Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title:	Advisory Committee on Reactor Safeguards ESBWR for Fermi Unit 3 R-COLA
Docket Number:	(n/a)
Location:	Rockville, Maryland
Date:	Wednesday, November 30, 2011

Work Order No.: NRC-1294 Pages 1-165

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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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SUBCOMMITTEE ON ESBWR FOR FERMI UNIT 3 R-COLA

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WEDNESDAY

NOVEMBER 30, 2011

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B1, 11545 Rockville Pike, at 8:30 a.m., Michael L. Corradini, Chairman, presiding.

MEMBERS PRESENT:

MICHAEL L. CORRADINI, Chairman

JOHN W. STETKAR, Member-at-Large

SAID ABDEL-KHALIK, Member

J. SAM ARMIJO, Member

MICHAEL T. RYAN, Member

ACRS CONSULTANTS PRESENT:

THOMAS S. KRESS

NRC STAFF PRESENT:

CHRISTOPHER BROWN, Designated Federal Official

RAJ ANAND, NRO/DNRL/BWR

DAN BARSS, NSIR/DPR/NRLB

BETHANY CECERE, NSIR/DPR/EP/IRIB

WAYNE CHALK, NSIR

GEORGE CICOTTE, NRO/DCIP/CHPB

GORDON CURRAN, NRO/DSRA/SBPB

EUGENE O. EAGLE, JR., NRO/DE/ICE2

MICHAEL EUDY, NRO/DNRL/BWR

JERRY HALE, NRO/DNRL

CHARLES HINSON, NRO/DCIP/CHPB

RONALDO JENKINS, NRO

ANDREA JONES, NSIR/DPR

CHANG-YANG LI, NRO/DSRA/SBPB

MARK LINTZ, NRO/DCIP/COLP

GREG MAKAR, NRO/DE/CIB1

EILEEN McKENNA, NRO/DNRL

PERRY PEDERSON, NSIR/DSP/CSIRB

RICHARD PELTON, NRO/DCIP/COLP

ED ROBINSON, NSIR/DPR

VERONICA RODRIGUEZ, NRO/DCIP/COLP

EDUARDO SASTRE, NRO/DE/CIB
ERIC SCHRADER, NRO
ANGELO STUBBS, NRO/DSRA/SBPA
MARK TONACCI, NRO/DNRL/BWR
ROBERT VETTORI, NRO/DSRA/BPFP
MIKE WASEM, NSIR/DPR/EP/NRLB
LARRY WHEELER, NRO/DSRA/SBP

ALSO PRESENT:
MICHAEL R. BRANDON, DTE Energy/Detroit Edison
PATRICIA CAMPBELL, GE-Hitachi
DAVE HARWOOD, DTE Energy
DAVID HINDS, GE-Hitachi
ROY KARIMI, ERI
NICHOLAS LATZY, DTE Energy
ADAM LIEBERGEN, Black & Veatch
RON MAY, DTE Energy
ED MYER, Black & Veatch
RYAN PRATT, DTE Energy
STEVEN RUS, Black & Veatch
WALTER SCHUMITSCH, GE-Hitachi
PETER W. SMITH, DTE Energy
STEVE THOMAS, Black & Veatch
KEVIN WEINISCH, KLD
WILLIAM R. ZIEGLER, Numerical Applications Inc.

T-A-B-L-E O-F C-O-N-T-E-N-T-S

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

8:29 a.m.

CHAIR CORRADINI: The meeting will come to order.

So this is a meeting of the Advisory Committee on Reactor Safeguards, the Subcommittee on the ESBWR for the Fermi Unit 3 R-COLA.

I am Mike Corradini. I am Chairman of the Subcommittee. The Subcommittee members currently in attendance are Dr. Said Abel-Khalik, Dr. Sam Armijo, Dr. Mike Ryan, and later, Dr. Shack and Stetkar will join us for a particular chapter, and Dr. Tom Kress, consultant to the Committee.

The purpose of this meeting is to discuss SERs for Chapter 11 which is Radioactive Waste Management, Chapter 12 which is Radiation Protection. Chapter 13, Conduct of Operations, and Chapter 9, Auxiliary Systems, associated with the Fermi 3 R-COLA.

Also, several issues and questions that were raised by the Subcommittee during the October meeting will be answered by the staff and the Applicant towards the end of the meeting.

The Subcommittee will hear presentations by and hold discussions which representatives of the NRC staff and the Applicant, Detroit Edison Company, or DTE, regarding these matters.

The Subcommittee will gather information, analyze relevant issues and facts and formulate proposed positions and actions as appropriate for deliberation by the full Committee.

Chris Brown is our 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 November 7, 2011. A transcript of the meeting is being kept and will be made available as stated in the Federal Register notice.

It is requested that the speakers first identify themselves and speak with sufficient clarity and volume so they can be readily heard. Also, please silence all iPhones and personal devices.

We have not received any requests from members of the public to make oral statements or written comments at this time. There is a bridge line setup for Detroit Edison to call in if DTE folks here or their associated engineers need help.

I would encourage that all those on the line please put the bridge line, please put their phones on mute so we don't get clicking and feedback effects.

The only other general statements I want to make is that this is the third of our Subcommittee meetings, which will probably four or five of them. We have started with issues that are really incorporated by reference with no exceptions or deviations. And we're going to proceed through as we go to chapters where there'll be additional discussions.

Other than that, we'll proceed with the meeting, and I'll call on Mark Tonacci to lead us off and do all the introductions of the various people.

MR. TONACCI: Good morning, and thank you. Thank you Committee and Committee members. I appreciate your time and attention here.

I just wanted to start with a couple new faces that are up here and a face that's leaving. NRO is going through a bit of a reorganization. Today is my last day as the Branch Chief of the BWR Branch which oversees ESBWR Design Certification, as well as the Fermi COL.

I will be leaving and taking over the AP1000 branch. That's going to be one branch instead of two as it has been in the past, since the design cert work on AP1000 is rather complete.

In my place for the BWR Branch, Ronaldo Jenkins will be taking over sitting to my left, and Ronaldo will be sitting at the table this morning for the most of the day as we've done much of the turnover.

The other face that you've seen before but not quite in this capacity. Jerry Hale is here. Adrian Muniz, the Lead Project Manager, is on leave for a period of time. And Jerry Hale has been and will continue to be acting as the Lead Project Manager for the Fermi application. And so with that, I'll turn over to Ronaldo.

MR. JENKINS: Good morning. Thank you and the Committee for meeting today. I'd like to turn it over to Jerry Hale to get into the meeting.

MR. HALE: Thank you.

MR. RYAN: Jerry?

MR. HALE: I'd like to thank everyone for being here today, especially the ACRS members. We're here to present four chapters today. Chapter 11, 12, 13 and 9. I'd also like to extend my personal thanks to all the members of the Fermi team who have gotten us here today, Lon Farborg, and we're bringing it all together here for this presentation.

CHAIR CORRADINI: Good. And we'll be

kicked off by Peter?

MR. SMITH: Yes.

CHAIR CORRADINI: Okay.

MR. SMITH: I'm Peter Smith from Detroit Edison, and before we start with Chapter 11, I just want to introduce a few people who are different from previous meetings. Today, I have Ron May with us, our Senior Vice President, and Dave Harwood, Director of Nuclear Development, Steve Rus is the Senior Vice President with Black & Veatch, who has been our COLA contractor from the beginning of this project.

And then on the GE side, I want to introduce David Hinds who's a new face from GE for us, but probably not a new face to some of you. And Kevin Weinisch from KLD who did our evacuation time estimate and Bill Ziegler from Numerical Applications, Inc., who did much of the dose calculations work in meteorology.

And with that, I'm going to turn over the Chapter 11 presentation to Nick Latzy of my staff. And, Nick?

MR. LATZY: Thank you, Peter. As Peter said, my name is Nick Latzy. I'm the engineering supervisor for the Fermi 3 Project, and I will be presenting Chapter 11, Radioactive Waste Management.

This first slide gives a sectional breakdown of the chapter. The sections I'll be presenting are sections 11.2, 11.3, 11.4 and 11.5.

Section 11.2 is the Liquid Waste Management System. In this section we provide site specific supplemental information which describes the cost benefit analysis for the Liquid Waste Management System. This analysis is based on the population dose estimates due to a liquid effluents described in Chapter 12.

The population dose in Chapter 12 assumes liquid effluents during normal operation even though the ESBWR is designed as a zero liquid effluent discharge plant. The cost parameters used to calculate the total annual costs for each applicable augment listed in Reg. Guide 1.110, are taken without exception from the Reg. Guide, Appendix A.

The analysis conservatively assumes that each potential augment is 100 percent effective in reducing the effluent dose to zero. And the analysis identified no additional cost beneficial augments.

In addition, section 11.2 provides standard information for the following COL items. The first standard COL item describes system design and sampling procedures to preclude non radioactive systems from becoming contaminated. These system design and sampling procedures are used to implement the Guidance and Inspection and Enforcement Bulletin 80-10.

The second standard COL item references the ESBWR design and procedures that minimize contamination of facilities and the environment in compliance with 10 CFR 20.1406.

The last item is a site specific supplemental item, and that item describes a design provisions for the Circulating Water Blowdown line to preclude any unmonitored release of radioactivity to groundwater.

In Section 11.3, the Gaseous Waste Management System. FSAR Section 11.3 provides site-specific information describing the cost benefit analysis for the Gaseous Waste Management System. The analysis is based on the population dose estimates due to gaseous effluents described in FSAR Chapter 12. The cost parameters from Regulatory Guide 1.110, Appendix A, were used as the basis for cost benefit evaluation without exception.

And, lastly, this analysis identified no additional cost beneficial augments.

Next slide please.

In Section 11.4, the Solid Waste Management System, provides information with regard to the Radwaste Building reconfiguration to increase storage capacity for Class B and C waste. This reconfiguration of the Radwaste Building as a departure from standard design in the DCD.

The standard design is six months of storage capacity. This reconfiguration gives Fermi 3 enough space to accommodate a minimum of ten years of Class B and C waste while maintaining enough space for at least three months of packaged Class A waste.

Departure affect. This departure affects structures system and component descriptions in FSAR Chapters 1, 9A, 11 and 12. The departure describes impacts to the Radwaste Building, which include waste storage provisions, waste storage component capacities, waste volumes, evaluation for shielding, impacts to occupational exposure, radiation zones and access routes.

MR. RYAN: Did you have to do any additional shielding? Plan for any additional shielding?

MR. BRANDON: Yes, this is Mike Brandon.

MR. RYAN: He has to come to a mic and identify yourself. I'm sorry.

MR. BRANDON: Yes, this is Mike Brandon, Licensing Manager for the Fermi 3 Project. There were some wall thicknesses that were revised, adjusted to accommodate the reconfiguration and the room sizes. Those wall sizes were adjusted such that the radiation zones were the same for the reconfigured Radwaste Building versus those that were described in the DCD.

MR. RYAN: Okay. Are you planning anything like self shielding with other ways to, you know, kind of arranging it so you can reduce scattered radiation or things like that, or just relying on the shield building itself?

MR. SCHUMITSCH: This Skip Schumitsch at GE-Hitachi. Again, the actual skids that, vendor skids that actually do the processing are self shielded. Now, they actually come in with all the shielding on them.

MR. RYAN: I see. But your waste containers at the end are going to be in storage for some time.

MR. SCHUMITSCH: Yes. Yes.

MR. RYAN: So some of those will likely be more radioactive than others. What happens if high radioactive content and ends up on the other wall, the other shield wall?

Am I being clear on that. I'm not sure if I am.

MR. SCHUMITSCH: Storing the waste meet the requirements for that level of waste. So some of them are actually some type of hits that then it would be storing the waste for the long term. Is that, have I answered your question or?

MR. SMITH: Well, I think from the standpoint of design you are. But I think, you're I think referring to operationally how I would manage this.

MR. RYAN: My experience is typically higher activity waste containers are placed in the center of a room with other waste between those hot wastes in the walls. So that you can do operational control to help you, you know, not challenge your dose limits at whatever boundary you've set. Is that correct?

MR. SMITH: And we have an ALARA program that will match.

MR. RYAN: Okay. But that is --

MR. SMITH: That is the standards. And that's what we do at current storage facility at Fermi 2, so I wouldn't expect it to be managed in a different fashion.

MR. RYAN: That same practice is something you're going to move over to the new unit. Thanks.

MR. LATZY: Thank you. Next slide please.

Additionally, section 11.4 provides standard supplemental information stating that the solid waste cost benefit analysis is addressed by the liquid effluent and gaseous effluent cost benefit analyses.

The first standard COL item addresses the specific testing and implementation of programs to comply with regulatory guidance which are Reg. Guide 1.143 and Reg. Guide 8.8.

The second standard COL item provides a standard COL response information describing design and procedures that address IEB 80-10, the prevention of cross contamination of non radioactive systems.

The last standard COL item on this slide provides information with regards to the incorporation by reference of NEI 07-10A, the Generic FSAR Template Guidance for Process Control Program. The milestone for development and implementation of the Process Control Program is addressed in FSAR Section 13.4.

Next slide please.

Lastly, the last section of Chapter 11 is 11.5, Process Radiation Monitoring System, which provides a description of the Offsite Dose Calculation Manual, NEI 07-09A, generic FSAR Template Guidance for Offsite Dose Calculation Manual Program Description, is incorporated by reference.

The ODCM includes the following information. The methodology and parameters used for calculation of offsite dose and monitoring. The program for process and effluent monitoring and sampling describes the methodology for deriving the lower limit detection for each effluent monitor. And provisions for sampling liquid and gaseous waste streams and batch liquid releases, including frequencies.

This concludes my presentation of Chapter 11. Are there any questions?

CHAIR CORRADINI: That's all right, subcommittee? Sounds fine.

MR. LATZY: Thank you very much.

CHAIR CORRADINI: Thank you. So the staff will come up now and discuss Chapter 11.

MR. ANAND: Good morning. My name is Raj Anand. I am one of the project managers working on the Fermi 3 COL application. I thank Detroit Edison for making their presentation on Chapter 11, Radioactive Waste Management.

I agree with the Detroit Edison presentation. The technical reviewer for Chapter 11 is George Cicotte, and now I will request George to present the highlight of Chapter 11 SER. George?

MR. CICOTTE: Could you go to the next slide please? I guess the next one.

First of all, as was noted by the applicant, 11.1 was incorporated by reference and there was not site specific information in that section so, you know, our review is limited to verifying that they did incorporated by reference.

In addition to the relevant sections of the DCD incorporated by reference, Sections 11.2 through 11.5 all had some site specific information, supplemental information. And we'll address those the parts that involve the most significant portions of the review. Next slide please.

The evaluation was performed using the guidance and consistent with the regulations and information you see on the slide. Including standard review plan and associated branch technical positions for certain aspects of it. Topics in Reg. Guide 1.206 and to reflect evaluation of the site specific features and parameters that were not part of the incorporated DCD. Next slide.

The more significant portions of the review involved how the applicant proposes to implement the provisions of both in 80-10, Contamination Minimization Groundwater Protection aspects under 20.1406.

The cost benefit analyses for the liquid gaseous and solid Radwaste processing systems. Maintaining exposures, as well as reasonably achievable, and long term temporary storage of radioactive waste in the event that a suitable disposal site's not available. Next.

I think in summarizing that their VIOT included the operational programs and radioactive protection that involves system operation and functions such as the site specific calculations of dose to the public.

And that will be discussed further in Chapter 12. Certain specific measures involve the Process Control Program and the Offsite Dose Calculation Manual and instrument capabilities and sensitivities that the applicant already discussed. Next slide.

In the areas of our review that we looked at complies with 20.1406 and, again, that's further discussed in Chapter 12. The application's information on cost benefit analysis for the liquid waste system showed that the dose reduction from the least cost augment was not cost beneficial because it didn't meet the threshold. Next slide.

On the departure, to achieve additional long term waste storage capacity, in particular for Class B and C waste, they reconfigured the positions of the Radwaste components and recalculated doses and the effect internal to the Radwaste Building.

The capacities and efficiencies systems, you know, relative to the DCD were not changed. But there were some configuration and nomenclature changes initially involving Tier 1 information that would have required prior NRC approval.

Because it was administrative and later, you know, through the review process, the applicant determined that they didn't need to make those Tier 1 changes that brought it back to being changes that did not require prior approval. And we looked at that to make sure that those conclusions were correct and determined that they were.

In addressing the standard COL on the dose objectives 10 CFR 50, Appendix I, changes in the description of the condensate system in Chapter 10 that affect the source term. And now these were changes in the description that were part of the DCD, not, it was still IBR. It was not something that the applicant had done.

Affect the source term, but the site specific parameters of distance, meteorology and land use, resulted in the need to the applicant to address how those dose objectives would be achieved under the site specific situation.

And applicant proposed an alternative methodology to limit radioiodine concentrations in the coolant that would be achieved through the procedure of the Offsite Dose Calculation Manual. Next.

Now, we'll discuss that further in Chapter 12 since the methodology itself did not involve the Radwaste systems. However, the condensate purification system operation capacity are a part of the process.

The initial issue arose during review of the draft Final Safety Analysis Report for the DCD That included a substantial increase in the calculated routine source term due to corrections in the description of operation of the condensate and feed water systems that were also incorporated by reference.

These DCD corrections involved how the

condensate flow is described. One of the economies of the ESPDR is that much of the heat energy remaining in high pressure intermediate turbine exhausts imparted to the feedwater to what's called an open feedwater system. Rather than that being directed to the, I meant to mention that's called a pump forward configuration.

But that approximately one-third of the coolant doesn't flow through the condensate purification system, and so in the change in the description in the DCD, that changed the routine source term. Because the review was concurrent with the application, a change that the applicant had to address.

What they came up with in order to meet the, because it increased the calculated iodine, radioiodine concentrations, which increased the dose to public and with child thyroid limiting that dose.

What they propose is if the concentration in the coolant, not as an effluent, but in the coolant should reach the point where it would result in a calculated dose from radioiodine they would limit that by diverting that flow in the condensate in the turbine exhaust instead of sending that pump forward.

They'd go to what's called a cascade

configuration where that fluid would then go back to the main condenser and then, you know, the configuration is physically possible to do that. That water would then all be through the condensate purification system which would bring the coolant concentration back down.

Next slide please.

And that was, we talked about the other portions of the application. Are there any questions?

CHAIR CORRADINI: More questions? Thank you very much. We'll move on to Chapter 12.

Either of you up again?

MR. SMITH: No. Mike Brandon.

CHAIR CORRADINI: Oh, I'm sorry.

MR. SMITH: Is going to do the presentation for Chapter 12. I'm sorry.

CHAIR CORRADINI: Okay. That's all right.

MR. BRANDON: Ready to get started?

CHAIR CORRADINI: Oh, yes.

MR. BRANDON: All right. Thanks.

I'm Mike Brandon and I will be presenting on Chapter 12. This is the index of the FSAR sections in Chapter 12. Two of those sections were incorporated by reference, and then I'll discuss briefly the other sections that had some standard COL or EF3 COL items.

This slide's on Section 12.1, which is Ensuring that Occupational Radiation Exposures are as Low as Reasonably Achievable (ALARA). Basically, the way this is done where you've incorporated the, in the NEI templates 07-03A, Generic FSAR Template Guidance for Radiation Protection, and 07-08A, which is Generic FSAR Template Guidance for ensuring that occupational exposures Are As Low as Reasonably Achievable (ALARA).

Both of those templates were approved by NRC in 2009 time frame. And, of course, we comply with Reg Guide 1.8, which is Qualification and Training of Personnel for Nuclear Power Plants, Reg. Guide 8.8, which is Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Plants with the ALARA, and 8.10, which is Operating Philosophy for Maintaining Occupational Radiation Exposures, ALARA.

Next slide.

This slide and the next three slides address topics in Section 12.2. The first topic is Plant Sources. The plant sources that we've identified that weren't part of the permanent plant design are calibration sources, check sources and sources associated with radiography.

Next slide.

This gets into some of the discussion that the staff has provided in Chapter 11. We did do a site specific evaluation for the annual airborne effluents and annual offsite doses.

As was previously stated, some of our Chi over Qs for the plant were greater than the corresponding values in the DCD. To compensate for that, or to accommodate that, we've established some limits on the iodine limits for the reactor water to ensure that the Appendix I doses were not exceeded.

Just for information, the Part 50, Appendix I limit, the most binding limit, is the limit on the thyroid dose. That's a limit of 15 mR per year. What we calculated for the Fermi 3 site is 11.3 mR per year. So that's the margin that we have. Crediting the limits for imposing for the RCS lead contamination levels.

MEMBER ARMIJO: How much was the reduction in the iodine limit, operational limit? Reduced it from what level to what level? I don't remember what the number was before we took the.

MR. ZIEGLER: I don't recall the number right off the top of my head, but the number that is used is what was in the DCD Rev. 6. When the DCD Rev.

7, this is Bill Ziegler at Numerical Applications, DCD Rev. 7 made the increase in the normal operating iodine. We retained the DCD Rev. 6 iodine for this analysis that yielded the 11.

MEMBER ARMIJO: 11.3.

MR. ZIEGLER: 11.3 child dose. I don't have the number right off the top of my head, but I could look it up.

MEMBER ARMIJO: I was just curious how much of a reduction you had to make.

MR. ZIEGLER: We can look it up and get back to you.

MEMBER ARMIJO: Yes, if you could, I would appreciate that.

MR. ZIEGLER: I don't recall the number.

DR. KRESS: Do you have a continuous measure of that iodine in the water? Or you take samples?

MR. SMITH: Operationally, there are technical specification requirements that require you to do sampling and analysis after revolutions like power changes and exceeding a certain percentage of thermal --

DR. KRESS: Several periods.

MR. SMITH: So just for background on

this, because I think we probably added a little bit of the why of why we did this. It was an operational change that was in the way the DCD was described that was identified. I think by the staff, and then revised and DCUF 7, that resulted in a net increase in coolant concentrations.

But the coolant concentrations to begin with are based on NUREG-016, which is based on fuel performance data from the '70s and '80s. And today, fuel performance is nowhere near that and to the point there's a risk that questions the ability for reactor coolant system leakage detection instrumentation that is based on to be able to function appropriately.

DR. KRESS: That was going to be my next question.

MR. SMITH: Right. So, the reality of what we've done here is that we would never expect operationally ever to get near the iodine concentrations that are specified here in and through our, you know.

I'm sure your familiar with the trend in fuel performance, that fuel pin failures are very rare today as they were fairly common 30 years ago. So that's kind of the background, but this was a --

MEMBER ARMIJO: So your initial iodine

limit was really based on a pretty high fraction of fuel failures during the cycle, but it was still within your safety analysis.

MR. SMITH: Right.

MEMBER ARMIJO: But your expectation based on current fuel performance is going to be far, far less.

MR. SMITH: That I would never expect that I would ever have to be in a condition where I would have to take actions to address this particular issue during operation.

MEMBER ARMIJO: Okay. Thank you.

MEMBER RYAN: And the last point is, just so I'm clear on the numbers, that the number that you get with the fuel performance you expect. Have you calculated that iodine release? Is that what results in 11.3?

CHAIR CORRADINI: No. That's the assumed failures or the --

MEMBER RYAN: That's the assumed failures.

CHAIR CORRADINI: That's what I thought. Great. Okay.

MR. SMITH: So, really the reality --

MEMBER RYAN: The margin you have then is really the margin between what you hope will be in much improved fuel performance, relative to the 11.4 would.

DR. KRESS: If you just, for some reason, did reach the level that you think is unacceptable, what action would you take?

MR. SMITH: So I'll give you some operational anecdotes because I used to be the fuel manager at Fermi, and I've lived through two fuel pin failures in the last, single pin failures, in the last 15 years. And the reality is that you won't operate with a failed pin.

DR. KRESS: You shut down.

MR. SMITH: So immediately what will happen is, what my experience has been, is we'll suppress, you know, we'll do suppression testing and find where the leaker is and then we'll suppress that assembly by inserting a control right adjacent to it, which we can do in the BWI.

And so then the next thing is my fuel guys are busily redesigning the core to find the symmetrical pairs out of the spent fuel pool that we could reinsert. And at the earliest convenience, we would shut down and do, and that's what we've done the last two times.

So I would say that's the, kind of what I would expect. And with INPO fuel performance indices, it's a big ticket item in the industry. People don't usually at least in the BWI world, run too long with a failed pin. It's just, you know, has too many downstream implications.

MR. BRANDON: Another aspect to bear in mind too is this 11 mR that I quoted is based on operating for the entire year at the limit. And certainly that would not occur if there was an adverse trend, then we'd start taking the actions that Peter referred to.

So it's a value that demonstrates our design, and can in fact, meet the CFR requirements. In reality, it's a limit that you wouldn't come near approaching, just a normal aspect of operations.

MEMBER ABDEL-KHALIK: Now, switching from pump forward to cascaded condensate system operation, is there something that the operator can do on the fly?

MR. BRANDON: Yes. The capability exists in the design to do that.

MEMBER ABDEL-KHALIK: They can just do that from the control room?

MR. HINDS: This is David Hinds from GEH, and yes, sir, controls exist from the control room to be able to shift the drains such that they are cascading as you've asked. So, yes, it can be done from the control room. Of course, monitoring, full plant power, as well as stable operation. Possibility of, you know, a slight power reduction in order to reconfigure to make sure that the plant's in a stable configuration. But it can be done from the control room.

MEMBER ABDEL-KHALIK: And how does that affect the feedwater temperature?

