Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
AP 1000 Subcommittee: Open Session

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Wednesday, October 19, 2011

Work Order No.: NRC-1215 Pages 1-139

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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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AP1000 SUBCOMMITTEE

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WEDNESDAY

OCTOBER 19, 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., Harold B. Ray, Chairman, presiding.

SUBCOMMITTEE MEMBERS:

HAROLD B. RAY, Chairman

DENNIS C. BLEY, Member

CHARLES H. BROWN, JR. Member

JOY REMPE, Member

MICHAEL T. RYAN, Member

ACRS CONSULTANT:

WILLIAM HINZE

DESIGNATED FEDERAL OFFICIAL:

WEIDONG WANG

I-N-D-E-X

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

8:27 a.m.

CHAIRMAN RAY: The meeting will now come to order. This is the second day of the meeting of the AP1000 Reactor Subcommittee, a standing subcommittee of the Advisory Committee on Reactor Safeguards. I'm Harold Ray, chairman of the subcommittee. ACRS members in attendance are Dennis Bley, Mike Ryan, Joy Rempe and Charles Brown.

ACRS consultant Dr. Bill Hinze is present and Weidong Wong is designated federal official for this meeting. I recited the purpose and scope of our discussion at the beginning of the meeting yesterday, I won't do it again now. We will have a closed portion of the meeting later this morning.

And we're going to begin today with an opportunity, not on the agenda, for the staff to respond to some action items from yesterday. So with that, Brian, go ahead.

MR. ANDERSON: Thank you, Mr. Chairman. Just for the record I'll say again. I'm Brian Anderson, I'm the lead project manager for the Levy County COLA review. With me at the front table are Mark McBride and Michelle Hart. Mark is a member of the NRC's Hydrology Branch. Michelle works in the

Siting and Accident Consequences Branch, both in the Office of New Reactors.

From yesterday's session the staff actually had three action items. One was related to a topic that's on the agenda for today. The other two items are listed on the screen. We had a follow-up related to chi/Q values and the associated margins to the DCV values.

And there was also a bullet on one of the groundwater slides in the staff's presentation, we'd like to clarify that bullet related to radionuclide activity at receptor sites. So with that I'll turn it over to Mark McBride to address the groundwater clarification.

MR. MCBRIDE: Thank you. The question came up at the very end of yesterday's session. And normally I would have referred it to our consultants at PNNL but because of telephone difficulties they were not able to respond to us. However, they were online and were able to listen to the entire session.

So by the time I called Paul Thorne as a follow-up he was already well on his way toward preparing a response. And the question was that there was a statement that was in my presentation yesterday. The alternate analysis resulted in a dose of 54

percent of the 10 CFR Appendix B limit that produces 50 millirems per year compared to the FSAR analysis that resulted in 0.7 percent.

And the question was was the comparison really made in terms of concentration or in terms of dose? And the answer is that it was made in terms of concentration. You have to keep in mind that the groundwater modeling program that was used to calculate concentrations at the receptor point deals entirely in concentration units.

And converting this to a dose would require additional analysis which was not carried out. So that's the basic answer, it's a concentration.

MEMBER RYAN: So it's a percent of the allowable concentration?

MR. MCBRIDE: Pardon?

MEMBER RYAN: It was the percent of allowable concentration?

MR. MCBRIDE: That's right.

MEMBER RYAN: And what was that citation again?

MR. MCBRIDE: 10 CFR 20, Appendix B. It's Table 2 specifically.

MEMBER RYAN: Right, that's correct. Thanks.

CHAIRMAN RAY: All right. That completes that item then I believe. Unless there's some question.

MEMBER RYAN: Yes. No.

CHAIRMAN RAY: All right. Michelle.

MS. HART: I understood that there were some questions on the chi/Q values yesterday. The first question what is short-term for the purposes of that analysis. And Don had answered that it is two hours, and that is true for the exclusionary boundary dose. However, for the low population zone dose it can go up as long as 30 days. And so that's the answer for that one.

MEMBER REMPE: But did he check all of them? The short-term and the long-term? Because that's what the slide had said, that he just checked the short-term ones.

MS. HART: For the purposes of Chapter 15, those short-term ones are the only ones that matter. The long-term ones are used for the effluence doses and those are also checked as well.

MEMBER REMPE: Okay.

MS. HART: And so you'll hear from the meteorologist later today about that.

MEMBER REMPE: Okay.

MS. HART: The other question was about the margin to the DCD chi/Qs, the site characteristic one's to the site parameter ones. And Don gave you an answer based on the current revision that was in-house, that it was approximately, off-site it was approximately a factor of two.

And that is true. There isn't a request for additional information that they responded to which did change those values for the off-site doses, I mean for the off-site chi/Qs. And those will be changing in the next revision so that there is not, basically, any margin for the EAB chi/Q in the next revision. It is less than the DCD value, but it is not much less.

MEMBER RYAN: Is it within the uncertainty of the calculation? Or does it overlap the uncertainty of the calculation? I guess if you're waiting for something to come in that's an unfair question at this point. Maybe we can address that when it --

MS. HART: Well the RAI response is in and the meteorologist is in the building. I mean he's in the room and I guess there's a presentation later today. But if you have any specific questions about that you can ask it then, or if you would like to hear

it now.

MEMBER RYAN: Yes, that's fine. Either way. But, I mean, that's fine.

MS. HART: Yes, but they are all less. Even in the RAI response they're all less.

MEMBER RYAN: If essentially equal that's fine, but that means one could be higher than the other or not. Could be the other way around. So I'm curious about the uncertainty of the calculated value.

MS. HART: Right.

MEMBER RYAN: Guessing they overlap.

