTROL SYSTEMS INCLUDING FUNCTIONAL DESIGN AND PROTECTION AGAINST SINGLE FAILURES
IV-3	BWR JET PUMP OPERATING INDICATIONS
V-4	PIPING AND SAFE-END INTEGRITY
V-10.A*	RESIDUAL HEAT REMOVAL SYSTEM HEAT EXCHANGER TUBE FAILURES
V-12.A	WATER PURITY OF BWR PRIMARY COOLANT
VI-1	ORGANIC MATERIALS AND POSTACCIDENT CHEMISTRY
VI-2.D	MASS AND ENERGY RELEASE FOR POSTULATED PIPE BREAK INSIDE CONTAINMENT
VI-3	CONTAINMENT PRESSURE AND HEAT REMOVAL CAPABILITY
VI-7.A.3	EMERGENCY CORE COOLING SYSTEM ACTUATION SYSTEM
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-1.A	POTENTIAL EQUIPMENT FAILURES ASSOCIATED WITH DEGRADED GRID VOLTAGE
VIII-4*	ELECTRICAL PENETRATIONS OF REACTOR CONTAINMENT
IX-1	FUEL STORAGE
IX-3	STATION SERVICE AND COOLING WATER SYSTEMS
IX-6	FIRE PROTECTION
XIII-2	SAFEGUARDS/INDUSTRIAL SECURITY
XV-3	LOSS OF EXTERNAL LOAD, TURBINE TRIP, LOSS OF CONDENSER VACUUM, CLOSURE OF MAIN STEAM ISOLATION VALVE (BWR), AND STEAM PRESSURE REGULATORY FAILURE (CLOSED)
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 OF 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

- TOPIC II-1.A, EXCLUSION AREA AUTHORITY AND CONTROL

DIFFERENCE

LICENSEE DOES NOT OWN PART OF EXCLUSION AREA EXTENDING OVER DES PLAINES AND KANKAKEE RIVER.

RESOLUTION

ARRANGEMENTS HAVE BEEN MADE WITH COAST GUARD TO CONTROL RIVER TRAFFIC DURING PLANT EMERGENCY.

- TOPIC II-4.A, TECTONIC PROVINCE
- TOPIC II-4.C, HISTORICAL SEISMICITY WITHIN 200 MILES OF PLANT

DIFFERENCE

REVIEW WAS NOT COMPLETED ACCORDING TO 10 CFR PART 100, APPENDIX A.

RESOLUTION

SEP DEVELOPED SITE SPECIFIC GROUND RESPONSE SPECTRUM.

- TOPIC VIII-4, ELECTRICAL PENETRATIONS OF REACTOR CONTAINMENT

DIFFERENCE

LOW VOLTAGE PENETRATIONS DO NOT CONFORM TO CURRENT CRITERIA.

RESOLUTION

LICENSEE HAS IMPLEMENTED CORRECTIVE PROGRAM.

MARGINS BETWEEN OUTER SEAL DAMAGE AND BREAKER TRIP POINTS INDICATE NO SIGNIFICANT RISK.

ISSUES NOT REQUIRING BACKFIT

- TOPIC II-3.B, FLOODING POTENTIAL AND PROTECTION REQUIREMENTS (SECTION 4.1.1)

DIFFERENCE

DRESDEN DESIGN BASIS GROUNDWATER LEVEL WAS 514 FT MSL. PLANT GRADE IS 517 FT MSL.

RESOLUTION

SEP TOPIC III-3.A CONCLUDED STRUCTURAL INTEGRITY WOULD BE MAINTAINED AT WATER LEVELS UP TO 517 FT MSL.

- TOPIC III-1, CLASSIFICATION OF STRUCTURES, COMPONENTS AND SYSTEMS (SECTION 4.2.2)

DIFFERENCE

FRACTURE TOUGHNESS TESTING DATA DO NOT EXIST FOR RSCS, RBCCW AND RWCU SYSTEMS.

RESOLUTION

NOT NECESSARY DUE TO LOW IMPORTANCE OF SYSTEMS TO SAFETY.

- TOPIC III-3.C, INSERVICE INSPECTION OF WATER CONTROL STRUCTURES

DIFFERENCE

INSPECTION FREQUENCY OF FLOW REGULATION STATION DOES NOT COMPLY WITH CURRENT CRITERIA (SECTION 4.4.1).

RESOLUTION

STATION IS NOT SAFETY RELATED.

DIFFERENCE

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, TORNADO MISSILES (SECTION 4.5.2)

DIFFERENCE

STATION BATTERIES ARE LOCATED IN CONCRETE BLOCK WALL ROOM.

RESOLUTION

BATTERY ROOM IS LOCATED IN MISSILE PROTECTED TURBINE BUILDINGS.

- TOPIC III-10.A, THERMAL OVERLOAD PROTECTION FOR MOTORS OF MOTOR-OPERATED VALVES (SECTION 4.12.2)

DIFFERENCE

LIMIT SWITCH MUST BYPASS TORQUE SWITCH TO INTITIATE VALVE MOVEMENT.

RESOLUTION

CRITERIA IS MET.

- TOPIC VI-10.B. SHARED ENGINEERED SAFETY FEATURES, ONSITE EMERGENCY POWER, AND SERVICE SYSTEMS FOR MULTIPLE-UNIT FACILITIES

DIFFERENCE

OPERATOR DOES NOT HAVE COMPLETE INFORMATION ON STATUS OF SHARED BATTERIES, CHARGERS AND BUSES (SECTION 4.23.3).

RESOLUTION

ADDRESSED AS PART OF TOPIC VIII-3.B.

DIFFERENCE

BATTERY ROOM VENTILATION IS NOT POWERED FROM ONSITE SOURCE.

RESOLUTION

ADDRESSED AS PART OF TOPIC IX-5.

- TOPIC VII-3, SYSTEMS REQUIRED FOR SAFE SHUTDOWN (SECTION 4.25.3)

DIFFERENCE

LONG TERM COOLING IS SUSCEPTIBLE TO SINGLE FAILURES IF SHARED DIESEL GENERATOR IS NOT AVAILABLE TO UNIT 2.

RESOLUTION

PROCEDURES EXIST FOR SHUTDOWN USING ISOLATION CONDENSERS AND HPCI UNTIL SHARED DIESEL GENERATOR IS MANUALLY TRANSFERRED.

ISSUES REQUIRING ADDITIONAL
INFORMATION OR ANALYSIS

• TOPIC III-2, WIND AND TORNADO LOADINGS (SECTION 4.3.3)

DIFFERENCE

NO EVALUATION OF SAFETY RELATED COMPONENTS OUTSIDE OF QUALIFIED STRUCTURES.

STAFF POSITION

LICENSEE IDENTIFY COMPONENTS AND ASSURE THEY ARE PROTECTED OR SAFE SHUTDOWN CAN BE ACHIEVED WITHOUT THEM.

- TOPIC III-5.A, EFFECTS OF PIPE BREAK ON STRUCTURES, SYSTEMS AND COMPONENTS INSIDE CONTAINMENT

DIFFERENCE

LICENSEE MUST DEMONSTRATE FUNCTIONAL CAPABILITY OF TARGET PIPE FOLLOWING PIPE TO PIPE IMPACT (SECTION 4.7.2).

DIFFERENCE

LICENSEE MUST ASSURE DETECTABILITY FOR THROUGH WALL CRACKS (SECTION 4.7.3).