MR. HINDS: The feedwater temperature should be maintained and in spec, and I will remind you that the ESBWR is designed for a band of feedwater temperature for feedwater temperature maneuvering. So we'd have pre-evaluated the full spectrum of feedwater temperature versus power, so we have an acceptable operation.

Yes. But I would expect to be very close to nominal feedwater temperature. However, again, we pre-evaluate it if there is a divergent from the normal 420 degrees Fahrenheit feedwater temperature. We have an acceptable pre-evaluated condition. So it wouldn't be an abnormal unevaluated situation, if we did diverge off of 420 degrees Fahrenheit.

MEMBER ABDEL-KHALIK: Thank you.

MR. BRANDON: Do you have a picture of the --

MR. HINDS: Yes, we have. There's a seventh heater, which is the last high pressure here. That heater is not normally in service, so if we started diverting some of drains back to the condenser and lost that preheat from that, we can place the seventh heater into service which provides additional heating capacity that is not normally in service.

Next slide.

MR. HALE: Excuse me. Could I have the initial question read back so that staff has a chance to capture it accurately?

CHAIR CORRADINI: You mean what Sam was asking?

MR. HALE: Yes, please.

CHAIR CORRADINI: Read back. Let me tell you what I think I wrote down and then, Jerry do you want to clarify?

MR. HALE: No, I just simply had a quick question about how much of a reduction in the operational iodine limit did Detroit Edison make?

CHAIR CORRADINI: Okay.

MR. HALE: And I have a rough idea, but I would just like the numbers before and after. Thank you very much.

CHAIR CORRADINI: Sure. And then we'll just, whenever you guys have it, we'll get back then.

MR. BRANDON: I think we have the answer although I was talking to Steve when you were repeating the question.

As far as the concentrations of the iodine isotopes in the RCS, before and after, the original DCD values were roughly twice what the values are that we're proposing as our limits.

MEMBER ARMIJO: That's from the DCD 7? Version 7? Was reduced back to the values in DCD 6?

MR. THOMAS: Correct.

MEMBER ARMIJO: And that's about a factor of two?

MR. THOMAS: About a factor of two. It depends on which isotope that you're looking at, and I can show you the specific numbers after, during the break if you want.

CHAIR CORRADINI: No. But I think at least to this point, does that answers your question.

MEMBER ARMIJO: Yes. That does. And, you know, the other thing is that your expected iodine limits are far less based on fuel performance.

MR. THOMAS: Yes. Correct.

MEMBER ARMIJO: I think that's all I need. Thank you.

MR. THOMAS: Thanks.

MR. BRANDON: Next slide addresses liquid effluents and associated offsite doses. The Fermi 3 design is actually designed to be a zero discharge plant, the same as Fermi 2.

We did do a liquid effluent offsite dose calculation that assumes that we were not a zero discharge plant, and those calculations demonstrated that we were a small fraction of the limits.

Next slide.

This slide deals with compliance with 10 CFR 20.1301 and 1302, which are limits to the public. The offsite doses to the members of the public are less than the limits in 10 CFR 20.1301. Just to refresh everyone's memory, those limits are 100 mR per year and a maximum dose rate of two mR per year.

The offsite doses to members of the public from the Fermi site dose are less than the limits in 40 CFR 190, and those limits are 75 millirem thyroid and 25 millirem whole body and 25 to any other organ.

And then lastly, compliance with 10 CFR 20.1302 as demonstrated by showing that the dose limits are in compliance with 10 CFR 20.1303 and make sure that those are not exceeded by performing radiation surveys and through calculations. Basically use our rem program to demonstrate those doses are within those CFR limits.

Next slide.

Those are the Section 12.3, Radiation Protection. This gets into the discussion we had on Chapter 11 with the Radwaste Building being reconfigured. As we stated in the previous presentation or discussed, the radiation zones were maintained consistent with the DCD. We did that by adjusting some wall thicknesses to ensure that was maintained consistent. And we did have to reconfigure some of our access and egress routes to reflect the changes in the floor plan.

Next slide.

This deals with minimization of contamination in waste generation. Again, this is basically achieved by incorporating my reference NEI 08-08A, which is Generic FSAR Template Guidance for Life Cycle Minimization of Contamination.

Next slide.

This slide deals with dose assessment, and then discusses basically the doses that we calculated to construction workers. The contributors for that were, the doses we looked at were direct doses, gaseous effluents and liquid effluents. The sources that we considered were the operation of Fermi 2 which is not in place now, but could be in place and operational during the construction phase and also sources that are, doses that could be due to the decommissioning remains of the Fermi 1 plant.

Just for your information, the total cumulative dose that we calculated from those three sources was somewhat conservative assumptions came up to 96.6 millirem TEDE compared to a limit of 100, and then the dose rate, maximum dose rate would be .128 compared to a dose rate limit of 2 mR per hour.

And that was for the 10 CFR 20.1301 limits relative to the 40 CFR 190 limits. Those limits again were 25 mR whole body. The doses that we had calculated for that purpose was 1.6 mR, so set your margin there. And then limit for the thyroid dose in 40 CFR 190 is 75 mR and then we calculated 10.4 mR to the construction workers.

MEMBER RYAN: What's your uncertainly in that first level which was butting up against the limit?

MR. BRANDON: On the TEDE dose for the 20.1301, that was a very conservative dose we, the dose due to the decommissioning of Fermi 1 was based on 25 mR, which is the codified limit. It will be well below that. The dose for the ISFSI was, I can't remember. I think it was 8.3. It was some calculated number based on full loading of ISFSI, which won't be the case at this time.

The doses due to the operation of Fermi 2 was a limiting dose based on some TLDs that we have staged in the field. It assumes the workers in the field for 2,080 hours per year, it assumes he's at the location where dose resources, this limiting dose resources combined, which in reality, he can't be at three places at one time. So there's a lot of conservative analysis.

MEMBER RYAN: I understand you bounded it as close as you can bound it to, you know, it's near the limit. But what I'm trying to understand is what's the actual expectation for doses from the actual sources versus this limit?

It's an unrealistic calculation because you just told me you're not going to get all three of those events?

MR. BRANDON: Right.

MEMBER RYAN: So what is the realistic dose?

MR. SMITH: We should go and do a look up.

MEMBER RYAN: That would be fine, yes. You understand my question.

CHAIR CORRADINI: Yes. Right.

MEMBER RYAN: It doesn't give me comfort when you bound everything and you tell me it's a number that's a little bit lower than the limit. Even if it was 75 percent of the limit, I still want to know what's the actual dose.

CHAIR CORRADINI: What's the best estimate?

MEMBER RYAN: Yes, what's the best estimate?

MR. SMITH: The highest.

MEMBER RYAN: If it's between the best estimate and your bounding analysis that I get some idea of, you know, of what uncertainty might do to your actual number.

MR. SMITH: Plus we've had a significant operational change in Fermi 2 that will reduce this, because during this period of time, we were operating with high hydrogen injection.

MEMBER RYAN: Sure.

MR. SMITH: With our Noble Chem and we're now doing Noble Chem, and so most of the dose from

Fermi 2 is the result of.

MEMBER RYAN: And all that are things that should be I think discussed in a best expectation kind of way. So that would be helpful to understand what that is.

CHAIR CORRADINI: So you guys have that? You just don't have it with you?

MR. SMITH: No. I think the thing is that what I would do is I would go and look at from a radiological and environmental monitoring program. Because these are all REMP TLDs that we take this data from, and we apply these same limits to people that are sitting in office buildings that are in the same location as to where we're going to build Fermi 3. So that would be probably a more typical estimate based on actual experience.

MEMBER RYAN: That would be helpful.

MR. SMITH: And the only thing that's missing from that is we don't have currently any fuel in our ISFSI for Fermi 2. So that's, and that was an eight or nine millirem per year contribution.

MR. BRANDON: We have the proof of that. It's unavailable to me today, but what Peter just said, we have TLDs in the field.

(Simultaneous speaking.)

MEMBER RYAN: If we could work something out that would, you know, kind of explain that, that would be fine.

MR. BRANDON: We'll take that as a follow up and we'll have some empirical data we can provide on that.

MR. SMITH: Good. All right.

MR. THOMAS: The other follow on piece of that is that in order to address uncertainties in that dose analysis, or is the monitoring that's discussed in the section 12.4. It will be performed to make sure that we don't see the limits.

MR. BRANDON: Okay. And then, next slide.

This is the last slide that talks about Operational Radiation Protection Program, and basically, it refers to the Appendix 12AA and 12BB, which incorporate the two NEI standards we previously talked about.

And that's all I have.

MEMBER RYAN: Thanks.

CHAIR CORRADINI: Okay. Other questions? All right. Thank you very much. We'll turn to the staff.

MR. ANAND: My name is Raj Anand. I'm one of the project managers working on the Fermi 3 COL application. And I thank Detroit Edison for making their presentation for Chapter 12, the radiation protection.

I agree with Detroit Edison's presentation. The technical reviewer for Chapter 12 is Charlie Hinson and George Cicotte also helped him in certain sections of the Chapter 12.

Now I turn it over to Charlie Hinson to present the highlight on status evaluation for Chapter 12.

Charlie?

MR. HINSON: Okay. Next slide, please.

Yes, my name is Charles Hinson. I'm the Senior HP in the Radiation Protection Branch, and I was the primary reviewer for Chapter 12, Radiation Protection. And George Cicotte, who's sitting to my left, reviewed portions of 12.2 of Chapter 12. And George will be discussing one of the slides in my presentation this morning.

This slide lists some of the regulations and review guides used for the review and evaluation of Chapter 12. The primary governing regulation that we use is 10 CFR 20, which are standards for protection against radiation. And Section 20.1406, which was discussed earlier today, states that "the applicants for licensees shall describe in the application how facility design and procedures for operations will minimize to the extent practical contamination of the facility and the environment, facilitate eventual decommissioning and minimize to the extent practical the generation of radioactive waste."

While the ESBWR DCD describes the design features of the Fermi plant, the Fermi FSAR describes those operational and programmatic considerations that the applicant will implement to prevent the spread of contamination and thereby facilitate decommissioning.

Next slide please.

FSAR Chapter 12 is composed of these five sections. Sections 12.1 and 12.5 address the applicants in ALARA Program and Radiation Protection Program, respectively.

And as was discussed earlier, NEI Template 07-03, 07-08A, which is Generic FSAR Temple Guidance for Ensuring that Occupational Radiation Exposures or ALARA, will be implemented by Fermi for Section 12.1 for the ALARA Program.

And NEI Template 07-03A, which is Generic FSAR Template Guidance for Radiation Protection Program, has been adopted for Section 12.5 of the

FSAR. And both these templates were developed to be applicable to all COL applicants, and these two NEI templates are referencing Appendix 12AA and 12BB of the FSAR.

Sections 12.2 through 12.4 addresses site specific aspects of the Fermi design. Okay. This slide, before you know, this slide and the next slide list all the COL items both standard and site specific, the departures and supplemental information that's contained in Chapter 12.

Our presentation will focus on the highlighted portions of these two slides, and George will address the list of site specific COL items on airborne effluents and doses and on liquid effluents and doses.

And then I will address the effects of long-term Radwaste storage departure on the Radwaste Building on the Radwaste shielding, and the applicant's compliance with 10 CFR 20.1406 as it applies to the discharge blowdown line.

Next slide.

And I will also address the applicant's evaluation of construction worker doses.

Okay. The next slide will be presented by George.

MR. CICOTTE: Okay. This goes back to the discussion of the proposal alternative methodology in the ODCM and the process of looking at the cascade versus pump forward configuration.

We looked at that from the standpoint of evaluating and was it a reasonable alternative methodology. And as far as whether or not the, you know, it was both, you know, mechanically feasible and something, you know, would be ALARA. And I'd like to re-stress, you know, as far as the amount of increase in the source term and the calculated dose, you know, we confirmed that it was in the process of this difference in the configuration.

The approximately one-third flow difference in the cleanup in the condensate purification system results in the level eventually rising to about a two-fold increase.

So this process is, it's not something that's immediate. It presumes a number of concerted assumptions such as operating, you know, with a 0.25 percent fuel failure for the entire year that this, you know, process is designed to evaluate.

If you look at Part 50, Appendix I, it, you know, provides enough flexibility in operation that this is something that they could do if they ever, you know, reach that point.

But as the Applicant pointed out, this is, you know, far below a level at which you'd have some kind of a, you know, operational constraint. You know, it doesn't approach the tech spec limit that used relative to the Part 20, you know, release rates. And we concluded that, you know, it was a reasonable alternative. That's it.

MR. CICOTTE: Okay. Next slide, please.

MR. HINSON: Okay. The Radwaste Building described in the ESBWR DCD is designed to hold approximately six months of Class B and C waste. And because of the uncertainty of a disposal options for Class B and C waste by the shutdowns of the Barnwell facility, the Applicant reconfigured the Radwaste Building to hold up to ten years of Class B and C waste, and a maximum of three months of Class A waste.

The staff reviewed this departure with respect to the adequacy of the shielding of the reconfigured Radwaste Building and also use of design features to minimize contamination, part of contamination in the building.

As part of our review, the staff compared the shield wall thicknesses and cubicle layouts for the reconfigured Radwaste Building with those described in the ESBWR DCD and found that there were no resultant changes in the area dose rates in the Fermi Radwaste Building resulting from the building reconfiguration.

The staff also confirmed that the process and drain piping from rooms containing high activity components will be routed to minimize personnel exposures in accordance with the Guidance contained in Reg. Guide 8.8.

Next slide, please.

As stated earlier, the ESBWR document site specific plant features which comply with the requirements of 10 CFR 20.1406. Although the Fermi FSAR does contain a description of those operational and programmatic considerations implemented to meet objectives of Reg. Guide 421 and the requirements of 10 CFR 20.1406.

The staff requested that the applicant describe those design features associated with any underground piping, including the discharge blowdown line that are incorporated to minimize potential for unmonitored and uncontrolled releases to the environment.

The Applicant responded, which is information that's in the DCD, that all underground piping would either be routed in trenches or in tunnels and would be accessible for visual inspections or enclosed within a guard pipe and monitored for leakage.

The liquid Radwaste pipe, which is the pipe coming out of the Radwaste Building leading to the blowdown line, coming from the Radwaste Building, is enclosed within a monitored guard pipe and will discharge into the discharge blowdown line.

At this point, the liquid Radwaste will be diluted by much large waterflow volume from a discharge blowdown line. So that the resulting effluent flow is below the release limits of Table 2 of 10 CFR Part 20, Appendix B.

This effluent would then flow underground through a 48 inch diameter high-density polyethylene pipe to a discharge point thirteen hundred feet into Lake Erie. This HPED pipe has no valves, vacuum breakers. Their other inline components.

In order to monitor for leakage from this line and other potential sources of onsite contamination, the Applicant will develop a groundwater monitoring program, which will include the utilization of groundwater monitoring wells.

Monitoring wells will be relied upon to

detect for groundwater contamination, and these wells should detect contamination before it becomes widespread and well before compliance with Section 20.1406 is challenged.

The Groundwater Monitoring Program will be consistent with the NRC accepted NEI Template 08-08A, Generic FSAR Template Guidance for Life Cycle Minimization of Contamination. And in NEI 08-08A describes a program which is consistent with the guidance provided in Reg. Guide 4.21 and also the requirements of 20.1406.

Next slide, please.

Okay. Reg Guide 1.206, Combined License Applications for Nuclear Powerplants, states that, "The FSAR should include a description of the estimated doses to construction workers working on a new reactor from nearby operating units."

Since this information was included in the Fermi Environmental Report, but not in the FSAR, the staff asked that the licensee, the Applicant, put this information and provide the basis and assumptions used by the Applicant to calculate the construction worker doses in Chapter 12 of the FSAR.

As you just heard, the Applicant stated that the maximum total estimated dose to construction workers would be 96.6 millirem, which is below the 10 CFR 20.1301 annual dose limit of 100 millirem to a member of the public. This dose is broken down as follows, 1.6 millirem of this total comes from gaseous effluents and 95 millirem comes from direct dose components, which there are three.

The first one was the operating dose rate from Fermi Unit 2 which was 56.3 rem, and this is primarily from N16, and Fermi 2 is currently operating with hydrogen water chemistry so that results in increased offsite doses.

And they're considering implementing a Noble water program, which has in the past been able to reduce operating the effluent dose, or not effluent, excuse me, the direct dose is by up to 83 percent. So this 53.6 millirem component of the 96.6 could be drastically reduced when this program goes in place.

The second component of the direct dose was the 25 millirem from the decommission site and, as was stated earlier, that's based on 10 CFR 20.1402 limits of a maximum dose for an average member of a critical group, which in this case, would be a farmer.

And the construction workers are not going to be working on that Fermi 1 area, so they're not going to get the 25 rem. And they're also not going to be farming on it and will get much less than this 25 millirem per year component.

And the third component of the direct dose are estimated was from the Fermi 2 ISFSI and that's assuming all casks are loaded with 15 year decay. And currently, there is not ISFSI on site. So, I was, to answer the question earlier about what is a realistic estimate of their dose, I would say the 56.3 millirem, which is the average, the highest dose from a currently operating Unit 2.

In fact, if they use the Noble Water Chemistry Program that those should be reduced greatly. The ISFSI dose, once its built in full, that will be roughly an accurate component. And then the 25 millirem from the decommissioned Fermi 1 site, I think that's very conservative and probably would be border maybe five, five millirem.

So the 96.6 millirem estimate is very conservative, not much.

MEMBER RYAN: Thanks. That summary is very helpful. I think that answers my question.

CHAIR CORRADINI: So do you want?

MEMBER RYAN: No. I don't think we need any additional information. He covered it. Thank you.

MEMBER ARMIJO: Just to check on that issue of how much the N16 goes down when you use Noble, Noble metals and don't have to inject so much hydrogen. Do you have any operating experience from other plants that give you confidence that that's a pretty valid assumption that you're going to have a major reduction?

MR. HINSON: Well, we've, we've seen noble water, noble metal chemistry, has been widely used in the industry to do this.

MEMBER ARMIJO: Yes, I know that. I just don't know how much it has reduced the N16.

MR. HINSON: Yes, the 83 percent was quoted by the licensee. I would probably say it may not be quite that large, but probably --

MEMBER ARMIJO: A factor of two is reasonable then?

MR. HINSON: I would say, yes, a factor of, yes.

MEMBER ARMIJO: You cut it in half?

MEMBER ARMIJO: Right. I think that's a reasonable estimate based on current plants, because a lot of plants are using that.

MR. SMITH: We just about have now one

cycle of operation from the two with noble metal chemistry.

MEMBER ARMIJO: Oh, you do?

MR. SMITH: Yes. So I don't know what the dose numbers are today, but --

MEMBER ARMIJO: Yes. Okay.

MR. SMITH: -- we got to that REMP cycle where we would get to that.

MEMBER ARMIJO: All right. Thank you.

MR. HINSON: Okay. And the Fermi site will be continually monitoring the construction worker force based on people from, you know, health physics staff from the operating unit will be monitoring the doses in the construction area to make sure that the doses the workers do not approach the 100 millirem per year limit using their REMP program.

And the staff's confirmatory calculations agreed with the Applicant's best estimates, like I said. And, therefore, the staff finds that the Applicant's construction worker dose estimates are acceptable and conservative.

Next slide. Any questions or comments?

MEMBER RYAN: That's fine. Thank you.

CHAIR CORRADINI: You're okay?

MEMBER ARMIJO: All set.

CHAIR CORRADINI: Any questions?

MR. HINSON: Okay. Can we proceed on to content of operations. Thank you.

CHAIR CORRADINI: I'm under the assumption that we're not going to go until noon for it, we could take a break after we discuss that chapter?

MR. SMITH: I'm all for that.

CHAIR CORRADINI: You know, I just want to carry on. I don't want to wait an hour.

MR. SMITH: I understand. That's fine.

MR. HALE: We're rounding up some of the staff presenters since we're running a little ahead of schedule.

CHAIR CORRADINI: Yes, I understand. Round up away.

(Off the record comments)

CHAIR CORRADINI: Peter or is it Raj?

MR. SMITH: Oh, I'm going to speak. This is Kevin from KLD.

CHAIR CORRADINI: Without a score I get.

MR. SMITH: I just felt lonely.

CHAIR CORRADINI: We can find someone I think.

MR. SMITH: Okay.

CHAIR CORRADINI: Go ahead.

MR. SMITH: Ready to go?

CHAIR CORRADINI: Yes, sir.

MR. SMITH: So before I get into Chapter 13, can you just move to the next slide which has the layout of topics that are covered by Chapter 13?

I just wanted to set a little bit of background on how we went about Chapter 13 given that how we developed the FSAR, what our philosophy was.

And I think that, you know, I talked about some of this in our main meeting that the first thing is we, you know, we had a really high standard of being faithful to, at that time, North Anna R-COLA, and even though Chapter 13 to a large degree is site specific information, you'll see a lot of commonality between what we, you know, based ourselves off of North Anna and adapted where necessary to fit our corporate structure.

So a lot of this isn't unique to us. And we've treated the industry templates that we've referenced here in the same fashion. Ron May will attest to how high a barrier I have to go through to deviate from anything that's being in standard.

And then the other thing I wanted to mention was, you know, much of Chapter 13 is about future activities, program development, procedure development, training, implementation and all of those kinds of things. And as I have laid out in May, I just wanted to talk about our schedule.

Because what we have is, we have a floating schedule for construction that basically spans about a ten year period from the point in time when we would have a corporate authorization to go and build this plant. And that includes a lot of up front planning to, you know, execute contracts to do site reorganization and to support operation of Fermi 2, et cetera. And we have a good amount of ample tail end contingency built into the process.

So what that has afforded us is the luxury of time that many of the things that others have some compression about, because they have early commercial operation dates, we don't have that same constraint. So things like getting a simulator in place and all of those kinds of things, which have been problematic, are not necessarily critical path items in our schedule.

And then the last thing I wanted to talk about this schedule is the way we go about, given that a lot of these are future activities, given that a lot of these future activities, you know, either show up in the form of license conditions or they show up as commitments. Because we've made specific commitments as follow in our FSAR.

Those commitments already exist in our schedule because that's what we use for our commitment tracking system, and so we have milestone points within our schedule that represent commitments.

So with that, I'm going to move on to 13.1, which is Conduct of Operations. I'm sorry, the Organizational Structure. So, there's another page there, so we have some EF3 COL information that basically describes our organizational structure for design construction and operations.

Like I said previously, it is not necessarily unique to us, you know, we have, we show all of the corporate interfaces in the structure. We describe all of the positions, the manning and the schedule for hiring and training.

This section also describes the overall staffing levels. They're estimates at this point, but they probably represent some pretty good estimates. Because we used information that we had worked on with North Anna at the time, as well as our own, from our experience.

All of our selection, training and qualification requirements are in accordance with ANSI

/ANS 3.1, Selection, Qualification and Training for Nuclear Power Plant Personnel. And we also described in this section commonality where there's some resource commonality between Fermi 2 and Fermi 3.

For example, you know, we intend to have a combined security protection and protected area and combined security force for both units. Other areas where there's those kinds of resource savings and some synergy are in the areas of training, emergency preparedness and radiation protection.

And then from the training program standpoint, our training program we've incorporated by reference, the NEI 06-13A Template for an Industry Training Program Description.

Going to the next slide here.

So 13.3 we skipped. We'll come back to that later because that's the emergency plan.

And so 13.4 and 13.5 are Operational Program Implementation and Plant Procedures. And, basically, we described in these sections the schedule and milestones for program implementation.

And they are all listed in Table 13.4-201, and we provide all the milestones for the operational programs. And 13.5 describes plant procedures. It defines the types of the administrative requirements that implement the requirements of our quality assurance program, operating and maintenance procedures, radiation protection, chemically emergency plan implementing procedures.

And we describe a implementing schedule for those procedures. And development schedule is based on really the kind of reasonable kind of, what kind of procedures they are.

Section 13.7 addresses Fitness for Duty program. And basically what we have done here is we have committed to any NEI 06-06 Revision 5, which addresses Fitness for Duty for New Nuclear Power Plant Construction Sites, satisfies the requirements of 10 CFR 26. And we've established compatible milestones for its implementation.

And as this area is one that seems to continue to evolve probably a change will be made as time goes on to maintain the pace with regulations.

Next slide.

13.8 addresses Cyber Security Plan. And, again, we have adopted an NEI, NRC endorsed template for the Cyber Security Plan, and the NEI 08-09, Revision 6. And the Plan describes the defensive model. It satisfies the requirements of 10 CFR 73.54. And, again, we have milestones for implementation of that program.

And then the next slide, we'll turn to the area of Emergency Planning. And we developed a new emergency plan for Fermi 3. We've separated it from Fermi 2. It's very similar to the Fermi 2 plan, but at the time that we started our combined license application, the Fermi 2 plan was undergoing a number of revisions, and it was going to become an administrative difficulty to try to keep the two in check.

So we separated the plan and we built a plan that's a Fermi 3 plan. Shares many commonalities with the Fermi 2 plan. And we share the emergency operations facility, the joint information center, and we capitalized with all of our long term relationships that we have had with the state and our local governments, counties.

And as part of the development of this plan, we performed a new comprehensive evacuation time estimate for this project.

Next slide, please.

So as I mentioned, we have a separate plan for Fermi 3. I think in the final analysis when we get to that point, we'll end up with a common plan.

CHAIR CORRADINI: So, if I might just

understand this. So the reason you have separate plans is just because of how the Fermi 2 plan was being modified?

MR. SMITH: Well, the Fermi 2 plan was in a --

CHAIR CORRADINI: Because it was being modified.

