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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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SUBCOMMITTEE ON FERMI UNIT 3

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THURSDAY

MAY 26, 2011

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ROCKVILLE, MARYLAND

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The Advisory Committee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, at 8:30 a.m., Michael L. Corradini, Chairman, presiding.

COMMITTEE MEMBERS PRESENT:

MICHAEL L. CORRADINI, Chairman

JOHN W. STETKAR, Member-at-Large

SAID ABDEL-KHALIK, Member

J. SAM ARMIJO, Member

SANJOY BANERJEE, Member

CHARLES H. BROWN, Member

JOHN D. SIEBER, Member

ACRS CONSULTANTS PRESENT:

THOMAS S. KRESS

GRAHAM B. WALLIS

NRC STAFF PRESENT:

RAJ ANAND, NRO/DNRL

OM P. CHOPRA, NRO/DE/EEB

JAMES GILMER, NRO/DSRA/SRSB

JERRY HALE, NRO/DNRL

ADRIAN MUNIZ, NRO/DNRL

BRUCE OLSON, NRO/DSER/RAPZ

AMAR PAL, NRO/DE/EEB

PAUL PIERINGER, NRO/DCIP/COLP

DINESH TANEJA, NRO/DE/ICE2

GEORGE THOMAS, NRO/DSRA/SRSB

MARK TONACCI, NRO

GEORGE WUNDER, NRO

ALSO PRESENT:

MICHAEL BRANDON, Detroit Edison Company

PATRICIA CAMPBELL, GE Hitachi

JACK DAVIS, Detroit Edison Company

JIM HARRELL, Numerical Applications Inc.

DAVID HARWOOD, Detroit Edison Company

NICHOLAS LATZY, Detroit Edison Company

ADAM LIEBERGEN, Black & Veatch

RON MAY, Detroit Edison Company

ALSO PRESENT:

EDWIN W. MEYER III, Black & Veatch

RYAN PRATT, Detroit Edison Company

WALTER SCHUMITSCH, GE Hitachi

PETER SMITH, Detroit Edison Company

WILLIAM ZIEGLER, Numerical Applications Inc.

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P-R-O-C-E-E-D-I-N-G-S

8:29 a.m.

CHAIR CORRADINI: The meeting will come to order. This is a meeting of the Advisory Committee on Reactor Safeguards, Subcommittee on Fermi Unit 3 COLA. My name is Mike Corradini. I'm Chairman of the Subcommittee.

Subcommittee members in attendance are, or soon to be, Dr. Said Abdel-Khalik, Sam Armijo, Mike Ryan (soon to be), John Stetkar, Charlie Brown, and our consultants -- and Jack Sieber. Excuse me. And our consultants Tom Kress and Graham Wallis.

The purpose of this meeting is to discuss SERs for Chapter 4, the Reactor; Chapter 7, Instrumentation and Control Systems; Chapter 8, Electrical Power; Chapter 15, Safety Analysis; and Chapter 18, Human Factors and Engineering associated with the Fermi 3 COLA.

The subcommittee will hear presentations by and hold discussions with representatives of the NRC staff and the applicant, Detroit Edison Company, regarding these matters.

The subcommittee will gather information and analyze relevant issues and facts and formulate proposed positions and actions as appropriate for

deliberation by the full committee. Christopher Brown is the designated federal official for this meeting.

The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on May 10, 2011. A transcript of the meeting is being kept and will be made available as stated in the Federal Register Notice.

It's requested that speakers first identify themselves, speak with sufficient clarity and volume so they may be readily heard. Also please silence all your cell phones and personal hand-held devices of any sort, brand, or nation.

We have not received any requests from members of the public to make oral statements or written comments. There is a bridge line set up for Detroit Edison to call on from staff if they need help. I assume that bridge line is open.

Is anybody on the bridge line? Can we at least verify that there is somebody there and then we can mute them again. So we're trying to unmute the line. Are the Detroit Edison staff on line there?

PARTICIPANT: Yes.

MR. WADLEY: This is Mike Wadley with Black and Veatch.

CHAIR CORRADINI: Okay. All right. So the way we'll proceed with this, and this is just some general statements to get going, is to remind the subcommittee we have gone through, finished, and have approved the certification for ESBWR.

We had started initially with North Anna as the reference COL. That has been replaced by Fermi and Detroit Edison Company as the reference COL. In some sense we are going to pick up where we left in that regard. I think we as a subcommittee haven't been together for about six months if memory serves me on this.

We will take the standard approach as we had with North Anna that much of what we will hear will be initially chapters that will be essentially included by reference so we're going to learn some details about the facility and Fermi 3 as a location. But a lot of what we're going to hear now, at least in the first couple of subcommittees, is the early chapters that are included by reference primarily.

Let me proceed with the meeting. I'll call on Mr. Adrian Muniz.

MR. MUNIZ: Muniz.

CHAIR CORRADINI: Muniz. Excuse me. I apologize. I should know. The lead project manager of Fermi 3 to review the design.

Adrian.

MR. MUNIZ: Good morning. My name is Adrian Muniz and I'm the NRC lead project manager for the Fermi Combined License Application. I would like to thank the committee for the opportunity for the staff to discuss their findings on Chapters 4, 7, 8, 15, and 18 as documented in the safety relations with no open items shared previously with the committee.

Next slide. On September 18, 2008, Detroit Edison submitted their Combined License Application, COLA, to construct and operate an ESBWR at the Fermi site. At the time the Dominion application for a ESBWR at the North Anna site was considered the reference COLA and the Fermi application was designated as a subsequent COLA.

However, back in June 2010 Dominion changed reactor technology for the North Anna application. Therefore, Detroit Edison became the reference COLA and the applicant took actions to transition to its new role.

These actions include providing responses to outstanding standard RAIs that were not addressed by North Anna, as well as providing an update, at least, of standard responses provided by North Anna that Fermi essentially adopted.

Next slide. This slide is intended to show the composition of each chapter of the Fermi application. For example, you can see Chapter 2 being a site-specific chapter meaning all the sections for review contain site-specific information. Whereas, Chapter 7 is the chapter that relies completely on information provided in the ESBWR DCD. Therefore, it's considered incorporation by reference to chapter.

Other chapters have a mix of site-specific information, IBR information, and standard material. Basically this slide is intended to provide an idea of how complicated a chapter might be; i.e., site-specific chapter versus a straightforward chapter. Or, in the case of standard materials, something that maybe you've seen previously during the North Anna SER with open items presentation.

That's basically my kickoff slides for this project. Are there any questions from the

committee members?

CHAIR CORRADINI: Committee? Okay. We'll keep on going.

MR. MUNIZ: With that I'll turn it over to Detroit Edison.

MR. SMITH: Good morning. My name is Peter Smith and I am with Detroit Edison and have been the lead for our Combined License Application since its inception.

Before we move into Chapter 8 I wanted to just take a few brief minutes to go through some background related to our project.

We announced our intention to prepare a Combined License Application for a potential new unit at the Fermi site in February of 2007. At that time we had not selected a reactor technology and we continued forth doing our site investigation.

In the fall of 2007 we selected the ESBWR as the technology that we would reference in our application. We had selected Black and Veatch as our contractor to prepare our COLA with us. Black and Veatch at that time was preparing a similar application for the River Bend ESBWR.

We submitted our application on September 18, 2008 and it was subsequently accepted

and docketed the end of November of 2008. From the beginning we've been committed to standardization in our approach to this. We've been very careful to not deviate.

We have only one departure in our application currently and that relates to the configuration of the rad waste building which we have a departure to rearrange it to expand the rad waste storage capacity and low-level rad waste storage capacity. It's an identical departure that the North Anna application had as well.

In addition to being faithful with all the standard material when North Anna was reference COLA, we were very coherent with all the other sections. I think if you look at our application and look at North Anna's in the site specific areas, there's a lot of similarities in how they are structured and how it's addressed. Departing from the DCD for us is a very big deal and we go through a lot of hoops internally to make a decision to do that.

As Adrian had mentioned, in July of 2010 after North Anna had amended their application to select their different technology, we transitioned into the role of the R-COLA. To a large degree the

coherence with the application our involvement in the Design Center Working Group made that a pretty seamless transition for us.

Next slide, please. I wanted to give just a little bit of orientation of where the site is located. As I mentioned, our application is for a potential new unit at the existing Fermi site. On the Fermi site today there is operating from Unit 2 a boiling water reactor, as well as the Fermi 1 plant which is undergoing decommissioning.

The Fermi site is located in Monroe County, Michigan and it's between Toledo to the south and Detroit to the north on the western shore of Lake Erie.

Next slide, please. Just for an orientation, this is a conceptual pictorial overview of the site. In this view Fermi 3 is the blue-colored structures. The Fermi 3 cooling tower is in the lower-left corner. To the northeast of Fermi 3 is the existing Fermi 2 plant and the Fermi 2 cooling towers to the north.

CHAIR CORRADINI: Where is Fermi 1 that is being decommissioned? I apologize.

MR. SMITH: Fermi 1 is if you follow the drawing if you go a little bit to -- we're looking

north so if you go a little bit to the south and east on the shoreline.

CHAIR CORRADINI: Okay, fine. Got it. Thanks. Human interaction is allowed. You can point.

MR. SMITH: It's hard for me to -- if I had a laser --

CHAIR CORRADINI: No, I understand. That's fine.

MR. SMITH: Anyways, so -- and in this drawing we have Fermi 1 removed as we need the space on the site for laydown and construction.

CHAIR CORRADINI: I understand. Thank you.

MR. SMITH: Before we move on to Chapter 8, I just wanted to introduce people here from Detroit Edison, DT Energy. With us today we have Jack Davis, who is our Senior VP and Chief Nuclear Officer, who is sitting behind.

I have Ron May who is our Senior Vice President of Major Enterprise Projects. This project is being conducted out of Major Enterprise Projects and Ron has overall responsibility for large capital projects within DT Energy as a whole.

In addition to that I have Dave Harwood

who is the Director of Nuclear Development. And myself. And then Mike Brandon, Nick Latzy, Joe LaPrad, James Moore, and Ryan Pratt who are all part of my team. They are all sitting along the side. Joel and James didn't make it on the planes yesterday so they're listening on the phone this morning.

And them from Black and Veatch I have Steve Thomas who is the engineering manager for the project and he's been involved since day one. And as well I have Ed Meyer who led our geotechnical and hydrology site investigation studies. And Adam Liebergen who has been providing support to the project for a long time.