DIFFERENCE

LICENSEE MUST PROVIDE CRITERIA AND RESULTS FOR PIPE WHIP LOAD FORMULATION (SECTION 4.7.4).

RESOLUTION

TO BE ADDRESSED IN LICENSEE'S FINAL REPORT.

- TOPIC VI-7.C.1, APPENDIX K - ELECTRICAL, INSTRUMENTATION AND CONTROL (EI&C) RE-REVIEWS (SECTION 4.21.1)

DIFFERENCE

BATTERY CHARGER FAULTS CAN BE TRANSFERRED TO REDUNDANT AC SOURCES.

DIFFERENCE

DG 2/3 CONTROL SYSTEM FAULTS CAN BE TRANSFERRED TO REDUNDANT DC SOURCES.

DIFFERENCE

INTERCONNECTION BETWEEN REDUNDANT DIVISIONS COULD TRANSFER FAULT FROM ONE DC SYSTEM TO OTHER DC SYSTEM.

RESOLUTION

LICENSEE IS PERFORMING A SHORT CIRCUIT ANALYSIS TO VERIFY ADEQUACY OF PROTECTIVE RELAYING.

DIFFERENCE

CLASS 1E SOURCES MAY NOT BE ADEQUATELY ISOLATED FROM NON-CLASS 1E LOADS.

RESOLUTION

LICENSEE WILL PERFORM SHORT CIRCUIT ANALYSIS TO DEMONSTRATE ADEQUACY OF PROTECTION.

- TOPIC VIII-3.A, STATION BATTERY CAPACITY TEST REQUIREMENTS (SECTION 4.27)

DIFFERENCE

BATTERY TEST PROGRAM DOES NOT MEET REGULATORY GUIDE 1.129 RECOMMENDATIONS.

STATUS

LICENSEE TO DEMONSTRATE CURRENT PROGRAM EXCEEDS RECOMMENDATIONS OF REGULATORY GUIDE 1.129.

ISSUES WITH HARDWARE BACKFITS

- TOPIC VI-4, CONTAINMENT ISOLATION SYSTEM (SECTION 4.18.6)

DIFFERENCE

BRANCH LINES CONTAIN SINGLE ISOLATION VALVE AND THREADED CAP.

STATUS

STAFF HAS RECOMMENDED INSTALLING A SECOND LOCKED CLOSED VALVE OR WELDING THE CAP.

LICENSEE HAS NOT RESPONDED.

- TOPIC VI-6, CONTAINMENT LEAK TESTING*
  (SECTION 4.19)

DIFFERENCE

RBCCW SYSTEM AND CONTAINMENT AIRLOCK ARE NOT LEAK TESTED.

RESOLUTION

LICENSEE WILL PROVIDE FOR LEAK TESTING.

* NOTE: REVIEWED AS PART OF 10 CFR 50, APPENDIX J.

- TOPIC VII-3, SYSTEMS REQUIRED FOR SAFE SHUTDOWN (SECTION 4.25.4)

DIFFERENCE

SHUTDOWN COOLING SYSTEM TEMPERATURE INTERLOCK ARE NOT TESTED.

RESOLUTION

LICENSEE WILL PROVIDE FOR TESTING.

ISSUES WITH PROCEDURAL BACKFITS

• TOPIC VI-7.C.1, APPENDIX K - ELECTRICAL, INSTRUMENTATION AND CONTROL (EI&C) RE-REVIEWS

DIFFERENCE

NO ADMINISTRATIVE CONTROLS TO VERIFY CORRECT POSITIONING OF DISCONNECT LINKS BETWEEN REDUNDANT DIVISIONS (SECTION 4.21.2).

STATUS

LICENSEE HAS NOT RESPONDED.

DIFFERENCE

CLOSURE OF THE BREAKERS FOR REDUNDANT 480V BUSES COULD RESULT IN OVERLOADING DIESEL GENERATOR (SECTION 4.21.3).

STATUS

LICENSEE HAS NOT RESPONDED.

DIFFERENCE

NO TECHNICAL SPECIFICATIONS LIMITING TIME DURING WHICH DG 2/3 CONTROL POWER CAN BE OBTAINED FROM UNIT 3.

STATUS

STAFF RECOMMENDS STS LIMITS LICENSEE HAS NOT RESPONDED.

- TOPIC VI-10.B, SHARED ENGINEERED SAFETY FEATURES, ONSITE EMERGENCY POWER, AND SERVICE SYSTEMS FOR MULTIPLATE-UNIT FACILITIES

DIFFERENCE

THERE ARE NO PROCEDURES PREVENTING PARALLEL OPERATION OF SHARED BATTERY SYSTEMS (SECTION 4.23.1).

STATUS

LICENSEE HAS NOT RESPONDED.

- TOPIC VI-10.B, SHARED ENGINEERED SAFETY FEATURES, ONSITE EMERGENCY POWER, AND SERVICE SYSTEMS FOR MULTIPLE-UNIT FACILITIES

DIFFERENCE

DIESEL GENERATOR 2/3 CAN BE PLACED IN "BYPASS" MODE DURING OPERATION.

STATUS

RESOLVED-LICENSEE HAS MODIFIED OPERATING PROCEDURES TO REQUIRE DIESEL GENERATOR MODE TO BE PLACED IN "NORMAL" POSITION.

- TOPIC VII-3, SYSTEMS REQUIRED FOR SAFE SHUTDOWN (SECTION 4.25.1)

DIFFERENCE

NO PROCEDURES FOR ACHIEVING SHUTDOWN FROM OUTSIDE CONTROL ROOM.

RESOLUTION

LICENSEE HAS MODIFIED PROCEDURE (APRIL 1982) TO ACHIEVE AND MAINTAIN HOT SHUTDOWN.

LICENSEE HAS COMMITTED TO PROVIDE PROCEDURES FOR ACHIEVING COLD SHUTDOWN AS PART OF FIRE PROTECTION REVIEW.

ISSUES WHERE LICENSEE DISAGREES WITH STAFF*

III-6
V-5
XV-16
XV-18

* TOPICS COVERED IN OYSTER CREEK REVIEW

ACRS SUBCOMMITTEE ON SEP

OCTOBER 26 AND 27

MILLSTONE UNIT NO. 1

NORTHEAST UTILITIES

CONDUCT OF PHASE II SIGNIFICANTLY DIFFERENT FROM ORIGINAL PLANS

- NRC STAFF PROGRAM vs. LICENSEE PROGRAM
- PROTECTION FROM INTERIM BACKFITS ABSENT IMMEDIATE SAFETY PROBLEM
- EXCLUDED FROM OTHER NRC INITIATIVES
- PROGRAM NOT FORMALIZED IN THE REGULATIONS

ORIGINAL SEP OBJECTIVES

- o CREATE DOCUMENTATION BASE
- o CAPABILITY FOR INTEGRATED AND BALANCED BACKFITTING DECISIONS
- o IDENTIFY IMMEDIATE SAFETY CONCERNS
- o REASSESS SAFETY ADEQUACY
- o EFFICIENTLY USE AVAILABLE RESOURCES
- o IMPROVE BASIS FOR POL CONVERSIONS

STAGES OF SEP PHASE II

- o NRC PROGRAM (3 YEARS)
- o LEAD PLANT (3 MONTHS)
- o LEAD TOPIC (2 YEARS SO FAR)
- o ACTUAL PROGRAM HAS BEEN HYBRID OF LEAD PLANT AND LEAD TOPIC
- o INCREASED LICENSEE INVOLVEMENT KEY FACTOR IN ACCELERATED RATE OF PROGRESS
- o LICENSEES HAVE BENEFITTED SIGNIFICANTLY BY EVALUATING TOPICS CONCURRENTLY