MR. SMITH: -- was in a different format and there were a number of changes that were in play with the Fermi 2 plan that would have made our development of our combined license application plan difficult to keep them in sync.

CHAIR CORRADINI: So, okay, if I say it back to you a different way. What you're saying is this plan that is documented here is not exactly the same as Fermi 2 but you expect, when all is said and done, they will be consistent.

MR. SMITH: Correct.

CHAIR CORRADINI: Okay.

MR. SMITH: Yes. They're not very inconsistent right now other than when you physically look at them, they look different.

CHAIR CORRADINI: Oh, you mean the way they read in terms of actions to be taken? But if you look at the details, they're essentially the same?

MR. SMITH: Correct.

CHAIR CORRADINI: Okay.

MR. SMITH: Probably didn't explain that very well.

CHAIR CORRADINI: No, no, no. I just , because of all things given where we are, this is important to understand how you have two plants on the same site. So I just wanted to make sure I understood what you're telling us.

MR. SMITH: Okay. So I'm not too far on my notes here, so.

So the one thing I was going to point out here that I had, excuse me for a second. The one thing that we have made it, actually, we'll have a license condition related to this is the Emergency Action Levels and will be developed for our ESBWR based on the methodology and NEI 07-01.

And the reason we don't have Emergency Action Levels specified at this point in time is that there are design parameters that we need to know in order to be able to establish those action levels. It won't be available until some point later in the process.

Next slide, please.

So on Emergency Facilities, this just

lists the facilities control room. It's where everything starts and where everything is commanded from. Technical Support Center, which is defined in the DCD. It's located in the Electrical Building. The Operations Support Center, it's location is also specified in the DCD in the Service Building.

Our Emergency Onsite Facility which currently exists on the site. It's about a mile and half from the plant proper in a facility that we call the Nuclear Operations Center, which is also our current training facility.

And then since we have an onsite EOF, we also have an alternate Emergency Operations Facility located about 22 miles from the site, in the Western Wayne Service Center, which is a Detroit Edison owned facility.

The Joint Information Center is at the Monroe County Community College, which is about 12 miles on to the west of the site. And our communications are described in the plan. And all the communications methods are described in the plan, as well as what we talked about in Chapter 9, which we will be talking about a little bit later today.

And then finally, this is just a map of where the site is, showing the Plume Exposure Pathway within a ten mile radius, and then the Ingestion Exposure Pathway, the 50 mile radius.

CHAIR CORRADINI: Go ahead. I'm sorry.

MR. SMITH: Oh, no. We're doing fine here, so.

And then, next slide, please. So emergency response again. The Control Room is the center for operational control of the plant. The TSC manages resources to support the Control Room when it's activated.

OSC provides manpower and support for the Control Room and TSC for in plant functions. The EOF directs Emergency Response Organization and coordinates with offsite agencies. That's where I've spent most of my time, in Emergency Response Organizations.

And the Joint Information Center is involved in the dissemination of information to the media. And nothing really unique.

The next slide is.

CHAIR CORRADINI: Any of these, just, if I might, and this is a bit off topic, but just so I understand. The way you described these functions, do any of these functions change order or roles if the site emergency becomes, it goes from various levels of, if it progresses to the point that I go from a, I don't know the proper vernacular, but let's say from a small emergency to a larger emergency.

MR. SMITH: So lowest levels in an unusual event.

CHAIR CORRADINI: Right. Do any of these functions change? That is, is the reporting structure or the authority move around as I move up the chain of potential?

MR. SMITH: From the standpoint of manipulating and doing operations within the plant, it always remains with the shift manager.

CHAIR CORRADINI: Okay.

MR. SMITH: So, at the lowest level of emergency, the shift manager fulfills the responsibilities of an emergency director. That's his role, and the control room and the control room staff are all trained.

CHAIR CORRADINI: Regardless of the level of the emergency?

MR. SMITH: Exactly. Because if you had an emergency that --

CHAIR CORRADINI: Yes. I just wanted to make sure.

MR. SMITH: Right. Exactly. Yes, so that

command in control always exists within the licensed shift manager.

CHAIR CORRADINI: Okay.

MR. SMITH: So then as you escalate in emergency levels, there are all these administrative responsibilities that grow with it. And are not necessarily the focus of the shift organization in mitigating whatever the casualty is their dealing with.

So that's why the concept of having these other facilities activate to coordinate outside activities, and provide information for the shift manager. But the command authority, you know, for doing things in the plant always remains with the shift manager.

CHAIR CORRADINI: Okay. But I'm with you there. So let me ask my question a little bit differently just to make sure I'm not misstating.

So that means as a potentially an emergency grows in magnitude, all of these things are become operational but all information must flow to the same individual or the designated position to make any decision about the plant operations.

MR. SMITH: Right. So we, you know, so the technical support center, the key word in there is support.

CHAIR CORRADINI: Understood. That's why I wanted to make sure.

MR. SMITH: Is to support. Okay.

And the operations support center is manpower, really field manpower within the plant. The coordination of that is done by the technical support center, but it's in conjunction with, no operation is done in the plant without the agreement of the shift manager.

CHAIR CORRADINI: Okay. Thank you.

MR. SMITH: The team works very well together, so. And then the emergency offsite facility, the offsite aspect of it is really what it's function is because it has all of the interfaces with the offsite organizations.

CHAIR CORRADINI: And again, an off, kind of an off base question, but I'm making sure I understand. So it's switched now to Fermi 2. There's exercising of all these command control connections and information flows in simulations. What is, I forget, I should know this. What is the frequency of the simulations you have to go through at these various emergency levels?

MR. SMITH: So, I'm going to.

CHAIR CORRADINI: This is just for information only for me.

MR. SMITH: Every two years we do an evaluated exercise.

CHAIR CORRADINI: But the exercise could be at various levels of simulators.

MR. SMITH: No. No. We do a, there are very large full participation exercises, but as a minimum on a two year basis, we do an exercise where we play with the counties and the state.

CHAIR CORRADINI: Okay.

MR. SMITH: So that portions of the exercise, and then I think it's once every six years that NRC and FEMA.

CHAIR CORRADINI: Are involved.

MR. SMITH: Are involved. I'm not sure about that frequency.

CHAIR CORRADINI: But that helps me at least just to --

MR. SMITH: Goes beyond my tenure as a emergency officer.

CHAIR CORRADINI: That helps me. Thank you.

MR. SMITH: Okay. So these are the agencies that we deal with. In the state of Michigan, I think we're very fortunate. Because the state police is the center of emergency management in the state of Michigan. So once the state is involved and the state emergency operations centers, we really have one principal point of contact between the emergency offsite facility and the state.

And then they disseminate information to the counties and others. They provide the interface for the state of Ohio. They provide the interface with the Province of Ontario.

As to the progress, so we don't find ourselves dealing with, you know, unprotective action recommendations to, you know, individual county, and at least it's done at the state level. And it works very well.

And then, you know, one of the uniquenesses we have here is where the Province of Ontario has a small sliver that's within the plume exposure pathway, and then, of course, the --

CHAIR CORRADINI: But you have to deal with the province's emergency management agencies.

MR. SMITH: Yes. Yes.

CHAIR CORRADINI: Okay. I forgot about that. You're right.

MEMBER ARMIJO: Yes, I think you're

unique. Is there any plants in the United States that have that?

CHAIR CORRADINI: Davis-Besse, Perry are not in that situation?

MR. SMITH: Davis-Besse's ingestion exposure pathway would encroach onto Ontario, as well as the Perry plant I think as well. I think --

CHAIR CORRADINI: That's what I was guessing.

MEMBER ARMIJO: But not the plumes.

MR. SMITH: Not the plume. I think we are unique from the standpoint of --

CHAIR CORRADINI: And Seabrook is the other one that went through my head and Vermont Yankee. Those are the other two that popped in my head is likely to involve Canadian.

MEMBER RYAN: Too far away from the border.

MR. SMITH: Too far away?

CHAIR CORRADINI: Well, then never mind. Sorry. Keep on going. Keep on going.

MR. SMITH: Anyway, so that's all I was going to say on this item. And we have certificates with all of these entities that, you know, as we put Fermi 3 into place, they will, they've agreed to work with us on the plan as they do currently in the Fermi 2, there's certification for that.

CHAIR CORRADINI: Okay. Thank you.

MR. SMITH: And then the last part of this was, we were going to talk a little bit about the evacuation time estimate. Like I mentioned, we had done a new evacuation time estimate for, as part of this project.

CHAIR CORRADINI: This is for both units or just for the area regardless?

MR. SMITH: For the area. Yes, it's really, I think independent of the unit. But 14 scenarios were considered. Everything was updated, you know, relative to the demographics of the area, considered different times of day, days of week, season, weather, and seven regions based on wind direction and strength.

And we also considered in this the impact of evacuation time on Fermi 3 construction workers during an accident at Fermi 2. And it was utilized in the development of the emergency plans. And we've communicated this with the state and the county, so they have already had the opportunity to take the benefit of this evacuation time estimate into their plans. And that's all I was going to say about that.

And then we have a number of post license activities.

CHAIR CORRADINI: Why don't I just go back to that since you highlighted this. This was required as part of the COLA or is this something you did along with it just to understand.

MR. SMITH: We had to update it because it --

CHAIR CORRADINI: Okay.

MR. SMITH: Yes. So, and then we, finally we have a number of like I indicated, a number of milestones for future activities, full participation exercise, onsite exercises. Development of detailed implementing procedures in accordance with the schedules I mentioned previously for procedure development. And then development of fully developed EALs and interaction with the state and counties regarding those.

And then we have a number of ITACCs that are related to exercising all of the aspects of the emergency facilities and the Emergency Response Organization in accordance with the plan.

CHAIR CORRADINI: Okay. Are there questions by the Committee? We'll turn to the staff then if we can. Staff is this, you got, all your folks are here?

MR. HINDS: We managed to round up twice the usual suspects.

CHAIR CORRADINI: Good. Well, send the suspects up.

MR. TONACCI: Mr. Chairman?

CHAIR CORRADINI: Yes.

MR. TONACCI: While we're waiting for the turnover, we are, I think, considerably ahead of schedule such that after lunch activities could be pulled forward.

CHAIR CORRADINI: I was going to suggest that. Is this the best time, so you need to contact other people?

MR. TONACCI: My guess, I don't know, I don't want to over estimate, but my guess is that we could probably at least start addressing Chapter 9 before lunch. So I'd like to do that after break maybe, if we could address.

MEMBER RYAN: We could take a break now.

CHAIR CORRADINI: You want to take a break now, and we can just coordinate that?

MEMBER RYAN: They can take all their folks and --

CHAIR CORRADINI: Yes. All right. Why

don't we take a 15 minute break now and start on the staff's part of Chapter 13 with the expectation we would immediately start go in with Chapter 9 following. Okay?

MR. TONACCI: We'll start pulling together. Thank you.

CHAIR CORRADINI: All right. So we'll take a break until 10:15.

(Whereupon, the foregoing meeting went off the record at 9:59 a.m. and went back on the record at 10:16 a.m.)

CHAIR CORRADINI: Okay, we're back in session. Let's get started with the staff's presentation for Chapter 13.

(Off the record comments)

MR. HALE: We have a number of presenters, so we may need to do a little shuffling of chairs.

CHAIR CORRADINI: Sure.

MR. HALE: But I'm Jerry Hale, Project Manager for the Fermi application. We're here to present SER Chapter 13 with no open items.

We have a number of presenters, and we'll start off with Rick Pelton who will present 13.1, 2, and then 13.5. Okay. Rick.

MR. PELTON: Good morning. I'm Rick

Pelton. I'm with the Operating Licensing Human Performance Branch in NRO, and we were part of the team that was responsible for reviewing the application for Sections 13.1, 13.2 and 13.5.

In Section 13.1, the Organizational Structure, there were two COL items. One, which requires the Applicant to provide, describe management tech support and operating organizations, and one that required the Applicant to provide their milestone for implementing firefighting training.

Staff confirmed that both of the items were addressed and there's no outstanding information expected to be addressed in the Fermi 3 FSAR related to this section. And the staff has determined that the Applicant, that DTE has provided sufficient information for satisfying the requirements of 50.40, 10 CFR 50.40(b) and 10 CFR 50.54(j-m).

Next slide.

For 13.2, which is training, there were two action, two items, one for reactor operator training and one for non-licensed staff training, which both require the Applicant to provide a description of the training and schedule for the licensed and non-licensed staff. The supplemental is a requirement to provide a schedule, or description of on a schedule for implementation of the training program, which is one of the appendices.

The staff's review confirmed that the items were addressed and that no outstanding information is expected to be addressed related to this section. And the DTE has addressed the COL items.

They've addressed the items and satisfied the requirements of 10 CFR 50.54, 10 CFR 51.20, and then the operator recall training and non-licensed staff training. And meet the requirements in Part 52, and then the operator licensing training and licensor requirements in Part 55.

Next slide.

13.5 is Procedures. And, here we go. They start there as 13.5.1 is Administrative Procedures and 13.5.2 is Operating and Maintenance Procedures. And there are many supplemental items being tracked by DTE related to the procedure programs.

The staff has reviewed the items addressed in 13.5.1 and in 13.5.2, and we expect no outstanding information to be addressed in the FSAR.

Based on the reviews, the staff has determined that sufficient information was provided to satisfy the requirements of 10 CFR 52.79(a)(14), (26), (29)(i), (29)(ii), (33), and (34), which are all related to the procedure development program for operating and emergency operating procedures.

That's it. Any questions?

CHAIR CORRADINI: None for me.

MR. PELTON: Okay. All right.

MR. HALE: Thank you, Rick. And Eric Schrader will present on 13.3, Emergency Planning.

MR. SCHRADER: As Jerry said, I'm Eric Schrader. I'm the lead reviewer for the Fermi 3 Emergency Preparedness section of the COL.

The staff review of regulations and guidance included 10 CFR 52.79 which requires an applicant for a COL to include information on emergency planning in their applications that complies with the requirements of 10 CFR 50.47 and Appendix E.

Detroit Edison provided the Fermi 3 emergency plan in Part 5 of its COLA, and in addition to the plan, the evacuation time estimate analysis for Fermi ten mile EPZ.

10 CFR 50.33(g) requires the applicant for a COL to include state and local emergency plans and describe both the ten and 50 mile EPZs. The Fermi 3 emergency plan supplemental information includes the

emergency plans for the state of Michigan, the state of Ohio and local governments for the counties of Monroe and Wayne.

10 CFR 50.47(a)(1)(ii) requires a finding of reasonable assurance that adequate protective measures for the public can and will be taken in the event of a radiological emergency, prior to the NRC issuing an initial operating license.

10 CFR 50.47(a)(2) requires an NRC finding of reasonable assurance to include the Federal Emergency Management, FEMA's finding and determination as to whether state and local emergency plans are adequate and whether there is reasonable assurance that they can be implemented.

They also reviewed the 16 planning standards of 10 CFR 50.47, any additional requirements of Appendix E to 10 CFR Part 50.

The NRC's staff's assessment as to whether there is reasonable assurance that the Fermi 3 emergency plans are adequate and whether there is reasonable assurance that they can and will be implemented takes into account both onsite and offsite plan reviews.

The staff used NUREG 800, Standard Review Plan for the review of safety analysis reports for a nuclear power plants light water addition, Reg Guide 1.101, Endorsed Guidance Criteria and NUREG 0654 as an acceptable method for complying with the planning standards identified in 50.47(b). Next slide.

The staff's review of the emergency plan focused on whether the plan represented an overall concept of operations for how the Detroit Edison emergency organization would respond to a radiological emergency at the Fermi site to protect the public health and safety.

The staff reviewed and evaluated evacuation time estimate analysis, dose assessment capabilities, adequacy of emergency response facilities, ability to communicate among staff and among facilities, federal, state and local governments, siren system and response to hostile action events.

Specifically, they reviewed the technical support center, which as the DTE representative noted, it's in the protected area in the electrical building and meets the standard plant design requirements of the ESBWR standard design.

Evaluation of the TSC size, location, habitability and ventilation is contained in NUREG-1966. The operational support center is located in a service building within a protected area separate from the control room. The OSC will provide an area for coordination of shift personnel supporting emergency response operations without causing congestion in the control room.

Activities include radiological surveys, repair and operation teams staging, coordination and how they are sent out into the plant for such things as first aid, search and rescue, damage control and emergency repair activities. It's not designed to be habitable under all emergency conditions, and emergency plan implementing procedures have provisions for relocating the OSC as needed.

The EOF will be a shared EOF with the existing Fermi 2 site. It's located approximately 5,000 feet southwest of the proposed Fermi 3 site on owner-controlled property. It's designed for habitability in the event of a postulated accidental radioactive release from Fermi 3.

It's designed with a protectant factor of 20, has an HVAC system with HEPA filters and has durable airborne radioactivity and area radiation monitors that alarm locally to assure that personnel exposures to radiological hazards do not exceed 10 CFR 20 limits. Next slide.

Post-COL items, license conditions, open items and confirmatory items. As Jerry stated, there are no open items. There are ten confirmatory items which will require the NRC staff to validate proposed revisions as being complete in the coming revisions to the Fermi 3 emergency plan and EP ITAAC.

The Applicant has proposed several license conditions including EP ITAAC to address items such as implementation milestones, a schedule for submittal of emergency plan implementing procedures, Emergency Action Levels developed in accordance with NEI 07-01, Rev. 0, with no deviations, and finalized letters of agreement with state and local governments. Next slide.

Results of the NRC staff evaluation of this information incorporated by reference in the DTE COLA application are documented in NUREG-1966. Staff's conclusion for Section 13.3, Emergency Planning, are subject to the successful closure of confirmatory items identified in the SER.

FEMA has reviewed the emergency plans for the states of Michigan and Ohio and the counties of Monroe and Wayne and provided an interim finding report of reasonable assurance, and concluded based on its review of offsite plans and procedures, there are adequate and there is reasonable assurance that the plans can be implemented with no corrections needed.

The DTE COLA includes post-COL activities, EP ITAAC, which are necessary and sufficient to provide reasonable assurance for onsite plans.

Based on the staff's evaluation of the Applicant's emergency plan for the proposed Fermi Unit 3, a review of FEMA's report of reasonable assurance finding regarding offsite emergency planning, the additional information and proposed textual changes provided in response to the staff's request for additional information, the staff finds that the Applicant's emergency plan meets the standards of 10 CFR 50.47(b) and the requirements of Appendix E to Part 50. Any questions?

CHAIR CORRADINI: Questions?

MR. HALE: 13.4, and I'll be presenting on 13.4.

CHAIR CORRADINI: Okay.

MR. HALE: Operational Program Implementation. Two COL items 13.4-1-A, Operational Programs, and 13.4-2-A, Implementation Milestones. Milestones were included in Table 13.4-201 of the FSAR includes both milestones, license conditions, that the Applicant has identified and also commitments that the

Applicant has identified.

The Applicant identified, well, there is a post-license, post-combined license activity, which states that "the implementation of each operational program will be evaluated by the staff according to the respective implementation milestone identified in 13.4-201."

And the Applicant identified the following license conditions. "No later than 12 months after issuance of the COL, applicant shall submit to the Director of NRO, a schedule for implementation of the operational programs listed in Table 13.4-201, including the associated estimate date for initial loading of fuel."

And the second license condition identified by the Applicant, "The schedule shall be updated every six months until 12 months before scheduled fuel loading, and every month thereafter until all the operational programs in Table 13.4-201 have been fully implemented."

Staff reviewed and concluded that the Applicant has adequately addressed COL items and supplemental information regarding the FSAR. Any questions on 13.4?

CHAIR CORRADINI: No.

MR. HALE: Okay. We'll go on to 13.5.

CHAIR CORRADINI: There's some duplication. I think that's where we are right?

MR. HALE: We're on 13.7, Fitness for Duty, which will be presented by Wayne Chalk. Wayne? We need to do a little shuffling.

CHAIR CORRADINI: You guys are done? Thank you.

MR. HALE: Wayne.

MR. CHALK: Good morning. I'm Wayne Chalk with the Office of Nuclear Security and Incident Response. Thank you for allowing me to present Fitness for Duty for you this morning.

I'd like to discuss an overview of our review, background information, application standards, technical review and then finally our conclusion on the application. Next, please.

Background information. Our program, Fitness for Duty, is governed by 10 CFR Part 26. It's fairly recently published in March of 2008. Became effective in April of 2008. Its purpose is to provide guidance, is a very prescriptive regulation on governing drug and alcohol and fatigue at nuclear power plants.

The phases of the FFD program for the

Applicant were operations program and the construction program.

The application standards for Part 26 are found in the guidance of Part 26 itself. For the operational program, it's Subparts a-h, n and o, and for construction it's Subpart k. The guidance that the directs the Applicant to comply with Part 26 is 10 CFR 52.79(a)(44).

Also there's a reference that's provided guidance, NEI 06-06, which is construction at nuclear power plants of the Fitness for Duty program there. And we're currently under compliance with Revision number 5.

The technical review consisted of the areas covered being adequacy of the construction phase and adequacy of the operations phase. There were milestones listed in the Applicant's Table 13.4-201 and there were no license conditions.

Our conclusion is that there is no outstanding information. There were four confirmatory items which all have been closed out by Revision 3 of the application. The COL is acceptable and it conforms to regulatory requirements. Are there any questions?

CHAIR CORRADINI: Thank you.

MR. CHALK: Thank you.

MR. HALE: 13.8, Perry. Okay, well, Section 13.8, Cyber Security, will be presented by Perry Pederson.

MR. PEDERSON: Good morning and thanks for the opportunity to address the Committee this morning. My name is Perry Pederson, I'm with NSIR, and we performed the review of the operating license applications, as well as the new reactor. Next slide.

So the basis for our evaluation, of course, is the new rule 10 CFR 73.54, which is part of 73.55, and the Cyber Security Program is to be integrated and part of the Physical Security Program and is dependent on physical security of course.

Appendix G, which is currently undergoing a revision to address, in particular, from my perspective, the cyber security events and what is a reportable event.

We reviewed the cyber security plan for Fermi 3, in accordance with all of this guidance, and kind of looking at that initial acceptance review LIC 109, we found all the pieces and parts were there and continued with our review. Next slide.

As I'm sure you've heard by now that cyber security is an operational program. Security is not an engineering problem that can really be solved by an equation. It's a program. It's programatic.

It requires that kind of attention and that kind of overview, and so it's not subject to an ITAAC. However, there will be some audits and inspections of the program, and Fermi has committed to be in compliance with 73.54 prior to fuel onsite.

The second point here is the clarification of scope provided by the Commission and in negotiations with NERC and FERC on the balance of plant dose systems that have a nexus to radiological health and safety are included within the scope. So they will be addressed and have been addressed in Fermi 3's plan as well. Next slide.

The format, or the template used by Fermi 3, was based on NEI 08-09 Revision 6, which we found acceptable. And this is a point just to clarify from an earlier statement, NEI 08-09 has not been endorsed by the NRC.

It's a technical distinction, but I think it's important to make. We found it acceptable for use and intend to endorse it in the next revision of our Regulatory Guide 5.71.

CHAIR CORRADINI: So, I guess I have listened to that. So from a process standpoint, until you endorse it as guidance, you look at each thing submitted on a case-by-case basis?

MR. PEDERSON: Yes, well we did --

CHAIR CORRADINI: I just wanted to make sure I understood.

MR. PEDERSON: Right. Right.

CHAIR CORRADINI: You've made that subtle distinction, and I want to understand what that means. I get it. Thank you.

MR. PEDERSON: Yes, and I think the answer to that is we would still look at everything even if it were endorsed. We would still look at everything.

CHAIR CORRADINI: But it's even more subtle that I understand then. Let's go on.

MR. PEDERSON: Okay. So we found that these two documents to be equivalent, and that if Applicant followed the template in 08-09, that that was acceptable. So, let's see here. Yes, this kind of jumps to the conclusion, the last bullet, so you can read that, but let's go to the next slide.

Here we have all the sections that are addressed within the cyber security plan itself. And there's only one section that deviated from that found acceptable NEI 08-09 template. And that's the section on document control and records retention.

And the reason we issued an REI in this case is that in our review, subsequent to finding that template acceptable, we had a question with the language there and whether it actually met the requirements of the rule.

So, in fact, on the operating side doing the licensing reviews for the operating reactors, we issued a generic REI to address this question.

So this was a case where the Applicant followed the template, but we found that that template language, in fact, didn't really meet the requirements of the rule. So the folks at DTE, they responded to that REI and we found their response to be acceptable. So that was the only deviation from the template, but then that was corrected through the REI process.

So unless you have any other questions on any of these other sections within the cyber security plan as noted in the previous slide, we found the submission to be acceptable and provides a good description of a cyber security program.

CHAIR CORRADINI: Are there questions by the Committee? All right. Thank you very much.

MR. PEDERSON: Okay.

CHAIR CORRADINI: Yes, Jerry.

MR. HALE: As many of you know, recently

the NRC published what's been called the EP rule to finalize enhancements to emergency preparedness regulations. I think Dan Barss would like to make a statement on this.

MR. BARSS: Yes. The rule was published on the 23rd of this month, just a week ago, and it's effective the 23rd of December. And it does have some impact on COLs, COL applicants, and we do want to not make that comment to you since this is kind of a current event, and to let you know, as far as this application goes, they are in compliance with the regulations that were written.

And actually written into the rule that's being published is special language that handles COL applicants. We've done all this review work and now we've changed some of the rules, some of the game.

And what we've built into the rule is deferred implementation opportunity for the applicants. And it hinges on when they'll get their COL. To get their COL before December 31st of 2013, they get to see whether they can defer implementation of these things until after.