From GE Hitachi I have Skip Schumitsch and Patricia Campbell who I think you're all familiar with in DCD's space. And as well I have Jim Harrell and Bill Ziegler from the Numerical Applications, Inc. who have done most of our dose calculation work.

With that, unless you have any questions about the background, we'll move on to Chapter 8.

CHAIR CORRADINI: Sounds fine.

MR. SMITH: Thank you.

CHAIR CORRADINI: These microphones are

the pickiest damn things in the world.

MEMBER STETKAR: The person you really need to worry about is our recorder. She'll get you if you do that too many times.

MR. SMITH: I'm trainable.

CHAIR CORRADINI: We think we are. It's never been proven. Go ahead.

MR. SMITH: So we're going to move right into talking about Chapter 8. Chapter 8 has four sections. 8.1 is a general introduction, general description of our connections with offsite power. 8.2 provides more detail on offsite power systems. 8.3 is onsite power systems. 8A is miscellaneous electrical systems.

I'm just going briefly go through each of those sections and talk about the supplemental information that we have incorporated as required by the DCD and beyond the DCD.

Next slide, please. So as I indicated, 8.1 is a general introduction that provides an overview of the transmission system including switchyard transformers and the transmission lines.

Slide 8 of the package -- don't go to that but it is in everybody's package -- is a composite drawing that shows the portion that's in

our FSAR and its interface with the DCD top and bottom. I think you have slide 8 and that will give -- I'll talk about a little bit more as we get to it. As I keep going it's a good point of reference.

So the offsite power system covered by 8.2 there's a number of COL items that we needed to address in our application. We have a description of the transmission system including the transmission lines, voltages, switchyard arrangements and just sort of a little bit of background.

MISO is the Midwest Independent Systems Operator and that's our point of interface. The transmission system that we connect to is owned by ITC Transmission so they are the owner and operator.

From a background standpoint once we had made our selection of reactor technology and had the appropriate information we needed in order to make an application for interconnection, we did that through MISO. Since we are in the ITC area the system impact study was performed for MISO by ITC. I'll be talking about that later but ITC owns the transmission system in our area.

MEMBER STETKAR: Peter, who owns the switchyards?

MR. SMITH: So the switchyards will both be -- well, the Fermi 2 switchyard is owned by ITC.

MEMBER STETKAR: ITC.

MR. SMITH: And the Fermi 3 switchyard, the part that you see on the top in the figure on page 8 will be owned by ITC.

MEMBER STETKAR: They are responsible for all testing and maintenance?

MR. SMITH: All testing, maintenance, the construction. They do things in coordination with us in accordance with the operating agreement.

MEMBER STETKAR: Well, we'll get to the switchyard later.

MR. SMITH: Okay.

MEMBER STETKAR: I'll let you go.

MR. SMITH: That's great. So moving on here, we provide a description of the normal and the alternate preferred power sources. Like I mentioned, the Fermi 3 normal and alternate preferred power sources are supplies from the Fermi 3 345-kV switchyard. The Fermi 3 switchyard is fed from three 345-kV transmission lines from the Milan station.

Just to give you an orientation for that, on slide 9 there's a map that shows the Fermi

site in the lower right-hand corner. Milan is up in the upper left-hand corner. There's about 26 miles of transmission lines for Fermi 3 that will be needed in that corridor.

Part of the corridor, the part in the dark red, is already a developed corridor. There's already transmission there. The last 11 miles that is the east/west portion on the top half of the figure is new transmission.

MEMBER STETKAR: Since you're talking about it, I have a few questions.

MR. SMITH: Okay.

MEMBER STETKAR: Can you go to slide 9 so that we have the graphic in front of us?

MR. SMITH: Okay.

MEMBER STETKAR: She'll get you. Just be careful when you put paper there. We'll put a barrier or something there. When you're here several times you'll either -- anyway.

Fermi 3 is supplied by three 345-kV transmission lines that are all routed in the same corridor. Right?

MR. SMITH: Right.

MEMBER STETKAR: Where are the Fermi 2 -- well, let me ask you first. Do any of those three

transmission lines also supply Fermi 2?

MR. SMITH: No.

MEMBER STETKAR: Okay.

MR. SMITH: No. So what the system impact study showed that if we had shared Fermi 2 switchyard that it would create an unstable situation. Fermi 2's transmission goes to the Brownstone station and Brownstone is up to the --

MEMBER STETKAR: That's what I wanted to ask you. You can use the mouse actually.

MR. SMITH: So Brownstone is up at Flatrock in the north corner there, NE. Just keep going up. It's not on the map.

MEMBER STETKAR: Okay. If I read the FSAR, it said that two and three transmission lines share the same right-of-way until you get out to I-75.

MR. SMITH: That's correct.

MEMBER STETKAR: And that's where they split?

MR. SMITH: That's correct.

MEMBER STETKAR: Okay.

MR. SMITH: Yes.

MEMBER STETKAR: Okay. And that's about --

MR. SMITH: Four miles roughly.

MEMBER STETKAR: Okay.

MR. SMITH: And then the Fermi 3 will continue on --

MEMBER STETKAR: There's a drawing in the FSAR. It's kind of a birds-eye-view of the site.

MR. SMITH: Yes.

MEMBER STETKAR: Do the Unit 2 transmission lines connect to the Unit 3 switchyard and then go over to Unit 2 or they are routed separately?

MR. SMITH: They are going to be a pass-through is the intention so there won't be any --

MEMBER STETKAR: There won't be any electrical connections at the Unit 3 switchyard?

MR. SMITH: When we originally planned the site, our first site plan had the two switchyards co-located. Then if you went to the site and you looked at the transmission towers, on Fermi 2 there's two sets of 345-kV towers with one arm on each of those towers that is not strong. So what our intention was --

MEMBER STETKAR: Run on the lines.

MR. SMITH: Run with that. So now as we went through the environmental review, we reorganized the site to deal with wetland issues. We relocated the Fermi 3 switchyard out to what is the edge of the owner-controlled area currently. We're going to use basically the two unhung arms as the lines for the normal and alternate power source out to the Fermi 3 switchyard.

On the site itself, the transmission towers will be shared between the two units but they are not electrically connected. There will be one circuit on one and one circuit on the other is what is envisioned. Does that make sense?

MEMBER SIEBER: So what you're saying was Fermi 2 switchyard is not electrically connected --

MR. SMITH: Correct.

MEMBER SIEBER: -- to Fermi 3.

MR. SMITH: That's correct.

MEMBER STETKAR: The only dependence would be for some period on site.

MEMBER BROWN: How far is that? How far are they co-located on the same set of towers?

MR. SMITH: Well, from the Fermi 3 transformer yard to the Fermi 3 switchyard is

approximately a half mile.

CHAIR CORRADINI: John, are you okay?

MEMBER STETKAR: Yeah, I understand the physical configuration.

MEMBER BROWN: I was trying to get a feel for that, too. What is the separation on the arms? Is it 20 feet, 30 feet?

MR. SMITH: No, it's wider than that actually. We're going to be relocating those towers as well to avoid a wetlands impact.

MEMBER BROWN: But you said you had -- maybe I just don't understand it yet. I'm trying to listen to --

MR. SMITH: I'm sorry.

MEMBER BROWN: I looked at the figures and I couldn't figure it out.

MR. SMITH: I need to go and get the dimension between the two sets of towers for you.

MEMBER BROWN: But you also said the two different plants are going to be on different ends of the arm on the same tower. At least that's what I got out of this. Is that not correct?

MR. SMITH: I'm sorry?

MEMBER BROWN: An unused arm on a tower.

MR. SMITH: Yes. There's two circuits

from Fermi 2 and they are on separate towers so there's --

MEMBER BROWN: Fermi 2 has separate towers?

MR. SMITH: Yes. And unstrung arms on those towers because originally there was a Fermi 3 for which we had a construction permit in the 1970s and so the intention was to string those back from that time frame so we're going to use the exiting open space on those towers.

MEMBER BROWN: Okay. So each tower will have a Fermi 3 and a Fermi 2.

CHAIR CORRADINI: For half a mile.

MEMBER BROWN: Pardon?

CHAIR CORRADINI: For half a mile.

MEMBER BROWN: For half a mile. I just wondered what the separation mechanical.

MR. SMITH: I don't know the dimension between them.

MEMBER BROWN: Okay.

MR. SMITH: Okay. I'll go back to where--

CHAIR CORRADINI: Go ahead.

MR. SMITH: I was on page 4. I think we were done with page 4. Page 5. So in addition in

8.2 we described this switchyard including its equipment design capacities and ratings, etc. We destroyed the AC and DC which are power in that section as well.

We describe the monitoring program for underground cables. Also there is another discussion of the monitoring programs around cables in Section 8.3. Both of those sections ultimately end up referring to the inspection program for underground cables that's going to be part of the maintenance rule talked about in 17.6. It covers all voltages of underground cables.

Next slide, please. There's also a description of the switchyard protective relaying. We describe the inspection and testing of the transmission lines and the switchyard. Inspection of the transmission lines is performed, as I mentioned previously, by ITC Transmission.

Also there's a description of the system impact study and the transients that were analyzed and the load flows that were analyzed that led to the conclusions of going to the mile and connection point from the Fermi 3 plant.

MEMBER STETKAR: A couple questions about, since you mentioned it, the switchyard

protective relaying. I notice that you have two 125 volt DC control power systems out in the switchyard.

It's noted that all the breakers out in the switchyard have dual trip coils. Do your breakers in the switchyard have one or two closing coils? If you've listened to some of these subcommittees before, you should have been ready for this one.

MR. SMITH: Okay. Sorry I missed that but I'll take that as --

CHAIR CORRADINI: Can we get back to that?

MR. SMITH: Yes.

MEMBER STETKAR: It's somewhat important because there's going to be a follow-up to this.

CHAIR CORRADINI: You want to give him a hint?

MEMBER STETKAR: Oh, yeah. The reason I ask about that is that everyone is always concerned, as they should be, about reliable tripping of those circuit breakers.

If I'm in a loss of offsite power situation, I would really like to be able to reclose those circuit breakers also so if the circuit breakers only have a single closing coil, as do

virtually all high-volt circuit breaks that I'm aware of. Yours could be different. That's why I always ask it. Let's presume they have a single closing coil.

Then the distribution of the DC power supplies to those closing coils, the actual configuration, becomes important so that if you lose one of those DC power supplies, you can have some assurance that you can actually reconnect the transmission lines back into your units and that's a little puzzle problem. That's where I'm headed with that one.

If they do include one closing coil, have you thought about how those DC power supplies are arranged to make sure that if you do lose one of them, your basic single failure, can you, indeed, reconnect at least one, if not more, of the transmission lines back into the site.