PLANT MODIFICATIONS

- SEISMIC ANCHORAGE
- SEISMIC STRUCTURE MODIFICATIONS
- NEW BATTERY RACKS
- MODIFICATIONS TO GAS TURBINE GENERATOR PROTECTIVE TRIPS
- REVISED BATTERY TESTING PROGRAM
- ISI PROGRAM FOR WATER CONTROL STRUCTURES
- LOCKING DEVICES ON ISOLATION VALVES
- VARIOUS TECHNICAL SPECIFICATION AND PROCEDURE CHANGES

OBSERVATIONS ON PHASE II

- o LARGE RESOURCE EXPENDITURE
  - - INTERNAL MANHOURS - 30,000
  - - CONSULTANT COSTS - $1.0 MILLION
  - - HARDWARE MODIFICATIONS - $1.5 MILLION
- o EXTENDED SCHEDULE
- o "INTEGRATION" CONCEPT LIMITED TO APPLICABLE SEP TOPICS
- o STRONG PROJECT MANAGEMENT
- o JUDGMENTS BASED UPON NUCLEAR SAFETY, NOT SRP CRITERIA
- o CONSIDERATION OF PLANT UNIQUE FEATURES
- o PROVISIONS FOR LICENSEE TO UTILIZE ITS KNOWLEDGE OF THE PLANT TO IMPLEMENT "INTEGRATION" CONCEPT

ORIGINAL SEP OBJECTIVES

- o CREATE DOCUMENTATION BASE
  - GENERALLY YES
- o CAPABILITY FOR INTEGRATED AND BALANCED BACKFITTING DECISIONS
  - IN THE CONTEXT OF SEP ISSUES ONLY, OBJECTIVE IS BEING MET
- o IDENTIFY IMMEDIATE SAFETY CONCERNS
  - GENERALLY YES
- o REASSESS SAFETY ADEQUACY
  - PARTIALLY MET
- o EFFICIENTLY USE AVAILABLE RESOURCES
  - NOT MET
- o IMPROVE BASIS FOR POL CONVERSIONS
  - AN IMPROVEMENT HAS BEEN ACHIEVED, BUT A QUESTION REMAINS REGARDING HOW EXTENSIVE A BASIS IS NEEDED

CONCLUSIONS

- o INCORPORATE POSITIVE ELEMENTS OF PHASE II INTO THE REGULATORY PPOCESS

  - SRP IS ONLY A STARTING POINT
  - STRONG PROJECT MANAGEMENT

- o INTEGRATION SHOULD CONSIDER ALL PLANT MODIFICATIONS, NOT ONLY SEP TOPICS

- o FORMALIZE ANY POTENTIAL NEW PROGRAM BY REGULATION

ACRS SUBCOMMITTEE ON SEP

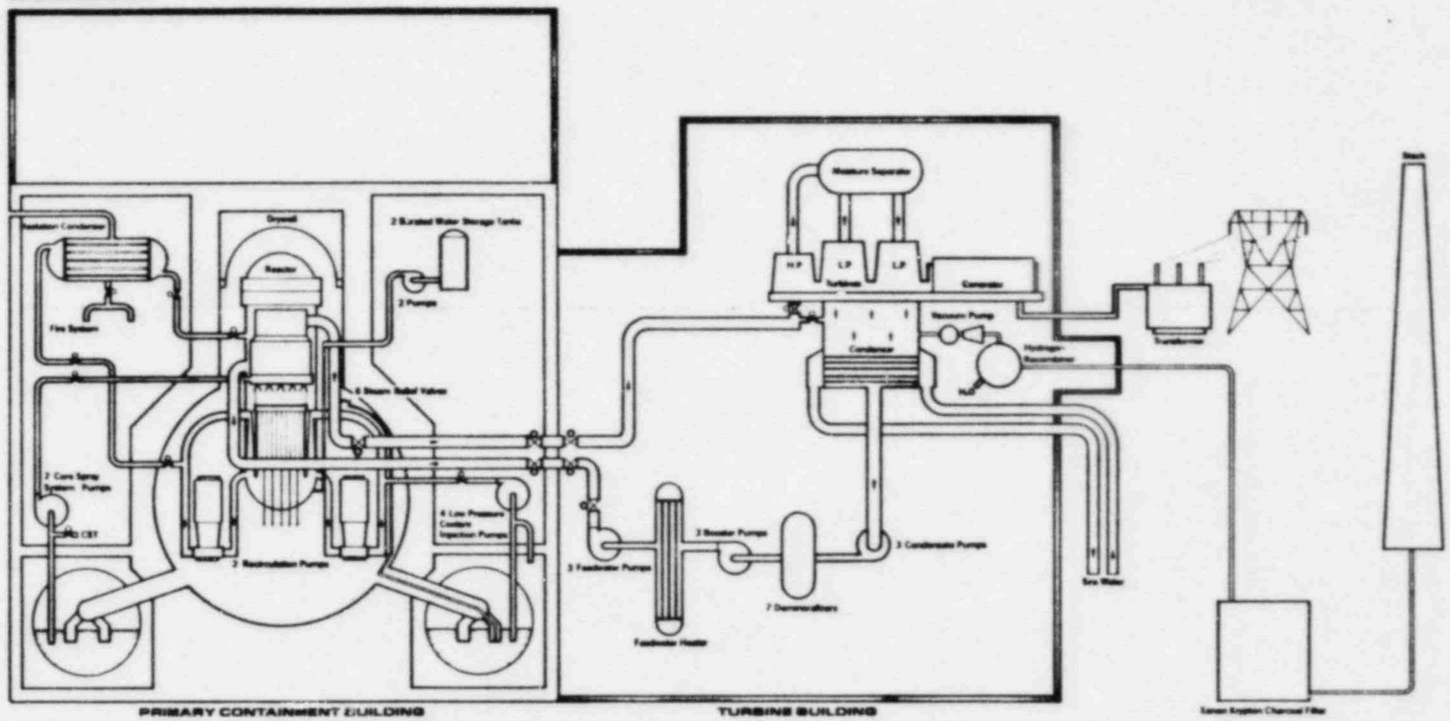
OCTOBER 26 AND 27

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	70 (EST.)

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.

TOPIC XV-18 - RADIOLOGICAL CONSEQUENCES OF MAIN STEAM LINE FAILURE OUTSIDE CONTAINMENT

NRC POSITION: IMPLEMENT BWR STANDARD TECHNICAL SPECIFICATION LIMITS FOR IODINE CONCENTRATION IN PRIMARY COOLANT

PRESENT MILLSTONE 1 TECHNICAL SPECIFICATION:

"THE REACTOR COOLANT SYSTEM RADIOACTIVITY CONCENTRATION IN WATER SHALL NOT EXCEED 20 MICROCURIES OF TOTAL IODINE PER ML OF WATER."

GE STANDARD TECH SPECS: SPECIFIC ACTIVITY $\leq$ 0.2 uCi/gm DEQ I-131 FOR NORMAL OPERATION, AND UP TO A MAXIMUM OF 40 uCi/gm FOR A SET TIME LIMIT.

BASIS (FROM NUREG-0123):

"ENSURE THAT THE 2 HOUR THYROID AND WHOLE BODY DOSES RESULTING FROM A MAIN STEAM LINE FAILURE OUTSIDE THE CONTAINMENT DURING STEADY STATE OPERATION WILL NOT EXCEED SMALL FRACTIONS OF THE DOSE QUIDELINES OF 10 CFR 100."