If they're not going to get their COL before that, then they have to go back and look at what changes were made and actually make amendments to the application and bring it into compliance. And --

CHAIR CORRADINI: Substantively, what sorts of things would be affected by the change in the rule?

MR. BARSS: Most of us, I think all of us have known about it along the way, so they're pretty much already in there. Some of the things that have been, do change, like the evacuation time estimates.

They have reduced your requirement for updating them. There now is a requirement for updating the evacuation time estimate.

And built into the rule now it says for COL, after the COL is issued, 365 days before they go to load the fuel, they have to do a review on their evacuation time estimate and determine whether they need to make any adjustments.

For an operating licensee, they now have to implement that requirement and do it at the rate and frequency required. For a COL or early site permit applicant, they don't have to do that review until just before they get ready to load the fuel because obviously there's no danger to the public, you know, for a plant that's not built or operating yet.

CHAIR CORRADINI: Understood.

MR. BARSS: So we built in things like

that with the reasonable expectation to when, and that's probably the biggest one that would impact, you know, I can think of.

And we just want the Committee to know that the rule was just, you know, passed. It is going to be implemented as of the 23rd of next month and there will be some provisions or some changes that this Applicant will need to look at and consider in the future.

CHAIR CORRADINI: Okay. Thank you very much.

MR. HALE: If there are no further questions, we'll move on to Chapter 9.

CHAIR CORRADINI: No, I think we're set with Chapter 13. We should move on, if we can, to Chapter 9. And we welcome Mr. Stetkar to the Committee.

MR. JENKINS: Mr. Chairman.

CHAIR CORRADINI: Yes.

MR. JENKINS: Perhaps we might want to consider moving to the follow-on issues from the October ACRS meeting. One of our reviewers is physically not here and --

CHAIR CORRADINI: Okay.

MR. JENKINS: -- and so the flow may work better if we put Chapter 9 after this next section.

CHAIR CORRADINI: That's fine. All the DTE people are here, so I don't think it matters to them if we do the issues versus the Chapter 9 first. Is that all right gentlemen?

MR. SMITH: Yes, that's okay.

CHAIR CORRADINI: They look happy, so yes, that's fine. We'll just flip it around. We'll discuss the things that were essentially follow on items that we just had individual questions on, that they were going to come back to us on. And then we can take Chapter 9.

MR. JENKINS: Thank you.

CHAIR CORRADINI: Thank you. I hope you find him. So Peter, you're still, the --

MR. SMITH: Yes, I'm going to speak to the open items.

CHAIR CORRADINI: Okay. Do you need any company up there?

MR. SMITH: What's that? Okay. I'm sorry. I'm just waiting for the slide show to come up.

(Off the microphone discussion)

MR. SMITH: So, one, I think you appreciated one thought provoking questions from the last meeting.

CHAIR CORRADINI: You're very kind.

MR. SMITH: All really good questions. So the first slide on Page 2 is a list of the questions. There's one not in here that we have integrated and that was the one related to the hydrogen.

CHAIR CORRADINI: Okay.

MR. SMITH: And that we've integrated into the Chapter 9 presentation, which is where we talk about hydrogen water chemistry and hydrogen storage, so.

CHAIR CORRADINI: Okay.

MR. SMITH: So, just a recap of the questions, and then we'll just move onto the next slide, which is the first of the questions. And it was related to the toxic gas analysis.

And basically, the discussion around that was, you know, we had demonstrated that we didn't need safety-related toxic gas isolation instrumentation. And the question was raised regarding whether or not we intended to have some sort of monitoring instrumentation that would alert the operators.

So we went back and looked at that. And the short answer is that, you know, we don't intend to install any additional instrumentation. The rationale for that is, is that, one, we do have a low hazard, but beyond that, there really is an extensive scheme of emergency planning activities that are mandated by the 1986 Emergency Planning and Community Right-to-Know Act, and EPCRA is what it's referred to, and then Title 3 of the Superfund Amendments and Reauthorization Act.

And so when I started going into looking at the scheme that exists within the state and county emergency planning structures and the training that goes down right to the level of first responders to accidents in police and firefighting, and that there's a scheme that already exists that, you know, based on the level of an incident that would occur involving the hazardous materials, we would be informed. And there are entries into the Monroe County emergency plan, for example, that talk to that.

So that was the conclusion for us. And then the other, the last piece of that is adding something additional. It brings with it a number of long-term operational and maintenance burdens that tend to take resources that would otherwise be directed to things that may be more safety significant.

CHAIR CORRADINI: So can I say it back to you?

MR. SMITH: Certainly.

CHAIR CORRADINI: No.

MR. SMITH: Yes.

CHAIR CORRADINI: Because you're covered by offsite procedures?

MR. SMITH: Yes, well, this is --

CHAIR CORRADINI: I mean, I'm being somewhat curt about it, but I want to make sure I'm clear. What I'm hearing you tell us is that the onsite chemical hazards are small so, if there were no offsite surrounding issues, no. But because there are potential ones, you're covered by procedures that are offsite and you would be alerted by them?

MR. SMITH: Yes.

CHAIR CORRADINI: Some train derails, a car overturns.

MR. SMITH: We've already established that we don't have to have protection --

CHAIR CORRADINI: Right.

MR. SMITH: -- in the design because of the distance and low hazards.

CHAIR CORRADINI: I understand, but my logic though is still, what I'm saying from a logical standpoint is, have I got it right? And that is if there were something, it would occur offsite, and offsite authorities would alert you.

MR. SMITH: So for example, a transportation accident on I-75 that involves a hazardous material. The first responders to that from the police and the fire --

CHAIR CORRADINI: Would alert all people in the area.

MR. SMITH: -- would make an assessment, and they're trained to do that, of the nature and significance of that event, and it would escalate within their plan to the point. And if it was going to impact us, we would be informed. Okay?

CHAIR CORRADINI: All right. The Committee will speak up if they need to. I just want to make sure I get it right.

MR. SMITH: Okay. No, I appreciate it.

Okay. The next one is we wanted to talk about D-RAP.

CHAIR CORRADINI: Mr. Stetkar is here.

MR. SMITH: So two things here is that, you know, we went off and, you know, we hadn't thought too much about the question that you raised. And the question really was, you know, if I went off and took the risk importances that I used for Fermi 2 and applied them to Fermi 3 I'd get this huge list of things that shouldn't be in there.

So as we went off and reviewed all of the associated regulatory guidance. What we discovered is that it's not prescriptive in the guidance as to what measures we have to use. So --

MR. STETKAR: It's not prescriptive in the regulatory guidance. On the other hand, you have a DCD with a list of equipment that's based on certain numerical importance measures and you've committed to follow NEI guidance that does indeed refer to different numerical importance measures. And, therefore, there's an inconsistency in your commitments.

MR. SMITH: But the NEI guidance provides us flexibility. That's what our conclusion was in the review of the NEI guidance.

Do you want to speak to that Patricia?

MS. CAMPBELL: The FSAR refers to NEO 702(a) which refers to NUMARC 9301 for Section 9.3.1, and it has flexibility in the factors.

MR. STETKAR: Okay, it does. On Unit 2, what numerical importance measures do you do on your existing maintenance rural program? What numerical importance measures do you use?

MR. SMITH: I don't know off the --

MR. STETKAR: My only point is that if a certain piece of equipment is deemed to be important to risk, at a particular plant, because it has a risk achievement worth of two. In other words, it will increase the core damage frequency by a factor of two if it is failed.

That's a, it's a numerical measure, but it's a qualitative assessment of importance. It says, hey, if this piece of equipment can increase my core damage frequency by a factor of two, I'm going to determine that that's an important piece of equipment and I should take care of it.

That's a qualitative assessment of importance to safety translated into a numerical measure. Now you're saying, however, on this other plant, well, I don't care.

If this particular piece of equipment increases my core damage frequency by a factor of 4.9, I don't care about it, because it's less than five.

I don't understand that discrepancy, especially with a, not a sister unit, but within your own organization if you're using those risk achievement worth and Fussell-Vesely importance as measures of your determination of what is important to safety.

In the Detroit Edison family, how you can rationalize that something that is two and half times more important to risk at Fermi Unit 3, isn't important.

So that's the question. There's a philosophical disconnect here, in my mind anyway.

MS. CAMPBELL: I think it goes back to the --

MR. STETKAR: And I don't care about flexibility. I mean you had the flexibility on Unit 2. You could have used the same type of flexibility. I would, I don't know what numbers you're using.

MR. SMITH: But the core damage frequency on Fermi 2 is significantly different from --

MR. STETKAR: It's a fractional contribution. It isn't an absolute value.

MR. SMITH: Right.

MR. STETKAR: That's the reason that they use fractions and not absolute contributions. But the determination of the relative importance of a particular piece of equipment to the safety of that plant regardless of what the absolute safety is.

DR. KRESS: Yes, that's always been a question I've had. As you know, I'm on the Committee.

And my opinion was that you're really trying to keep below some sort of acceptance value. And that does involve the absolute value of CDF and LERF. So it's always been sort of strange to me that we use something like a fraction change --

MR. STETKAR: It does, but that's what people use right at the moment.

DR. KRESS: I know. But that's always seemed strange to me.

MR. STETKAR: I only bring it up because the ESBWR and their design certification is the only design center that's under current review that uses substantially larger margins, numerical margins.

DR. KRESS: I would actually go to a --

MR. STETKAR: That's okay.

DR. KRESS: -- to an absolute --

(Simultaneous speaking.)

MR. STETKAR: There are different opinions about risk metrics. My question was prompted by the notion that, of the inconsistency between the design certification. And when we asked GEH about this during the design certification process, they had a rationale about why, you know, their margins were different. It's fine.

The question was precipitated in terms of now Detroit Edison's interpretation of what is important to safety going forward, and how is that measure of importance interpreted consistently, you know, even within the organization. Because, for example, if at Unit 2 they're using kind of the traditional numbers that most people use, and I don't know whether you are or not.

DR. KRESS: I think this is a subject that ACRS ought to be looking into.

MR. STETKAR: It gets into the risk metrics, the whole risk metrics things, but --

DR. KRESS: Yes.

MR. STETKAR: The subject of this meeting is, you know. Detroit Edison you're feeling, you know, a bit of the brunt of this, so, and I know the flexibility that you can read the words in there. I know in practice what people use, you know, out in the industry.

MR. SMITH: And, you know, I think it was clear that we hadn't really thought that far ahead, you know, in the last meeting. And I don't know that we're at a conclusion today either.

MR. STETKAR: I was going to say, are you going to clarify that going forward, because it is addressed not as quantitatively as I brought it up, but it is addressed in that section of your FSAR, which is what precipitated the question originally.

MR. SMITH: So, ultimately, we will. Because we're going to cross that bridge.

MR. STETKAR: Yes.

MR. SMITH: So now that we're aware of it, we can cross that bridge sooner than later.

CHAIR CORRADINI: So tell me the bridge you're going to cross and when you plan to cross it on. I understand the issue, but I'm a lot more cloudy than Mr. Stetkar on this, but the inconsistency exists. You see it. And now, what is the plan?

MR. SMITH: Now? So I have a lot of things to go through before we even decide to build this plant. So, and then sometime after that time frame, I have a milestone that says I'm going to have these programs in place, so.

MR. STETKAR: So most likely, something about the program implementation will have to be modified.

MR. SMITH: Or we'll have to address it in our tracking system before then.

MEMBER ARMIJO: Or defend it.

CHAIR CORRADINI: Yes, but you can't defend the inconsistency. I guess is what I'm, you know.

MR. STETKAR: What I'm hearing you say though, Peter, is that you're aware of the inconsistency --

MR. SMITH: Yes, that's what I answered.

MR. STETKAR: -- and you're not going to formally address it until you actually develop the implementing procedures for your maintenance program. Is that appropriate?

MR. SMITH: There may be others who cross this bridge before I do as well.

CHAIR CORRADINI: And you might be helped out by them.

MR. SMITH: I might benefit from that, or, and so, but I just --

MR. STETKAR: Probably not for ESBWR, because we have looked at some COL applicants for other design centers and they, at least in the COL applicant phase, have used the, let me call them the traditional risk importance measures. For whatever reason.

MEMBER ARMIJO: I'm confused. Your handout says there are no inconsistencies between the D-RAP and the maintenance rule risk significance measures. And now you're saying there are.

MS. CAMPBELL: But, this is Patricia Campbell from GEH. There really are no inconsistencies, and I don't think that it's appropriate to say that they're inconsistent. The D-RAP list will become part of the maintenance rule and the maintenance rule will be developed using the D-RAP list and it will have an expert panel to look at what other equipment would be added. And --

MEMBER ARMIJO: Did the risk significance measures come along with the D-RAP list or are they already specified?

MS. CAMPBELL: The D-RAP list is based on the risk measures that are given in the ESBWR and, I don't want to speak for DTE, but I understand at this point, that DTE intends to use that risk measure for developing the D-RAP list that will become part of the maintenance rule.

So it would basically in the way the FSAR is written now, it's consistent with the ESBWR. And the maintenance rule section of the FSAR is also consistent with ESBWR.

And the ESBWR does have the lowest core damage frequency --

MEMBER ARMIJO: I understand that.

MS. CAMPBELL: -- and the way that it

appears that some of the NRC guidance is coming out, and I'm sorry that the NRC staff members are not here to speak to this. I think it would be good if they were here.

But there is some thought already in the movement toward using the CDF and that one size doesn't fit all. So that's already reflected in some portions of Reg. Guide 1.174, the May 2011 version. So we don't believe that there are any inconsistencies, even using the risk measures that were approved for the ESBWR in implementing the maintenance rule using those risk measures.

CHAIR CORRADINI: Does that help you?

MEMBER ARMIJO: Well, it's not what I heard John say. That's my problem.

MR. STETKAR: The problem is an interpretation, and everything that GEH has said from a legal licensing prospective, is true. I cannot dispute anything that they said.

The NUMARC document that is referred to provides guidance, but there's also words in there that says it's flexibility. All of that being said, the industry has accepted risk achievement worth and Fussell-Vesely importance measures. I can't speak for every utility because I have not looked at every utility. But they're pretty universally applied.

Of risk achievement worth of two and a Fussell-Vesely importance of .005 as determinations of risk important structures, systems and components.

And many of the other design centers, I can't speak for all of them because we've not reviewed all of them, also use those same measures regardless of what they're currently estimated design certification incomplete PRAs estimate for what their core damage frequencies might be. Not knowing what those core damage frequencies will actually be when the PRAs are completed and are full scope.

So arguments necessarily about absolute core damage frequency are somewhat speculative until the PRAs are actually developed to a level of consistency that comply with all of the standards, you know, or all of those things that have to be in place a year before fuel load and everything like that.

It's a matter of, in some sense, it's a matter of philosophy, and this issue is being discussed with the staff at several levels. And it's more important. The reason I brought it up with Detroit Edison is because it's, you know, it's a matter of sort of corporate interpretation of that transition process.

And I can understand, you know, I can understand. I just wanted kind of an answer of whether you thought about it. I sort of get where you're headed. And eventually, I understand it will get sorted out. It's not going to get sorted out right at the moment.

CHAIR CORRADINI: So if I, again, going from a, now that we've had this conversation, I'm in Sam's corner about this. I'm fuzzy.

So my interpretation is, let's not use the word inconsistency, but something needs to be sorted out before this plant is up and running relative to how something translates from D-RAP into maintenance rule.

MR. SMITH: We agree with that.

CHAIR CORRADINI: A sorting out process needs to be gotten. At least that's how my understanding is.

MR. BRANDON: This is Mike Brandon. My understanding of this is everything that is now captured in D-RAP will be captured in the latest rule program. Okay? What's captured in the maintenance rule program will grow as our knowledge and detail design is further developed. Okay?

The D-RAP may grow because of that as

well. But also in the maintenance rule, we will include additional things above and beyond what's considered D-RAP by the expert panel.

CHAIR CORRADINI: That's what I would term as a sorting out process.

MR. BRANDON: Right.

CHAIR CORRADINI: Good.

MR. BRANDON: So what's in the D-RAP will by definition be in the maintenance rule. And by definition, there will be additional things in the maintenance rule that are identifying, interviewed by the expert panel.

CHAIR CORRADINI: Okay, fine.

MR. STETKAR: You just don't know, you don't know where that --

MEMBER ARMIJO: The inconsistency went away because --

MR. STETKAR: -- you know, what the population of that additional --

MR. BRANDON: Right. In the criteria phase.

MR. STETKAR: And the specific criteria that might be applied.

(Simultaneous speaking.)

MR. STETKAR: But that's the process.

CHAIR CORRADINI: But that's fine. But I think we're okay. We should move on. We do have the lingering generic issue that we will love to talk about it another time.

MR. STETKAR: That's a generic issue. In fact, we do have, and we're having dialogue with the staff about that. We have a meeting on it in January.

CHAIR CORRADINI: Move to another question.

MR. SMITH: Next one. Loss of offsite power frequencies. So the question was provide the basis for the loss of offsite power frequency that was used in the PRA evaluation. And so, we went back and did a little bit of homework of where our numbers came from.

And the 1.73 times 10^{-2} frequency was based on Fermi 2 PRA analysis which would be updated to include the 2003 event with a Bayesian update.

And that number was previously reviewed with the staff associated with the license amendment for Fermi 2 that extended emergency Bayesian generator AOTs in the 2006 time frame. So that number is less than the mean that was used in the ESBWR PRA.

And we also looked at it from the standpoint of, you know, what was the distribution considered in the ESBWR PRA. And, you know, even if we took the one over 24 events, or two over 24 events, they're still within the range of uncertainties that were considered in the PRA.

CHAIR CORRADINI: Any comments by the Committee? I'm going to have turn to somebody else. John, do you have any comments at this point?

MR. STETKAR: No. I think that's fine.

CHAIR CORRADINI: And then.

MR. SMITH: So the next question.

CHAIR CORRADINI: Is going to be picked up later I guess.

MR. SMITH: Well, so we have it later in our slide. So what I wanted to let you know is what we were doing on this particular one. This is related to the service water, loss of service water.

So we couldn't answer the question when we were here last time. And we went back and we looked into the details of the ESBWR PRA. The initiating frequency for loss of service water came from the industry, the industry documents that was considered for an initiating event.

And the ESBWR PRA, as you pointed out John, did not model the transition from the normal power heat sink where we would normally be using in the natural draft cooling towers as our source of cooling water to the auxiliary heat sink mechanical draft cooling towers.

And so once we had figured that out, we set GEH off on to turning those number for us. And over lunch I was going to actually get a --

MR. STETKAR: Okay.

MR. SMITH: -- review of the numbers. We have the numbers but they're not verified yet. And so, but that's the answer to the question. And --

MR. STETKAR: I think one of the, I mean that was, you know, we noted sort of the omission from the modeling part of the thing that a bit of the problem on some of the gen-air initiating event frequencies for things like loss of service water, if I can call it that, loss of compound of cooling water, is that the plant-specific configurations of those fluid systems are so different that it's really difficult to sort of rationalize the gen-air frequency.

You really do need to look at the plant-specific configuration and whether any switching is involved and how many pumps you have and that sort of thing. It sounds like you're headed down that track, so that --

MR. SMITH: Which ultimately we will be required to do with our --

MR. STETKAR: Which ultimately you'd be required to do. It's just a question of how it's addressed here.

MR. SMITH: Okay. Thanks. So we still owe you some info on that, but it's forthcoming. We just didn't have enough time.

And then the last one, and actually we wanted to talk about the, the impression was regarding flooding.

MR. STETKAR: This is the one where we provide bases-wide flooding in the yard is not a concern?

MR. SMITH: Correct.

MR. STETKAR: Okay.

MR. SMITH: So the ESBWR PRA excludes consideration of flooding from external sources by specifying site parameters that preclude flooding from external sources. The PRA addresses internal flooding of the plant as an external event. And it says "see Section 1.3.2 and Section 13 of the PRA."

An exclusion is consistent with the ASME PRA guidance for screening external scenarios with a frequency of less than 1E X 10^{-6} events per year. And the Fermi 3 site characteristics are bounded by the ESBWR site parameters with margin, and Fermi 3 site flooding event from external sources has an exceedance probability of less than 1E X 10^{-6} is our conclusions.

MR. STETKAR: That last bullet, that statement though, did you do an analysis to confirm that?

MR. THOMAS: No.

MR. STETKAR: I mean, that's a statement, but --

MR. THOMAS: That statement's directly from the ANSI standard ANS-2.8-1992, which is titled, "Determining Design Basis Flooding at Power Reactor Sites."

It says, "The following combinations of flood causing events are considered to have an exceedance probability of less than 1 X 10^{-6} and shall be used if they apply as design flood bases for power reactor sites."

So we used that combination of events to determine our design basis flood.

CHAIR CORRADINI: I don't appreciate. Can you say that again. I'm confused. I'm sorry. Maybe everybody else got it. I don't get it.

MR. THOMAS: The ANSI standard specifies

or provides the methodology for calculating your design basis flood. And it provides different scenarios to be considered depending if you're on an ocean, or if you're a lake, or a stream --

CHAIR CORRADINI: Okay.

MR. THOMAS: -- and the opening statement as part of the ANSI standard, or as part of the ANS standard, you're supposed to look at combinations of those events occurring simultaneously, you know, could it be a flood on a nearby stream coupled with a surge from the lake, a wind driven event in that case.

In the opening statement where it talks about those falling combinations of flood causing events, it states that these combinations have an exceedance probability of less than 1 X 10^{-6}.

MR. STETKAR: What's the basis for, I mean who did, I haven't studied that document. I have studied a lot of flooding analyses. I have seen a lot of floods that were predicted as once in 10,000 floods that have occurred twice in ten years, so I'm aware of the optimism in outdated documentation. What analyses were done to justify those numbers for your particular site?

MR. THOMAS: It specifies more the methodology that's used, you know, which would be, like in this case, the maximum flood for the Fermi site is a surge from Lake Erie which is driven from the east.

And you start off with an initial lake level that's your 100 year lake level, 100 year max. You apply 100 mile an hour wind. In this case, we applied 100 mile an hour wind, and it took several hours to build up that water level to reach the static water level.

Our three second gust at the site is less than 100 miles per hour, so the probability of having a 100 mile an hour wind persist for several hours is a variable probability event. Just, you know, looking at a three second gust.

Our max predicted flood level is 3.9 feet below site grade. The DCD parameter is one foot below site grade or the site parameter. So we have 2.9 feet of margin between the actual flood predicted level and the DCD parameter.

It would take a, you would have to increase those, you know, either the initial lake level in combination with that wind to get that flood level up higher, because if you start pushing that water level and you have one level towards the west, it's going to flood out a significant land mass.

MEMBER ARMIJO: Have you analyzed and dispositioned a seismically-induced flooding equivalent to a Tsunami from Lake Erie on your site?

CHAIR CORRADINI: I think that's what we just talked about.

MEMBER ARMIJO: That was just wind-driven. You've been doing wind driven. I'm talking seismically generated.

CHAIR CORRADINI: Oh, seismically.

MR. THOMAS: We did not calculate a seismically-induced Tsunami.

MEMBER ARMIJO: I don't know anything about the seismicity of that area or anything like that but is that part of your analysis?

MR. THOMAS: We did look at the history of tsunamis in the area of the plant and there has been no recorded events in the vicinity of the plant. And that's recorded in Section 2.4 of the FSAR.

MEMBER ARMIJO: Okay. So basically, you don't see a risk from a seismic generated --

CHAIR CORRADINI: So can I say it back to you so I get it right? So the last part of how you kind of worked through your logic, now I get. But your point is with that margin and with the guidance that falls below the exceedance probability level?

MR. THOMAS: That is correct.

CHAIR CORRADINI: With this combination of events and with the numerical values you estimated from the wind, from the highest point in the lake, et cetera, et cetera.

MR. THOMAS: That's correct.

MR. STETKAR: And you say even with a 100 mile an hour wind-driven flood, you are still almost three feet below.

MR. THOMAS: We are at 2.9 feet of margin --

MR. STETKAR: Of margin, yes.

MR. THOMAS: -- below the DCD value.

MR. STETKAR: Okay. Okay. All right. Thanks.

CHAIR CORRADINI: Anything else from the Committee? We're going to pick up the service water when we talk about Chapter 9.

MR. SMITH: If we get a chance to convene here to talk about the numbers.

CHAIR CORRADINI: That's fine. That's fine, but we'll get it eventually. But I understand where we're going with that.

MR. SMITH: And the hydrogen. The one remaining is the hydrogen that we'll pick up with

Chapter 9.

CHAIR CORRADINI: I was confused. That's my mistake. Okay. Anything else from the Committee? We can switch over and have you guys begin your Chapter 9 discussion.

MR. SMITH: Okay.

CHAIR CORRADINI: Is that all right?

MR. SMITH: Yes, that's fine with us.

CHAIR CORRADINI: Okay.

MR. SMITH: So Ryan Pratt and Nick Latzy are going to run through this presentation. If you want to just advance to their first slide of what we're going to talk about here.

Ryan's going to talk about 9.1 and 9.2. Nick 9.3, and 9.4 is an IBR section, as well as 9(b). And Nick will be doing 9.5 and 9(a).

So with that, Ryan?

MR. PRATT: All right. Thank you, Peter. Good morning. My name is Ryan Pratt, Licensing Engineer with Detroit Edison. And as he said, I will be discussing the first two sections of Chapter 9.

Section 9.1, Fuel Storage and Handling, incorporates the DCD by reference with two COL items. The first item describes the scope of the fuel handling procedures and it commits to developing these procedures six months prior to fuel receipt. Additionally, the first item describes the requirements for testing and inspection of fuel handling equipment.