A related question --

CHAIR CORRADINI: Just to be clear, so you guys understand where John is coming from?

MR. SMITH: Yes. Absolutely.

CHAIR CORRADINI: So if we have a chance we can come back to that.

MEMBER STETKAR: They probably don't

know.

CHAIR CORRADINI: If we can't answer it in this meeting, we'll make notes and get back to you about it and you'll get back to us.

MR. SMITH: Certainly. I think where we're at on this is that I don't know that we have that level of detail because the detail design has not been done, nor have any of the procurement of the equipment.

MEMBER STETKAR: I understand, but it's the time to ask the question, though.

MR. SMITH: So it's a good --

MEMBER STETKAR: What are the power supplies to the battery chargers for the switchyard, the AC power supplies?

MR. SMITH: What we have described in the SAR is that they are derived as described in the DCD. They are on the nonsafety related two 125 volt batteries that are fed from the PIP buses.

MEMBER STETKAR: Okay.

MR. SMITH: And then similarly the AC is in the same configuration.

MEMBER STETKAR: Okay. So they come from the PIP buses. I guess I missed that.

What are the rated lives of the

switchyard batteries?

MR. SMITH: I believe the DCD says two hours.

MEMBER STETKAR: Okay. I didn't go back and look at the DCD. Two hours?

MR. SMITH: That's what I recall at this point.

MEMBER STETKAR: Okay.

MR. SMITH: I can verify that for you.

MEMBER STETKAR: Okay. Check on it. Again, it's all related to this question of if you do have a prolonged loss of offsite power how do you get power back.

MR. SMITH: Right. I think that is part of why the DCD has them fed from the PIP buses as well as you can energize from the ancillary diesels.

MEMBER STETKAR: Okay. Thanks.

MR. SMITH: Thank you.

Moving onto page 7. I mentioned previously the generator interconnection and our operation agreement with ITC Transmission for the switchyard controlling system analysis. Also we have supplemental information that describes the results of the system impact study and the conclusion that there is no single failure that can

prevent Fermi 3 offsite power from performing its required functions of providing power to Fermi 3. I'll take the question from Mr. Stetkar.

Moving on to page 10, Section 8.3, which is onsite power systems. Actually there were two COL items that we needed to describe. One was related to specifying the safety-related battery float and equalizing voltages which we have done in the FSAR as well as in the tech specs based on vendor information.

We also have a description of training procedures for station blackout and implementation schedule for that. We have a milestone in our schedule. Any questions on that?

Then, finally, on Section 8A, Miscellaneous electrical systems, and the only COL item related to that is a discussion of cathodic protection. Basically what it says is that we will provide cathodic protection that is designed in accordance with industry standards, mainly the National Association of Corrosion Engineers standards is what is mentioned within the FSAR.

That's all I have on Chapter 8. Is there any other questions?

MEMBER STETKAR: Yes, I have one more.

I was trying to read my notes. I apologize. I didn't get a lot of sleep. I physically got here last night but I didn't get a lot of sleep.

CHAIR CORRADINI: You're dedicated.

MEMBER STETKAR: Or crazy.

CHAIR CORRADINI: At least dedicated.

MEMBER STETKAR: In the FSAR thinking about the spacing of the towers out through the corridor, FSAR says that, "Each 345-kV transmission line occupies a common right-of-way and traverses from the Fermi site within the anticipated 91 meter, 300 foot right-of right.

Failure of any one 345-kV tower or pole due to structural failure can at most disrupt and cause a loss of power distribution to itself and the adjacent line if one is present." That says that the spacing between the tower lines is not greater than the height of the tower. Is that right? So I guess what I'm asking is can a tower failure take down two of the three Fermi 3 circuits?

MR. SMITH: No, because the three Fermi -- two of the three Fermi 3 circuits so the -- what the FSAR is talking about is the lines from the switchyard that leave the plant, the three Milan lines.

MEMBER STETKAR: Milan.

MR. SMITH: Right. So those are spaced so -- well, currently what we have is we've got a wide space in between the two 345-kV towers. What ITC Transmission has proposed is a single pole tower in between the two.

There's also 120-kV corridor that runs down the same corridor that currently feeds Fermi 2 as the second offsite source for Fermi 2. Within that corridor it's envisioned there will be a transmission tower that will have a Fermi 2 circuit and a Fermi 3 circuit on it, a pole tower in the center that has a Fermi 3 circuit on it, and then a mirror of that on the opposite side so that the structural failure of one of the towers in that section at most will take out the circuits on the one tower plus the pole tower in the center.

MEMBER STETKAR: So it could take out two Fermi 3 circuit and a Fermi 2 circuit?

MR. SMITH: That's correct.

MEMBER STETKAR: Okay.

MR. SMITH: Once you get out to the I-75 area it's a --

MEMBER STETKAR: You have more space out there?

MR. SMITH: No. Actually there's a -- you end in this super highway of power that runs parallel to I-75 and that's why there's the words to ITC --

MEMBER STETKAR: What about the Fermi 3 right-of-way after you split at I-75 for the remaining 20 whatever miles it is?

MR. SMITH: I believe the same desire is to have that same situation throughout all the way --

MEMBER STETKAR: Three tower lines with one circuit?

MR. SMITH: Yes.

MEMBER STETKAR: But the spacing will be such that you can get physical interference --

MR. SMITH: I think that would be possible.

MEMBER STETKAR: -- with the appropriate tower collapse. Okay. Thank you.

MR. SMITH: Any other questions?

CHAIR CORRADINI: I don't think so.

MR. SMITH: Now it's going to be --

CHAIR CORRADINI: Are you guys going to switch the staff talking about it or are you going to go through your other chapters? What's the plan?

MR. SMITH: The staff is going to talk next.

CHAIR CORRADINI: Okay. Stay close.

MR. HALE: Good morning. Jerry Hale. I'm the project manager for Chapter 8, Safety Review. Chapter 8 provides an overview of the transmission system including the switchyard, transformers, and the transmission lines.

I would like to introduce Amar Pal. Amar is a technical reviewer for Chapter 8 and will take you through the presentation.

CHAIR CORRADINI: Okay. Thank you.

MR. PAL: Good morning.

CHAIR CORRADINI: Good morning.

MR. PAL: My name is Amar Pal. I'm with the NRO DE/EEB. As he said, I'm the main reviewer for the Chapter 8 COL application.

Section 8.1 of the FSAR talks about the design bases, criteria, regulatory guides and some description of the whole overall plan. The applicant submitted some supplemental information about the connection to the grid and found it acceptable based on meeting the criteria of GDC 17.

Go to 8.2. 8.2, offsite power system, includes two or more physically independent circuits

that encompass the grid, transmission lines, and switchyard components that supply electric power to safety-related and other equipment, and is capable of operating independently of the onsite standby power sources. There are 10 COL action items.

MEMBER STETKAR: Amar, when you make your finding of physical independence, how do you reconcile things that all of the transmission lines for both of these nuclear units are routed in the same physical corridor for I thought I calculated seven miles.

I think the Detroit Edison folks said it was four miles, but somewhere on the order of five or six miles let's say, where that corridor is subject to potential damage by straight-line winds, by tornadoes, by local icing conditions, by seismic events --

CHAIR CORRADINI: Other things.

MEMBER STETKAR: Other things that we might be able to think about. How are they physically independent then?

MR. PAL: Well, we have several RAI regarding these transmission lines. One RAI talks about galloping conductors and --

MEMBER STETKAR: I understand that.

That's not what I'm asking about. I'm asking about --

MR. PAL: As long as --

MEMBER STETKAR: -- events that --

MR. PAL: As long as you're not taking all but -- we're looking at the separation --

MEMBER STETKAR: Have you seen Joplin, Missouri photos? Those are not galloping conductors. We aren't concerned about galloping conductors here. We're concerned about severe external events that may be localized in their effects.

For example, icing with high winds, tornadoes, localized seismic damage. Those types of things that can, in fact, affect all of the tower lines within close proximity to one another. What I'm asking you as the staff is how do you reconcile your finding of physical independence in light of those types of external hazards?

MR. PAL: First of all, seismic is not a consideration at all. GDC 17 does not require the offsite power system to be seismically designed.

MEMBER STETKAR: Okay.

MR. PAL: So --

MEMBER STETKAR: I'll give you seismic

then.

MR. PAL: As for the other things, there will be loss of offsite power equal to the onsite power system. In this case it's a passive design so they depend on the DC battery.

MEMBER BROWN: But for only two hours.

MEMBER STETKAR: Let me take --

MR. PAL: Seventy-two hour battery.

CHAIR CORRADINI: Forgive me. I think I know where you're going.

MR. PAL: I'm sorry.

MEMBER STETKAR: No, this -- I'm asking in general. I mean, this happens to be an ESBWR site which happens to be a passive site but you could site a different reactor type at the same site and have precisely the same offsite power configuration.

CHAIR CORRADINI: I think John is asking a generic question.

MEMBER STETKAR: I'm asking a generic question.

MR. HALE: Can we give you a generic answer?

MEMBER STETKAR: Sure.

MR. HALE: Can we provide a generic

answer that would satisfy you?

MEMBER STETKAR: I don't know if I'll be satisfied but a generic answer --

MR. CHOPRA: My name is Om Chopra. I'm from Electrical Engineering Branch, Office of New Reactors. Let me see if I can answer this question. GDC 17 doesn't require offsite power system to be single failure proof. GDC 17 only requires that you must minimize the probability of losing both sectors simultaneously.

The switchyard cannot be, or the transmission line, cannot be seismically qualified or protected from tornadoes or anything like that. That's why we have the onsite power systems, the diesel generators, which are protected from flooding, from seismic events.

CHAIR CORRADINI: Can you repeat that? That helps me, at least. Maybe it doesn't satisfy John but at least I understand. Can you repeat what you said so I get it correctly in my head?

MR. CHOPRA: What I said was offsite power system is not single failure proof. It doesn't have to be. GDC 17 requires only you must minimize the probability of losing your offsite circuits. That means they can be on the same

corridor but they should be physically separated so that one tower falling on the other doesn't know out both the circuits.

DR. WALLIS: The criterion is minimize the probability? That doesn't mean anything to me. Minimize the probability is not a criteria. It's too vague.

MR. CHOPRA: That's right, but what I'm saying is the requirements doesn't say that you must have, you just minimize it whenever you can.