AND:

"THESE VALUES ARE CONSERVATIVE IN THAT SPECIFIC SITE PARAMETERS OF THE (   ) SITE, SUCH AS SITE BOUNDARY LOCATION AND METEOROLOGICAL CONDITIONS, WERE NOT CONSIDERED IN THIS EVALUATION. THE NRC IS FINALIZING SITE SPECIFIC CRITERIA WHICH WILL BE USED AS THE BASIS FOR THE REEVALUATION OF THE SPECIFIC ACTIVITY LIMITS OF THIS SITE. THIS REEVALUATION MAY RESULT IN HIGHER LIMITS."

NU POSITION: BY LETTER DATED 1/13/82, ANALYSIS RESULTS WERE DOCKETED FOR THIS EVENT USING THE FOLLOWING ASSUMPTIONS FOR IODINE CONCENTRATION:

SOURCE OF ISOTOPIC MIX	uCi/gm DEQ I-131 / 20 uCi/gm I	THYROID DOSE (REM)
NORMAL OPERATING	.7338	4.11
NUREG-0016	1.564	8.76
APPENDIX I	2.474	13.85
TID-14844	3.192	17.86

CONCLUSION: MILLSTONE 1 WILL ACCEPT A TECHNICAL SPECIFICATION LIMIT FOR IODINE IN PRIMARY COOLANT OF 2.474 uCi/gm DEQ I-131.

MILLSTONE NUCLEAR POWER STATION, UNIT 1

TOTAL TOPICS REVIEWED IN PHASE II	137
TOPICS DELETED BECAUSE COVERED BY USI, TMI TASK	20
TOPICS THAT DID NOT APPLY TO MILLSTONE 1	31
FINAL NUMBER OF TOPICS REVIEWED	86
TOPICS THAT WERE ACCEPTABLE ON ANOTHER DEFINED BASIS OR MEETING CRITERIA	48
TOPICS CONSIDERED IN INTEGRATED ASSESSMENT	38

OF 38 TOPICS, NUMBER OF ISSUES CONSIDERED IN INTEGRATED ASSESSMENT	86
NUMBER OF ISSUES SIMILAR TO OYSTER CREEK	59
NUMBER OF PLANT SPECIFIC ISSUES	27

MILLSTONE 1 TOPICS (ISSUES) COVERED IN OYSTER CREEK PRESENTATION

TOPIC	SECTION	COVERED IN OYSTER CREEK
II-3.B,	4.1.1	
II-3.B.1,	4.1.2	
II-3.C	4.1.3	4.1.7 - Addit. Inform.
	4.1.4	
	4.1.5	
	4.1.6	4.1.4,6 - Administ.
	4.1.7	4.1.9 - Hardware
II-4.F	4.2.1	
	4.2.2	
	4.2.3	
III-1	4.3.1	4.2 - Addit. Inform.
	4.3.2	4.2 - Addit. Inform.
	4.3.3	4.2 - Addit. Inform.
	4.3.4	4.2 - Addit. Inform.
	4.3.5	4.2 - Addit. Inform.
III-2	4.4.1	4.3.1 - Addit. Inform.
	4.4.2	4.3.2 - Addit. Inform.
	4.4.3	4.3.3 - Addit. Inform.
	4.4.4	4.3.4 - No Backfit
	4.4.5	4.3.6 - Addit. Inform.
	4.4.6	4.3.8 - Addit. Inform.
III-3.A	4.5.1	(SEE 4.1.1)
	4.5.2	4.4.2 - Addit. Inform.
III-3.C	4.6.1	(SEE 4.1.7)
	4.6.2	4.5.4 - Administ.
	4.6.3	4.5.4 - Administ.
III-4.A	4.7	4.6.4 - Disagreement
III-4.B	4.8	4.7 - Administ.
III-5.A	4.9.1	
	4.9.2	4.9.2 - No Backfit
	4.9.3	4.9.3 - No Backfit
III-5.B	4.10.1	
	4.10.2	
	4.10.3	4.10.1 - Addit. Inform.
III-6	4.11.1	(SEE 4.2.1)
	4.11.2	
	4.11.3	
	4.11.4	
	4.11.5	4.11.4 - No Backfit
	4.11.6	4.11.5 - Addit. Inform.
	4.11.7	
	4.11.8	4.11.2 - Addit. Inform.
III-7.B	4.12	4.12 - Addit. Inform.
III-8.A	4.13	4.13 - No Backfit
III-10.A	4.14	4.14.1 - Addit. Inform.
IV-2	4.15	4.15 - No Backfit
V-5	4.16.1	4.16.1 - Hardware
		4.16.1 - Disagreement
	4.16.2	4.16.3 - No Backfit
V-10.B	4.17	4.18 - Administ.
V-11.A	4.18	4.19 - Addit. Inform.
V-12.A	4.19.1	4.20 - Disagreement
	4.19.2	
VI-4	4.20.1	4.22.1 - Hardware
	4.20.2	
	4.20.3	4.22.2 - Disagreement
	4.20.4	4.22.3 - No Backfit
	4.20.5	4.22.4 - No Backfit
	4.20.6	4.22.5 - No Backfit
	4.20.7	
VI-7.A.3	4.21.1	
	4.21.2	
VI-7.A.4	4.22	4.24 - No Backfit
VI-7.C.1	4.23.1	4.25.1 - Hardware
	4.23.2	
VI-10.A	4.24.1	4.26.2 - Disagreement
	4.24.2	4.26.2 - Disagreement
	4.24.3	4.26.1 - No Backfit
VII-1.A	4.25.1	4.27.1 - Addit. Inform.
	4.25.2	4.27.2 - Hardware
VII-3	4.26	4.30.1 - Administ.
VIII-1.A	4.27	
VIII-2	4.28.1	
	4.28.2	
	4.28.3	
	4.28.4	4.31 - Hardware
VIII-3.A	4.29	
VIII-3.B	4.30	4.32 - Hardware
IX-3	4.31	
IX-5	4.32.1	4.34.3 - Addit. Inform.
	4.32.2	4.34.4 - Addit. Inform.
		4.34.1 - Administ.
	4.32.3	
	4.32.4	
XV-1	4.33	4.35 - No Backfit
XV-3	4.34	
XV-16	4.35	4.36 - Disagreement
XV-18	4.36	4.37 - Disagreement

LIST OF 31 TOPICS

THAT DO NOT APPLY TO

MILLSTONE 1

SEP Topic No.	SEP title	Date of letter	Reason for deletion of topic
II-4.E	Dam Integrity	11/16/79	Not applicable to site.
III-3.B	Structural and Other Consequences (e.g., Flooding of Safety-Related Equipment in Basements) of Failure of Underdrain Systems	11/16/79	Not applicable to site because site does not have a system whose function is to lower the groundwater table.
III-7.A	Inservice Inspection, Including Prestressed Concrete Containments With Either Grouted or Ungrouted Tendons	11/16/79	Not applicable to this unit's containment design.
III-7.C	Delamination of Prestressed Concrete Containment Structures	11/16/79	Not applicable to this unit's containment design.
III-8.B	Control Rod Drive Mechanism Integrity	9/26/80	Review published as NUREG-0479, "Report on BWR Control Rod Drive Failures."
III-10.B	Pump Flywheel Integrity	11/16/79	Not applicable to BWRs.
V-1	Compliance With Codes and Standards	11/27/81	Reviewed under inservice inspection/ inservice test program.
V-2	Applicability of Code Cases	11/16/79	Not applicable at this time; to be reviewed for any future modifications using references to Code Cases.
V-3	Overpressurization Protection	11/16/79	Not applicable to BWRs, based on operating experience.
V-7	Reactor Coolant Pump Overspeed	11/16/79	Not applicable to BWRs.
V-8	Steam Generator Integrity	11/16/79	Not applicable to BWRs.
V-9	Reactor Core Isolation Cooling System (BWR)	11/16/79	Not applicable to this facility design.
VI-2.C	Ice Condenser Containment	11/16/79	Not applicable to this unit's containment design.