MS. HART: He will be able to answer that question for you.

MEMBER RYAN: Okay. Great, thanks.

CHAIRMAN RAY: All right. So there's this little piece then that we'll get to later on today. Thank you.

MS. HART: Thank you.

MEMBER RYAN: Very much.

CHAIRMAN RAY: All right. With that, Brian, I think we're ready for the applicant. Looks like it. We don't have to wait long for the meteorology to be subject again. Bob, you can begin.

MR. KITCHEN: Good morning.

CHAIRMAN RAY: Good morning.

MR. KITCHEN: We're going to talk about Sections 2.0 through 2.3, which will address site characteristics, demography of nearby facilities and meteorology.

So as indicated we'll be talking a bit about this right now. Paul Snead, who we introduced yesterday is the Environmental Services supervisor that's going to present for us. So, Paul.

MR. SNEAD: Good morning. Go to the next slide. We can go through some of these briefly. FSAR 2.0 Site Characteristics. For this Section of course the DCD was incorporated by reference.

Table 2.0-201 compares the site specific characteristics to the AP1000 required site parameters found in DCD Table 2-1. All site specific characteristics are bounded by the AP1000 site parameters for Levy.

Next slide. In Section 2.1, Geography and Demography. Again DCD was incorporated by reference. There was a COL information item addressed as noted. The population density in 2000 for 20 miles surrounding the Levy site was 97 people per square mile.

The population density projected for 2020, within 20 miles, is 146 people per square mile, which

is well below the Reg Guide 4.7 criteria 500 people per square mile.

FSAR 2.2, Nearby Industrial Hazards. Again, DCD was incorporated by reference and ICOL information item was addressed. We evaluated nearby industrial hazards in accordance with the standard review plan. Sources of potential hazards within the five miles were road transportation of explosive material.

Failure of a nearby natural gas pipeline and toxic material release from a nearby water treatment plant. No design basis events were identified that required any mitigating actions.

And then Section 2.3, Meteorology. The DCD was incorporated by reference and these five information items that you see on the slide were addressed. All of the AP1000 DCD site parameters are met.

We thought we would discuss with you three major items of interest, or we thought might be items of interest. One, is a discussion of onsite calm wind observations. Another is the operating basis wind speed site parameter. And a third is the maximum site characteristic temperatures for the Levy site. So we're going to talk about each of these in turn.

The site is located about eight miles inland and there is a diurnal sea breeze wind effect that is consistently observed at the site using onsite meteorological tower, evaluating the two years of data that we collected there. The onsite meteorological tower meets all of the NRC Guidance in Reg Guide 1.23.

And there were calm winds that were observed in our data that required further evaluation. Most of the observed calm winds were actually light winds. True calm winds exhibit erratic and meandering wind direction. The observed winds had measurable direction. So our actual observations of true calm winds, that are actually near zero wind speed and variable wind direction, were rare and infrequent.

So in terms of resolution of the light wind speeds in our chi/Q modeling analysis the standard PAVAN dispersion modeling approach was not designed for treatment of very light winds. Basically the way PAVAN is modeled, chi/Q is inversely proportional to wind speed such that as wind speeds such that as wind speeds go to zero concentration goes to infinity.

So basically Progress Energy performed a detailed sector-by-sector assessment of the data using an analysis that was consistent with NRC Guidance in

Reg Guide 1.145. And the maximum possible sector dependent two-hour chi/Qs were substituted for PAVAN extrapolations in light wind cases. So the conclusion of the light wind discussion was that the projected worst case impacts of routine and accidental releases do not exceed the AP1000 DCD criteria at or beyond the exclusionary boundary. Any questions?

CHAIRMAN RAY: All set, thanks.

MR. SNEAD: All right. Next we'll talk about the operating basis wind speeds for the site. The DCD operating basis wind speed for the site parameter is 145 miles per hour based on a three-second gust. The DCD procedures were followed to determine the 50 and 100-year recurrent Levy characteristic wind speeds, which includes hurricanes.

The 50-year recurrent wind speeds were 120 miles per hour. The 100-year recurrent wind speeds were 128 miles per hour. So the conclusion here was that maximum wind speeds at the Levy site region will not exceed the DCD wind speed criteria as defined by the procedure. Any question there?

And then with regard to site characteristic temperatures for the Levy site. The maximum safety temperature criteria is 115 degrees dry bulb, 86.1 degrees Fahrenheit coincident wet bulb.

And then the 86.1 degrees Fahrenheit non-coincident wet bulb.

Analysis was based on long-term historical records from the region surrounding the Levy site. We used National Weather Service data that had the longest available data to us from Tampa, Jacksonville and Tallahassee. And the statistical regression analysis procedure was used to estimate the 100-year recurrent temperatures for the site based on historical temperature records.

MEMBER BROWN: How far back did the historical go?

MR. SNEAD: I have that. It's, I believe it was on the order of 50 to 60 years. For all those sites. Next slide. So no projected maximum site temperatures exceeded the criteria, concluding that the maximum ambient temperature at the Levy site region are below the DCD ambient temperature criteria.

DR. HINZE: Did you do any comparison with your Crystal River statistics?

MR. SNEAD: We did look at Crystal River data, that being a little closer to the coast from a wind speed standpoint. It wasn't really representative temperature wise, it was consistent with the same type of information we were getting from

Tampa and Tallahassee.

DR. HINZE: Very good.

MEMBER BROWN: How close did you get to the 115?

MR. SNEAD: The highest that we saw to the 115 was a Tallahassee reading of 105.1 degrees dry bulb. The highest coincident wet bulb temperature was 82.3 degrees, coincident wet bulb temperature of 82.3 degrees in Jacksonville. For the non-coincident wet bulb temperature we did have a reading in Tampa of 85.5 degrees, wet bulb, non-coincident. Any further questions?