CHAIR CORRADINI: I think what Professor Wallis is asking is how do you guys determine minimize? How do you define minimize in your thinking process I guess is what --

DR. WALLIS: With what constraints and to what level? I mean, minimize by itself doesn't mean anything.

MR. CHOPRA: Well, it does because if the two towers are separated a distance more than the height of the tower so if the tower falls, it will not knock out the other circuits so you have essentially minimized

the --

CHAIR CORRADINI: Okay. So what you're saying is just practically speaking the way you

determine minimize in your mind is that sort of event.

MR. CHOPRA: Right.

CHAIR CORRADINI: Okay.

MEMBER BROWN: But -- go ahead, John.

MEMBER STETKAR: You know, I understand that. I always like to say that unfortunately I don't have a law degree and neither does Mother Nature. The question that we've asked for other sites is that as you start to add units to a site, here we are adding a second unit to a site and all of the transmission lines for both sites now share a common corridor.

You've looked at tower inferences and galloping conductors and electrical power supplies and things like that. Suppose I put 20 more units at this site and all of the offsite power lines for those 20 units share the same corridor and that all of your tower interferences, if I could squeeze them in there somehow, how would the staff feel about that in terms of independence?

MR. CHOPRA: I don't think you can physically have so many towers in the same location.

MEMBER STETKAR: Money buys real estate so let's say we could buy that real estate.

MR. CHOPRA: But that would be a loss of offsite power and the plants are designed for that.

MEMBER BROWN: For how long? How long could you deal with no offsite power at all? I've forgotten.

MR. CHOPRA: Seventy-two hours.

MEMBER BROWN: Seventy-two hours is the ESBWR.

MR. THOMAS: This is Steve Thomas. Seventy-two hours is without a diesel. That's just on the batteries. The diesels if you have fuel oil for seven days.

MEMBER BROWN: How long?

MR. THOMAS: Seven days.

MEMBER BROWN: Just seven days?

CHAIR CORRADINI: Seven days. You can put any qualifier you want. It's seven days.

MEMBER BROWN: Just in light of many events I'm just looking at seven days if you lost access due to tornadoes that took out the ability to get fuel in or something like that. It was just a thought process. That's one of the things I was looking at.

CHAIR CORRADINI: But let's return back to John's question just so we stay on track.

MEMBER BROWN: Part of my question is along the lines of that as well.

CHAIR CORRADINI: But just so -- I wan to make sure that your question has been answered which is at least from the staff's perception of the process at this point, when you're thinking through minimize, that's what you're thinking?

MR. CHOPRA: Yes.

CHAIR CORRADINI: Okay.

MR. CHOPRA: I would also like to add one more thing. For passive designs they don't need AC power for accident mitigation so rolled-off offsite power is not that important in passive designs.

CHAIR CORRADINI: So let me ask a follow-on question which I think kind of connects with what John and Charlie are worried about. We all change our worry as time marches on and events occur.

From the standpoint of restoring power after seven days, does the ITC and the utility have a plan such that seven days hence there are practical means to do that? There are procedure plans?

MR. SMITH: So and we have practical

experience as we did have a tornado that passed through the Fermi site last year and I just don't recall how long it took for offsite power to -- I think we had one circuit that remained and it took eight hours for ITC to respond and restore power offsite.

CHAIR CORRADINI: I'm looking for that sort of practical experience or plans that you have.

MR. SMITH: And similarly when we had the 2003 loss of grid event.

CHAIR CORRADINI: That's the one I was thinking of.

MR. SMITH: You know --

MEMBER STETKAR: But that's easy because you didn't have anything physically destroyed. You had to reboot the system basically.

MR. SMITH: For Fermi 2 we had our CETGs that are running. We had our diesels running. Actually we had power available fairly soon thereafter but we did not need it immediately and others did. We went for a while longer than necessary but the power was available in a short period.

CHAIR CORRADINI: Jack.

MEMBER SIEBER: A couple of things that

I just want to point out. The staff's description of GDC 17 matches exactly what's in the rules. It seems to me that you have a number of actions to restore electric power, one of which is to repair the transmission system, the other of which is to bring in fuel to the diesel generators. Obviously, I think --

CHAIR CORRADINI: I just wanted to make sure because you've expressed it from an experiential standpoint. That's what I was looking for.

MEMBER SIEBER: Obviously you have worked both paths to a successful point.

MR. SMITH: I was going to offer just one other thing. In the SER for the ESBWR DCD there's as discussion about the applicability of GDCs 2, 4, and 5. The staff has taken a position that is documented in the ESBWR DCD related to GDCs 2 and 4 that has been shared with the industry.

GDC 2 is the effects of external events and it's not applicable to the offsite transmission system is the staff's position, as well as GDC 4 is the dynamic effects of GDC and it's not applicable to the offsite transmission system as well. There

is a path of correspondence that discusses that view.

MEMBER SIEBER: I do have a question related to this to ask. With your vision of the new system and Fermi 3 in place have you, or your system operator, run stability tests to determine whether this system is stable?

MR. SMITH: Yes.

MEMBER SIEBER: And, if so, how much margin do you have?

MR. SMITH: I can't speak to the margin but I mentioned that was part and parcel of the system impact study. You're talking a margin in reserve?

MEMBER SIEBER: Right.

MR. SMITH: I don't know what out -- it's looking into the future and I don't know what our current policy is for what we retain today or what the system retains.

MEMBER SIEBER: Okay. Thank you.

CHAIR CORRADINI: Other questions?

Go ahead.

MR. PAL: The COL action items we viewed that and found they have adequately addressed all the items. They have provided two supplemental

informations, one regarding test and inspection, and the other is the failure mode and effect analysis. We found them to be adequately addressed.

We'll discuss three of the RAIs which are somewhat important. One of them is RAI 8.2-2 regarding separate transmission system. Staff was concerned about these items because all these transmission lines are coming from Milan 1, 2, and 3 which is one location. Finally, we have to agree that GDC 17 does not require a separate transmission system to be provided.

About RAI 8.2-11 regarding compliance with the maintenance rule, we found that all the offsite components are included in the maintenance rule based on their incorporation of the NEI Technical Report 07-2 which also addresses the reliability of this significant part.

Regarding underground cable program or weighted empowerments, the applicant is committed to do a program which would include all the positions, the industrial operating experience. We found that is also acceptable.

MEMBER STETKAR: Amar, I didn't real through the RAIs and responses so I don't have all of the actual details but reading through the FSAR I

just wanted to make sure that I understood it clearly. Is the applicant committing to do inspections and testing, periodic testing of the low voltage underground cables?

MR. PAL: All the cables which are --

MEMBER STETKAR: Yes. Okay. There was some discussion about the scope of testing, as I understand. I just wanted to make sure that commitment has been made.

MR. PAL: Yes.

MEMBER STETKAR: Good. Thanks.

MR. PAL: Next slide. Conclusion. We find that the COL items 1 through 10 related to the design of the plant site and its interference with the local transmission agreed and the supplemental informations are adequately addressed and they comply with the requirements of GDC 17 and 10 CFR 50.65. That's the scientific finding.

The next section is 8.3.1 which includes standby power sources, distribution systems, and auxiliary support systems that supply power to safety-related equipment, or equipment important to safety for all normal operating and accident conditions.

They included DCD by difference so only thing we have to add is just COL action items. There are two COL action items. One is cathodic protection, and the other one is the cable instruction program. Cathodic protection was done based on the industry guidance so staff found them both adequately addressed.

The next section 8.3.2, Onsite DC Power System. All action items about the battery float and equalizing voltage. They have followed the vendors recommendations so that is acceptable to the staff.

Another item about the station blackout procedures. Since the plant is a passive design, we don't depend on the AC power source. No AC power source is required. However, they have to have a program procedure to cope with the station blackouts.

They have committed to do these procedures which will include response guidelines, AC power registration and guidelines which is consistent with the new 700 or the Reg Guide 1.1.55. Based on that we found that it is acceptable.

Staff Findings. Fermi Unit 3 COL FSAR provides normal preferred and alternate preferred

power to the UATs and RATs respectively are physically and electrically separate from one another.

Sufficient information about offsite power system, switchyard, interconnection entities to maintain grid reliability and stability and minimize a loss of offsite power.

Cable condition monitoring program. We have talked about that. And the SBO, ESBWR procedures we talked about that. Based on that we find that they have provided sufficient information to warrant operations.

CHAIR CORRADINI: Other questions for the staff? John.

MEMBER STETKAR: Not for the staff but just to follow up to the Detroit Edison folks.

If you could, I'm trying to do some real-time research here and that's often not very effective. I was looking for the DCD reference to the life of the switchyard batteries and I can't quite find it, at least readily. All I find is statements saying, "COL applicant will address switchyard DC power."

MR. PAL: Exactly.

MEMBER STETKAR: So if you could find

either a reference in the DCD to that two-hour battery life that you cited, or some other documentation, I would appreciate that.

MR. PAL: If I may, the DCD does not talk about the switchyard battery life.

MEMBER STETKAR: Thanks.

CHAIR CORRADINI: Peter, did you have something you wanted to --

MR. SMITH: No, I'm good.

MEMBER STETKAR: Understand I'm going to find the reference for that.

CHAIR CORRADINI: Other questions for Jerry or Amar? Okay. So we should switch out and turn back to the next one.

MR. PAL: Thank you.

CHAIR CORRADINI: Discussion? We're doing what next, 4? Chapter 4 next?

MR. SMITH: Yes. So Chapter 4, Reactor. We incorporate DCD Chapter 4 by reference and there's two standard COL items. A list of areas that are discussed in Chapter 4 are incorporated by, or that we address as COL supplements. They are on the next page, page 3.

Basically what we're saying is that there are no changes to the fuel control rod or core

design that are described in the reference certified design. Similarly, in 4A no deviations from the typical control rod pattern and associated power distributions that we anticipate from the reference design.

CHAIR CORRADINI: Questions?

MEMBER ARMIJO: We've asked those questions already.

MR. SMITH: So these were standard COL items that we adopted from North Anna.

CHAIR CORRADINI: So are we going to do a trade-out or are you just going to proceed merrily along? What does the staff want to do here?

MR. MUNIZ: I'll leave it up to you but the rest of the chapters are really simple.

CHAIR CORRADINI: So my suggestion is we have our people up there. It will take more time to switch you out. Let's keep on going.

MR. SMITH: Okay. Chapter 7 is next on the agenda, I believe. Chapter 7 was completely incorporated from the DCD by reference with no COL or supplemental items.

MEMBER BROWN: I have one question.

MR. SMITH: Okay.

CHAIR CORRADINI: If he didn't have a

question, I'd be shocked.