SEP Topic No.	SEP title	Date of letter	Reason for deletion of topic
VI-7.A.1	Emergency Core Cooling System Reevaluation To Account for Increased Reactor Vessel Upper-Head Temperature	11/16/79	Not applicable to BWRs.
VI-7.A.2	Upper Plenum Injection	11/16/79	Not applicable to BWRs.
VI-7.B	Engineered Safety Feature Switchover From Injection to Recirculation Mode (Automatic Emergency Core Cooling System Realignment)	11/16/79	Not applicable to BWRs.
VI-7.C.3	Effect of PWR Loop Isolation Valve Closure During a Loss-of-Coolant Accident on Emergency Core Cooling System Performance	11/16/79	Not applicable to BWRs.
VI-7.F	Accumulator Isolation Valves Power and Control System Design	11/16/79	Not applicable to BWRs.
VI-9	Main Steam Line Isolation Seal System (BWR)	11/16/79	Not applicable to this facility design.
VII-7	Acceptability of Swing Bus Design on BWR-4 Plants	11/16/79	Not applicable to this facility design.
IX-4	Boron Addition System (PWR)	11/16/79	Not applicable to BWRs.
X	Auxiliary Feedwater System	11/16/79	Not applicable to BWRs.
XI-1	Appendix I	12/4/81	Being resolved under generic activities A-02, "Appendix I," and B-35, "Confirmation of Appendix I Models." (See "Basis for Deletion" in Appendix A under Topic XI-1.)
XI-2	Radiological (Effluent and Process) Monitoring Systems	12/4/81	Being resolved under generic activities A-02, "Appendix I." (See "Basis for Deletion" in Appendix A under Topic XI-2.)

SEP Topic No.	SEP title	Date of letter	Reason for deletion of topic
XV-2	Spectrum of Steam System Piping Failures Inside and Outside Containment (PWR)	11/16/79	Not applicable to BWRs.
XV-6	Feedwater System Pipe Breaks Inside and Outside Containment (PWR)	11/16/79	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)	11/16/79	Not applicable to BWRs.
XV-12	Spectrum of Rod Ejection Accidents (PWR)	11/16/79	Not applicable to BWRs.
XV-17	Radiological Consequences of Steam Generator Tube Failure (PWR)	11/16/79	Not applicable to BWRs.
XV-23	Multiple Tube Failures in Steam Generators	11/16/79	Not applicable to BWRs.
XVI	Technical Specifications	11/5/80	Will be addressed after completion of the integrated assessment.

LIST OF 20 TOPICS

THAT WERE DELECTED BECAUSE

THEY ARE COVERED BY

TMI-2 ACTION PLAN OR UNRESOLVED SAFETY ISSUES

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	Instrumentation for Monitoring Accident Conditions
		TMI III.A.1	Improve Licensee Emergency Preparedness - Short Term
II-2.D	Availability of Meteorological Data in the Control Room	TMI II.F.3	Instrumentation for Monitoring Accident Conditions
		TMI III.A.1	Improve Licensee Emergency Preparedness - Short Term
		TMI I.D.1	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	Fracture Toughness of Steam Generator and Reactor Coolant Pump Supports
		USI A-7	Mark I Containment Long-Term Program
		USI A-24	Environmental Qualification of Safety-Related Equipment
		USI A-46	Seismic Qualification of Equipment in Operating Plants
		SEP III-6	Seismic Design Considerations
		SEP V-1	Compliance With Codes and Standards (10 CFR Part 50, Section 50.55a)
III-11	Component Integrity	USI A-46	Seismic Qualification of Equipment in Operating Plants
		USI A-2	Asymmetric Blowdown Loads on Reactor Primary Coolant
		SEP III-6	Seismic Design Considerations
III-12	Environmental Qualification of Safety-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

SEP Topic No.	SEP Title	TMI, USI, or SEP No.	TMI, USI, or SEP Title
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

SEP Topic No.	SEP Title	TMI, USI, or SEP No.	TMI, USI, or SEP Title
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

LIST OF 48 TOPICS

THAT MEET CURRENT CRITERIA

OR EQUIVALENT

LIST OF TOPICS THAT MEET CURRENT CRITERIA OR EQUIVALENT

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 Diffussion Characteristics for Accident Analysis
II-3.A	Hydrological 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
III-7.D	Containment Structural Integrity Test.
III-8.C	Irradiation Damage, Use of Sensitized Stainles Steel, and Fatigue Resistance
III-10.C	Surveillance Requirements on BWR Recirculation Pumps and Discharge Valves
IV-1.A	Operation With Less Than All Loops in Service
IV-3	BWR Jet Pump Operating Indications
V-6	Reactor Vessel Integrity
V-10.A	Residual Heat Removal System Heat Exchanger Tube Failures
V-11.B	Residual Heat Removal System Interlock Requirements
VI-1	Organic Materials and Postaccident Chemistry
*VI-2.D	Mass and Energy Release for Postulated Pipe Break Inside Containment
*VI-3	Containment Pressure and Heat Removal Capability
VI-6	Containment Leak Testing
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)
VI-10.B	Shared Engineered Safety Features, Onsite Emergency Power, and Service System for Multiple-Unit Stations
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
*IX-1	Fuel Storage
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)

* Denotes Equivalent

XV-9	Startup of an Inactive Loop or Recirculation Loop at an Incorrect Temperature, and Flow Controller Malfunction Causing an Increase in BWR Core Flow Rate
XV-11	Inadvertent Loading and Operation of a Fuel Assembly in an Improper Position (BWR)
XV-13	Spectrum of 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 Openig 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[1]

[1]The Operational Quality Assurance Program was reviewed according to the criteria specified for operating reactors in 1974 (See Appendix A). NRC has recently approved the licensee Quality Assurance Program ND-QA-1, Rev. 4A. Letter dated April 9, 1982, from W. P. Haass (NRC) to W. G. Counsil (NNECo).

TOPIC II-1.A, EXCLUSION AREA AUTHORITY AND CONTROL

DIFFERENCE:

- THE LICENSEE HAS NOT SPECIFICALLY DEFINED AN EXCLUSION AREA OVER THE WATERS OF LONG ISLAND SOUND.

RESOLUTION:

- THE LICENSEE HAS MADE ARRANGEMENTS WITH THE U.S. COAST GUARD, AS DOCUMENTED IN THE MILLSTONE NUCLEAR POWER STATION EMERGENCY PLAN AND THE STATE OF CONNECTICUT EMERGENCY PLAN, FOR CONTROL OF WATER TRAFFIC IN THE VICINITY OF THE MILLSTONE SITE IN THE EVENT OF A PLANT EMERGENCY.