CHAIRMAN RAY: All right. Thank you, Bob.

MR. SNEAD: Thank you.

CHAIRMAN RAY: All right. I guess we'll engage in some shuttle back and forth here and hear from the staff on these subjects before moving on. So, Brian, are you ready?

MR. ANDERSON: Good morning. This is the NRC's staff's presentation for Sections 2.0, 2.1, 2.2 and 2.3 of the Levy County COLA. I'm Brian Anderson, I was the project manager for this portion of the staff safety review. With me at the front table are Rao Tamara and Kevin Quinlan. Rao and Kevin are both members of the Citing and Accident Consequences

Branch.

Kevin performed the meteorology portions of the review. Rao is involved with the demography and nearby facilities portion of this review. I'll start by providing a similar overview to what you just heard from Progress Energy.

Section 2.0 of the FSAR is a description of the characteristics of the Levy County proposed site. That provides a table which compares Levy County site parameters to DCD specified parameters. So it's a little bit of nuance in the way that 2.0 is structured.

But the staff's review in 2.0 and the conclusion that they make in their safety evaluation is to determine that all of the site characteristics are acceptable and that they are bounded by the parameters of the AP1000 DCD.

So similar to what you heard yesterday during the seismic and geology portions of the review, the hydrology portions of the review and what you'll hear from Rou and Kevin, the staff found that all of the site parameters that are discussed in Chapter 2 of the FSAR are acceptable.

Those are the acceptable values that we then compare to the AP1000 DCD values. And just to

reiterate Progress Energy's conclusion that all of the values are bounded by the AP1000 DCD. And with that I will turn the presentation over to Rao Tamara.

MR. TAMARA: My name is Seshagiri Rao Tamara. I'm a technical reviewer in Siting and Accident Branch in the Office of New Reactors. My branch chief if Robert Schaaf and Levy Safety Manager is Brian Anderson.

Section 2.1 of FSAR addresses the geography and demography. Section 2.2 addresses the location and description of nearby facilities and evaluation of potential accidents due to these facilities.

In Section 2.1 the applicant addressed the site location, excluding the area boundary and population distribution. This have been individually verified from the publicly available information at the site location by determining the UTM coordinates with the new proposed units from latitude and longitude.

The staff reviewed the applicant addressed information pertaining to EAB, ownership of the land, control over the EAB and population distribution. The staff independently verified the published data and projections based on the data from Census Bureau

county projections.

Also verified the nearest population center, Ocala, which is about 30 miles to the east, northeast of the site. The population density within 20 miles from the center of the proposed units in 2020, five years after the approval, is independently determined by the staff and found to be comparable to that of the applicant reported value of 146 persons per square mile, which is less than acceptable value of 1,200.

Based on this independent review of the data from different available sources and the confirmation of the information the staff considers that the required information is addressed by the applicant in Section 2.1 pertaining to above areas is adequate and acceptable. Next slide please.

The applicant identified and provided descriptions of the nearby facilities, transportation routes, military facilities and pipelines within the five miles of the site. The staff independently verified the information from the publicly available data and also from the information obtained from the Levy County Planning Department.

And also other sources. And therefore considers the applicant has identified all activities

that have the potential for hazards on the site and in the site vicinity. The evaluation of these potential accidents from the activities are addressed Section 2.2.3. Next slide, please.

The applicant addressed the potential accidents from the identified facilities and activities within five miles of the site performing site-specific hazard evaluations for potential explosions, vapor cloud explosions from natural gas release from pipelines. Aircraft crashes and fires.

Staff also performed independent analysis and verified that there are no adverse effects due to road transport of chemicals or explosives. Transport of natural gas via pipelines and fires. The aircraft properly determined by the applicant exceeded the acceptance criteria of 10^4 minus 6 per year.

However, based on the applicant's application of conditional core damage probability of 5.85 10^4-8 for the AP1000 design, the core damage frequency, CDF, is determined smaller than the current planned CDF acceptance criteria, 10^4-8 per year. Therefore, this has also been reviewed by and addressed in the 19.2 PRA specs.

Based on the delivery of the applicant's analysis, of course the staff also has performed an

independent analysis, getting data from FAA for the total flights. And it also meets the acceptance criteria.

MEMBER RYAN: I'm just curious, does the FAA database include military flights or is that separate?

MR. TAMARA: Yes, what we requested is, it is very difficult to get day-by-day, so we have asked them to give five years of data. All the flights flying within five miles of the site.

So they gave every flight, which has a designation of five types of aircrafts. Air carrier, commercial airline, military and so every flight which is going within the ten miles, per day.

It has a flight number, origination, destination and what is the type of the flight. Like that they give for five years. So we analyze it for five years and we took the maximum and saw what is the, you know, what would be the probability.

And we applied what would be if there is a one percent increase, or whatever it is, what it would be in the future.

Just see the projection and see whether that also will apply. So based upon that confirmed analysis, still probably it is acceptable. So that's

what we did. But since the applicant didn't have that kind of data they made a conservative calibration therefore. They addressed it from the consequence point of view.

MEMBER RYAN: All right. Thanks very much.

MR. TAMARA: Based on the review of the applicant analyses and results and also on the staff's independent confirmatory calculations, the staff concludes that he applicant provided sufficient information and evaluations to meet the requirements of 10 CFR 52 and 10 CFR 100.

And it has been demonstrated with a reasonable assurance that the plant is adequately protected and can be operated safely. Any questions?

CHAIRMAN RAY: Okay. No questions. Thank you very much.