MEMBER BROWN: When we were -- since you've incorporated the DCD, all the stuff out of that by reference, we had long, extensive discussions on the DCD in this chapter.

Finally at the end of all those discussions the GE Hitachi acquiesced and modified Chapter 7 extensively to include some information relative to the circuits and the reactor protection systems, safeguards, etc.

That was somewhere around Rev. 5 or 6 or 7 and now we're up to Rev. 9. All I'm looking for right now is a confirmation that none of that part of the -- none of that information that was added or put into the chapter, because I was able to look at that, has been modified in any way, shape, or form.

CHAIR CORRADINI: That's not a question. Detroit is.

MEMBER BROWN: I don't know. I have no idea. I've got to ask it somewhere so I ask it now. If staff can answer that, that's fine.

CHAIR CORRADINI: Can we hold that until the staff comes up? Let's hold that.

MEMBER BROWN: That's fine with me.

CHAIR CORRADINI: Okay. Great.

MR. SMITH: Chapter 15. Chapter 15 is incorporated by reference with one standard supplemental item which is talked about on the next slide. That is a commitment and milestone for implementation, development and implementation of procedures that discuss the use of instrumentation to aid in detecting a possible mislocated fuel bundle after fueling operations. That, again, is a standard supplement we followed with North Anna that satisfies an SRP requirement.

Any questions? Okay.

CHAIR CORRADINI: I don't expect any.

MR. SMITH: Okay. Thank you.

Chapter 18. Chapter 18 is also incorporated by reference with one standard COL item and that COL item is related to establishing a milestone for the implementation of the human performance monitoring program.

MEMBER STETKAR: Actually, I have a question.

MR. SMITH: Okay.

MEMBER STETKAR: As I was reading through the FSAR they mention -- confirm that the Human Performance Monitoring Program will be implemented prior to the first license operator

training class. Will that Human Performance Monitoring Program use the Fermi 3 plant specific simulator?

MR. SMITH: Yes, it will.

MEMBER STETKAR: It will? Okay.

MR. SMITH: Because the simulator would be in place.

MEMBER STETKAR: I want to make sure it was Fermi plant specific and not a generic --

MR. SMITH: To kind of expand upon your question, what we have for Fermi 3 is we have a floating schedule that can be pinned at any start point. If you look at where we are, we basically laid out an approximate 10-year period from the time that we get the go-ahead to go and execute this project.

The first portion of that is obtaining the remaining public service commission approvals. Then there's about three years worth of site work before we get anywhere close to pouring safety-related concrete so we're not on a compressed schedule. We have a long lead time to order and --

MEMBER STETKAR: That's good. That's a good lead-in because I wanted to make sure it was

the plant specific simulator and that there wasn't any time compression.

Backing up from the data fuel load, approximately when would you expect that first licensed operator training class to start?

MR. SMITH: It's a minimum of three years.

MEMBER STETKAR: Minimum of three years. So from my perspective, does that mean that all of the human factors, engineering, ITAAC, at least related to the control room, maybe not the physical plant of the control room but at least the control panel design will be completed prior to that three-year period because you do have the plant specific at that point that you're training people with? This was not human performance monitoring. I'm trying to get it back into the ITAAC.

MR. SMITH: Another philosophical mantra we have at Detroit Edison, you know, we had a long construction period on Fermi 2 and it was done in the time design as you construct and license as you construct.

I think from our perspective we need to have a virtually complete design before we're going to start construction so that would -- if I say

that's four years after I give the go-ahead that I need to be at that point, that's well in advance of the time that I'm going to start my operator training program at the latest in that sequence. Given that, all of the design and human factors engineering would have already been accomplished.

MEMBER STETKAR: Prior to that?

MR. SMITH: Prior to that.

MEMBER STETKAR: At a minimum prior to that, you know, your target three years before fuel load. Thank you very much.

MR. SMITH: Thank you.

CHAIR CORRADINI: Other questions? We'll proceed then to the staff. So you guys are going in the same order?

MR. MUNIZ: Yes.

CHAIR CORRADINI: Okay. Jerry, are you going to kick it off or is Raj?

MR. HALE: I'm going to let Raj.

CHAIR CORRADINI: Okay. Raj will start. Okay.

MR. ANAND: Good morning. My name is Raj Anand and I'm one of the project manager working on the Fermi COL application. I thank Detroit Edison for making their presentation on their

application. The staff agrees with Detroit Edison's presentation.

I will discuss with you Chapter 4, Reactor; Chapter 7, Instrumentation and Control Systems; Chapter 15, Safety Analyses; and Chapter 18, Human Factors Engineering.

Let me start with Chapter 4. Chapter 4 of the application incorporates by reference ESBWR certified design document Rev. 9 with no departure. Rulemaking for ESBWR is in progress.

There are two supplemental information items that the applicant has addressed in their application. One item is in the area of nuclear design, and the other one is related to typical rod patterns and associated power distribution for ESBWR.

The applicant has stated that there are no changes to the fuel, control rod, or core design from the reference DCD. The staff reviewed the information contained in the FSAR and concluded that the applicant provided adequate information to address the COL items. Therefore, they are accepted.

Chapter 7, please. Chapter 7, Instrumentation and Control System incorporates by

reference the ESBWR DCD without departure or supplement. The staff reviewed the application and checked against the reference DCD to ensure that no issues relating to this chapter remains for the review. The SER has no open items. ESBWR DCD has no COL action items.

CHAIR CORRADINI: So can you take up Mr. Brown's question now that he had asked?

MEMBER BROWN: Do you understand my question?

MR. ANAND: Yes, sir. The staff is ready to answer the question. Dinesh Taneja is on the microphone.

MR. TANEJA: Good morning. This is Dinesh Taneja from the I&C Branch. The GEH presentation that was made to the ACRS and the last minute additions that were made were incorporated in Rev. 9 of the DCD and we have reviewed it and our FECR acknowledges that those additions are additional clarifications that were done or incorporated as represented to the ACRS.

MEMBER BROWN: In our meeting.

MR. TANEJA: Yes.

MEMBER BROWN: Okay.

MR. TANEJA: We verified it and our FECR

acknowledges that.

MEMBER BROWN: Okay. That's all I wanted was to just confirm it. Thank you.

MR. TANEJA: That's fine.

MR. ANAND: Chapter 15, please. Fermi 3 FSAR Rev. 3, Chapter 15, Safety Analysis incorporate ESBWR DCD Rev. 9 by reference. There is one supplemental information item related to Section 15.3, analysis of infrequent events.

The applicant is committed to develop all fueling verification procedures. The applicant has stated that the procedure will discuss the use of nuclear instrumentation to aid in detecting, if possible, mislocated fuel bundle after refueling operations.

The staff found that the supplement information is acceptable and it meets the acceptance criteria provided in the SRP Section 15.4.7.

CHAIR CORRADINI: No problems. Questions, anyone?

Go ahead.

MR. ANAND: The last chapter I want to present to you, sir, is Chapter 18, the Human Factors Engineering, which incorporates the ESBWR

DCD Rev. 9 by reference with one standard COL action item.

There is no open item in the SER. The applicant has stated that the human performance monitoring program will be implemented prior to the beginning of the first licensed operator training class. This COL item is implemented through the use of the training simulator during the periodic training exercises. The staff considers the applicant's response acceptable.

MEMBER BROWN: I just have -- John, I don't know whether this is relevant or not because I don't remember all the details from the previous discussion of the DCD but this says we're deferring all this until prior to the first licensed operator for the Human Performance Monitoring Program which I understand.

I remember a discussion of human factors engineering being incorporated into the basic design and I'm presuming that there's been no change relative to the layouts and the other concepts that were in the basic DCD. Is that relative to how human factors were factored into the stuff? Is that true, also?

MEMBER STETKAR: That's my

understanding.

MEMBER BROWN: When you say there's no change, every time somebody gets their hands on a panel they want to change something.

MEMBER STETKAR: Well, I mean, the human factors engineering in the DCD is basically a commitment to implement a program. That's the genesis of my question.

MEMBER BROWN: This is monitoring, not engineering.

MEMBER STETKAR: The genesis of my question to Detroit Edison about when will the actual human factors engineering ITAAC be closed out relative to the start of this training. That will actually implement the final design, you know, the layout of the panels and all that.

MEMBER BROWN: I missed that nuance.

MEMBER STETKAR: That's what I was trying to get at and the timing of that stuff because in the DCD it's simply programmatic commitments.

MR. ANAND: This concludes my presentation if there is any question on any of the four chapters I presented.

CHAIR CORRADINI: Any questions about

the four chapters?

Okay. I have a general question for the staff but it kind of is in preparation for future subcommittees.

John, did you have a question? I'm sorry.

MR. SMITH: I wanted to get at if I needed to provide you some additional information.

MEMBER STETKAR: No, I'm pretty happy. I just wanted to make sure that I understood the relative timing of things. It all actually hinges around the use of the plant specific simulator for this program and the timing of that.

MEMBER BROWN: Well, my thought was when is the simulator available and when will you be able to factor that into the actual plant design as well if all this stuff is late?

MEMBER STETKAR: Minimum three years before fuel load is what I heard according to the schedule.

MEMBER BROWN: And that gives you enough time to factor anything you learn from the simulator experience into the actual design of the equipment if you need to modify something. Okay.

CHAIR CORRADINI: Other questions for

Raj? Okay.

Since we seem to have a bit of time left, the one action that we're going to get back to probably next time we're together is the questions on Chapter 8 relative to the closing coils. And you're clear on that?

MR. SMITH: Yes.

CHAIR CORRADINI: Okay. We'll make note to make sure we've got it right in our heads relative to that. Then the only other thing is there was questions about what I'll call a generic issue in terms of transmission line independence which will probably keep on coming up.

MEMBER STETKAR: That's a generic issue.

CHAIR CORRADINI: It's a generic issue. You just happened to be in front of us when we started worrying about it.

MEMBER STETKAR: Well, we started worrying about it on others in all fairness to Detroit.

CHAIR CORRADINI: Right. We've been worrying about it for a while. John's been worried about it for a long time.

MEMBER STETKAR: It's something that will reappear in every COL application unless

there's geographic diversity in terms of the --

CHAIR CORRADINI: Just so -- I think where we're coming from, this has gone back a number of months if not a year or so in questions in other venues.

Go ahead.

MEMBER BROWN: I just want to -- as one of my concerns, Fermi 3 is a passive plant. Fermi 2 is not a passive plant. Am I not correct?

MEMBER STETKAR: No, you are correct.