INTEGRATED ASSESSMENT SUMMARY

(38 TOPICS)

- TOPICS NOT REQUIRING BACKFIT
- TOPICS REQUIRING ADDITIONAL ENGINEERING ANALYSIS
- TOPICS WITH HARDWARE BACKFITS
- TOPICS WITH PROCEDURAL BACKFITS
- TOPICS NNECO HAS NOT ADDRESSED OR DOES NOT AGREE WITH THE STAFF POSITION

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X27458

LIST OF TOPICS (ISSUES) NOT REQUIRING ANY FORM OF BACKFIT

TOPICS II-3.B, II-3.B.1 AND II-3.C, HYDROLOGY

- DIESEL FUEL OIL TRANSFER PUMPS SUSCEPTIBILITY TO WAVE ACTION DURING A PMH (Section 4.1.5).

TOPIC III-5.B, EFFECTS OF PIPE BREAKS OUTSIDE CONTAINMENT

- MODERATE-ENERGY PIPING REVIEW (Section 4.10.1).

TOPIC III-6, SEISMIC DESIGN CONSIDERATIONS

- STRUCTURAL INTEGRITY OF MOTOR-OPERATED VALVES (Section 4.11.2).
- SUPPORTS OF THE LOW-PRESSURE COOLANT/INJECTION CONTAINMENT SPRAY HEAT EXCHANGERS (Section 4.11.3).
- FUNCTIONAL QUALIFICATION OF SAFETY-RELATED ELECTRICAL EQUIPMENT (Section 4.11.5).

TOPIC VI-7.A.3, EMERGENCY CORE COOLING SYSTEM ACTUATION SYSTEM

- TESTING OF THE EMERGENCY SERVICE WATER (ESW) SYSTEM (Section 4.21.2).

TOPIC VIII-2, ONSITE EMERGENCY POWER SYSTEMS (DIESEL GENERATOR)

- ANNUNCIATORS OF THE GAS TURBINE GENERATOR (Section 4.28.4).

TOPIC IX-3, STATION SERVICE AND COOLING WATER SYSTEMS

- FAILURE OF NON-REDUNDENT PIPE RUNS (Section 4.31).

TOPIC XV-3, LOSS OF EXTERNAL LOAD, TURBINE TRIP, LOSS OF CONDENSER VACUUM, CLOSURE OF MAIN STEAM ISOLATION VALVE (BWR), AND STEAM PRESSURE REGULATOR FAILURE (CLOSED)

- MCPR CALCULATION (Section 4.34).

TOPICS II-3.B, II-3.B.1 AND II-3.C, HYDROLOGY
(SECTION 4.1.5)

DIFFERENCE:

- THE DIESEL FUEL OIL TRANSFER PUMPS ARE SUSCEPTIBLE TO WAVE ACTION DURING A PROBABLE MAXIMUM HURRICANE (PMH).

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, PIPE BREAK OUTSIDE CONTAINMENT
(SECTION 4.10.1)

DIFFERENCE:

- THE EFFECTS OF MODERATE-ENERGY PIPING CRACKS WAS NOT ADDRESSED BY THE LICENSEE.

RESOLUTION:

- AN ANALYSIS OF THE MODERATE ENERGY SYSTEMS INDICATES THAT:
  - FLOODING IN THE TURBINE BUILDING (CONDENSER BAY) WOULD AFFECT THE FEEDWATER COOLANT 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, SEISMIC DESIGN CONSIDERATIONS
(SECTION 4.11.2)

DIFFERENCE:

- THE STRUCTURAL INTEGRITY OF MOTOR-OPERATED VALVES ATTACHED TO SMALL PIPING (4 IN. OR SMALLER) WAS NOT ADDRESSED BY THE LICENSEE.

RESOLUTION:

- THE STAFF HAS REVIEWED INFORMATION PROVIDED BY THE LICENSEE AND CONCLUDES THAT PIPE STRESSES CAUSED BY VALVE ECCENTRICITY ARE ACCEPTABLE; HOWEVER, VALVE INTEGRITY REMAINS UNRESOLVED DUE TO LACK OF INFORMATION.

(SECTION 4.11.3)

DIFFERENCE:

- THE SUPPORT OF THE LOW-PRESSURE COOLANT INJECTION/CONTAINMENT SPRAY HEAT EXCHANGERS MIGHT NOT BE ADEQUATELY RESTRAINED.

RESOLUTION:

- THE LICENSEE PROVIDED ADDITIONAL INFORMATION.
- THE STAFF HAS REVIEWED THE RESTRAINTS AND MOUNTING DETAILS AND HAS FOUND THEM ACCEPTABLE.

TOPIC VI-7.A.3, EMERGENCY CORE COOLING SYSTEM ACTUATION SYSTEM (SECTION 4.21.2)

DIFFERENCE:

- 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.

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 FUNCTIONS 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 IX-3, STATION SERVICE AND COOLING WATER SYSTEM
(SECTION 4.31)

DIFFERENCE:

- A SINGLE FAILURE IN NON-REDUNDANT PIPE RUNS OF THE SERVICE WATER SYSTEM (SWS) AND THE TURBINE BUILDING SECONDARY CLOSED COOLING WATER (TBSCCW) SYSTEM COULD RESULT IN LOSS OF SYSTEM FUNCTION.

RESOLUTION:

- THE ESSENTIAL EQUIPMENT SERVICED BY THE TBSCCW SYSTEM CONSIST PRIMARTLY OF COMPONENTS OF THE FEEDWATER COOLANT INJECTION (FWCI) SYSTEM. THE LOSS OF THIS EQUIPMENT WILL NOT INHIBIT SAFE SHUTDOWN OF THE PLANT.
- THE ESSENTIAL EQUIPMENT SERVICED BY THE SWS IS THE DIESEL GENERATOR AND THE TBSCCW SYSTEM HEAT EXCHANGERS.
  - THE GAS TURBINE GENERATOR, WHICH IS AIR COOLED, COULD PROVIDE EMERGENCY POWER. SHOULD THE GAS TURBINE ALSO BE UNAVAILABLE, THE ISOLATION CONDENSER (AC POWER INDEPENDENT) COULD BE USED TO MAINTAIN THE PLANT IN A SAFE SHUTDOWN CONDITION.
  - THE SWS LINE MAY BE UNDERLAINED BY PEAT. THIS ISSUE IS COVERED UNDER TOPIC II-4.F (SECTION 4.2.3).

TOPIC XV-3, LOSS OF EXTERNAL LOAD, TURBINE TRIP, LOSS OF CONDENSER VACUUM, CLOSURE OF MAIN STEAM ISOLATION VALVE (BWR), AND STEAM PRESSURE REGULATOR FAILURE (CLOSED)

(SECTION 4.34)

DIFFERENCE:

- 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.

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.

LIST OF TOPICS (ISSUES) REQUIRING ADDITIONAL ANALYSIS PRIOR TO RESOLUTION

TOPIC II-3.B, II-3.B.1 AND II-3.C, HYDROLOGY

- DETERMINE THE EFFECTS OF PROBABLE MAXIMUM HURRICAN (PMH) WAVE LEAKAGE AND IDENTIFY ANY NECESSARY CORRECTIVE ACTIONS (Section 4.1.1).
- PROVIDE ANALYSIS OF PMH WAVE STRUCTURAL EFFECTS (Section 4.1.1).
- IDENTIFY MEASURES NEEDED TO PROTECT AGAINST THE EFFECTS OF A PMH SURGE FLOODING OF THE INTAKE STRUCTURE (Section 4.1.2).