MR. TAMARA: Thank you.

MR. QUINLAN: Good morning. My name is Kevin Quinlan and I'm a meteorologist in the Siting and Accident Consequences Branch within the Division of Site and Environmental reviews. I'll be discussing Section 2.3 of the Levy County SER COL for meteorology. My branch chief is Robert Schaaf and the project manager for Chapter 2, the SER, is Brian

Anderson.

Section 2.3 of the Levy FSAR incorporates by reference Section 2.3 of the AP1000 DCD. Please note that Section 2.3 of the AP1000 DCD standard content SER, with open items, was issued with no open items.

There are five subsections in SER Section 2.3 related to regional climatology, local meteorology, an onsite meteorological measurements program, short-term atmospheric dispersion estimates for accidental releases and long-term atmospheric dispersed estimates for routine releases.

LNP supplemental Item 2.0-1 includes Table 2.0-201, which is a comparison table of AP1000 DCD site parameters and the LNP site characteristics. Next slide, please.

SER Section 2.3.1 describes the review of regional climatological information and addresses one AP1000 COL information items. AP1000 COL information item 2.3-1 states that the applicant should provide site specific information related to regional climatology.

This section of the SER addresses the 50 and 100 year return period to three second gust wind speeds. The wind speeds were confirmed by the staff

through the use of Figure 6-1B of the ASCE 705 document. And by examination of the NOAA Coastal Services Center Hurricane Database.

The maximum tornado wind speed of 300 miles an hour was determined through the use of Regulatory Guide 1.76 Revision 1. Because the applicant identified the most conservative tornado site characteristic by following the NRC guidance and the site characteristic is bounded by the DCD site parameter, the staff found it acceptable.

To determine the maximum precipitation winter roof load, the applicant followed the guidance provided in Interim Staff Guidance 7. Interim Staff Guidance on assessment of normal and extreme winter precipitation loads on the roofs of seismic category 1 structures.

Because the applicant followed the Staff Guidance and the site characteristic is bounded by the DCD site parameter the staff found the analysis to be correct and acceptable.

Ambient temperature and humidity site characteristics were confirmed through the use of National Climatic Center data records from the Tampa, Florida and Tallahassee, Florida National Weather Service Reporting stations. The calculation of 100-

year return period temperatures uses a method endorsed by the ASHRAE Fundamentals Handbook.

Because the applicant followed the appropriate NRC guidance, a conservative method and the site characteristics are bounded by the DCD site parameters, the staff found the analysis to be acceptable.

The applicant presented all of this information in FSAR Section 2.3.1. The staff found that all LNP site characteristics were bounded by the AP1000 DCD site parameters and are therefore acceptable to the staff.

AP1000 COL information Item 2.3-2 states that the applicant should provide site specific information related to local meteorology. This section of the FSAR addresses the potential cooling tower induced affects on ambient temperature, moisture and salt deposition.

This section of the FSAR also provided detailed information showing that the LNP meteorological data are representative of the site area. The applicant presented this information in the FSAR Section 2.3.2, and the staff has accepted it as correct and adequate. Next slide please.

MEMBER REMPE: Could you go back for a

second? It has there that the effects of salt deposition on the ambient, or the cooling tower effects on ambient temperature, moisture and salt deposition?

MR. QUINLAN: Yes.

MEMBER REMPE: What did you do for salt deposition?

MR. QUINLAN: We looked at SACTI the program that analyses cooling tower plumes. And our main concern was the effect of corrosion in the switch yard. So the long-term effects of salt building up and the potential effects on the equipment used in the switch yard.

And essentially the conclusions were that it would take two months of salt deposition in the switch yard to create any type of, really even to hit the lower limits of the contamination that you'd be concerned of.

And in that time you have all kinds of local precipitation, being Florida the constant rain at the site, it would wash away the salt. So it really was of little concern.

MEMBER REMPE: Okay. Thanks.

MR. QUINLAN: You're welcome.

CHAIRMAN RAY: Well, wait a minute. That

seems, forgive me for saying so, sir, but glib in the sense that there are dry periods, they may be exceptional but --

MR. QUINLAN: Yes.

CHAIRMAN RAY: The question is is there some way of assuring that under unusual conditions there wouldn't be a -- I mean the threat in the switch yard is a loss of offsite power. This is a very robust plant design so perhaps we're not too worried about that.

But, nevertheless, is there something other than just relying on a rainstorms to remove the salt build-up that you considered? Insulator is typically done on a seaside plant pretty frequently. Is that part of the assessment also?

MR. QUINLAN: It was not part of the assessment in Chapter 2 and I wouldn't want to speak as far as inspection procedures or plant procedures, but I would imagine that that would be --

CHAIRMAN RAY: Okay. Well I certainly understand that it's not within the scope of Chapter 2. I guess I would just say if the judgement was reached that salt deposition, or accumulation, wouldn't be a problem because it rains often it seems like that needs a little more assessment. Brian, you

tell me who can respond to that.

I mean you could respond by saying, well there's nothing safety related in the switchyard anyway so we don't care. I don't think you'll say that but that's one answer you could give.

MR. ANDERSON: I won't say that now, but I will take this a follow-up and give you an answer sometime today.

CHAIRMAN RAY: Yes. Because, like I say, if we're relying on the frequency of rain to keep the switchyard in service, why I think we need to talk about it a little bit more.

MR. ANDERSON: Okay.

CHAIRMAN RAY: Okay. We'll direct a question to the applicant at some point as well. But go ahead.

MR. QUINLAN: SER Section 2.3.3 describes a review of the onsite meteorological measurements program and addresses AP1000 COL Information Item. AP1000 COL Information Item 2.3-3 states that the applicant should describe site specific onsite meteorological measurements program.