The second standard COL item identifies requirements for handling heavy loads and safe load path procedures, which are to be developed prior to fuel load. Inspection and testing requirements for heavy load lifts are also described.

Section 9.2, Water Systems. This section incorporates the DCD by reference with standard COL items, standard supplemental information and site-specific conceptual design information.

The first water system described. The plant water service system is a RTNSS Class C system. The plant service water system has two independent redundant trains that provide cooling water to the reactor component cooling water system and the turbine component cooling water heat exchangers.

The PSWS rejects heat to either the normal power heat sink or the auxiliary heat sink, and the normal power heat sink utilizes a natural draft cooling tower while the auxiliary heat sink uses the mechanical draft cooling towers.

MR. STETKAR: Ryan, you don't have a

drawing of that system here in your slides do you?

MR. PRATT: Not in the slides, no.

MR. STETKAR: There's one in the back up slides? Do you have any?

MR. PRATT: I don't think so.

MR. STETKAR: Doesn't sound right.

MR. PRATT: No.

MR. STETKAR: Okay. I have a couple of questions. This relates back again in terms of, because I'm a PRA guy, and I always think of reality of the PRA versus the actual design.

The PRA says that it conservatively accounts only for the auxiliary heat sink. I'm sorry, alternate heat sink. Auxiliary heat sink.

It assumes that the cross-tie valves at both the discharge side of the PSWS pumps and the return valves to the auxiliary heat sink cooling towers are all open. Such that, for example, any pump can supply both trains of reactor cooling water system or reactor compliment cooling water system and the turbine component cooling water system and either cooling tower can cool all of the heat loads.

Actually, now I'm assuming you're going to normally operate the system with flow back to the normal cooling tower, which means that the return valves to the alternate heat, auxiliary heat sink cooling towers will be closed because the water has to know where it wants to go.

Which means that those valves actually need to open under some conditions, which means they can be subject to failures, common cause failures, power supply failures, all kinds of failures that are not modeled at all in the PRA.

Are there, do you know, are there any signals that will essentially transfer from the normal heat sink to the alternate heat sink, the auxiliary heat sink? You know, any automatic signals?

MR. SCHUMITSCH: This is Skip Schumitsch with the GEH. On a loss of preferred power, everything will align back to the auxiliary heat sink so I --

MR. STETKAR: Okay. So loss of preferred power is one thing that we'll do that.

MR. SCHUMITSCH: I think the main thing we're concerned about with this normal heat sink of losing the circ water pumps at that point.

MR. STETKAR: Okay. So loss of preferred, if I looked at the I&C someplace, I'd find at least that signal that would transfer.

When it does that realignment, do you

essentially sectionalize the system so that train A supply goes to train A loads and comes back to train A cooling tower and train B supply, if I call them train A and train B, go to train B loads and come back to train B cooling tower?

MR. SCHUMITSCH: I don't believe the DCD says that but the FSAR actually says that after ILLOP, that's what happens.

MR. STETKAR: So it actually does sectionalize. So it's, okay, I mean that sort of makes sense in terms of cooling capacity because the PRA essentially says one cooling tower can cool all loads, but with the return line completely open, half my molecules are not going to get cooled.

And it's not clear to me that a cooling tower cooling half my molecules can actually cool all of the loads. So if the line up actually does sectionalize it, I understand how it will work.

It's one thing that you really need to look at again when you update that PRA to make it plant specific.

MR. SMITH: The success criteria for that transition.

MR. STETKAR: Right, because in this area, I believe the PRA is quite optimistic in terms of not looking at either the failure modes or dependencies because it essentially says you can cool anything with anything, which is not actually true, especially under those loss of power conditions.

MR. SCHUMITSCH: This is Skip Schumitsch again. I don't know if it helps, but the reasons I know these answers is because of the task Peter has given me to do that.

MR. STETKAR: That's excellent. That's why you're here and it's probably why I'm here. So, thanks.

MR. SCHUMITSCH: Let's see. That's all I had on plant service water. Thank you.

MR. HINDS: This is David Hinds, GEH. We are doing a sensitivity study at this time for that specific --

MR. STETKAR: There's one thing that I came up, you know, I don't recall whether I asked it during the PRA review but, if I were going to do a bounding-type PRA analysis, I would have probably done the bounding PRA analysis on the auxiliary heat sink which you did, but I would have aligned it by train.

MR. HINDS: Thanks.

MR. PRATT: Okay, next slide.

The plant service water system uses carbon steel piping for both buried and above grade portions. Corrosion protection is consistent with ASME B31.1 for the buried portions of the piping.

And the PSWS basin has capacity for seven days of heat removal without active makeup, which is to be confirmed by an ITAAC. Next slide.

MR. STETKAR: Another question. That calculation for the seven day cooling cites a number of 1.92 times ten to the tenth BTUs, and I think, I'm not sure, but that may account only for reactor compliment cooling water system loads. Is that correct?

MR. LIEBERGEN: This is Adam Liebergen from Black & Veatch. That does account for reactor component cooling system loads only, because of the seven day event you're on diesel power. So you do not have the turbine component cooling water system active.

MR. STETKAR: Okay. Let's now talk about not the artifice of design basis single failure coincident loss of offsite power construct. Let's talk about real accidents where you indeed would have a reasonable fraction of the stuff out in the turbine building still operating needing cooling.

Let's talk about the PRA that takes full credit for the stuff out in the turbine building for accident mitigation, namely the condensate systems and the main feed water system that's cooled by turbine component cooling water.

How long can the inventory of water in your basin remove heat from the reactor component cooling water system and post-trip, because I grant you you're going to lose some of your heat loads out in the turbine building when you trip, but not all.

Post-trip heat loads out in the turbine building which would indeed be the load that you're evaporating water from. In the real world, when you have transient events. You understand my question is.

You say you can make it for seven days based on RCCW heat loads. The question is how long can you make it based on RCCW head loads plus expected post-trip TCCW heat loads.

And if you can't make it for seven days for that, are the operators instructed to actively isolate TCCW and what are those instructions?

MR. LIEBERGEN: The post seven day assumption assumes you do not have any of your non-RTNNS for support.

MR. STETKAR: I understand what the assumptions are.

MR. LIEBERGEN: So that would assume you don't have the service water, the makeup for the inventory available, which in this case you also don't have non-RTNNS would include the turbine component cooling water system. Again, it's a bounding case scenario.

If you still have these other systems, you can add water to the pool. You can add makeup water. We're considering the case where you don't have, you only have the RTNNS systems available and that's what the bounding considerations for. It's not a partial consideration.

MR. STETKAR: Okay. So what you're saying is that under the conditions where you would have the systems out in the turbine, the loads out in the turbine building, you would expect to have makeup capacity to the pool --

MR. LIEBERGEN: That's correct.

MR. STETKAR: -- under those conditions, to the basin.

MR. HINDS: This is David Hinds. I assume you're considering the basin pool.

MR. STETKAR: Yes, the basin.

MR. HINDS: So makeup --

MR. STETKAR: You'll have to excuse me.

I'm coming from another meeting where the term pool is operative so.

MR. HINDS: So, yes, the assumptions are lined up with power supplies and such that the diesel generator is powering the critical loads, and if the critical loads would be powered in the case of the loss of offsite power, if you had the offsite power, which would be a generic trip event.

In fact, a generic trip event might even go into island mode. However, if you go into a generic trip event with, including the turbine trip, then there should be adequate power from all sides --

(Simultaneous speaking.)

MR. HINDS: So you aren't limited to just the boil off of the initial inventory.

MR. STETKAR: Okay, that makes sense.

MR. PRATT: That our reactor component cooling water heat load is based on having the diesels providing the power. Since the diesels don't power those other systems there's sort of a glitch in there.

MR. STETKAR: Okay. Okay. Thanks, thanks, thanks.

MR. PRATT: Okay, next slide.

Section 9.2 also provides site-specific conceptual design information regarding the makeup water system and the demineralization portion of the makeup water system as described.

We also describe the plant-specific portions of the potable and sanitary water system and describe how it interfaces with the French town and township municipal water system.

And 9.2 also commits to develop procedures for identifying and connecting makeup water sources to the ultimate heat sink seven days after an accident.

MR. STETKAR: Where are those makeup sources? I mean I understand procedures but --

MR. PRATT: The fire protection system could be a makeup source, as well as the fuel and ox fuel cooling system has connections for various outside water sources.

MR. STETKAR: Well, I'm asking what those various outside water sources might be. Are we talking about flying tankers or are we talking about ships coming in on Lake Erie and laying hoses or are we talking about Lake Erie or have you identified those sources? I mean, you know, I can write procedures about anything.

MR. THOMAS: The sources that we've identified, at least readily available, would be the circ water basin. There's water available there.

MR. STETKAR: Okay.

MR. THOMAS: And obviously, there's a large water supply called Lake Erie, and we can hook up a portable pump to.

MR. PRATT: We do have other tanks like a station water tank that would have water in it or could have water in it that we could use. And there's always a portable tanker or fire truck we could bring in if we --

MR. STETKAR: Ultimately, it's Lake Erie.

MR. PRATT: Correct.

MR. STETKAR: Okay.

MR. PRATT: Okay, next slide.

I'll be going to address a standard COL item by stating that freeze protection is provided for the condensate storage and transfer system.

And finally, Section 9.2 provides site-specific information regarding the station water system. The plant cooling tower makeup supplies describes, which provides makeup water. Go ahead.

MR. STETKAR: You go through these things so quickly.

MR. PRATT: I'm sorry.

MEMBER STETKAR: There's probably a method here. Freeze protection for the condensate storage transfer system, it gets cold in your part of the world. Do you have freeze protection for outdoor tanks for Unit 2?

The question is I understand you're going to provide heat and freeze protection and that's in addition or clarification anyway. The question is do you need it, and if so, you know, what's your operating experience been from Unit 2 in terms of unique.

I'm trying to assess the vulnerability, you know, since you're installing it, I'm trying to assess the vulnerability to extremely low temperatures for that water supply.

MR. PRATT: I'm going to get back to you on --

MEMBER STETKAR: It's an operating experience question, you know, because --

MR. PRATT: You know, my recollection was I don't have any recollection of freeze issues with outside water tanks at Fermi 2.

MR. STETKAR: For Fermi 2.

MR. PRATT: For Fermi 2. So we have our two condensate storage tanks at Fermi 2 are sitting outside. They're on --

MR. STETKAR: But that, I mean do they

have freeze, the question is do they have freeze protection. Typically, if they have freeze protection, you know, they'll have sensors that turn it on and off and you might be able to understand, you know, how frequently these --

MR. PRATT: I don't even recall that ever showing up on a POD as a problem list or anything like that. I know we --

MR. STETKAR: Yes, I mean, if they don't you haven't had any problems, you know, I'm fine.

MR. PRATT: And then the, you know, temperatures hover around the freezing point just to make things miserable, so --

MR. STETKAR: Oh, yes.

MR. PRATT: -- it's not like we get the deep freeze for long periods of time, but so --

MR. STETKAR: Yes, if you could, you know, so take a look at Unit 2 operating experience and see, you know, if you don't have it at all, fine, you know, I don't care. It's a good, you know, defense on that sort of issue. If you do have it and it's --

CHAIR CORRADINI: He's going to ask you a question either way, so you better --

MR. STETKAR: If you do have it and it's been required, you know, by some amount of record, that's information also.

MR. SMITH: Yes, we just need to get and can now pull up a description.

MR. STETKAR: Okay.

MR. PRATT: And on the station water system, the plant cooling tower makeup supplies described, which provides makeup to the cooling tower basins for both the PSWS and circ water systems. The pre-treated water supply system, which provides makeup water to the fire protection system is also described.

And if there's no questions on that, then I'll turn it over to Nick for the rest of Chapter 9.

MR. LATZY: Hello again. My name is Nick Latzy, and I'll be presenting the remainder of Chapter 9, which as Peter stated, will include 9.3, 9.5 and 9(a), the fire hazards analysis.

Section 9.3, the Process Sampling System. In Section 9.3, standard COL item. 9.3.2-1 is addressed by providing the description of the post-accident sampling program.

The post-accident sampling program meets the requirements of NUREG 0800. Section 9.3.2 for actions required in lieu of a post-accident sampling system. Additionally, 9.3 provides a site-specific system description stating that the hydrogen water chemistry system is used to inject hydrogen to the feed water system and oxygen to the offgas system.

The description of the hydrogen storage facility is provided to satisfy the DCD COL item 9.3.9-2(a) as site-specific information.

And finally, on this hydrogen water storage, the hydrogen water chemistry storage facility is located within a fenced area outside the plant protected area and is open to prevent the accumulation of hydrogen and meets the requirements of EPRI NP-4947-SR and EPRI NP-5283-SR-A.

MEMBER ARMIJO: Is that hydrogen storage facility common for, does that supply the hydrogen water chemistry system, as well as other needs, for example, generators? Is it kind of a common hydrogen storage facility?

MR. LATZY: Yes, it is.

MEMBER ARMIJO: Okay.

MR. LATZY: And finally, on this slide the inspection and testing requirements are provided in Section 9.3.9.4. Next slide, please.

The next two slides will provide our response to a follow-up question from the October 21st ACRS meeting regarding the hydrogen water chemistry system. The first bullet, the storing and handling of hydrogen complies with EPRI-NP-5283-SR-A, guidelines for permanent BWR hydrogen water chemistry installations.

And the second bullet, I'm going to describe the design features for the hydrogen storage in the yard, the distances and system design parameters, including tank size, line size, operating parameters are specified so that a tank or line rupture at the storage location will not have an adverse impact to safety-related structures or air pathways into safety-related structures.

Piping between the storage location and the turbine building is routed underground and, per EPRI-NP-5283, shall be designed for cathodic protection, or coated and wrapped, for the appropriate soil conditions such as frost depth and liquefaction and also for vehicle loads.

Excess flow check valves are installed to limit a large release to the storage location. This design feature restricts the release to the turbine building in the event of a line break.

And finally on this slide, the PRA assumes on-site storage facility follows EPRI-NP-5283 and is considered to be low risk.

Any questions? Next slide.

On this slide, it'll be the design features for hydrogen handling in the turbine building per Reg. Guide 1.189, "Fire Protection for Nuclear Power Plants," and EPRI-NP-5283, excess flow protection is designed to ensure that a line break will not result in the hydrogen concentrations exceeding two percent, i.e., 50 percent of the lower explosive limit, with or without ventilation operation.

MEMBER ABDEL-KHALIK: Have you ever had extensive hydrogen leaks from the generator in Unit 2?

MR. SMITH: Yes, we had hydrogen seal oil from --

MEMBER ABDEL-KHALIK: And what is the maximum leak rate?

MR. SMITH: Well, it gets accumulated in the seal oil and then it's --

MEMBER ABDEL-KHALIK: Up to the staff.

MR. SMITH: Yes, and I don't recall what the usage of hydrogen is for the generator.

MEMBER ABDEL-KHALIK: A thousand? Two thousand? Cubic feet per day or?

MR. SMITH: It's not that high. I'm certain of it not being that.

MEMBER ABDEL-KHALIK: Well, the normal is

600.

MR. SMITH: So we also have a GEC generator, too, which is a little bit different design than what's typically installed in U.S. Nuclear plants. And I'll find out what our usage is.

MEMBER ABDEL-KHALIK: Okay.

MR. SMITH: But I know we've had a maintenance history associated with the main generator and hydrogen usage in the main generator on Unit 2.

MEMBER ABDEL-KHALIK: Okay.

MR. LATZY: Continuing on. The second bullet, hydrogen monitors will be installed in the turbine building. Specific locations will be determined during detailed design and DCD Figure 9.3-5 provides a simplified diagram.

Instrumentation indicates and/or alarms abnormal or undesirable conditions. DCD provides requirements to isolate hydrogen supply if normal building ventilation is lost.

And commitments in FSAR Section 9.5 to perform a compliance review prior to fuel load to ensure that the Fire Hazards Analysis reflects the final as-built design. In conclusion, hydrogen does not present a noxious gas concentration or a combustion hazard. Next slide. Any questions?

CHAIR CORRADINI: Questions? Okay. Go ahead.

MR. LATZY: In Section 9.3, COL item 9.3-10-1(a) is addressed with site-specific system description information for the oxygen storage facility. As with the hydrogen water chemistry storage facility, the bulk oxygen storage tank meets ASME Code Section 8 requirements and the EPRI documents, as previously stated.

In Section 9.3, DCD COL item 9.3-11-1(a) and 2(a) are addressed with site-specific information by stating a zinc injection system is not being utilized. Next slide.

Moving into Section 9.5, Other Auxiliary Systems. Section 9.5 addresses numerous COL items, some of which include the following. Secondary fire water source is from Lake Erie.

MR. STETKAR: Can I ask you about that? There's a drawing in the FSAR. It's Figure 9.5-201 that shows the fire protection system yard main loop. And I got a little confused when, the FSAR says that that drawing in combination with Figure 9.5-1 in the DCD defines the fire protection water system.

I think I might know how it works, but I don't want to speculate. The drawing in the FSAR shows a yard loop with interconnections to several loads, and in the middle of that drawing, there are three pumps shown that are not labeled. Are they the primary fire water pumps or are they the secondary fire water pumps on that drawing?

MR. LATZY: I believe they are the primary water pumps.

MR. STETKAR: Now I'm really confused. Because if they are, now I'm confused. I don't understand how the whole thing is piped together. I thought I knew how it worked, but that's why I didn't want to speculate. And because they weren't identified on --

CHAIR CORRADINI: Could you quote the figure on that John?

MR. STETKAR: Yes. It's Figure 9.5-201 of the FSAR. Of the FSAR. And the FSAR descriptions says, well, the DCD says the scope of the secondary fire protection system and the yard mains are COL scope of supply.

The FSAR shows the drawing of this yard main loop with interconnections and three outlines of pumps and a couple of storage tanks. And it's got two makeup supplies. One of the makeup supplies is shown from the line that says station water and the other line says Lake Erie (FPS secondary pumps).

And I couldn't, for the life of me, figure out how that figure and Figure 9.5-1 in the DCD communicate with one another to tell me where all of the pumps and pipes and valves interconnect.

And I thought I had it, but when they said that the three outlines of pumps on the FSAR figure are indeed, if those are indeed the primary fire water pumps, and someplace out there, not shown on that drawing for the line coming in, are the what's called the secondary fire pumps.

Now I'm not quite sure. Because I don't understand where all of the interconnections are. I thought I had it, but I was --

MR. LATZY: Well, the station water is out at the Lake.

MR. STETKAR: I got the station water. I understand that one.

MR. LATZY: Okay.

MR. STETKAR: Where are the fire protection system secondary pumps? Where are they and what are they?

CHAIR CORRADINI: Do we have information? Do we need to wait and take it offline so you can answer his question.

MR. LATZY: Let me take it offline and come back to answer your question.

CHAIR CORRADINI: Okay.

MR. STETKAR: Because I wasn't quite sure. Then anyway, check.

MR. LATZY: Okay.

CHAIR CORRADINI: So the question is you're not understanding the whole piping.

MR. STETKAR: I'm not understand -- if I look at the DCD figure, the DCD figure shows ostensibly the primary fire protection system. The reason that I'm concerned about this is that the primary fire protection system provides some, I have to be careful about what words I have, important functions let's say. I don't want to use words that I shouldn't.

And it interfaces with the, what's characterized in the DCD, is the secondary fire protection system which handles unimportant functions, that does have cross-connections.

CHAIR CORRADINI: Okay. So the piping system is, at this point, you have questions.

MR. STETKAR: I'm a bit confused about --

CHAIR CORRADINI: Okay. Right.

MR. STETKAR: -- about how those two

drawings are really interrelated to one another.

MR. JENKINS: This is Reynaldo Jenkins. We want to look at that a little bit later after lunch.

MR. STETKAR: You will.

CHAIR CORRADINI: Okay.

MR. LATZY: Okay. Okay, continuing on. FSAR Table 9.5-201 supplements the DCD Table 9.5-1 with specific codes, standards and regulatory guidance outside the scope of the DCD.

In addition, 9.5 provides supplemental information to describe the control of combustible materials, hazardous materials and ignition sources.

This section provides standard COL information on fire barriers and electrical raceway, fire barrier systems. It provides standard COL information with regard to quality assurance controls of the operational fire protection system program.

And lastly, the FSAR contains the following commitments as they relate to the fire protection program. Fire pump testing, fire barriers, manual smoke control, FHA compliance review of final as-built design, fire brigade and quality assurance and related procedures. Next slide, please.

Section 9.5 provides site-specific

information to address COL items regarding onsite and offsite emergency communications. These include provides a description of the Emergency Notification System, Health Physics Network, Emergency Response Data System, Crisis Management Radio System, Fire Brigade Radio System, which is in compliance with Reg. Guide 1.189.

And the transmission system operator communications link, which is a dedicated line which is provided between the control room and the power system operator. Next slide, please.

Section 9.5 provides site-specific information with regard to the diesel generator fuel oil storage transfer system with a standby and ancillary diesel generators.

The standby diesel fuel oil storage and transfer system is RTNSS C and the ancillary diesel fuel oil storage and transfer system is RTNSS B.

The first standard COL item is addressed for both standby and ancillary diesels by stating procedures and will ensure sufficient onsite inventory of fuel oil for seven days of continuous operation.

Additionally, the site-specific COL item is addressed for both standby and ancillary diesels by providing a corrosion protection system used for underground oil transfer piping.

MR. STETKAR: I was going to ask Ryan this, but he speaks fast enough that he got out from under it so I'll ask you and, by implication, him.

The underground piping. I know that the diesel fuel oil piping is carbon steel as is the plant service water piping. Will that piping be direct buried in soil or will it be routed in underground, you know, ducts.

MR. LATZY: They'll be buried in ducts.

MR. STETKAR: So it's not going to be directly in the soil?

MR. LATZY: It won't be direct like that.

MR. STETKAR: Okay, good. Are those ducts, will they have accessibility for external inspection of the piping?

MR. LATZY: Yes.

MR. STETKAR: Okay, excellent.

MR. LATZY: Thank you.

MR. STETKAR: I have one more question for Ryan but I'll let you finish your stuff before I get back to him.

MR. LATZY: Next slide, please.

Finally, in Section 9A, the Fire Hazards Analysis. Section 9A contains site-specific information as it relates to the two COL items. One being the yard fire zone drawings and two being the FHA for site-specific areas.

For the yard zone, for the yard fire zone area drawings, FSAR Table 9A.5-7R Sheet 1, was provided for site-specific area on the hydrogen and oxygen storage area.

Additionally, Sheet 2 was added for the station water intake. For the FHA site-specific areas, Table 9.5-5R, Sheets 1-9, were added to cover the Radwaste building reconfiguration and support of the departure.

This concludes my presentation on Chapter 9. Are there any questions?

CHAIR CORRADINI: You have a question for Ryan.

MR. STETKAR: For Ryan I do.

MR. LATZY: Any questions in Chapter 9, John?

MR. STETKAR: Yes, I do. I have, as a matter of fact, one for Ryan.

Ryan, and this is just kind of point of information. In the FSAR, I read a little bit of information that seemed to indicate that the original design of the underground plant service water system piping was a, what is it, fiberglass reinforced polyester pipe.

And, you know, it was done for corrosion resistance and fouling resistance and all the resistance that that kind of pipe gives you. And apparently, it was later changed to carbon steel pipe with coatings and cathodic protection and all that kind of stuff that that's supposed to give you. Why was that done?

CHAIR CORRADINI: That's one you can kick upstairs.

MR. SMITH: So the reason we did it, is we didn't have an oar in the water on fiberglass reinforced on polyester piping and North Anna did. And so when we took over as the R-COLA, it was becoming, our issues were all becoming about finding a suitable regulatory set of standards --

MR. STETKAR: Okay, good.

MR. SMITH: -- to set that up. So we abandoned that because we didn't want to have that be a big focus for us and went to carbon steel piping. And I guess my full expectation is that there's a lot of work going on research for establishing a regulatory scheme for alternate piping materials.

And I am confident that that will come to fruition before I actually need to do this without being --

MR. STETKAR: So there still may be option. It may go to that, that other piping material.

MR. SMITH: Actually, I think our preference would be to do that, but, you know, they're all one-offs right now for those alternate materials. And I think when the scheme of regulation is such that there's codes and standards that we can apply that to, we would do that, so.

MR. STETKAR: That's the sense that I got. I just wanted to make sure that I sort of understood the back story, so thanks.

MEMBER ARMIJO: I had a question for Ryan on fuel handling going back to Slide 3. In the ESBWR with such a tall vessel, I think represents a unique challenge in fuel handling, and I'm just wondering how far along you've gotten into your planning or analysis of how to assure that you can really reduce the risk of any kind of a fuel assembly drop with an accurate alignment of all the tooling and you have to in there, yes.

I'm just wondering, and this is more my curiosity of how far along Detroit Edison or GEH has gone in that area?

MR. HINDS: This is David Hinds from GEH. We are working with several, I'll say reputable refueling bridge manufacturers at this time. We haven't made the final decision we would do in conjunction with the plant owner to make the final procurement decision.

However, we have several options where we've working actively with refueling bridge manufacturers that we currently have ongoing relationships with, and this is well within our capability.

Using existing technology with fail safe grapples, for instance. The added challenge that you mentioned is really a longer reach which gets into number of sections in the mast as opposed to really challenging the technology that would lead to a potential drop, meaning fail safe grapples for instance.

MEMBER ARMIJO: Well, I know it's doable, I just didn't know how far.