TOPIC II-4.F, SETTLEMENT OF FOUNDATIONS AND BURIED EQUIPMENT

- EVALUATE THE STRUCTURAL CAPABILITY OF THE PILES SUPPORTING THE TURBINE BUILDING (Section 4.2.1).
- EVALUATE THE STRUCTURAL CAPABILITY OF THE PILES SUPPORTING THE GAS TURBINE GENERATOR BUILDING (Section 4.2.2).
- CONDUCT SOIL INVESTIGATION IN THE AREA OF THE SAFETY-RELATED WATER PIPELINES WHERE THEY MAY BE UNDERLAIN BY PEAT (Section 4.2.3).

TOPIC III-5 [illegible]CTS OF PIPE BREAK ON STRUCTURES, SYSTEMS AND COMPONENTS [illegible]DE CONTAINMENT

- SUBMIT AN ANALYSIS OF CASCADING PIPE BREAKS INSIDE CONTAINMENT (Section 4.9.

TOPIC III-5.B, PIPE BREAK OUTSIDE CONTAINMENT

- SUBMIT A REVIEW OF THE SPECIFIED JET IMPINGEMENT ANALYSIS OF PIPE BREAKS OUTSIDE CONTAINMENT (Section 4.10.2).

TOPIC III-6, SEISMIC DESIGN CONSIDERATONS

- SUBMIT INFORMATION ABOUT THE ANCHORAGE DESIGN OF THE SPECIFIED TRANSFORMERS AND CONTROL ROOM PANELS (Section 4.11.4).

TOPIC III-7.B, DESIGN CODES, DESIGN CRITERIA, LOAD COMBINATIONS, AND REACTOR CAVITY DESIGN CRITERIA

- EVALUATE THE ADEQUACY OF ORIGINAL DESIGN CRITERIA ON A SAMPLING BASIS FOR SPECIFIED STRUCTURAL ELEMENTS: PROVIDE INFORMATION REQUESTED IN TOPICS II-3.B, II-4.F, III-2, III-3.A, and III-6 THAT HAS BEEN DEFERRED TO THIS TOPIC (Section 4.12).

TOPIC VI-4, CONTAINMENT ISOLATION SYSTEM

- REVIEW ISOLATION CAPABILITY OF TWO LINES AN IMPLEMENT MODIFICATIONS IF NECESSARY (Section 4.20.7)

TOPIC VI-7.A.3, EMERGENCY CORE COOLING SYSTEM ACTUATION SYSTEM

- DEMONSTRATE THAT THE SPACE COOLERS IN THE CORE SPRAY SYSTEM AND LOW PRESSURE COOLANT INJECTION SYSTEM PUMPS ROOMS ARE NOT ESSENTIAL (Section 4.21.1).

TOPIC IX-5, VENTILATION SYSTEMS

- PROVIDE INFORMATION ON THE SPACE COOLERS FOR THE FEEDWATER COOLANT INJECTION AND DIESEL GENERATOR AREAS (Section 4.32.3).

- DEMONSTRATE THAT SUFFICIENT VENTILATION CAN BE PROVIDED TO THE EQUIPMENT IN THE INTAKE STRUCTURE IN A TIMELY MANNER IN CASE OF A LOSS-OF-OFFSITE-POWER EVENT (Section 4.32.4).

TOPICS II-3.B, II-3.B.1 AND II-3.C, HYDROLOGY
(SECTION 4.1.1)

DIFFERENCE:

- 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.

RESOLUTION:

- THE LICENSEE WILL ANALYZE THE POTENTIAL EFFECTS OF THE INLEAKAGE AND IMPLEMENT ANY CORRECTIVE ACTION DEEMED NECESSARY.
- THE LICENSEE WILL ADDRESS THE STRUCTURAL CONSERNS IN THE INTEGRATED STRUCTURAL ASSESSMENT PROPOSED IN TOPIC III-7.B (SECTION 4.12).

(SECTION 4.1.2)

DIFFERENCE:

- THE INTAKE STRUCTURE MAY BE FLOODED BY A PMH SURGE AND HIGH WAVES ENTERING THROUGH THE OPENINGS BELOW.

RESOLUTION:

- THE LICENSEE WILL ANALYZE AND IMPLEMENT ANY NECESSARY CORRECTIVE ACTION.

TOPIC II-4.F, SETTLEMENT OF FOUNDATIONS AND BURIED EQUIPMENT (SECTION 4.2.1)

DIFFERENCE:

- THE LICENSEE HAS NOT DEMONSTRATED THAT THE PILES SUPPORTING THE TURBINE BUILDING:
  - 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 REDUCTION 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 (SECTION 4.12).

(SECTION 4.2.2)

DIFFERENCE:

- THE CONCERNS OF THE TURBINE BUILDING (SECTION 4.2.1) ARE APPLICABLE TO THE GAS TURBINE GENERATOR BUILDING, ADDITIONALLY.
- 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 (SECTION 4.12).

TOPIC II-4.F (CONTINUED)
(SECTION 4.2.3)

DIFFERENCE:

- ONE AREA OF THE SERVICE WATER AND EMERGENCY SERVICE WATER LINES MAY BE SUPPORTED ON UNSUITABLE PEAT MATERIAL.

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 (SECTION 4.12).

TOPIC III-5.A, EFFECTS OF PIPE BREAKS ON STRUCTURES, SYSTEMS AND COMPONENTS INSIDE CONTAINMENT

(SECTION 4.9.1)

DIFFERENCE:

- THE LICENSEE HAS NOT DEMONSTRATED THAT CASCADING PIPE BREAKS WOULD NOT PRODUCE CONDITIONS MORE SEVERE THAN THOSE ANALYZED BY THE LIMITING DESIGN-BASIS LOSS-OF-COOLANT ACCIDENT (LOCA).

RESOLUTION:

- THE LICENSEE WILL SUBMIT AN ANALYSIS OF CASCADING PIPE BREAKS AND PROPOSE ANY NECESSARY CORRECTIVE MEASURES. IF THE PROPOSED CORRECTIVE MEASURES INCLUDE LEAK DETECTION, THE LEAKAGE DETECTION SYSTEM SENSITIVITY WILL BE CONSIDERED UNDER TOPIC V-5 (SECTION 4.16.1).

TOPIC III-5.B, PIPE BREAK OUTSIDE CONTAINMENT
(SECTION 4.10.2)

DIFFERENCE:

- 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.

RESOLUTION:

- THE LICENSEE WILL PERFORM A REVIEW OF THE AFFECTED JET IMPINGEMENT ANALYSIS AND WILL SUBMIT IT TO THE STAFF.

TOPIC III-6, SEISMIC DESIGN CONSIDERATIONS
(SECTION 4.11.2)

DIFFERENCE:

- THE STRUCTURAL INTEGRITY OF MOTOR-OPERATED VALVES ATTACHED TO SMALL PIPING (4 IN. OR SMALLER) WAS NOT ADDRESSED BY THE LICENSEE.

RESOLUTION:

- THE STRUCTURAL INTEGRITY OF THE VALVE REMAINS UNRESOLVED DUE TO LACK OF INFORMATION.

(SECTION 4.11.4)

DIFFERENCE:

- 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.

RESOLUTION:

- THE LICENSEE WILL PROVIDE THE STAFF ADDITIONAL INFORMATION ON THE ANCHORAGE DESIGN OF THE AFFECTED EQUIPMENT.

(SECTION 4.11.7)

DIFFERENCE:

- 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 VI-4, CONTAINMENT ISOLATION SYSTEM
(SECTION 4.20.7)

DIFFERENCE:

- 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.