MEMBER BROWN: I don't know Fermi 2 all that well but it's a boiling water reactor?

MEMBER STETKAR: Yes.

MEMBER BROWN: So I presume it's a GE-style same as what everybody is talking about?

MEMBER STETKAR: ESBWR 4, mark 1 containment boiling water.

MEMBER BROWN: So when I start looking at putting all this stuff in the same right-of-way and you start looking at how can we affect Fermi 2 based on all this stuff being put in the same right-of-way, that one doesn't have the same robustness in terms of the passive features.

I guess I'm still somewhat concerned. I

hear all the words but I don't see a figure. I don't mean a detailed figure but I mean just kind of a one-line diagram that shows what's the general concept of the layout and the separation, the combination of Fermi 2 and Fermi 3 on the same towers.

Just something to give a pictorial or a visual, a representation of what this looks like from the station -- I mean, from the plant and the transformers clear out to the Milan substation or whatever it is. Is my question clear? I'm not looking for excruciating detail. This is what I call just a conceptual thought process.

MR. SMITH: And I think what we need to do is we need to go and pick the pictures that we have available.

MEMBER STETKAR: That might help, Peter, if you come back since we have a follow-up on the switchyard. If you show the power line onsite and offsite out to I-75 where they split, that would help a little bit.

CHAIR CORRADINI: That would give us some indication.

MEMBER BROWN: Yes, and a little bit on the Fermi 2 and Fermi 3 both on the same towers. I

mean, if you're going to put more towers in, my fundamental thought was why wouldn't I shift stuff around.

CHAIR CORRADINI: So we're kind of into the part --

MEMBER BROWN: I understand it's close but that was my point.

CHAIR CORRADINI: That's fine. You're okay. So we're kind of into the part that I want to make sure we get members comments generally for our first of what will be four or five subcommittee meetings on the reference COL.

Charlie has already put his oar in the water. Let's go this direction. Sanjoy, any comments?

MEMBER BANERJEE: No, but does this -- I was just trying to clarify whether it has an ESP or not. I assume it does not.

CHAIR CORRADINI: Does not.

MEMBER BANERJEE: Okay.

CHAIR CORRADINI: We will hear extensively about the site in one of the future meetings and we would welcome you to attend.

MEMBER BANERJEE: I'm not sure he would.

CHAIR CORRADINI: I would. I can't

speak for the other members.

John, anymore?

MEMBER STETKAR: Nothing, no.

CHAIR CORRADINI: Okay. Consultants? Okay.

Let me now turn to the staff at least to make sure all the members understand where we are going with this in the future. The plan is, and I'm going to turn to Adrian so you correct me. I'll say it and you tell me when I'm wrong.

The plan is our next subcommittee meeting will be when staff is ready with their next set of SERs with open items. That's estimated to be in the third week of September, the week of September 19th.

MR. MUNIZ: Right now we have it for September 20th and 21st.

CHAIR CORRADINI: Okay. Well, sometime that week. We will caucus privately but sometime the week of our subcommittee meetings. It's a half day. I wanted to ask Adrian a question, though.

Maybe this is not the right time but at least since you guys did a nice job of trying to lay out what is site specific and what isn't, do you know what's coming up yet in that third week of

September?

MR. MUNIZ: We are currently looking at what chapters might be ready for that time frame.

CHAIR CORRADINI: But you are unclear at this point?

MR. MUNIZ: I'm unclear at this point but we can share that with you later.

CHAIR CORRADINI: I just wanted to let the committee members know that as we know it, we will tell you and get you the appropriate documentation for the second subcommittee meeting. All right? We have two or three others. Let's just say a few more in October and November in anticipation of a letter for the full committee meeting in December.

That's about all I have. I guess I wanted to thank our start-up meeting with Detroit Edison and the staff. Are there any further comments? Otherwise, we're adjourned for the subcommittee meeting. We'll all see each other probably after lunch for another subcommittee meeting.

(Whereupon, at 9:52 a.m. the meeting was adjourned.)

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Presentation to the ACRS Subcommittee

Fermi Unit 3 COL Application Overview

May 26, 2011

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Fermi Unit 3 Transition to R-COL

- Detroit Edison submitted an application on September 18, 2008 to construct and operate an ESBWR at the Fermi site.
  - ❑ North Anna (Dominion) was the Reference plant COL Application (R-COLA)
  - ❑ Fermi was designated as a subsequent COL application (S-COLA)
- Dominion revised the North Anna application to reflect change in reactor technology in June 2010.
- Detroit Edison acknowledged status of the Fermi COLA as the ESBWR R-COLA in July 2010 and described actions taken to transition to its new role.

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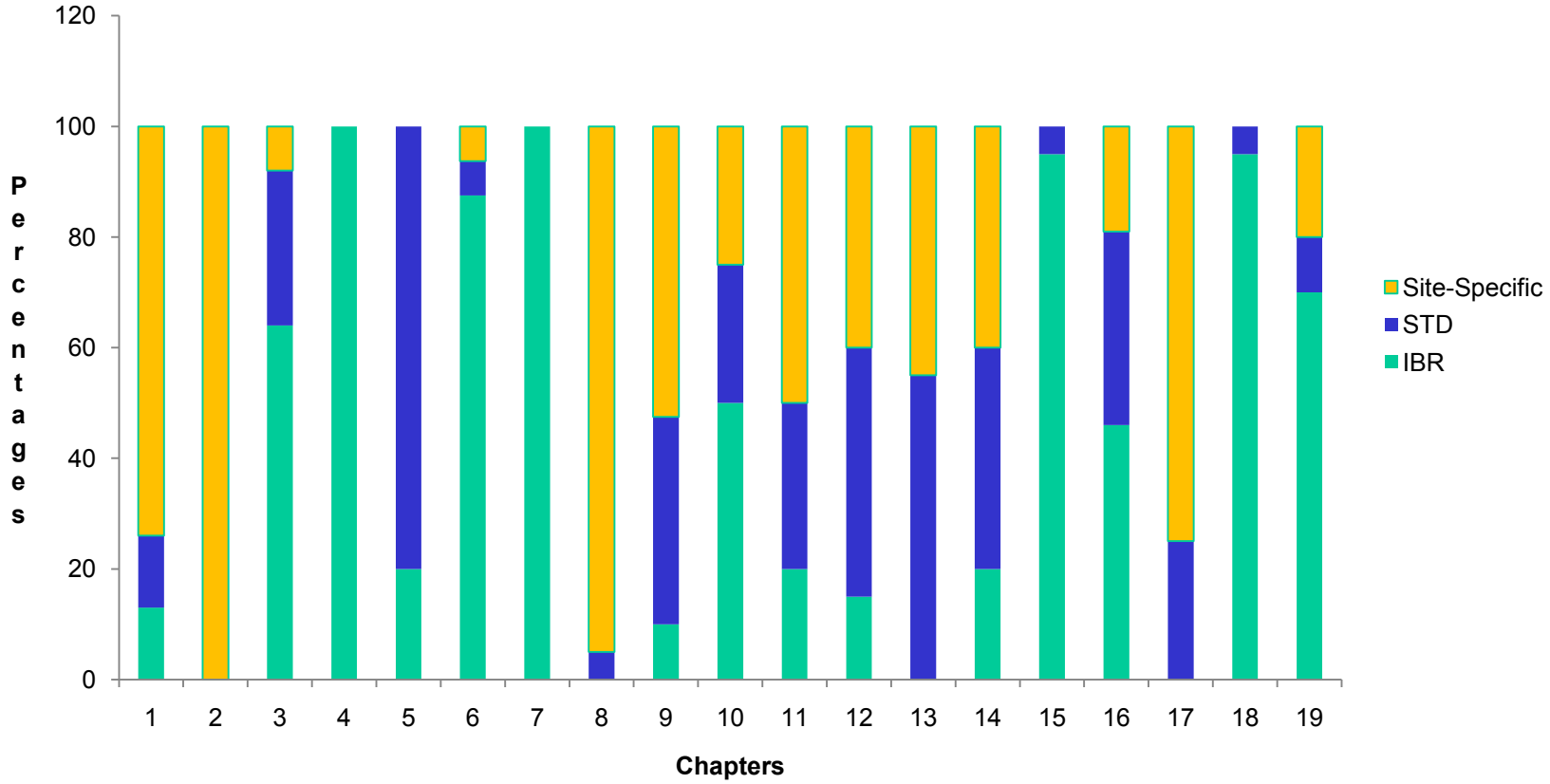
Fermi Unit 3 Application Overview



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FERMI 3 COLA
Presentation to ACRS Subcommittee
Opening Comments

FERMI 3: Background

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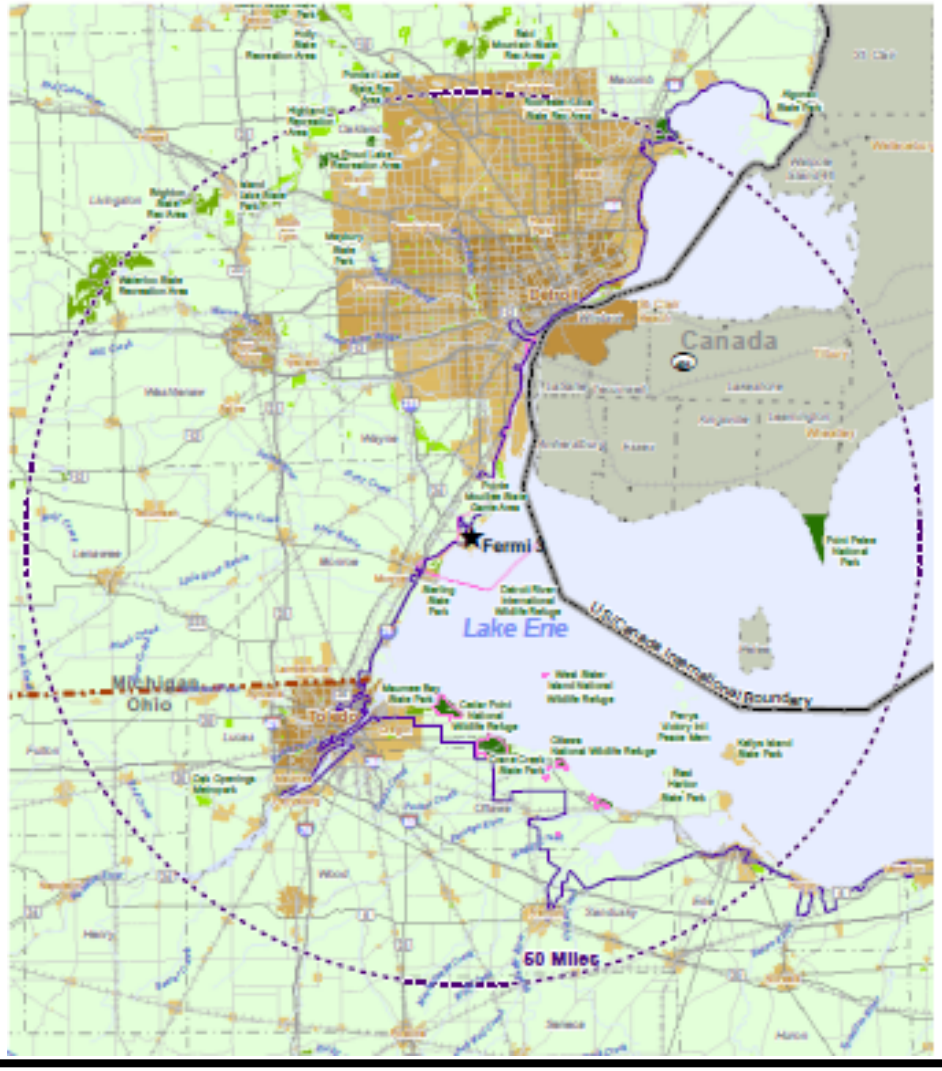
- Announced intention to prepare COLA 2/2007
- Submitted COLA 9/18/2008
- Committed to Standardization
  - Currently one departure
  - Coherence with RCOLA
- Transitioned to RCOLA 7/2010