MR. HINDS: Additionally, using state-of-the-art camera technology because it is quite a distance for operator visual without the use of cameras. And so cameras are used as well as state-of-the-art grapples with fail safe. Then it really gets into the number of mast sections for the reach.

MEMBER ARMIJO: And everything besides --

MR. HINDS: And have a very rigid mast in the, the appropriate number of mast sections. And so we have been doing mast stack ups and tolerances and clearances.

MEMBER ARMIJO: And will there be testing of this proposed thing at some point full scale?

MR. HINDS: Of course. Yes, they'll be testing at the manufacturing facility followed by testing with test weights and dummy fuel assemblies prior to actual fuel movement.

MEMBER ARMIJO: Okay. Thank you.

CHAIR CORRADINI: Other questions of DTE? Okay. At this point, we're at a perfect time to take a lunch break and then come back with the staff discussing Chapter 9.

MR. JENKINS: Yes.

CHAIR CORRADINI: Okay.

(Whereupon, the foregoing matter went off the record at 11:57 a.m. and went back on the record at 1:02 p.m.)

CHAIR CORRADINI: Why don't we get started.

MR. HALE: I'm Jerry Hale. I'm sitting in for Mike Eudy who should be here shortly, but hopefully I can get started with Chapter 9.

SER with no open items for auxiliary systems.

MEMBER ARMIJO: Well, I'm sorry. Got to turn this thing off. There.

MR. HINDS: And we'll start with Section 9.2.1, Plant Water Systems. Chang Li was the technical reviewer on that.

MR. LI: My name's Chang Li. I'm with Balance of Plant Systems Branch and the reviewer for Section 9.2.1 and 9.2.5.

Section 9.2.1, the Plant Service Water System is a non-safety system and is subject to regulatory treatment of non-safety system was reviewed in ESBWR DCD, Fermi FSAR incorporated by reference of the DCD with the exception of the site-specific issues such as COL information items, conceptual design information and interface requirements.

The COL information items address the two resolution water treatment and the corrosion protections. Supplemental information addressed the actual interface requirements of basin resource storage capacity. The conceptual design information, which has system description, and the table about plant service water system component design characteristics.

The Applicant provided the plant-specific design CDI in Sections 9.2.1.2 of the FSAR. The Fermi system description and component design parameters adopted CDIs in the design certification, except site-specific temperature parameters.

These parameters, the Fermi site-specific temperature parameters, are bounded by the temperature parameters in the design certification.

The staff's review of Fermi FSAR issued nine RAIs. The RAI and RAI responses addressed material selections, codes and standards, water treatment programmatic controls, such as maintenance rules and D-RAP, analysis of basin water capacity, ITAAC, initial testing, all the RAIs were resolved. The staff concluded the adequacy of Section 9.2.1.

MR. HINDS: Any questions on 9.2.1?

CHAIR CORRADINI: Questions from the Committee? No. Go ahead.

MR. LI: Section 9.2.5 is Ultimate Heat Sink. The ultimate heat sink only have a standard COL items to address the post seven day makeup to ultimate heat sink.

The Applicant made a commitment, so for a fully satisfied their commitment with respect to their procedures set up for the post seven day water makeup. The staff found the application acceptable.

CHAIR CORRADINI: We'll stop you if necessary. Keep on going.

MR. EUDY: We'll go on to, Rob Vetori is going to go over Section 9.5.1, Fire Protection Systems.

MR. VETTORI: Good afternoon. 9.5.1, Fire Protection System. And as you can see, there were like seven COLAs and supplemental items, and I would just like to briefly discuss a few of them.

For example, 9.5.1-2A, addresses a DCD COL item regarding the secondary firewater capacity. In the COL, the Applicant stated that tests will be performed to demonstrate at the secondary fire protection pump circuit supplies the required flow and pressure at the turbine building yard interface boundary.

Another example is COL 9.5.1-10A. That addresses the DCD COL item regarding fire brigades. The implementation of the fire brigade will be in accordance with the milestones in Sections 13.4 for the fire protection program.

The staff accepts Fermi 3's fire brigade implementation milestone as given in Section 13.4, since they will provide appropriate protection consistent with the plant's completion schedule. Additionally, the fire brigade requirements of the DCD are incorporated by reference.

And the last example of the COLs, COL 9A.7-2-A, addresses the DCD COL item related to site detailed fire hazard analysis included under Appendix 9A of the Fermi 3 FSAR.

The staff reviewed the information provided and determined that the detailed fire hazard analysis of the plant areas that are outside the scope of the certified design will be completed six months prior to fuel load.

Again, staff accepts site-specific fire hazard analysis milestones since they will provide appropriate protection consistent with the plant's completion schedule.

The bottom item down there, the Tier 2 departure. Departure 11.4-1, we've been going over it this morning. The Applicant has reconfigured the radwaste building to accommodate the long-term storage of low level radioactive waste.

With respect to the review for Section

9.5.1, the Applicant has revised several, excuse me, Tier 2 DCD tables. Now, examples of the type of information provided by these tables are, and there's a lot of information provided on the tables.

But some of the examples are the type and quantity of combustibles that will be found in each area, type of detection, system installed in the area and type of automatic fire extinguishing system installed. I believe the table was about eight or nine sheets in length.

Additionally, the Applicant has revised several Tier 2 DCD figures. Information provided on these revised figures detail the reconfigured layout of the radwaste building. Next slide, please.

Okay. As far as commitments go again, there are nine commitments affecting fire protection. I'll just go over a couple of them with you.

For example, Commitment 9.5-001 relates to the testing of the secondary fire protection pump. Testing will demonstrate at the secondary fire protection pump supplies a minimum of 2,130 gallons per minute with a sufficient discharge pressure to develop a minimum of 107 psi the turbine building yard interface boundary, which is the level required by the DCD.

This testing cannot be performed until the system is built, and the Applicant has specified that this testing will completed prior to fuel receipt.

The last item, the last of those commitments found at the bottom, 9A-001, 002 and 003, relate the fire hazard analysis of the yard area outside the scope of the certified design.

Detailed fire hazard analysis of the yard area that is outside the scope of the certified design cannot be completed until cable routing is performed during final design. This information will be provided six months prior to fuel load.

So in the conclusion, staff concludes that the Applicant has adequately addressed the COLs, commitments and the departure in the Fermi 3 FSAR.

CHAIR CORRADINI: Any questions?

MR. EUDY: Okay. We'll have Gene Eagle go over communication systems.

MR. EAGLE: Eugene Eagle, NRO, Division of Engineering, Instrument Control Branch.

This section, 9.5.2, deals with communication systems. It primarily is associated with verbal communication systems as compared to digital transmission. The summary the FSAR Section 9.5.2 is this. It incorporates by reference the ESBWR design and control document, Section 9.5.2. It describes the communication systems that provide intra-plant communications and plant to offsite communications during normal maintenance, transit, fire and accident conditions.

It addressed five COLA information items adequately. It dealt with a multiple of independent and diverse systems, most with alternate power supply in case of loss of primary power source. A current status is there are no open items.

There was one RAI, and it was closed. There are no confirmatory items, and the design adequately conforms to the regulations and guidance. Slide 2, please.

There were five COLA information items that are summarized, excuse me. Next slide. Whoops, I'm sorry. Okay. Yes, that's okay. Thank you.

There were five COLA information items as presented on the slide here. It covers communications from both onsite and also the communications to offsite agencies and to the emergency personnel, medical facilities and many other types of areas.

The systems have equipment with the capability to provide emergency communications support for the main control room, the TSC, the EOF and OSC for security, fire brigade, emergency plan, links to the NRC, principal response organizations, governmental units and the public.

The system equipment includes the use of radio, private and public telephone, public address, sound powered phones, fax, microwave, remote warning sirens and backup power as uninterruptible power supplies and batteries.

The system, the main point, is that it has a considerable amount of diversity and independence. If one system is lost, it doesn't effect other systems, and how other systems be used as alternates.

Is there any questions?

CHAIR CORRADINI: Questions? We're all right.

MR. EUDY: In conclusion of Chapter 9, the staff finds that the Applicant has adequately addressed the relevant information in the DCD and Applicant has met the applicable regulations and is in conformance with applicable guidance with respect to items in Chapter 9 FSAR.

Jerry, could you talk about the summary of the Chapter 9 issues raised?

MR. HINDS: We do have some follow-up items from just prior to lunch. I think there were several questions --

MR. EUDY: Right.

MR. HINDS: -- and I believe, Peter, I think your guys are prepared to address those?

CHAIR CORRADINI: Is this the time you want Peter back up there?

MR. HINDS: If there are no further questions.

CHAIR CORRADINI: We're fine with the staff's review of Chapter 9, so --

MR. HINDS: Okay, that you.

CHAIR CORRADINI: So we'll just go to general clarification questions that we had during the day.

(Off the microphone comments)

MR. HINDS: Just to repeat, here are the four items that I recorded. There was a question related to freeze protection and operating experience. There was a question on the leak rate, the hydrogen leak rate, maximum leak rate.

CHAIR CORRADINI: For the generators?

MR. HINDS: And there was a question about the location of the fire protection system secondary pumps. And then a question about the difference about the DCD drawing that the FSAR drawing for fire protection.

CHAIR CORRADINI: Yes. Pick any one you want.

MR. SMITH: Okay. So the first two related to the follow-ups on FERMI 2, I'm not prepared to answer. I need to do some follow-up with the plant.

MR. THOMAS: Peter?

MR. SMITH: Yes.

MR. THOMAS: Really quick. The tank does have a steam supply from the aux boiler for freeze protection. But I don't know. The question is the operating experience.

MR. SMITH: Yes, so we need to do a follow-up on that.

CHAIR CORRADINI: Okay.

MR. SMITH: And then on the figures related to the fire protection system it appears we have an inaccuracy in the drawing that John was looking at this morning, relative to the text. The text all appears to be right. But the drawing has, at least it looks like, we have a connection point that's wrong.

CHAIR CORRADINI: Missing?

MR. SMITH: Wrong. Or appears to be in

the wrong place. So we'd like to do some more follow-up on that to make sure that that's --

CHAIR CORRADINI: So this in that DCD or in --

MR. SMITH: No, this is in our FSAR.

MR. THOMAS: The question about where the secondary pumps were located at. Those are located out at the station water intake structure. And there's two pumps and then there's also a jockey pump similar to the primary pump configuration. But like Peter said, the connection shown on the figure needs to be corrected.

CHAIR CORRADINI: Okay.

MALE PARTICIPANT: Hydrogen leakage rate from the generator, or usage rate from the generator on --

MR. SMITH: Right, so that's another FERMI 2 follow-up. So the first two.

CHAIR CORRADINI: So those will be coming later?

MR. SMITH: Right.

CHAIR CORRADINI: All right. That's fine. Any other questions? Does the staff have any comments to make?

MR. JENKINS: We have no comments at this time.

CHAIR CORRADINI: Okay.

MR. SMITH: So over the lunch period I had a short briefing on the question about the PRA treatment of the service water system alignment configuration. And we can talk about the result of that. I was going to get Skip Schumitsch from GEH to come and talk about that if that's acceptable.

CHAIR CORRADINI: That's fine.

MR. SMITH: And we have a handout to provide here. And, Skip, why don't you come up.

MR. SCHUMITSCH: So just a quick summary again. What the question was was provide the basis for a loss of service water frequency using the PRA valuation, given that there may be a difference in service water system alignment.

So the DCD allows two alignments, I don't think there was any question about that. You could either be aligned to the auxiliary heat sync, the PSWS basin, or you can be aligned to the normal plant heat sync, which in FERMI's case is the large natural draft cooling tower.

So in both cases the PSWS pumps are going to suction from the basin. They go to the heat loads and the two trains. They come back and in one situation they go to the cooling towers in the PSWS basins and the water falls back into the basins, cycle repeats.

In the other situation they go to the natural draft tower and the circ water pumps bring that cooled water back into the service water basin. So again, both of those are perfectly acceptable for the DCD.

And as Member Stetkar mentioned, our PRA model, the one in the DCD, only modeled the one where you're normally aligned to the PSWS basin. So what Peter had as to --

CHAIR CORRADINI: Which is an alternative --

MR. SCHUMITSCH: It was just what we called alternative heat sync, yes. So what Peter asked us to do was go ahead and rerun our models. Just the model of record for the DCD PRA, the EFW PRA and with this other event. So we basically did four configurations.

So for the DCD we had a non-loss of preferred power event with the auxiliary heat sync in the normal configuration. And then a loss of preferred power event with DDHS in normal alignment. We compared those events with four FERMI 3 specific events. One non-loss of power event with the HS normal alignment and one non-less of power event with -- loss of preferred power, I've got to be careful with this.

CHAIR CORRADINI: You're going to have to say these slower for me, I'm sorry.

MR. SCHUMITSCH: Okay. So the first --

CHAIR CORRADINI: So first of all you had two calculations, simulations from the original. One without preferred power, one with loss of preferred power.

MR. SCHUMITSCH: Right. Now we do four. Basically those two and then each one of those two align to the auxiliary heat sync and one aligned to the natural draft tower. So in all of the non-loss of preferred power it just bounded, there was really no change in what the valves do.

In the loss of preferred power events, as the member said, the valves have to change state. We have to close the valves that are starting to return to the natural draft tower and open the valves and let it go back to the fan in the basin.

The fans really are not relevant on all of our loss of preferred events the fans were always, they shut down when you lost preferred power. When the diesel started and the buses got re-energized there was always a start signal on those fans. So there's really no change in that.

So really the only thing that was changing is valve positions. So basically we did that analysis. So I've really gone through the first two bullets of this handout. And the last bullet was that even when we do these valves changing state the increases are not significant.

There was approximately a one percent change in the ESBWR CDC, which isn't significant. So I mean one percent of a 10^{-8} plant we're talking somewhere out in the 10^{-10}.

CHAIR CORRADINI: But can I say it back to you though, so I get right? So with a loss of preferred power, and with a failure of the switch to your alternative cooling, and staying in the normal cooling mode that adds to the CDF on this magnitude?

MR. SCHUMITSCH: Yes.

CHAIR CORRADINI: Okay. And this is base don the reliability of the valves given these conditions?

MR. SCHUMITSCH: These valves are already modeled in our model. There was a certain percentage of failure based on operator actions. It's actually a very conservative model, which it always assumes that one train has failed. I mean you start there and that what you probably, they kind of argue with me whether that's a realistic assumption. But it's a very conservative assumption.

But you start with one train failed and then using the probabilities of the valve not repositioning, that results in a one percent increase in CDF.

CHAIR CORRADINI: Okay.

MALE PARTICIPANT: At least I think I understand.

CHAIR CORRADINI: Other questions? All right. Anything else from GEH? Otherwise I think we're done. So let me go around and see if the subcommittee has any comments. Otherwise let me look at you guys and make sure, Jerry, the next set will be Chapter 2.

MR. HALE: We have four chapters remaining. Chapters 1, 2 and 3.

CHAIR CORRADINI: I was going to say 2 and 3 are the big --

MR. HALE: Yes, and 14.

CHAIR CORRADINI: Oh, 14 is still remaining.

MR. THOMAS: Chapter 10?

MR. HALE: Yes, and 10, I'm sorry.

CHAIR CORRADINI: But 2 and 3 are the ones that have, I'm going to use the wrong terminology, but differences from the DCD. There are some --

MR. HALE: Those are the ones that involve the backfill analysis. That's correct.

CHAIR CORRADINI: Right, which is different?

MR. HALE: Yes.

CHAIR CORRADINI: Okay.

DR. KRESS: Mike, I had a question I didn't get asked. On their one percent change?

MR. SCHUMITSCH: Yes, sir.

DR. KRESS: It actually went to core damage, but it's because of the low frequency that it's only this amount?

MR. SCHUMITSCH: No. The one percent is real. We multiply times the 10^{-8}, changes out to the 10^{-11}. But yes the one percent has nothing to do with the actual ESBWR CDF.

DR. KRESS: But it has to do with the frequency of the valve?

MR. SCHUMITSCH: Yes.

DR. KRESS: That's the reason it's only

this magnitude?

MR. SCHUMITSCH: Yes.

DR. KRESS: Thank you, that was my question.

MR. SCHUMITSCH: And again, just remember that the FPWR, everybody knows about all the passive cooling but we also have the air cooled and auxiliary diesels and the air cooled fire pumps. So again, if you don't have service water we've still got other air cooled means of moving water.

CHAIR CORRADINI: Do you have any comments, Tom?

DR. KRESS: No.

CHAIR CORRADINI: All right. Well I'll thank everybody. We finished a bit early. And we will see all of you back sometime in 2012. When is still to be determined. So please, for the Committee, let's remember all of this so we don't have to have them re-explain it. With that our subcommittee meeting is adjourned.

(Whereupon, the meeting in the above-mentioned matter was concluded at 1:26 p.m.)

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Fermi 3 COLA
Presentation to ACRS Subcommittee
Chapter 11

Chapter 11, Radioactive Waste Management: Chapter Topics

	FSAR Section	Presenter
11.1	Source Terms	IBR Section
11.2	Liquid Waste Management	N. Latzy
11.3	Gaseous Waste Management	N. Latzy
11.4	Solid Waste Management	N. Latzy
11.5	Process Radiation Monitoring System	N. Latzy

11.2 Liquid Waste Management System

EF3 SUP Describes cost benefit analysis for liquid waste management system

- Analysis is based on population dose estimates due to liquid effluents described in FSAR Chapter 12.
- Population dose in FSAR Chapter 12 assumes liquid effluents during normal operation even though ESBWR is designed as a zero liquid effluent discharge plant.
- Uses cost parameters from RG 1.110, Appendix A, without exception.
- Conservatively assumes that each potential augment is 100% effective.
- No additional augments were identified.

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11.2 Liquid Waste Management System

STD COL Describes design and procedures to preclude non-radioactive systems from becoming contaminated.

STD COL References design and procedures that minimize contamination of facilities and environment.

EF3 SUP Describes design provisions for the Circulating Water Blowdown line to preclude an unmonitored release of radioactivity to the groundwater.

11.3 Gaseous Waste Management System

EF3 SUP Describes cost benefit analysis for gaseous waste management system.

- Analysis is based on population dose estimates due to gaseous effluents described in FSAR Chapter 12.
- Uses cost parameters from RG 1.110, Appendix A, without exception.
- No additional augments were identified.

11.4 Solid Waste Management System

EF3 DEP Radwaste Building Reconfigured to Increase Storage Capacity for Class B and C Waste.

- Departure from the standard design in the DCD.
- Departure affects structure, system and component descriptions in Chapters 1, 9A, 11, and 12.
- Departure describes impacts to the Radwaste Building, including waste storage provisions, waste storage component capacities, waste volumes, evaluations for shielding, impacts to occupational exposure, radiation zones and access routes.

11.4 Solid Waste Management System

STD SUP Solid waste cost benefit analysis is addressed by the liquid effluent and gaseous effluent cost benefit analyses.

STD COL Specifies testing and programs to comply with regulatory guidance (RG 1.143 and RG 8.8).

STD COL Describes design and procedures that address IEB 80-10 (prevention of cross-contamination of non-radioactive systems).

STD COL Incorporates by reference NEI 07-10A, “Generic FSAR Template Guidance for Process Control Program,” for development of the Process Control Program.

11.5 Process Radiation Monitoring System

STD COL Provides description of Offsite Dose Calculation Manual (ODCM). Incorporates by reference NEI 07-09A, "Template Guidance for Offsite Dose Calculation Manual Program Description."

ODCM includes:

- Methodology and Parameters used to calculate offsite dose.
- Program for process and effluent monitoring and sampling.
- Addresses lower limits of detection and sensitivities for effluent monitors.
- Provisions for sampling, including frequencies.

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Presentation to the ACRS Subcommittee

Fermi Unit 3 COL Application Review

SER Chapter 11 with No Open Items "Radioactive Waste Management"

November 30, 2011

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Summary of Technical Discussion Points for Fermi 3 COL Chapter 11

	FSAR Section	Summary of Supplemental Information
11.1	Source Terms	G. Cicotte (IBR Section)
11.2	Liquid Waste Management System	G. Cicotte (Site-Specific)
11.3	Gaseous Waste Management System	G. Cicotte (Site-Specific)
11.4	Solid Waste Management System	G. Cicotte (Site-Specific)
11.5	Process Radiation Monitoring System	G. Cicotte (Site-Specific)

Regulations and Review Guidance

- Regulatory Guide 1.206
- 10 CFR 52.79(d)(1)
  - may reference design certification and update to reflect site/design specific parameters and features
- 10 CFR 52.79(a)(17)
- 10 CFR Part 20 – TMI Requirement
- NUREG-0800 Section 11.0 (SRP)

Standard, Site-Specific, and Supplementary Information Summary

Sec	COL/Sup Item	Description
11.2	STD COL 11.2-1-A	Implementation of IE Bulletin 80-10
	STD COL 11.2-2-A	**Implementation of 10 CFR 20.1406**
	EF3 SUP 11.2-1	**Section II.D, App I, Part 50, Cost-Benefit Analysis (CBA) liquid**
	EF3 SUP 11.2-2	**Groundwater Protection, 10 CFR 20.1406**
11.3	**EF3 SUP 11.3-1**	**Section II.D, App I, Part 50 CBA gaseous**
11.4	**EF3 DEP 11.4-1**	**Long-Term Temporary Radwaste Storage, Class B/C**
	STD COL 11.4-1-A	Regulatory Guides 1.143, 8.8 (ALARA)
	STD COL 11.4-2-A	Implementation of IE Bulletin 80-10

Standard, Site-Specific, and Supplementary Information Summary (continued)

Sect	COL/Sup Item	Description
	STD COL 11.4-3-A	Process Control Program
11.4	STD COL 11.4-4-A	Temporary Storage Facility
	STD COL 11.4-5-A	Compliance with 10 CFR 20.1406
	EF3 SUP 11.4-1	Section II.D, App I, Part 50 CBA solid
11.5	STD COL 11.5-1-A	Subsystem Sensitivities, Lower Limits of Detection
	STD COL 11.5-2-A	**Offsite Dose Calculation Manual**
	STD COL 11.5-3-A	Process / Effluent Monitoring & Sampling
	STD COL 11.5-4-A	Site-Specific Offsite Dose Calculations
	STD COL 11.5-5-A	Instrument Sensitivity Derivations for ODCM

Site-Specific Review Issues

- **Compliance with 10 CFR 20.1406:**
  - STD COL 11.2-2-A and 11.4-5-A: Compliance discussed in SER Section 12.3.
- **Implementation of Section II.D of Appendix I to Part 50:**
  - EF3 SUP 11.2-1 and 11.3-1: Augments not cost-beneficial.

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Site-Specific Review Issues

- **EFS DEP 11.4-1, Long-Term Radwaste Storage:**
  - Initial Departure included Tier 1 changes, later amended to Tier 2 only, not requiring prior NRC approval
  - Internal Radwaste Building reconfiguration to accommodate 10 years of Class B and C wastes, and 3 months of Class A wastes.
- **STD COL 11.5-2-A: Dose objectives of 10 CFR 50, Appendix I**
  - Child thyroid dose limiting
  - Proposed achieving objective through alternative methodology – operational limitations in ODCM

Site-Specific Review Issues

- **Correction in DCD condensate purification system (CPS) FSAR Chapter 10:**
  - Discussed further in Section 12.2
  - DCD routine source term revised (Section 11.1), with corresponding increase in effluents and calculated offsite doses.
  - Applicant proposed alternative methodology to achieve dose objectives via ODCM limiting operational configuration.
  - Divert open feedwater flow back to main condenser instead of downstream of CPS, resulting in purification of 100% feedwater flow.

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Chapter 11.0

Questions/Comments

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Fermi 3 COLA
Presentation to ACRS Subcommittee
Chapter 12

Chapter 12, Radiation Protection: Chapter Topics

	FSAR Section	Presenter
12.1	Ensuring that Occupational Exposures are ALARA	M. Brandon
12.2	Plant Sources	M. Brandon
12.3	Radiation Protection	M. Brandon
12.4	Dose Assessment	M. Brandon
12.5	Operational Radiation Protection Program	M. Brandon
12A	Calculation of Airborne Radionuclides	IBR Section
12B	Calculation of Airborne Releases	IBR Section
12AA	ALARA Program	M. Brandon
12BB	Radiation Protection	M. Brandon

12.1 Ensuring that Occupational Radiation Exposures are ALARA

STD SUP Provides description of the ALARA program.

STD COL Complies with RGs 1.8, 8.8, and 8.10.

Incorporates approved templates by reference NEI 07-03A, "Generic FSAR Template Guidance for Radiation Protection," and 07-08A, "Generic FSAR Template Guidance for Ensuring that Occupational Exposures are as Low as Reasonably Achievable (ALARA)."

12.2 Plant Sources

STD COL Identifies contained sources, not part of the permanent plant design, and the associated controls.

- Calibration Sources
- Check Sources
- Radiography

12.2 Airborne Effluents and Doses Offsite

EF3 COL Evaluates annual airborne effluents and annual offsite doses due to airborne effluents during normal operations.

- Long Term dispersion and deposition factors are provided in FSAR Section 2.3.5. Several long term dispersion and deposition factors are greater than the corresponding values in the DCD.
- The reactor water operational iodine limits were reduced to accommodate the site specific long term dispersion and deposition factors.
- Calculated dose to maximum exposed individual complies with 10 CFR 50 Appendix I.
- Calculated radionuclide concentrations at site boundary comply with 10 CFR 20 Appendix B.

12.2 Liquid Effluents and Doses Offsite

EF3 COL

Evaluates annual liquid effluents and annual offsite doses due to postulated liquid effluents during normal operations.