A new meteorological tower was built for Units 1 and 2 and began recording in February of 2007. The staff has verified the location of the new tower

is representative of the site area and meets the guidance provided in Regulatory Guide 1.2.3 Revision 1.

The staff has determined that the applicant has adequately provided all relevant information in FSAR Section 2.3.3. Next slide, please.

SER Section 2.3.4 describes a review of the short-term atmospheric dispersion estimates, or chi/Q values, that are used to evaluate design basis accidental releases to the exclusion area boundary, the outer boundary of the low population zone and the control room.

AP1000 COL Information Item 2.3-4 states that the applicant should provide site specific short-term atmospheric dispersion estimates. Using NRC approved computer models, the applicant has provided this information and the staff has accepted it as correct and adequate.

FSAR Section 2.3.5 describes the review of long-term atmospheric dispersed estimates that are used to evaluate releases of meteorological affluence to the atmosphere during normal plant operation.

AP1000 COL Information Item 2.3-5 states that the applicant should provide site specific long-

term atmospheric disperse estimates. Using NRC approved computer models the applicant has provided this information and staff has accepted it as correct and adequate. Slide please.

In conclusion, all LNP site characteristics presented in FSAR Section 2.3 have been found to be acceptable and bounded by the corresponding AP1000 site parameters.

Section 2.3 of the LNP, COL, FSAR has been reviewed by the staff and has been found to adhere to all regulatory requirements. SER Section 2.3 has been submitted with no open items, exemptions or departures.

There are currently seven confirmatory items that the applicant has committed to through the RAI process. The staff will be looking to ensure that the information presented in the RAI responses are included in the next provision of the FSAR. And once these commitments are confirmed the staff will close the confirmatory items. Thank you.

CHAIRMAN RAY: Now, if the RAI answers, I think you had a question about it, didn't you or are you satisfied?

MEMBER RYAN: It'll be all right.

CHAIRMAN RAY: All right.

DR. HINZE: Let me just slip in with a question. How did you show that the meteorological measurements program was located in a representative area? What's representative area?

MR. QUINLAN: Well, to make sure that it conformed to Regulatory Guide 1.23 guidance, we actually did a site inspection in 2008. We went out there and surveyed the area to make sure that there were not obstructions. But one of the other comparisons that we did was we looked at the meteorological data from the surrounding National Weather Service stations, be it Tampa, Tallahassee, Orlando.

And then we compared wind directions, wind speeds to make sure that they are close. We also looked at temperature and humidity data to make sure that they were reasonably close to each other too. So we really compared it against the whole region to make sure that the site was representative.

DR. HINZE: Crystal River as well?

MR. QUINLAN: We did not use Crystal River data, no.

DR. HINZE: Thank you.

CHAIRMAN RAY: All right. Nothing else, we'll -- Thank you very much.

MR. QUINLAN: Thank you.

CHAIRMAN RAY: Okay. Now, we're doing well, which I'm interested in maintaining that performance. So we will move on without taking a break at this time and take up Chapter 8 and 9 on the part of the applicant's. And since this does involve Chapter 8 and offsite power why don't you talk to us about the switchyard and salt buildup and what you're going to do about it. If it shouldn't rain.

MR. KITCHEN: Okay. Bob Kitchen. We have Jeremy Baksh, who's a senior engineer, actually our transition planning group. And Mike Franklin who's our supervisor of site engineering. Jeremy is going to discuss Chapter 8, Electrical Power and then Mike will discuss Chapter 7 and 10.

CHAIRMAN RAY: Okay. And Jeremy, so I don't look for it you make sure you talk about keeping salt off the insulators in the switchyard so that we still have offsite power.

MR. BAKSH: Would you like me to address that question prior to my presentation?

CHAIRMAN RAY: No, no, no. Whenever it comes up. I'll keep quiet on that point and expect you'll take it up.

MR. BAKSH: Yes, sir, I will. So again,

good morning. My name is Jeremy Baksh. I'm an Electrical Engineer with Progress Energy's New Generation Department. Next slide, please, Bob. So as has been mentioned previously, we got our standard plan so the DCD is incorporated by reference. And we can discuss those site specific portions of our application, Chapter 8, which include the switchyard and connected transmission.

So integration of the Levy units into the Progress Energy transmission system will require the construction of 91 circuit miles of 500 kV transmission and 88 circuit miles of 230 kV transmission.

Progress Energy will also construct four new substation facilities in addition to the switchyard at Levy. And perform upgrades to various substations and transmission lines within our service territory.

We have completed our failure modes and effects analysis. And we've also performed a grid stability study and meet the Westinghouse requirements for the AP1000. Next slide please, Bob.

Here we show a simple sketch --

MEMBER BROWN: How close did you come to the three second limit? You didn't state, I didn't

find it in the FSAR. So that's I asked the question.

MR. BAKSH: I'm going to actually have to defer that question to Mr. Pigg from our group.

MR. KITCHEN: We'll have to, think we need to -- Ken, do you have an answer for that?

KEN: No I don't have an answer for that.

MR. KITCHEN: We'll have to check that out and get back to you.

MR. BAKSH: Let's go to the next one. Here we show a simple sketch of the Levy switchyard in relation to the Units LNP1 and LNP2. The switchyard is shown on the right of the drawing. The transmission corridor that contains the four transmission lines that leave the Levy property are shown to the right of that switchyard. Those lines turn and head south and exit the property. Next slide please, Bob.

Now we show a simple single line diagram of the Levy switchyard. The output of the step-up transformers, or the GSUs for the units, is connected to a unique double-breaker position within the 500 kV portion of the switchyard shown on the top of the drawing.