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, EMERGENCY CORE COOLING SYSTEM ACTUATION SYSTEM (SECTION 4.21.1)

DIFFERENCE:

- THE TECHNICAL SPECIFICATIONS DO NOT REQUIRE THE TESTING OF THE CORE SPRAY SYSTEM PUMP SPACE COOLERS.

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, APPENDIX K - ELECTRICAL INSTRUMENTATION AND CONTROL RE-REVIEWS (SECTION 4.23.2)

DIFFERENCE:

- THE 125-V DC SYSTEM 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.

RESOLUTION:

- THE LICENSEE WILL EVALUATE THE EXISTING MANUAL TRANSFERS AND IDENTIFY THE CORRECTIVE ACTIONS DEEMED NECESSARY.

TOPIC IX-5, VENTILATION SYSTEMS
(SECTION 4.32.3)

DIFFERENCE:

- 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.

RESOLUTION:

- THE LICENSEE WILL PROVIDE THE REQUIRED INFORMATION.

(SECTION 4.32.4)

DIFFERENCE:

- 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.

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.

LIST OF TOPICS (ISSUES) THAT REQUIRE EQUIPMENT MODIFICATIONS OR ADDITIONS

TOPIC VIII-2, ONSITE EMERGENCY POWER SYSTEMS (DIESEL GENERATOR)

- BY-PASS GAS TURBINE GENERATOR (GTG) LIGHT-OFF SPEED AND GENERATOR EXCITATION SPEED TRIPS UNDER ACCIDENT CONDITIONS (Section 4.28.1).
- BY-PASS GTG HIGH LUBE OIL TEMPERATURE TRIP UNDER ACCIDENT CONDITIONS (Section 4.28.2).
- BY-PASS TURBINE ELECTRICAL GENERATOR SPECIFIED TRIPS UNDER ACCIDENT CONDITIONS (Section 4.28.3).

TOPIC VIII-2, ONSITE EMERGENCY POWER SYSTEM (DIESEL GENERATOR)

(SECTION 4.28.1)

DIFFERENCE:

- THERE ARE FOUR STARTUP TRIPS (LIGHT-OFF SPEED, LIGHT-OFF TEMPERATURE, STARTING AIR-IGNITION CUROFF SPEED, AND GENERATOR EXCITATION SPEED) NOT PRESENTLY BY-PASSED DURING EMERGENCY OPERATION OF THE GAS TURBINE GENERATOR (GTG).

RESOLUTION:

- THE LICENSEE WILL BY-PASS 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.

(SECTION 4.28.2)

DIFFERENCE:

- 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 BY-PASSED DURING EMERGENCY OPERATION OF THE GTG.

RESOLUTION:

- THE LICENSEE WILL BY-PASS 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.

TOPIC VIII-2 (CONTINUED)
(SECTION 4.28.3)

DIFFERENCE:

- THERE ARE SEVEN PROTECTIVE TRIPS (LOSS OF EXCITATION, OPENING OF THE EXCITER BREAKER, GENERATOR DIFFERENTIAL, NEGATIVE SEQUENCE, REVERSE POW GENERATOR UNDERSPEED, AND VOLTAGE RESTAINED OVERCURRENT) ASSOCIATED WITH THE OUTPUT BREAKER OF THE GTG NOT PRESENTLY BY-PASSED DURING EMERGENCY OPERATION.

RESOLUTION:

- THE LICENSEE WILL MAINTAIN THE GENERATOR DIFFERENTIAL AND VOLTAGE-RESTAINED OVERCURRENT TRIPS AND BY-PASS THE REMAINDER AS IS CURRENTLY DONE ON THE DIESEL GENERATOR.

LIST OF TOPICS (ISSUES) WHICH REQUIRE PROCEDURAL, TECHNICAL SPECIFICATION OR ADMINISTRATIVE CHANGES

TOPIC VIII-2, ONSITE EMERGENCY POWER SYSTEMS (DIESEL GENERATOR)

- IMPLEMENT A PREVENTIVE MAINTENANCE PROGRAM OF THE GTG, IMPROVE EXISTING ONE, OR PROVIDE JUSTIFICATION FOR NOT DOING SO (Section 4.28.2).

TOPIC VIII-3.A, STATION BATTERY TEST REQUIREMENTS

- REVISE TECHNICAL SPECIFICATIONS TO REQUIRE BATTERY SERVICE DISCHARGE TESTS (Section 4.29).

TOPIC VIII-2, ONSITE EMERGENCY POWER SYSTEMS (DIESEL GENERATOR) (SECTION 4.28.2)

DIFFERENCE:

- AS IS DEMONSTRATED BY THE NUMEROUS LERs RELATED WITH THE FAILURE OF THE GAS TURBINE GENERATOR, ITS RELIABILITY HAS BEEN GENERALLY LOW.

RESOLUTION:

- THE LICENSEE SHOULD DEVELOP AND IMPLEMENT AN IMPROVED PREVENTIVE MAINTENANCE PROGRAM OF THE GTG, OR JUSTIFY THAT THE EXISTING MAINTENANCE PROGRAM IS ADEQUATE.

  - MANY OF THE FAILURES OF THE GTG ARE ASSOCIATED WITH MAINTENANCE AND MAY HAVE BEEN PREVENTED WITH AN APPROPRIATE PREVENTIVE MAINTENANCE PROGRAM.

  - LOSS-OF-NORMAL-AC-POWER ACCOUNTS FOR 41% OF THE TOTAL CORE-MELT PROBABILITY ACCORDING TO THE MILLSTONE 1 IREP STUDY.

TOPIC VIII-3.A, STATION BATTERY TEST REQUIREMENTS
(SECTION 4.29)

DIFFERENCE:

- THERE IS NO BATTERY SERVICE TEST REQUIRED IN THE STATION TECHNICAL SPECIFICATIONS.

RESOLUTION:

- THE LICENSEE WILL PROPOSE A TECHNICAL SPECIFICATIONS CHANGE TO REQUIRE A BATTERY SERVICE TEST AT LEAST ONCE EVERY 18 MONTHS.

LIST OF TOPICS (ISSUES) ON WHICH

THE STAFF AND LICENSEE DISAGREE ON RESOLUTION

OR THE LICENSEE HAS NOT RESPONDED

TOPICS WITH WHICH THE STAFF AND THE LICENSEE DISAGREE

TOPIC VI-10.A, TESTING OF REACTOR TRIP SYSTEM AND ENGINEERED SAFETY FEATURES, INCLUDING RESPONSE TIME TESTING

TOPIC XV-16, RADIOLOGICAL CONSEQUENCES OF FAILURE OF SMALL LINES CARRYING PRIMARY COOLANT OUTSIDE CONTAINMENT

TOPIC XV-18, RADIOLOGICAL CONSEQUENCES OF MAIN STEAM LINE FAILURE OUTSIDE CONTAINMENT (BWR)

TOPICS TO WHICH THE LICENSEE HAS NOT RESPONDED

TOPIC VI-4, CONTAINMENT ISOLATION

- INSTALL A SECOND VALVE AND ADMINISTRATIVELY CONTROLLED LOCKING DEVICES ON BOTH, ON SPECIFIED LINES PENETRATING THE CONTAINMENT (Section 4.20.2).

TOPIC VIII-3.B, DC POWER SYSTEM BUS VOLTAGE MONITORING AND ANNUNCIATION

- INSTALL SPECIFIED BATTERY STATUS ALARM OR INSTRUMENTATION.