- Conservative analysis as ESBWR is designed for recycle of liquid radwaste (i.e., zero discharge).
- Calculated dose to maximum exposed individual complies with 10 CFR 50 Appendix I.
- Calculated radionuclide concentrations at site boundary comply with 10 CFR 20 Appendix B.

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12.2 Compliance with 10 CFR 20.1301 and 20.1302

EF3 COL Offsite doses to members of the public are less than the limits in 10 CFR 20.1301.

EF3 COL Offsite doses to members of the public from the total Fermi site dose are less than the limits in 40 CFR 190.

EF3 COL Compliance with 10 CFR 20.1302 is demonstrated by showing that dose limits in 10 CFR 20.1301 are not exceeded by performing radiation surveys and through calculations.

12.3 Radiation Protection

EF3 DEP Radwaste Building Reconfigured to Increase Storage Capacity.

- Departure is discussed in more detail as part of Chapter 11 presentation.
- Shielding in Radwaste Building confirmed to be adequate for building configuration.
- Radiation Zones were maintained consistent with the DCD.
- Access and Egress Routes were adjusted to reflect changes to the Radwaste Building floor plan.

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12.3 Minimization of Contamination and Waste Generation

STD COL Programs and procedures are implemented to comply with 10 CFR 20.1406 and RG 4.21.

- Incorporates by reference NEI 08-08A, “Generic FSAR Template Guidance for Life Cycle Minimization of Contamination.”
- Describes Operational Programs that are implemented to meet 10 CFR 20.1406.

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12.4 Dose Assessment

EF3 SUP Evaluated annual dose from potential sources on-site to individual construction worker and collective doses to all construction workers.

- Individual construction worker dose is less than the limits in 10 CFR 20.1301 and 40 CFR 190.

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12.5 Operational Radiation Protection Program

STD COL Describes Operational Radiation Protection Program.

- Appendix 12AA describes the ALARA program. Incorporates approved NEI 07-08A by reference.
- Appendix 12BB describes the Radiation Protection program. Incorporates approved NEI 07-03A by reference.
- Appendix 12BB includes a description of access controls for Very High Radiation Areas (VHRA).

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Presentation to the ACRS Subcommittee

Fermi Unit 3 COL Application Review

SER Chapter 12 with No Open Items "Radiation Protection"

November 30, 2011

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Regulations and Review Guidance

10 CFR Part 20, and Appendix B to Part 20

10 CFR 50.34(f), 50.34a, 50.36a, and Appendix I to Part 50

40 CFR Part 190, implemented under Part 20.1301(e)

10 CFR 20.1406

NUREG-0800, Section 12 (SRP)

Regulatory Guide 1.206

Fermi 3 COL Chapter 12
FSAR Sections Reviewed

	FSAR Section	Reviewer & Section Type
12.1	Ensuring that Occupational Radiation Exposures are ALARA	C. Hinson (Standard)
12.2	Plant Sources	C. Hinson & G. Cicotte (Site-Specific)
12.3	Radiation Protection	C. Hinson (Site-Specific)
12.4	Dose Assessment	C. Hinson (Site-Specific)
12.5	Operational Radiation Protection Program	C. Hinson (Standard)

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Listing of COL Items, Departures and Supplemental Information Items For Fermi 3 COL Chapter 12

Sect	COL/Dep/Sup Item	Description
12.1	STD COL 12.1-1-A	Follow guidance of RG 8.10
	STD COL 12.1-2-A	Follow guidance of RG 1.8
	STD COL 12.1-3-A	Operational considerations-ALARA program
	STD COL 12.1-4-A	Follow guidance of RG 8.8
12.2	**EF3 COL 12.2-2-A**	**Airborne effluents and doses**
	EF3 COL 12.2-3-A	**Liquid effluents and doses**
	STD COL 12.2-4-A	Other contained sources
12.3	**EF3 DEP 11.4-1**	**Long-Term Radwaste Storage**
	STD COL 12.3	Operational considerations-airborne monitors
	STD COL 12.3-4-A	**Compliance with 10 CFR 20.1406**

Listing of COL Items, Departures and Supplemental Information Items For Fermi 3 COL Chapter 12 (continued)

Sect	COL/Dep/Sup Item	Description
12.4	**EF3 SUP 12.4-1**	**Annual doses to construction workers**
12.5	STD COL 12.5-1-A	Equipment, Instrumentation & Facilities
	STD COL 12.5-2-A	Compliance w/50.34(f)(2)(xxvii)-I sampling
	STD COL 12.5-3-A	Radiation Protection Program
	STD COL 12.1-4-A	Follow guidance of RG 8.8
App. 12AA	STD SUP 12.1-1	ALARA Program
App. 12BB	STD COL (various)	Radiation Protection Program

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Section 12.2-Plant Sources: Airborne and Liquid Releases Offsite and Doses

EF3 COL 12.2-2-A	Airborne Effluent and Doses
EF3 COL 12.2-2-A	Liquid Effluent and Doses

- The applicant proposes to limit the reactor water operational iodine radioisotope concentrations in the ODCM, to comply with organ dose objectives of 10 CFR Part 50, Appendix I.
- The operational limitations on iodine concentration to be included in the ODCM is consistent with flexibility as described in 10 CFR 50, App. I.
- The offsite doses to members of the public are less than the limits in 10 CFR 20.1301, 20.1302, 10 CFR Part 50 Appendix I, and 40 CFR Part 190.

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Section 12.3-Radiation Protection

Staff's review of EF3 DEP 11.4-1:

- EF3 DEP 11.4-1: Long-Term Radwaste Storage
- RAIs 12.3/4-7,9: Describe the Radwaste Building reconfiguration and any resulting changes in source terms or area dose rates
- Applicant's responses (October 19, 2010 & March 21, 2011)
  - FSAR modified to include reconfigured Radwaste Building layout drawings and tables showing Radwaste Building shielding geometry
  - Staff compared the revised figures and tables against those in the ESBWR DCD and found the changes acceptable
  - No changes made to equipment source terms or area dose rates
  - In accordance with RG 8.8, process and drain piping from rooms containing high activity will be routed to minimize personnel exposures

Section 12.3-Radiation Protection

Staff’s review of STD COL 12.3-4-A:

- STD COL 12.3-4-A: Compliance with 10 CFR 20.1406
- RAI 12.3/4-6: Describe the discharge blowdown line features that minimize the potential for unmonitored and uncontrolled releases to the environment
- Applicant’s responses (Oct. 19, 2010 & August 1& 24, 2011)
  - Blowdown line is a buried 48” HDPE seamless pipe with no valves, vacuum breakers, or other inline components
  - Radwaste discharge line is enclosed within a guard pipe
  - A groundwater monitoring program, which includes the utilization of groundwater wells, will be developed consistent with NEI 08-08A
  - NEI 08-08A addresses the guidance of RG 4.21 and requirements of 10 CFR 20.1406

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Section 12.4-Dose Assessment

Staff's review of EF3 SUP 12.4-1:

- EF3 SUP 12.4-1: Annual Doses to Construction Workers
- RAIs 12.3/4-1,3,5: Provide the bases and assumptions used to calculate the construction worker dose estimates
- Applicant's response (May 21, 2010)
  - FSAR modified to include a description of the estimated contributions to construction worker doses from direct radiation and gaseous effluents
  - Direct radiation sources include exposure from Fermi 2, the Fermi 2 ISFSI, and the decommissioned Fermi 1 site
  - Annual dose to a construction worker is below 10 CFR 20.1301 limits

SER with No Open Items
Chapter 12.0

Questions/Comments

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Presentation to ACRS Subcommittee
Chapter 13

Chapter 13, Conduct of Operations: Chapter Topics

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	FSAR Section	Presenter
13.1	Organizational Structure of Applicant	P. Smith
13.2	Training	P. Smith
13.4	Operational Program Implementation	P. Smith
13.5	Plant Procedures	P. Smith
13.7	Fitness for Duty	P. Smith
13.8	Cyber Security (Per SER)	P. Smith
13.3	Emergency Planning	P. Smith

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13.1 Organizational Structure of Applicant

EF3 COL Describes Fermi 3 organizational structure.

Design and construction organization and responsibilities are described in Appendix 13AA.

13.2 Training

STD COL Provides Description of Training Program.

Appendix 13BB incorporates by reference NEI 06-13A, “Template for an Industry Training Program Description,” for the Training Program.

13.4 Operational Program Implementation

STD COL Provides operational program implementation milestones.

13.5 Plant Procedures

STD SUP Describes administrative and operating procedures (including abnormal and emergency procedures).

Describes procedure development program.

Describes procedure implementation plan.

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13.7 Fitness for Duty (FFD)

STD SUP Commits to NEI 06-06, Revision 5, "Fitness for Duty Program for New Nuclear Power Plant Construction Sites."

Meets 10 CFR Part 26.

Milestones for implementation established in Section 13.4 for different categories of personnel.

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13.8 Cyber Security

- Cyber Security Plan (CSP) developed consistent with NEI 08-09, Revision 6, “Cyber Security Plan for Nuclear Power Reactors.”
- CSP describes the site defensive model.
- CSP satisfies the requirements of 10 CFR 73.54.
- Milestones for implementation are established in Section 13.4.

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13.3 Emergency Planning

- Emergency Plan Design
- Emergency Facilities
- Emergency Response
- Emergency Planning Zone
- Evacuation Time Estimate
- Offsite Education and Alerting

Emergency Plan Design

- Separate Plan for Fermi 3, Emergency Response Actions are coordinated with Fermi 2. Same EPZ for both units.
- Developed in accordance with:
  - 10 CFR 50.47
  - 10 CFR Appendix E
  - NUREG-0654/FEMA-REP-1
- Emergency Action Levels (EALs) will be developed in accordance with NEI 07-01, “Methodology for Development of Emergency Action Levels, Advanced Passive Light Water Reactors.”

Emergency Facilities

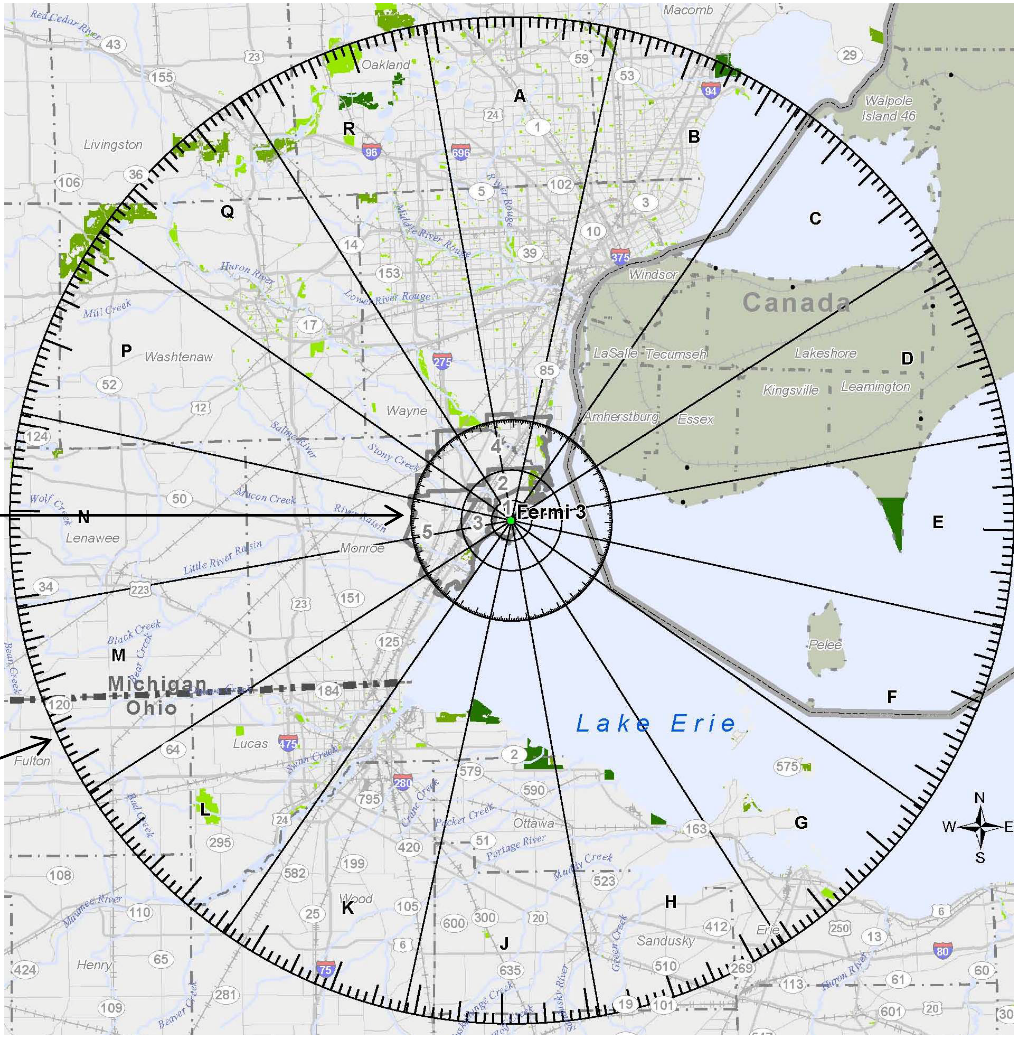
- Control Room
- TSC; Location specified in DCD (Electrical Building)
- OSC; Location specified in DCD (Service Building)
- EOF; Serves both Fermi 2 and Fermi 3 (Onsite Nuclear Operations Center)
- Alternate EOF; Approximately 22 miles from Site (Western Wayne Center)
- Joint Information Center (JIC) – Monroe County Community College (Approximately 12 miles from Site)
- Communications are described in Emergency Plan

Chapter 13, Conduct of Operations: Supplemental Information

Emergency Planning Zones

Plume Exposure Pathway (10 mile radius)

Ingestion Exposure Pathway (50 mile radius)



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Emergency Response

- Control Room - Operational Control of the Plant.
- TSC - Manages resources to support Control Room.
- OSC - Provides manpower and support to Control Room and TSC for in-plant functions.
- EOF - Directs Emergency Response Organization and Coordinates with Offsite Agencies.
- JIC - Coordinates dissemination of information to media and public.

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Emergency Response - Outside Agencies

- State of Michigan
  - Emergency Operations Center
  - Emergency Management Division
  - Department of Environmental Quality
  - Department of Community Health
- Local Government
  - Monroe County
  - Wayne County
- Federal Government
  - NRC
  - FEMA
- Province of Ontario

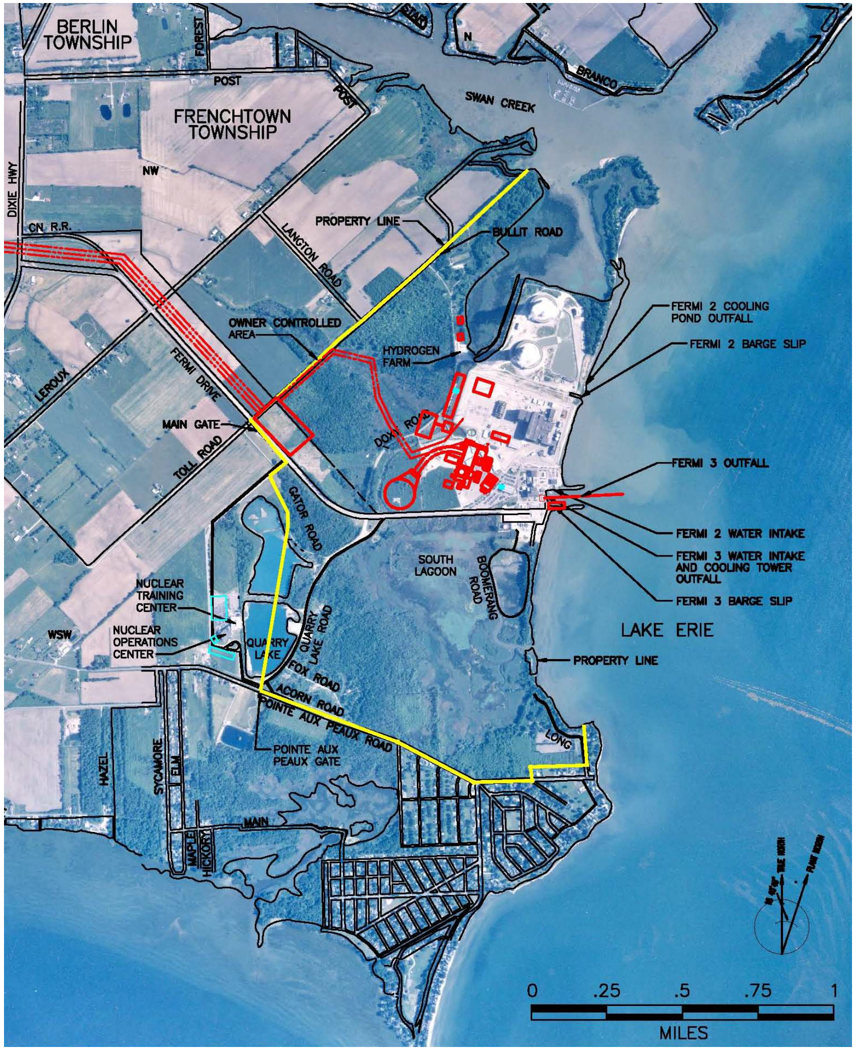
Evacuation Time Estimate (ETE)

- Fermi 3 specific ETE performed for COLA (updated August 2010).
- Complies with NUREG-0654/FEMA-REP-1 and NUREG/CR-6863.
- Considered 14 scenarios (time of day, day of week, season, weather) and 7 regions (based on wind direction and wind strength).
- Considered impact on evacuation time of Fermi 3 construction workers during an accident at Fermi 2.
- Utilized in the development of Emergency Plans.
- Provides information to Licensee and State and Local Governments needed for protective action decision making.

Post-COL Activities

- Milestones, License Conditions
  - Full participation exercise.
  - Onsite exercise.
  - Detailed implementing procedures submitted to NRC.
  - Fully developed set of EALs.
- ITAAC
  - Address elements of emergency preparedness that cannot be completed during COL application stage.

Chapter 13, Conduct of Operations: Supplemental Information – Back-up Information



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SER Chapter 13 with No Open Items
"Conduct of Operations"

November 30, 2011

Summary of Technical Discussion for Fermi 3 COL Chapter 13

	FSAR Section	Summary of Supplemental Information
13.1	Organizational Structure of Applicant	Richard Pelton
13.2.1 13.2.2	Reactor Operating Training Non-Licensed Operator Training	Richard Pelton
13.5.1.1 13.5.2.1	Administrative Procedures Operating and Emergency Operating Procedures	Richard Pelton
13.3	Emergency Planning	Eric Schrader
13.4	Operational Program Implementation	Jerry Hale
13.7	Fitness for Duty	Wayne Chalk
13.8	Cyber Security	Perry Pederson

Section 13.1 – Organizational Structure of Applicant

- **Staff's Review of COL & Supplemental Items:**
  - EF3 COL 13.1-1-A, "Management and Technical Support Organization," requires the applicant to describe the management, technical support, and operating organizations.
  - EF3 COL 9.5.1-10-A, "Fire Brigade," requires the applicant to provide a milestone for implementing manual firefighting.
- **Staff Conclusion:**
  - The staff's review confirmed that the applicant has addressed EF3 COL Item 13.1 1-A, EF3 COL Item 9.5.1-10-A, and no outstanding information is expected to be addressed in the Fermi 3 COL FSAR related to this section.
  - The staff has determined that the applicant has provided sufficient information for satisfying the requirements of 10 CFR 50.40(b) and 10 CFR 50.54(j–m).

Section 13.2 - Training

- **Staff's Review of COL & Supplemental Items:**
  - STD COL 13.2-1-A, "Reactor Operator Training," requires the applicant to provide a description of, and the schedule for, the training program for reactor operators and senior reactor operators, and the licensed operator requalification program.
  - STD COL 13.2.2-A, "Training for Non-Licensed Plant Staff," requires the applicant to provide a description of, and the schedule for, the training program for non-licensed plant staff.
  - STD SUP 13.2-1, "Training," requires the applicant to provide a description of, and the schedule for implementation of the training program
- **Staff Conclusion:**
  - The staff's review confirmed that the applicant has addressed STD COL 13.2-1-A, STF COL 13.2-2-A, STD SUP 13.2-1, and no outstanding information is expected to be addressed in the Fermi 3 COL FSAR related to this section.
  - The staff has determined that the applicant has addressed COL Items STD COL 13.2-1-A and 13.2-2-A and STD SUP 13.2-1, provided sufficient information for satisfying the requirements of 10 CFR 50.54(i),10 CFR 50.120, 10 CFR 52.79(a)(33) and (34), 10 CFR 55.13, 55.31, 55.41, 55.43, 55.45, and 55.59, and is acceptable.

Section 13.3 – Emergency Planning

- **Regulations**
  - 10 CFR 52.79(a)(21) compliance with 10 CFR Part 50.47 and Appendix E
  - 10 CFR 50.33(g) – State and local emergency plans and EPZ
  - 10 CFR 50.47(a)(1)(ii) – Reasonable assurance finding
  - 10 CFR 50.47(a)(2) – FEMA offsite finding, NRC onsite finding
  - 10 CFR 50.47(b) – 16 Planning Standards
  - Appendix E to 10 CFR Part 50
- **Guidance**
  - Regulatory Guide 1.101 – EP for Nuclear Power Reactors
  - NUREG-0654 – Criteria for 16 planning standards
  - NUREG-0396 / EPA 520/1-78-016 – Planning Basis
  - NUREG-0800 SRP – Section 13.3 EP

Section 13.3 – Emergency Planning

Emergency Plan & Supporting Information

- TSC - Located in the PA in the Electrical Building, complies with ESBWR DCD described design requirements of location, size, habitability, and ventilation.
- OSC - Located in the Service Building within the PA, separate from the Control Room and provides an area for coordination of ERO personnel to support emergency response operations.
- Emergency Operations Facility – Share existing approved Unit 2 EOF.

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Section 13.3 – Emergency Planning

Post COL Items, License Conditions, Open Items & Confirmatory Items

- Post-COL Activities
  - EP ITAAC
  - EP Implementation Milestones
  - Emergency Action Levels (NEI 07-01)
  - Finalized Letters of Agreement
- No Open Items
- 10 Confirmatory Items

Section 13.3 – Emergency Planning

- **Conclusions**
  - Reasonable assurance exists for the offsite plans
  - DTE COL application includes post-COL activities, including EP ITAAC necessary to provide reasonable assurance for onsite plans
  - With the additional information and proposed textual revisions provided in response to the staff's requests for additional information, the NRC staff finds that the applicant addressed the required information relating to EP.

Section 13.4 – Operational Program Implementation

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- **Staff's Review of COL & Supplemental Items:**
  - **COL Item 13.4-1-A Operational Programs**
  - **COL Item 13.4-2-A Implementation Milestones**
  - **Post Combined License Activity:**
    - Implementation of each operational program will be evaluated by the staff according to the respective implementation milestone identified in FSAR Table 13.4-201.
  - **The applicant identified the following license conditions:**
    - No later than 12 months after issuance of the COL, applicant shall submit to the Director of NRO, or the Director's designee, a schedule for implementation of the operational programs listed in FSAR Table 13.4-201, including the associated estimated date for initial loading of fuel.
    - The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until all the operational programs listed in FSAR Table 13.4-201 have been fully implemented.
  - **Staff Conclusion: The applicant has adequately addressed COL and Supplemental information regarding Fermi 3 COL FSAR.**

Section 13.5.1 - Administrative Procedures

- **Staff's Review of COL & Supplemental Items:**
  - STD SUP 13.5-1, Plant Procedure
  - STD COL 13.5-1-A, Administrative Procedures Development Plan
  - STD SUP 13.5-2, Procedure Control
  - STD SUP 13.5-3, Procedure Identification
  - STD SUP 13.5-4, Procedure Development
  - EF3 COL 13.5-4-A, Industry Guidance
  - STD SUP 13.5-5, Control of Procedure Format and Content
  - STD SUP 13.5-6, Procedure Detail
  - STD SUP 13.5-7, Procedure Development
  - STD SUP 13.5-8, Shutdown Management Procedures
  - STD SUP 13.5-9, Administrative Procedures for Activities that are Important to Safety

Section 13.5.1 - Administrative Procedures (continued)

- **Staff's Review of COL & Supplemental Items:**
  - STD SUP 13.5-10, Administrative Procedures Described in ASME NQA-1
  - EF3 SUP 13.5-11, Procedure Control as Discussed in the QAPD
  - STD SUP 13.5-12, Procedure Style (Writer) Guide
  - STD SUP 13.5-13, Procedure for Maintenance and Control of Procedural Updates
  - STD SUP 13.5-14, Pre-COL Administrative Programs and Procedures
  - STD SUP 13.5-15, Administrative Procedures for Control of Operation Activities
  - STD SUP 13.5-16, Plant Administrative Procedures
  - The above items require the applicant to prepare plant procedures in accordance with established guidelines.

Section 13.5.1 - Administrative Procedures (continued)

- **Staff's Conclusion**
  - The staff's review confirmed that the applicant has addressed COL items STD COL 13.5-1-A and EF3 COL 13.5-4-A, and supplemental items STD SUP 13.5-1 through STD SUP 13.5-10, EF3 SUP 13.5-11, and STD SUP 13.5-12 through STD SUP 13.5-16, and that no outstanding information is expected to be addressed in the Fermi 3 COL FSAR related to this section.