The 500 and 230 kV BUSes are connected through two 500 to 230 kV autotransformers shown in

the center of the drawing. And they are connected to unique break and a half positions on both the 500 and 230 kV BUSes. The 230 kV BUS at the Levy site is a normal source for all reserve Aux transformers for Unit 1 and 2 shown to the bottom of the drawing. And we've highlighted a breaker and a half configuration and the double breaker schemes.

The Levy switchyard is a new addition to the Progress Energy's transmission system and will be constructed to meet all current and applicable industry standards, as well as our own internal standards for design and construction. For example, all 500 kV lines constructed will have three equivalent protection schemes, while all BUSes and transformers will have two.

All breakers will have separate trip coils sourced from separate DC supplies. The layout and design features employed on the Levy switchyard offer high reliability and support maintenance activities going forward.

CHAIRMAN RAY: When it says future line, how is that future scheduled relative to plant operation? Before? After?

MR. BAKSH: It would be based on transmission needs.

CHAIRMAN RAY: Okay. So it's not related to --

MR. BAKSH: It is not related to the issue.

CHAIRMAN RAY: We should ignore it for the purposes of this?

MR. BAKSH: That's correct.

CHAIRMAN RAY: Okay.

MR. BAKSH: Next slide, please, Bob.

CHAIRMAN RAY: Before you --

MR. BAKSH: I'm sorry.

CHAIRMAN RAY: Okay. Go ahead and finish the next slide. I'm sorry. Go ahead and do that and I'll ask my question.

MR. BAKSH: The next slide is very simple. So as I mentioned earlier we performed an FMEA and confirmed for the Levy switchyard that no single initiating event results in one or more off site transmission lines or a loss of offsite power at the LNP 1 or LNP 2.

MEMBER BROWN: The figure you had in the FSAR conflicts like all the lines come in along the same path. The figure I'm referring to is 8.2-202. And it just shows all the lines coming parallel to each other and then going up into the, seaward's

north. The east side of the switchyard.

MR. BAKSH: That's correct, sir.

MEMBER BROWN: There's no other, when you say you did the analysis, how far apart are all those. I mean there was no definition that I could see that specified how far they were apart other than the statement in the FSAR that you did the FMEA.

MR. BAKSH: Right, you are correct that the structures are located within a common corridor. Currently the structures are spaced 105 feet apart, center to center. And they are designed such that no one structure has the ability to impact an adjacent structure if an accident were to occur.

MEMBER BROWN: So I take it they're not 150 feet tall?

MR. BAKSH: The structure heights will vary. They're averaging between 110 to 190 feet tall. But the structures would be designed, we have two different designs right now. We have a single mono-pole design and what we describe as the battered a-frame design. So it's a typical a-frame structure but the legs are built inward so a collapse of that structure would collapse upon itself and not lean to one side.

MEMBER BROWN: I guess I don't picture it,

since I'm not familiar with that type of construction I --

MR. BAKSH: That's all right --

MEMBER BROWN: You mean to say it goes like this?

MR. BAKSH: It's a battered A-frame so the legs are bent inwards and there's a crossmember that runs across. But there is no vertical -

MEMBER BROWN: So there's no way for it to fall over?

MR. BAKSH: Well it's designed to collapse in on itself. We can show a picture.

MEMBER BROWN: Put little nicks on the inside, so if it's like when you're doing a lumberjack thing you're putting nicks on the inside so it only goes one direction. I'm just --

(Simultaneous speaking)

MEMBER BROWN: I have no familiarity with this at all.

CHAIRMAN RAY: And we don't need to. Like I say loss of offsite power is a design, it's a plant design basis.

MEMBER BROWN: So 150 feet center to center and the tallest towers are about 190 feet?

MR. BAKSH: Yes, sir. And those towers

are in relation to the barge canal so the crossing in the barge canal area would have the tallest towers.

MEMBER BROWN: Okay.

MR. BAKSH: Okay. The question was asked about salt spray on the switchyard. Our typical practice is to coat our insulators within our substation switchyard. So we'll employ a silicon based coating prior to energization of the switchyard. We do have standard maintenance practices for a hotwash of insulators, which can be done after a major storm event as we have experience with our Crystal River site, which is on the coast as well.

Recently Progress Energy has employed the use of polymer bushing for insulators and for large transmission equipment. So with the polymer insulators and the coating we will employ our maintenance practices to ensure that we minimize salt build-up on transmission equipment within the switchyard.

CHAIRMAN RAY: Do you guys have any experience with evaporative salt cooling towers?

MR. BAKSH: Not within the coastal area to my knowledge.

CHAIRMAN RAY: Well you'll get some experience then. And you may find you'll have to

change your maintenance practices but that's, there'll be adequate warning that you have flash-overs.

MR. THOMAS: There was a question. Chase Thomas, with Progress Energy. There was a question about our experience. We do have Units 4 and 5, natural draft cooling towers that are salt water.

MR. BAKSH: Across the river.

MR. THOMAS: And they're right adjacent to the switchyard if I'm not mistaken.

MR. BAKSH: Yes. And the insulators at the Crystal River switch are coated.

CHAIRMAN RAY: Okay. So you do have that much experience at least?

MR. THOMAS: Yes.

CHAIRMAN RAY: Okay. All right.

MR. BAKSH: That's all I intended to present. Unless there were other questions.

CHAIRMAN RAY: Okay. I mean in a coastal environment where you have foggy days you can build up salt on the insulators very fast.

MEMBER BROWN: I did have one other questions.

CHAIRMAN RAY: Gratuitous advice.