FERMI 3: Site Location



FERMI 3 Site Pictorial View

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FERMI 3 COLA Team Meeting Participants

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Jack Davis, Sr. VP and CNO
Ronnie May, Sr. VP – MEP
David Harwood
Peter Smith
Michael Brandon
Nicholas Latzy
Joseph LaPrad
James Moore
Ryan Pratt

BLACK & VEATCH
Steve Thomas
Edwin Meyer III
Adam Liebergen

GE HITACHI
Walter Schumitsch
Patricia Campbell

NUMERICAL APPLICATIONS, INC
Jim Harrell
Bill Ziegler

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Presentation to ACRS Subcommittee
Chapter 8

Chapter 8, Electrical Power: Chapter Topics

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- Introduction – General Description
- Offsite Power Systems
- Onsite Power Systems
- Miscellaneous Electrical Systems

Chapter 8, Electrical Power: Supplemental Information

8.1 Introduction

EF3 SUP Provides overview of the transmission system, including the switchyard, transformers, and the transmission lines.

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8.2 Offsite Power System

EF3 COL Describes the transmission system including transmission lines, voltages and switchyard arrangement.

EF3 COL Describes the normal and alternate preferred power sources. The Fermi 3 normal and alternate preferred power sources are supplied from the Fermi 3 345-kV switchyard. The Fermi 3 switchyard is fed from three 345-kV transmission lines from the Milan station.

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8.2 Offsite Power System (continued)

EF3 COL Describes the switchyard including equipment design criteria, capacities, and ratings.

EF3 COL Describes the AC and DC switchyard power.

EF3 COL Describes the monitoring program for underground cables. There is also a COL item in Section 8.3 related to underground cable monitoring.

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8.2 Offsite Power System (continued)

EF3 COL Describes the switchyard protective relaying.

EF3 SUP Describes the inspection and testing of transmission lines and the switchyard. Inspection of transmission lines is performed by the transmission operator (ITC*Transmission*).

EF3 COL Describes the results of the system impact study that analyzed load flow, transient stability, and fault analysis for the addition of Fermi 3.

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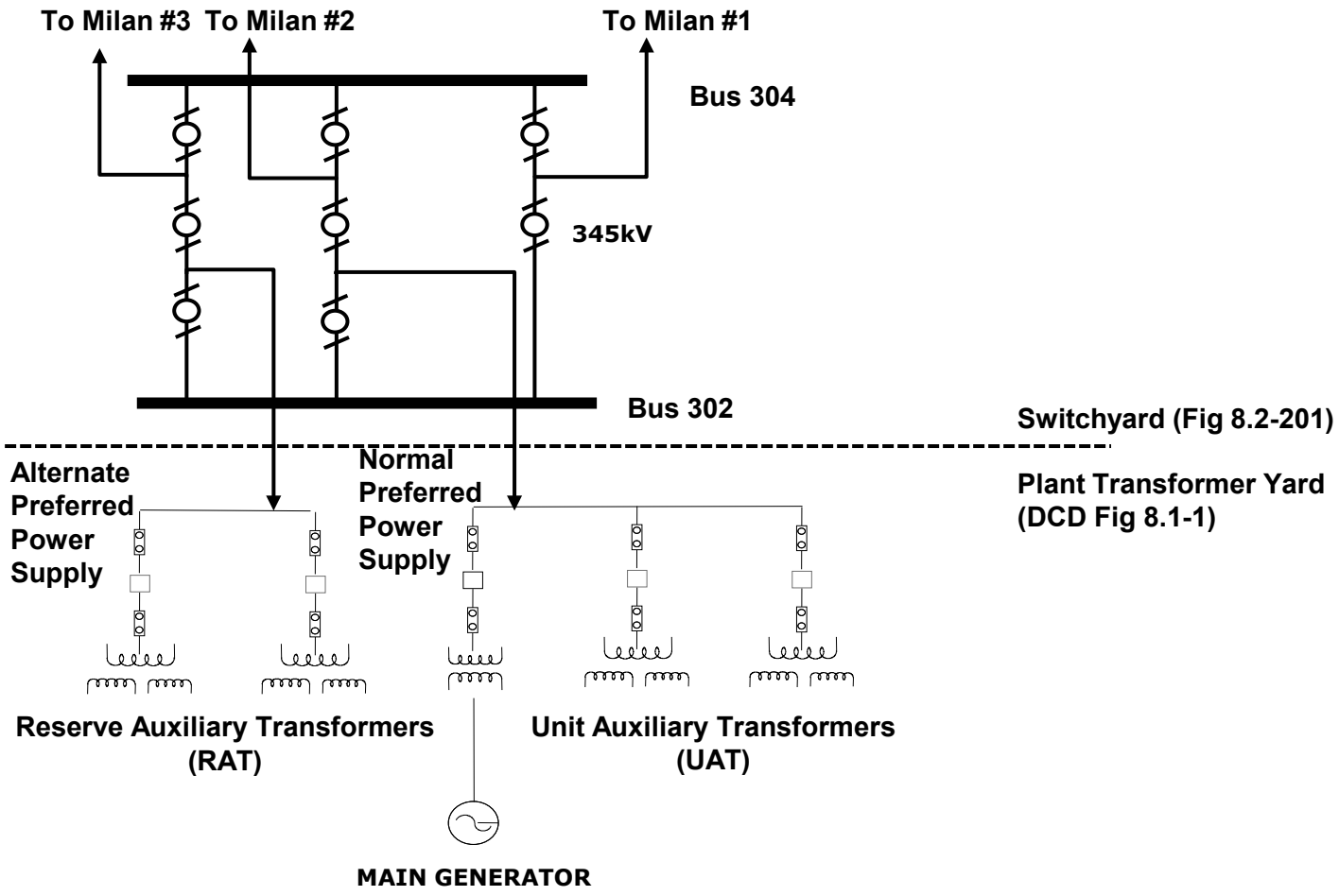
8.2 Offsite Power System (continued)

EF3 COL Describes the Generator Interconnection and Operation Agreement with ITC*Transmission* for switchyard control and systems analysis.

EF3 SUP Describes that there are no single failures that can prevent the Fermi 3 offsite power system from performing its required functions of providing power to Fermi 3.

Chapter 8, Electrical Power:
Fermi 3 Transmission System Configuration



Chapter 8, Electrical Power: Fermi 3 Transmission System Configuration (Figure 8.2-203)

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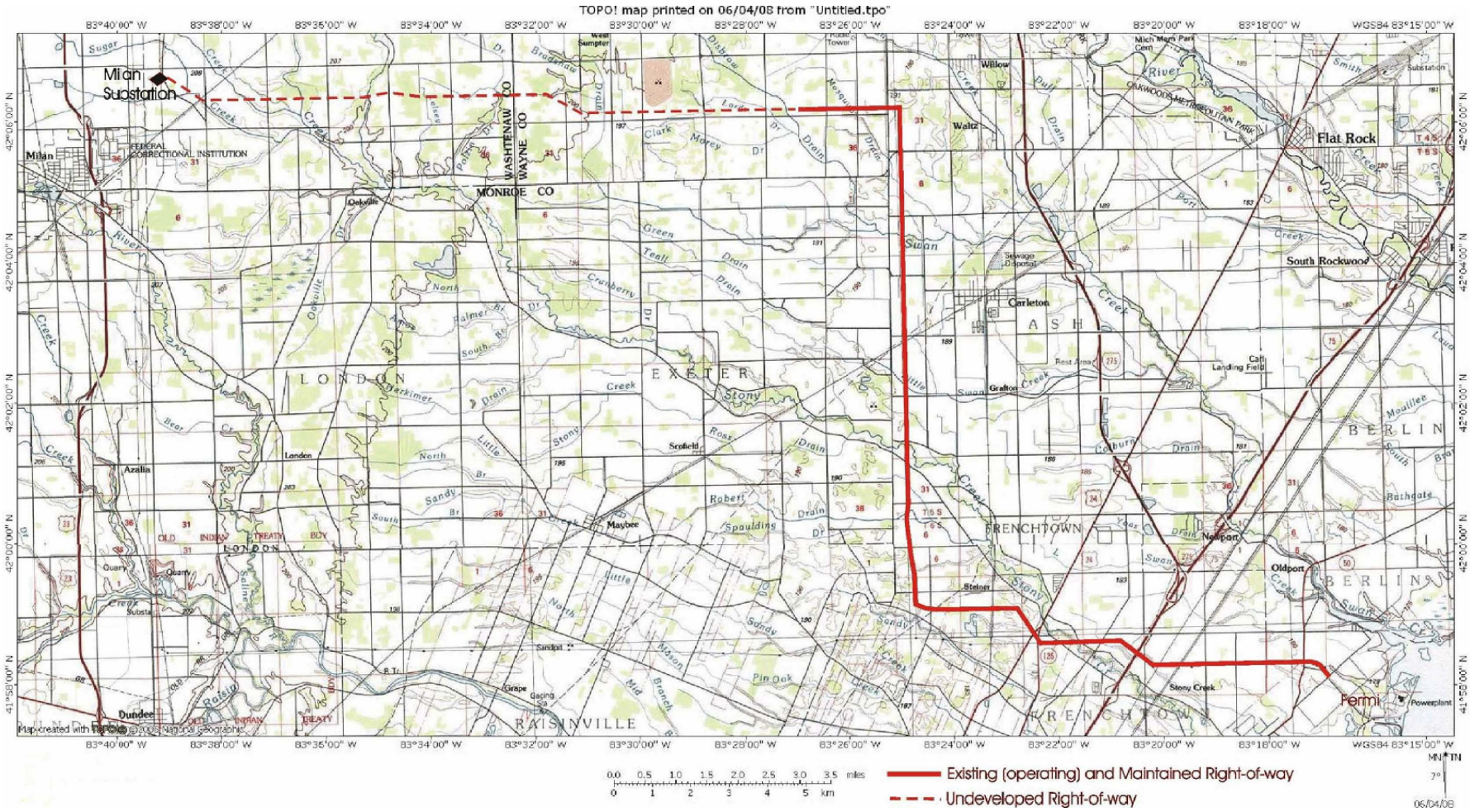

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8.3 Onsite Power Systems

EF3 COL Describes the Safety-Related Battery Float and Equalizing Voltages based on vendor information.