  - The staff has determined that the applicant has provided sufficient information for satisfying the requirements of 10 CFR 52.79(a)(14), (26), (29)(i), (29)(ii), (33), and (34).

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Section 13.5.2 – Operating and Maintenance Procedures

- **Staff's Review of COL & Supplemental Items:**
  - STD COL 13.5-1-A, Administrative Procedures Development Plan
  - STD COL 13.5-2-A, Plant Operating Procedures Development Plan
  - STD COL 13.5-3-A, Emergency Procedures Development
  - EF3 COL 13.5-4-A, Implementation of Plant Procedures Plan
  - STD COL 13.5-5-A, Procedures Included in Scope of Plan
  - STD COL 13.5-6-A, Procedures for Calibration, Inspection, and Testing
  - STD SUP 13.5-18, Classification of Procedures
  - STD SUP 13.5-19, System Operating Procedures
  - STD SUP 13.5-20, General Operating Procedures
  - STD SUP 13.5-21, Abnormal Operating Procedures
  - EF3 SUP 13.5-22, Emergency Operating Procedures

Section 13.5.2 – Operating and Maintenance Procedures (continued)

- **Staff's Review of COL & Supplemental Items:**
  - STD SUP 13.5-23, Alarm Response Procedures
  - EF3 SUP 13.5-24, Temporary Procedures
  - STD SUP 13.5-25, Fuel Handling Procedures
  - STD SUP 13.5-26, Maintenance and Other Operating Procedures
  - STD SUP 13.5-27, Plant Radiation Protection Procedures
  - STD SUP 13.5-28, Emergency Preparedness Procedures
  - STD SUP 13.5-29, Instrument Calibration and Test Procedures
  - STD SUP 13.5-30, Chemistry Procedures
  - STD SUP 13.5-31, Radioactive Waste Management Procedures
  - STD SUP 13.5-33, Inspection Procedures
  - STD SUP 13.5-34, Modification Procedures
  - STD SUP 13.5-35, Heavy Load Handling Procedures

Section 13.5.2 – Operating and Maintenance Procedures (continued)

- **Staff's Review of COL & Supplemental Items:**
  - STD SUP 13.5-36, Material Control Procedures
  - STD SUP 13.5-37, Security Procedures
  - STD SUP 13.5-38, Refueling and Outage Planning Procedures
  - STD SUP 13.5-40, Refueling Cavity Integrity Procedure

  - The above items require the applicant to prepare plant procedures in accordance with established guidelines.

Section 13.5.2 – Operating and Maintenance Procedures (continued)

- **Staff Conclusion**
  - The staff's review confirmed that the applicant has addressed COL items STD COL 13.5-1-A through STD COL 13.5-3-A, EF3 COL 13.5-4-A, STD COL 13.5-5-A, and STD COL 13.5-6-A, and supplemental items STD SUP 13.5-18 through STD SUP 13.5-21, EF3 SUP 13.5-22, STD SUP 13.5-23, EF3 SUP 13.5-24, STD SUP 13.5-25 through STD SUP 13.5-31, and STD SUP 13.5.33 through STD SUP 13.5-40, and that no outstanding information is expected to be addressed in the Fermi 3 COL FSAR related to this section.
  - The staff has determined that the applicant has provided sufficient information for satisfying the requirements of 10 CFR 52.79(a)(14), (26), (29)(i), (29)(ii), (33), and (34).

Section 13.3 – Emergency Planning

- Regulations
  - 10 CFR 52.79(a)(21) compliance with 10 CFR Part 50.47 and Appendix E
  - 10 CFR 50.33(g) – State and local emergency plans and EPZ
  - 10 CFR 50.47(a)(1)(ii) – Reasonable assurance finding
  - 10 CFR 50.47(a)(2) – FEMA offsite finding, NRC onsite finding
  - 10 CFR 50.47(b) – 16 Planning Standards
  - Appendix E to 10 CFR Part 50
- Guidance
  - Regulatory Guide 1.101 – EP for Nuclear Power Reactors
  - NUREG-0654 – Criteria for 16 planning standards
  - NUREG-0396 / EPA 520/1-78-016 – Planning Basis
  - NUREG-0800 SRP – Section 13.3 EP

Emergency Plan & Supporting Information

- TSC - Located in the PA in the Electrical Building, complies with ESBWR DCD described design requirements of location, size, habitability, and ventilation.
- OSC - Located in the Service Building within the PA, separate from the Control Room and provides an area for coordination of ERO personnel to support emergency response operations.
- Emergency Operations Facility – Share existing approved Unit 2 EOF.

Post COL Items, License Conditions, Open Items & Confirmatory Items

- Post-COL Activities
  - EP ITAAC
  - EP Implementation Milestones
  - Emergency Action Levels (NEI 07-01)
  - Finalized Letters of Agreement
- No Open Items
- 10 Confirmatory Items

Section 13.3 – Emergency Planning

- **Conclusions**
  - Reasonable assurance exists for the offsite plans
  - DTE COL application includes post-COL activities, including EP ITAAC necessary to provide reasonable assurance for onsite plans
  - With the additional information and proposed textual revisions provided in response to the staff's requests for additional information, the NRC staff finds that the applicant addressed the required information relating to EP.

Section 13.4 – Operational Program Implementation

- **Staff's Review of COL & Supplemental Items:**
  - **COL Item 13.4-1-A Operational Programs**
  - **COL Item 13.4-2-A Implementation Milestones**
  - **Post Combined License Activity:**
    - Implementation of each operational program will be evaluated by the staff according to the respective implementation milestone identified in FSAR Table 13.4-201.
  - **The applicant identified the following license conditions:**
    - No later than 12 months after issuance of the COL, applicant shall submit to the Director of NRO, or the Director's designee, a schedule for implementation of the operational programs listed in FSAR Table 13.4-201, including the associated estimated date for initial loading of fuel.
    - The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until all the operational programs listed in FSAR Table 13.4-201 have been fully implemented.
  - **Staff Conclusion: The applicant has adequately addressed COL and Supplemental information regarding Fermi 3 COL FSAR.**

Section 13.7 – Fitness for Duty

- Fitness for Duty, Lead Technical Reviewer
  - Wayne Chalk
- Fitness for Duty, Senior Program Manager
  - Paul Harris

Section 13.7 – Fitness for Duty

- Overview
- Background Information
- Application Standards
- Technical Review
- Conclusion

Section 13.7 – Fitness for Duty

Background Information

- 10 CFR Part 26
  - Publication Date: March 31, 2008
  - Effective Date: April 30, 2008
  - Purpose
- Phases of the FFD Program
  - Operations
  - Construction

Section 13.7 – Fitness for Duty

Application Standards

- Acceptance Criteria
  - 10 CFR Part 26, FFD Program
  - 10 CFR 52.79(a)(44)
- **References**
  - NEI 06-06, Revision 5

Section 13.7 – Fitness for Duty

Technical Review

- Areas Covered
  - Adequacy of Construction Phase
  - Adequacy of Operations Phase
- Milestones
  - Table 13.4-201 Operational Programs Required by NRC Regulations
- No License Conditions

Section 13.7 – Fitness for Duty

Conclusion

Conclusions:

- No Outstanding Information
- Fermi Unit 3 COL FSAR is Acceptable
- Conforms to Regulatory Requirements

Section 13.8 – Cyber Security

- **Staff's Review of COL & Supplemental Items:**
  - COL Items

Section 13.8 – Cyber Security (cont)

Regulatory Evaluation

- The following NRC regulations include the relevant requirements for the CSP:
  - 10 CFR 73.54, Protection of Digital Computer and Communication Systems and Networks
  - 10 CFR 73.55(a)(1), 10 CFR 73.55(b)(8), and 10 CFR 73.55(m)
  - Appendix G, Reportable Safeguards Events, to 10 CFR Part 73, Physical Protection of Plants and Materials
- Detroit Edison (DTE) submitted the Fermi 3 CSP per 10 CFR 73.54
- Submission was found acceptable IAW LIC 109

Section 13.8 – Cyber Security (cont)

Regulatory Evaluation

- Cyber Security is an operational program
  - SECY 05-0197 policy: cyber security program deployment is not subject to ITAAC
  - NRC to conduct post-licensing inspections to confirm program implementation
- Commission clarified the scope of 10 CFR 73.54 to include SSCs in the balance of plant
  - Includes important to safety SSCs with potential to affect plant reactivity

Section 13.8 – Cyber Security (cont)

Regulatory Guide (RG) 5.71 and NEI 08-09 Rev. 6

- RG 5.71 is one way for licensees to meet the requirements of 10 CFR 73.54
- NRC staff found NEI 08-09 Revision 6 acceptable for use by licensees to meet the requirements of 10 CFR 73.54
- RG 5.71 and NEI 08-09 Revision 6 are comparable documents
- DTE submitted Fermi 3 CSP and it was reviewed against the corresponding sections in RG 5.71 and NEI 08-09 Revision 6
- Staff Conclusion:
  - The applicant has adequately addressed COL and Supplemental information regarding Fermi 3 COL FSAR

Section 13.8 – Cyber Security (cont)

Fermi 3 CSP Elements

Scope and Purpose	**Ongoing Monitoring and Assessment**
Analyzing Digital Computer Systems and Networks and Applying Cyber Security Controls	**Modification of Digital Assets**
Cyber Security Assessment and Authorization	**Attack Mitigation and Incident Response**
Cyber Security Assessment Team	**Cyber Security Contingency Plan**
Identification of Critical Digital Assets	**Cyber Security Training and Awareness**
Examination of Cyber Security Practices	**Evaluate and Manage Cyber Risk**
Tabletop Reviews and Validation Testing	**Policies and Implementing Procedures**
Mitigation of Vulnerabilities and Application of Cyber Security Controls	**Roles and Responsibilities**
Incorporating the Cyber Security Program into the Physical Protection Program	**Cyber Security Program Review**
Cyber Security Controls	**Document Control and Records Retention and Handling – *Issued RAI 4920***
Defense-in-Depth Protective Strategies	**Implementation Schedule**

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SER with No Open Items
Chapter 13

Questions/Comments

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Fermi 3 COLA
Presentation to ACRS Subcommittee
Chapter 9

Chapter 9, Auxiliary Systems: Chapter Topics

DTE Energy

	FSAR Section	Presenter
9.1	Fuel Storage and Handling	R. Pratt
9.2	Water Systems	R. Pratt
9.3	Process Auxiliaries	N. Latzy
9.4	Heating, Ventilation, and Air Conditioning	IBR Section
9.5	Other Auxiliary Systems	N. Latzy
9A	Fire Hazard Analysis (FHA)	N. Latzy
9B	Summary of Analysis Supporting Fire Protection Design Requirements	IBR Section

9.1 Fuel Storage and Handling

STD COL **Fuel Handling Operations:**

- Commits to develop fuel handling procedures, including scope and milestones for completion.
- Describes requirements for testing and inspections plans for fuel handling equipment.

STD COL **Handling of Heavy Loads:**

- Identifies requirements for heavy load and safe load path procedures.
- Describes requirements for testing and inspection of equipment.

9.2 Water Systems

Plant Service Water System

- Classified as a RTNSS C system (consistent with DCD).
- Two independent redundant trains providing cooling water to the RCCWS and TCCWS heat exchangers.
- Rejects heat to either the normal power heat sink (NPHS) or the auxiliary heat sink (AHS). The NPHS uses a natural draft cooling tower and the AHS uses mechanical draft cooling towers.

Plant Service Water System (continued)

(EF3 COL Items)

- Carbon steel pipe is used for buried and above grade portions of PSWS.
- Corrosion protection system consistent with the guidance contained in ASME B31.1, Nonmandatory Appendix IV, is provided for the surfaces of the buried portion of PSWS.
- Basin storage capacity for 7 day heat removal without active makeup (confirmed by ITAAC).

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Makeup Water System

EF3 CDI Provides site specific information for the demineralization portion of the system.

Potable and Sanitary Water System

EF3 CDI Describes plant-specific systems, including the interface with the municipal water system.

Ultimate Heat Sink (IC/PCCS Pools)

STD COL Commits to develop procedures for identifying and connecting makeup water sources to the UHS seven (7) days after an accident.

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Condensate Storage and Transfer System

STD SUP Addresses freeze protection for the Condensate Storage and Transfer System.

Station Water System

EF3 CDI Plant Cooling Tower Makeup Supply – makeup to PSWS and CIRC basins.

Pretreated Water Supply System – makeup to Fire Protection System.

9.3 Process Auxiliaries

Process Sampling System

STD COL Describes Post-Accident Sampling Program.

Program meets requirements of NUREG-0800, Section 9.3.2, for actions in lieu of a Post Accident Sampling System.

Hydrogen Water Chemistry System

EF3 CDI Used to inject hydrogen into the Feedwater System and oxygen into the Offgas System.

Describes hydrogen storage facility, relative location, and tank size.

STD CDI Describes inspection and test requirements.

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Hydrogen Water Chemistry System (continued)

Follow-up for October 21st ACRS Meeting (Chapter 6)

- Storing and handling of hydrogen complies with EPRI NP-5283-SR-A, “Guidelines for Permanent BWR Hydrogen Water Chemistry Installations.”
- Hydrogen Storage in the Yard – Design Features
  - Distances and system design parameters (tank size, line size, operating parameters) are specified so that a tank or line rupture at the storage location will not have an adverse impact to safety related structures or air pathways into safety related structures.
  - Piping between storage location and Turbine Building is routed underground and, per EPRI NP-5283, shall be designed for cathodic protection (or coated and wrapped), for the appropriate soil conditions (such as frost depth and liquefaction), and for vehicle loads.
  - Excess flow check valve installed to limit a large release to the storage location. This design feature restricts the release to the Turbine Building in the event of a line break.
  - PRA assumes on-site storage facility follows EPRI NP-5283 and is considered to be low risk.

Hydrogen Water Chemistry System (continued)

Follow-up for October 21st ACRS Meeting (Chapter 6)

- Hydrogen Handling in the Turbine Building – Design Features
  - Per Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants," and EPRI-NP-5283, excess flow protection is designed to ensure that a line break will not result in the hydrogen concentration exceeding 2 percent (i.e., 50% of the lower explosive limit) with or without normal ventilation operating.
  - Hydrogen monitors will be installed in the Turbine Building. Specific locations will be determined during detailed design. See DCD Figure 9.3-5 for simplified diagram.
  - Instrumentation indicates and/or alarms abnormal or undesirable conditions.
  - DCD provides requirements to isolate hydrogen supply if normal building ventilation is lost.
  - Commitment in FSAR Section 9.5 to perform a compliance review (prior to fuel load) to ensure that the Fire Hazards Analysis (FHA) reflects the final as-built design.

- In conclusion, hydrogen does not present a noxious gas concentration or combustion hazard.

Oxygen Injection System

EF3 COL Provides a description of the oxygen storage facility.

Zinc Injection System

STD COL Zinc Injection System is not being utilized.

9.5 Other Auxiliary Systems

Fire Protection System and Program (EF3 COL Items)

- Secondary firewater source is from Lake Erie.
- Specifies applicable codes, standards, and regulatory guidance.
- Describes control of combustible materials, hazardous materials, and ignition sources.
- Provides details on fire barriers and electrical raceway fire barrier systems.
- Specifies applicable quality assurance controls.
- Commitments associated with fire pump testing, fire barriers, manual smoke control, FHA compliance review of final as-built design, fire brigade, and quality assurance related procedures.

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Emergency Communication Systems

EF3 COL Onsite and Offsite Emergency Communication Systems

- Emergency Notification System (ENS)
- Health Physics Network
- Emergency Response Data System
- Crisis Management Radio System
- Fire Brigade Radio System – complies with RG 1.189

EF3 COL Transmission System Operator Communications

Diesel Generator Fuel Oil Storage and Transfer System

- Standby Diesel Fuel Oil is classified as RTNSS C (consistent with DCD).
- Ancillary Diesel Fuel Oil is classified as RTNSS B (consistent with DCD).

STD COL Procedures ensure sufficient onsite inventory of fuel oil for 7 days of continuous operation.

EF3 COL Corrosion protection system used for underground fuel oil transfer piping.

9A Fire Hazards Analysis (FHA)

- Site specific information

EF3 COL Yard Areas

- Hydrogen and Oxygen Storage
- Station Water Intake

EF3 DEP Radwaste Building reconfigured in support of departure in Chapter 11.

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Presentation to the ACRS Subcommittee

Fermi Unit 3 COL Application Review

SER Chapter 9.0 with No Open Items "Auxiliary Systems"

November 30, 2011

Summary of Technical Discussion Points for Fermi 3 COL Chapter 9

	Discussion Topic	Presenter/Description
	Introduction	M. Eudy
9.2.1	Plant Service Water Systems	C. Li (Site Specific COL, SUP, CDI items)
9.2.5	Ultimate Heat Sink	C. Li (Post 7 Day Makeup to UHS and COM)
9.5.1	Fire Protection System	R. Vettori (Site-Specific COL and SUP items, Dep11.4-1, COMs)
9.5.2	Communication Systems	E. Eagle (Site-Specific)
	Conclusions/Questions	M. Eudy

9.2.1 – Plant Service Water System

Staff's Review of COL, Supplemental and CDI Items:

- **EF3 COL Item 9.2.1-1-A: Material Selection**

  The COL applicant selected carbon steel that meets ASTM standards as PSWS pipe material and provided water treatment and corrosion protection system to preclude long-term corrosion and fouling.

- **EF3 SUP Item 9.2.1-1: Basin Reserve Storage Capacity**

  A basin reserve storage capacity of 2.4 million gallons was established by determining the evaporation rate for the auxiliary heat sink (AHS) using the heat load of 1.92xE10 Btu over a 7 day period as defined in the DCD.

- **EF3 CDI System Description**

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9.2.1 – Plant Service Water System

- **EF3 CDI Table 9.2-201, "PSWS Component Design Characteristics"**

  The applicant provided plant-specific design information in Section 9.2.1.2 of EF3 FSAR to address the conceptual design information (CDI).

- **Interface Requirement**

  The applicant provided plant-specific ITAAC to demonstrate that EF3

  PSWS contains an inventory of cooling water sufficient for removing post 72-hour heat from the RCCWS for a period of seven days without active makeup supporting the post-72 hour RTNSS cooling function.

Staff's Conclusions:

The applicant has adequately addressed COL, supplemental information, CDI, and interface requirement in the Fermi 3 COL FSAR.

9.2.5 – Ultimate Heat Sink

Staff's Review of COL & Post COL Commitment:

- **STD COL Item 9.2.5-1-A: Post 7 Day Makeup to UHS**

  The applicant identified COM 9.2-001 as a commitment to address the post seven days makeup to UHS

- **Post Combined License Activity (COM 9.2-001):**

  Procedures that identify and prioritize available makeup sources seven days after an accident, and provide instructions for establishing necessary conditions, will be developed in accordance with the procedure development milestone in Section 13.5

Staff's Conclusions:

The applicant has adequately addressed COL and the Commitment in the Fermi 3 COL FSAR.

9.5.1 - Fire Protection System

Staff's Review of COL & Supplemental Items:

- EF3 COL Item 9.5.1.1-A: Secondary Firewater Storage Source
- EF3 COL Item 9.5.1-2-A: Secondary Firewater Capacity
- EF3 COL Item 9.5.1-4-A: Piping and Instrumentation Diagrams
- EF3 COL Item 9.5.1-10-A: Fire Brigade
- EF3 COL Item 9A.7-1-A: Yard Fire Zone Drawings
- EF3 COL Item 9A.7-2-A: Detailed FHA of the Yard
- EF3 SUP 9.5.1-1 and EF3 SUP 9A-01 Codes and Standards

Staff's Review of Tier 2 Departure:

- EF3 DEP 11.4-1: Long Term, Temporary Storage of Class B and C Low-Level Radioactive Waste

9.5.1 - Fire Protection System

Staff's Review of Post COL Commitments:

- COM 9.5-001: Fire Pumps
- COM 9.5-002: Fire Barriers
- COM 9.5-003: Manual Smoke Control
- COM 9.5-004: Fire Hazard Analysis
- COM 9.5-006: On site Fire Operations Training
- COM 9.5-007: Quality Assurance
- COM 9A-001, 9A-002, 9A-003 Detailed Fire Hazard Analysis of the Yard Area

Staff's Conclusions:

The applicant has adequately addressed COL, COMs and the Tier 2 Departure in the FERMI 3 COL FSAR

9.5.2 – Communication Systems

Summary of FSAR Section 9.5.2

- Incorporated by reference ESBWR DCD, Section 9.5.2
- Describes the communications systems that provide intraplant communications and plant-to-offsite communications during normal, maintenance, transient, fire, and accident conditions
- Addressed 5 COL information items adequately
- Multiple independent and diverse systems; most with alternate power supply in case of loss of primary power source

Staff's Review of COL information items:

- EF3 COL 9.5.2.5-1-A Emergency Notification System
- EF3 COL 9.5.2.5-2-A Grid Transmission Operator
- EF3 COL 9.5.2.5-3-A Offsite Interfaces (1)
- EF3 COL 9.5.2.5-4-A Offsite Interfaces (2)
- EF3 COL 9.5.2.5-4-A Fire Brigade Radio System

9.5.2 – Communication Systems

Staff's Conclusions:

- Systems have equipment with capability to provide emergency communications support for the MCR, TSC, EOF, OSC, security, fire brigade, emergency plan, links to the NRC, principal response organizations, governmental units, and the public
- System equipment includes use of radio, private and public telephone, public address, sound power phones, fax, microwave, remote warning sirens and backup power as uninterruptable power systems and batteries
- No open items; one RAI - closed
- No confirmatory items
- Design adequately conforms to relevant regulations and guidance

Chapter 9 – "Auxiliary Systems" Conclusion

In conclusion, with the exception of the confirmatory items identified, the staff has confirmed that the applicant has addressed the relevant information as specified in the referenced ESBWR DCD. In addition, the staff concludes that the applicant has met the applicable regulations and is in conformance with applicable guidance with respect to Fuel Storage and Handling, Water Systems, Process Auxiliaries, HVAC, and Other Auxiliary Systems as specified in the staff's Chapter 9 SER.

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Chapter 9.0
“Auxiliary Systems”

Questions/Comments

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Fermi 3 COLA
Presentation to ACRS Subcommittee
Resolution to Open ACRS Questions
from October 21, 2011 Meeting

Resolution to Open ACRS Questions from October 21, 2011 Meeting

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ACRS Open Questions

- *Does Detroit Edison intend to provide instrumentation for hazardous gas detection?*
- *Discuss transition from D-RAP to Maintenance Rule given possible differences in risk parameters.*
- *Provide bases for loss of offsite power (LOOP) frequency used in PRA evaluation.*
- *Provide bases for loss of service water frequency used in PRA evaluation given that there may be differences in Service Water system alignment.*
- *Provide bases for why flooding in the Yard is not a concern.*

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Does Detroit Edison intend to provide instrumentation for hazardous gas detection?

- Based on Fermi 3 Toxic Gas Analysis, safety-related monitors and control room isolation are not required for toxic gas hazards.
- Detroit Edison has determined that adequate protection is provided based on:
  - Low chemical hazards for Fermi 3 site.
  - Coordination with Federal, State, and local agencies will provide opportunities for notification of Fermi 3 if nearby accidents occur, including transportation accidents that may involve chemical hazards. For example, Emergency Management Plan for Monroe County addresses communication actions in the event of a hazardous material release or incident.

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Discuss transition from D-RAP to Maintenance Rule given possible differences in PRA importance measures.

- Fermi 3 D-RAP is based on the ESBWR D-RAP listing.
- D-RAP SSCs will be included in Maintenance Rule Program.
- No inconsistencies between D-RAP and Maintenance Rule risk significance measures at Fermi 3.
- Fermi 3 Maintenance Rule Program (FSAR Section 17.6) is based on NRC-approved NEI 07-02A.
  - Refers to NUMARC 93-01, Section 9.3.1, for methods to establish risk significant measures.
  - NUMARC 93-01, Section 9.3.1, includes flexibility in establishing risk significance measures.
  - Maintenance Rule Program includes D-RAP SSCs and expert panel SSCs (see Fermi 3 FSAR Section 17.4, STD COL 17.4-2-A).

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Provide bases for loss of offsite power (LOOP) frequency used in PRA evaluation.

- ESBWR PRA LOOP frequencies are based on NUREG/CR-6890, “Reevaluation of Station Blackout Risk at Nuclear Power Plants Analysis of Loss of Offsite Power Events: 1986-2004”. The 2003 event is included (affected 9 plants).
- The plant specific 1.73 E-2 frequency was based on the Fermi 2 PRA analysis which had been updated to include the 2003 event using a Bayesian update.
- The NRC staff has reviewed the Fermi 2 LOOP frequency in 2007 per an RAI associated with a Fermi 2 LAR and accepted the methodology of the Bayesian update.

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Provide bases for loss of service water frequency used in PRA evaluation given that there may be differences in Service Water system alignment.

[Later]

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Provide bases for why flooding in the Yard is not a concern.

For Fermi 3, flooding in the yard is not a risk significant concern.

- ESBWR PRA excludes consideration of flooding from external sources challenging the plant by specifying site parameters that preclude flooding from external sources. PRA addresses internal flooding of plant as an external event (see Section 1.3.2 and Section 13 of PRA).
- Exclusion is consistent with ASME PRA guidance for screening external flooding scenarios with a frequency of less then 1E-6/yr (see ASME PRA Standard).
- Fermi 3 site characteristics are bounded by ESBWR site parameters for flooding.
- Fermi 3 site flooding event from external sources has an exceedance probability of less than 1E-06 (see ANSI/ANS-2.8-1992).