MEMBER BROWN: If I can find it again. Yes. In your assessment of plant interface

requirements, it was on page, grid availability you talked about being 99.9 percent. And you said leading causes of forced outage were recorded, or public interference. What's public interference?

MR. BAKSH: That's an information --

MEMBER BROWN: Just an information item.

MR. BAKSH: Yes, if I can get back to you on that. I'm not clear, I'd had to read that section and get the context of it.

MEMBER BROWN: So there's nothing else in there?

CHAIRMAN RAY: Would it be like car accidents, that sort of thing?

MR. BAKSH: It could potentially be, you know.

MEMBER BROWN: I was just trying to get a feel for what you mean. You went through a list of other items, such as lightning strikes, animals running into, I guess, the posts or doing something. I have no idea how a wolf or fox would impact the towers. But the public interference seemed like an interesting one. With trucks going down the road, what's the adjacency. Can you have semis run into them or something.

MR. BAKSH: We do have transmission

circuits that are located close to road right of way and that impacted by public traffic, so vehicles. These circuits would not be. They would be in our common corridor that we would own and purchase the land right to.

CHAIRMAN RAY: Well, Palo Verde lost all offsite power due to a squirrel, for example.

MEMBER BROWN: Is that right? Ran up a post huh?

CHAIRMAN RAY: No, in the switch gear.

MEMBER BROWN: Well that's not good.

CHAIRMAN RAY: So anyway it can happen.

MEMBER BROWN: Well I'd be interested in what you considered in terms of public interference, just a question that's all.

MR. BAKSH: I can follow-up with you.

CHAIRMAN RAY: Okay. Anything else?

MEMBER BROWN: That's it.

MR. KITCHEN: Okay we'll go ahead and move to Chapter 9 and 10. Mike.

MR. FRANKLIN: Good morning. My name is Mike Franklin, I'm the supervisor of site engineering for the Levy Project. Today I'll be covering Chapter 9, which is Auxiliary Systems. And Chapter 10, which is Steam and Power Conversion. As you've seen before

the DCD is incorporated by reference and standard material has also been incorporated. What I plan to cover this morning is our site-specific raw water system.

For Levy the raw water system's comprised of two separate subsystems. A saltwater subsystem, which takes its source from the cross floor at a barge canal. It provides make-up to the surf water system mechanical draft cooling towers.

And then we have the freshwater subsystem that takes its source from the underground aquifer and it provides makeup to the service water system cooling tower, the fire protection system water storage tanks and the potable water storage tank and the demand water treatment system.

Next slide, Bob. Neither raw water subsystem serves a safety related function. The raw water system does not have interconnections with any system that contains radioactive fluids. It is a robust design. Failure of the system or its components does not affect the ability of the safety related system to perform its intended function.

The freshwater subsystem of raw water can maintain water supply to the service water system after sustaining a single active component failure.

This includes a loss of normal AC power, since the freshwater, raw water well pumps and the booster pumps can be manually loaded on the stand-by diesel generator.

Flooding from the raw water system is bounded by the surf water system. Failure analysis for both the yard area and the turbine building. That's all I have on Chapter 9. Are there any questions?

CHAIRMAN RAY: No.

MR. FRANKLIN: Okay. The next is Chapter 10, which is Steam and Power Conversion. As similar to Chapter 9, the DCD is incorporated by reference and the standard material has also been incorporated. What I plan to cover this morning are the site specific cooling towers and the circ water system blowdown system.

Levy's a little different. Instead of natural draft cooling towers we'll be using mechanical draft cooling towers. The towers are less than 70 feet tall. The closest seismic Category 1 structure is approximately 700 feet away. So a tower collapse does not affect safety related structure systems or components.

A tower failure could potentially rupture

raw water system, circ water system and blowdown piping. However, that rupture does not result in flooding of any safety related SSEs and that's due to the grading differences between the cooling towers and the safety related structures. Next slide, Bob.

This is a schematic of our blowdown, circ water blowdown system. And I just wanted to cover some of the design features of that system. The blowdown is on the high pressure side of the circ water system pumps. There are two vacuum breakers installed in series. And they are located near the pumps and before the tie ins to the waste water system, the sanitary drain system and the liquid radwaste system.

The blowdown piping is made of 54 inch high-density polyethylene piping. There is a cross-connect located between the units. The blowdown system has a very high flow rate, while the plants are operating, of approximately 28,000 gallons per minute, that's per unit. Just to give you a perspective, the maximum liquid radwaste flow rate is 75 gallons per minute per unit.

CHAIRMAN RAY: Is this like a semi once through cooling system almost. The blowdown, I'm just referring to the blowdown being the size that it is.

MR. FRANKLIN: Right. And it's about three times what you would see for a solely fresh water plant. The liquid radwaste piping is double walled until it reaches the point of the blowdown line and it's also part of our groundwater monitoring program, which will be performed in accordance with NEI 0808.

And the blowdown piping from that interconnection point to where it discharges to the Crystal River Energy Complex discharge canal is also included in the scope of the groundwater monitoring program.

CHAIRMAN RAY: Maybe keep it in perspective it's about an eight mile run, right?

MR. FRANKLIN: It's a total of about 13 miles.

CHAIRMAN RAY: Thirteen miles.

MR. FRANKLIN: Yes. There is one vent valve that's located prior to its crossing the cross floor at the barge canal. That valve is a manual valve that is locked closed. And it's only operated when needed, primarily during system startup. So that's all I have on Chapter 10. Open to any questions you may have.

CHAIRMAN RAY: No, we've got a pretty good

overview starting out as to how that thing is laid out.

MR. FRANKLIN: Okay. Thank you very much.

CHAIRMAN RAY: One question. When are they going to rename the cross floor to barge canal to something else?