EF3 SUP Describes training and procedures to mitigate a Station Blackout (SBO).

Chapter 8, Electrical Power: Supplemental Information

8A Miscellaneous Electrical Systems

EF3 COL Describes Cathodic Protection System. Cathodic Protection system design is in accordance with Industry Standards.

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(PM SLIDE)

Fermi Unit 3 COL Application Review

SER Chapter 8.0
"Electric Power"

May 26, 2011

Section 8.0 – Electric Power
ESBWR FERMI 3 COL – Review Topics of Interest

- **COL Application Contains:**
  - COL Information Items
  - Supplemental Information

- **COL Review Included:**
  - Confirmation that all COL Information Items identified in the ESBWR DCD are addressed.
  - An assessment and determination that the Fermi Unit 3 COL FSAR information provides sufficient level of detail for Offsite Power and Onsite Power Systems.

Section 8.1 Electric Power - Introduction

- **Section 8.1 –** Staff reviewed applicable Design Bases, Criteria, Regulatory Guides, Standards, and other documents to be implemented in the design of the electrical systems that are beyond the scope of the Design Certification.

- **Specific items of interest:**
  - Supplemental Information is adequately addressed.

- **Section Conclusion**
  - The applicant has adequately addressed supplemental information regarding Fermi Unit 3 connection to the 345 kV switchyard through the unit main step-up transformer.

Section 8.2 Offsite Power System

- **Section 8.2 –** The Offsite Power System includes two or more physically independent circuits that encompass the grid, transmission lines, and switchyard components that supply electric power to safety-related and other equipment, and is capable of operating independently of the onsite standby power sources.

- **Specific items of interest:**
  - COL License Information Items are adequately addressed.
  - Supplemental Information – Testing and inspection of switchyard components and failure modes and effect analysis.
  - RAI 8.2-2 Regarding separate transmission system.
  - RAI 8.2-11 Regarding compliance with the requirements of 10 CFR 50.65(a)(4)
  - RAI 8.2-7 and 8.2-11 Regarding the cable monitoring program

Section 8.2 Offsite Power System Cont'd

- **Section Conclusion**
  - The Applicant has adequately addressed COL information items EF3 COL 8.2.4-1-A thru 8.2.4-10-A related to the design of the plant site switchyard and its interface with the local transmission grid, and EF3 SUP 8.2-2 and 8.2-3 related to testing and inspection of switchyard components and failure modes and effects analysis. The staff concludes that the requirements of GDCs 17 and 18 and 10 CFR 50.65 are satisfied for this section.

Subsection 8.3.1 Onsite AC Power System

- **Subsection 8.3.1 -** Includes Standby Power Sources, Distribution Systems, and Auxiliary Support Systems That Supply Power to Safety-Related Equipment, or Equipment Important to Safety for All Normal Operating and Accident Conditions.
- **Specific items of interest:**
  - COL License Information Items Are Adequately Addressed.
- **Section Conclusion**
  - The applicant has adequately addressed the Fermi 3 COL items involving cathodic protection systems and the cable monitoring program. The staff concludes that the guidance of National Association of Corrosion Engineers standards and NUREG/CR 7000 and recommendations of GL 2007-01 are satisfied for this section.

Subsection 8.3.2 Onsite DC Power System

- **Subsection 8.3.2** - Includes four independent Class 1E DC divisions to provide reliable power for safe shutdown of the plant without the support of battery chargers during a loss of all AC power sources coincident with a DBA for 72 hours and non-Class 1E DC power systems.

- **Specific items of interest**:
  - COL License Information Items are adequately addressed.
  - **Section Conclusion**
  - The applicant has adequately addressed the Fermi 3 COL item regarding safety-related battery float and equalizing voltage values, and supplemental information pertaining to training and procedures to mitigate a Station Blackout event. The staff concludes that the requirements of GDC 17 and 10 CFR 50.63 are satisfied for this section.

Staff Findings

- The Fermi Unit 3 COL FSAR provides:
  - Normal preferred and alternate preferred power to the UATs and RATs respectively are physically and electrically separate from one another.
  - Sufficient information about offsite power system, switchyard, interconnection entities to maintain grid reliability and stability and minimize a loss of offsite power.
  - Cable condition monitoring of underground or inaccessible cables within the scope of the Maintenance Rule (MR) is incorporated into the MR program.
  - Regarding SBO, ESBWR design does not require an AAC power source. However, training and procedures to mitigate an SBO event are implemented. Procedures will include (1) SBO Response Guidelines, (2) AC Power Restoration and (3) Severe Weather Guidelines.

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Fermi 3 COLA
Presentation to ACRS Subcommittee
Chapter 4

Chapter 4, Reactor: Chapter Topics

Incorporates the DCD Chapter 4 by Reference with Two Standard COL Items – denoted with * in the following List of Topics:

- Fuel System Design
- Nuclear Design*
- Thermal and Hydraulic Design
- Reactor Materials
- Functional Design of Reactivity Control System
- Typical Control Rod Patterns and Associated Power Distribution for ESBWR*
- Fuel Licensing Acceptance Criteria
- Control Rod Licensing Acceptance Criteria
- Stability Evaluation

Chapter 4, Reactor: Supplemental Information

4.3 Nuclear Design

STD COL There are no changes to the fuel, control rod, or core design from that described in the referenced certified design.

4A Typical Control Rod Patterns and Associated Power Distribution for ESBWR.

STD COL There are no changes to the fuel, control rod, or core design from that described in the referenced certified design.

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Presentation to ACRS Subcommittee
Chapter 7

Chapter 7, Instrumentation and Control

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- Incorporates DCD Chapter 7 by Reference with no COL or supplemental items.

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Chapter 15

Chapter 15, Safety Analysis: Chapter Topics

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Incorporates DCD Chapter 15 by Reference with one standard supplemental item – denoted with * in the following list of topics:

- Analytical Approach
- Nuclear Safety Operational Analysis
- Analysis of Anticipated Operational Occurrences
- Analysis of Infrequent Events*
- Analysis of Accidents
- Special Event Evaluations

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15.3 Analysis of Infrequent Events

STD SUP

Procedures discuss the use of nuclear instrumentation to aid in detecting a possible mis-located fuel bundle after fueling operations

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Presentation to ACRS Subcommittee
Chapter 18

Chapter 18, Human Factors Engineering: Chapter Topics

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Incorporates DCD Chapter 18 by Reference with one standard COL item – denoted with * in the following list of topics:

- MMIS and HFE Program Management
- Operating Experience Review
- Functional Requirements Analysis and Allocation of Functions
- Task Analysis
- Staffing and Qualifications
- Human Reliability Analysis
- Human-System Interface Design
- Procedure Development
- Training Program Development
- Human Factors Verification and Validation
- Design Implementation
- Human Performance Monitoring *

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18.13 Human Performance Monitoring

STD COL The HPM program will be implemented prior to the beginning of the first licensed operator training class.

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Fermi-3 COL Application Review

SER Chapter 4
"Reactor"

May 26, 2011

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ACRS Subcommittee Presentation SER Chapter 4, "Reactor"

Scope / content of COL application

- Incorporated the DCD by Reference

  4.2 Fuel System Design

  4.3 Nuclear Design

  4.4 Thermal and Hydraulic Design

  4.5 Reactor Materials

  4.6 Functional Design of Reactivity Control System

  Appendix 4A Typical Control Rod Patterns and Associated Power Distribution for ESBWR

  Appendix 4B Fuel Licensing Acceptance Criteria

  Appendix 4C Control Rod Licensing Acceptance Criteria

  Appendix 4D Stability Evaluation

- STD COL Items -Two

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ACRS Subcommittee Presentation
SER Chapter 4, "Reactor"

COL ITEMS

- STD COL 4.3-1-A, Variances from Certified Design

  No changes to the fuel, control rod and core design, and hence the COL item is satisfied.

- STD COL 4A-1-A, Variances from certified design

  No changes to control rod patterns and associated power distribution from the reference certified design. Hence, the COL item is satisfied.

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Fermi-3 COL Application Review

SER Chapter 7
"Instrumentation and Control Systems"

May 26, 2011

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SER Chapter 7 Instrumentation and Control Systems

- Chapter 7 Incorporates by Reference (IBR) ESBWR DCD without departures or supplements
- SER has no Open Items
- ESBWR DCD has no COL information items.

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Fermi-3 COL Application Review

SER Chapter 15
"Safety Analyses"

May 26, 2011

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ACRS Subcommittee Presentation SER Chapter 15 - Safety Analysis

Content of Chapter 15

- The Fermi-3 FSAR, Revision 3, Chapter 15, "Safety Analyses," incorporates the ESBWR DCD, Rev. 9 by reference.
- One Supplemental information item.

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ACRS Subcommittee Presentation SER Chapter 15 - Safety Analysis

Supplemental Information Item STD SUP 15.3-1

- Applicant is committed to develop core fueling verification procedures.

This is acceptable to the staff.

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Fermi-3 COL Application Review

SER Chapter 18
"Human Factors Engineering"

May 26, 2011

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SER Chapter 18
"Human Factors Engineering"

- No Open Items/Chapter 18 is IBR
- STD COL 18.13-1-A Provide Milestone for Human Performance Monitoring program.
- Program to begin prior to first licensed operator training class.
- Applicant's response is satisfactory