MR. FRANKLIN: The Progress Energy --

(Off the record comments)

CHAIRMAN RAY: All right. Now let's see. It's 9:25 we're doing well. We won't go to the closed session. I think we should still hold that so we can terminate it at the lunch break. Do you agree, Brian?

MR. ANDERSON: Yes, sir, I do agree.

CHAIRMAN RAY: Okay. So you guys are up. So just looking ahead for those who are bringing folks from next door or whatever, we will take a break after this presentation. And then we'll look to try and do some of the afternoon stuff and then have the closed session, as I said, so that we can end it at the lunch break and wrap up perhaps shortly after we return from lunch. Okay.

MR. ANDERSON: This is the NRC Staff's presentation of Chapters 8, 9 and 10. I'm Brian Anderson, I was the project manager for these portions of NRC's review. With me are Om Chopra and Larry

Wheeler. Om is a lead electrical reviewer in the electrical engineering branch. And Larry is a lead reviewed in the Balance of Plant Branch. Both within the Office of New Reactors.

This slide highlights the site specific evaluations that were performed in Chapter 8. As you can see the majority of these items are highlighted here and will be touched on in some way as part of Om's presentation. Om's presentation will be an overview of these items. But as you can see the majority of the site specific material in Chapter 8 is part of the staff's presentation today. And with that I will turn it over to Om.

MR. CHOPRA: Good morning. My name is Om Chopra and I'm from Electrical Engineering of Nuclear Reactors. This morning I'll be presenting the staff review of Levy County COL FSAR Chapter 8. We just saw the overview and the same COL action items and the supplement items are identical to what we presented to the Committee for summer as well as water.

The applicant has adequately addressed LNP Supplement 8.1-1 regarding Levy County Unit 1 and 2 connection to the Progress Energy Florida Transmission System. They have adequately described the connection of the auxiliary, main and the startup transfer going

to the switchyard. And the applicant has adequately addressed supplement regarding additional information on regulatory guidelines and standards. Next slide, please.

The applicant has adequately addressed the details of the plans to chart connection to the grid. You saw the presentation from the applicant. Unit 1 and 2 are connected to a new common switchyard having two voltages, 500 kV and 230 kV and there are four transmission line that connect the switchyard to the Progress Energy Florida grid, as you heard from the applicant.

The applicant has provided the site specific voltage and frequency variations expected at the LNP Units 1 and 2 switchyard during transient and steady state operating conditions. And site specific frequency decay rate.

The applicant incorporated a cable condition monitoring program for underground, or inaccessible cables, into the maintenance crew program. The cable condition monitoring program incorporates the guidelines of GL 2007-01 and NUREG CR 7000. Next slide please.

The applicant has adequately addressed all site power systems adequacy, reliability, testing and

inspection of switchyard components and effects analysis of the switchyard. And they have also addressed the interfaces. It is also the applicant's stability analysis indicates that the designs satisfy Westinghouse interface requirement.

The reactor coolant pump BUS holders will remain above roof as necessary to maintain the flow assumed in the Chapter 8 analysis for three seconds following a turbine trip.

CHAIRMAN RAY: But do you know the answer to the question that was asked? How much margin there is in the three seconds?

MR. CHOPRA: Well, the AP1000 design is that on a turbine trip the generator stays online for additional 15 seconds. After 15 seconds they open the breaker. So that 15 seconds connection still to the grid provides, it stores the voltage for the electrical and pump BUSes.

CHAIRMAN RAY: so it's not a grid related answer, it's plant related.

MR. CHOPRA: Yes it is grid related. Sir, it is grid related because they still have to demonstrate that the grid is stable. So what we ask them to do is provide a grid stability analysis. So what they do is they look at various transmission

lines and the generation to the grid.

And they will take the worst case and see if those lines or those generators are not there if the grid was still stable. So that analysis indicates the grid is stable. But what we want to know here is if you keep the generator online for under 15 seconds they would satisfy that three second criteria.

CHAIRMAN RAY: Okay. Charlie, does that answer your question?

MEMBER BROWN: Well, the point being is that when you have a turbine trip and the generator stays online the grid is picking up load because it's slowing down. So you have to worry about, number one, the grid stability, that's the one issue.

The second issue is that you were running within 15 percent of the rated voltage so that you don't have adverse reactor cooling pump effects. And therefore you've got to keep yourself within that band for three seconds. Didn't really answer the question.

They say they did the analysis, I just wondered how --

CHAIRMAN RAY: Okay. But I'm trying to get you to ask the question of him.

MEMBER BROWN: You beat me to it. So my point being is when they did the analysis how close

did they come to the three seconds, or there is no analysis that applies to that. I'm just responding to what I saw in here and regulated in the DCD, that's all.

MR. CHOPRA: Let me put it in a different way. They did the analysis, they said with the worst case the voltage drops to 15 percent. But Westinghouse criteria is you must maintain at least 80 percent voltage at the RCP pump BUSes. So that is a transient for 15 percent, for worst case.

So obviously they meet the criteria of 30 percent voltage. This is the worst case they have calculated. And no cases in will go below 15 percent. And Westinghouse criteria you must have 80 percent. So they allowed 20 percent transient voltage.

MEMBER BROWN: Okay. That wasn't stated in the FSAR. It just said that the limit was 15 percent. They didn't say that they have five percent margin in it. So you're telling me that they got five percent margin relative to the DCD?

MR. CHOPRA: Well, they said the worst case is 15 percent, so we asked the question 15 percent is acceptable. And they said yes, because Westinghouse allows you to go up to 20 percent.

MEMBER BROWN: Okay. Let me go back. If

you read the words, their words say, "The grid voltage at the high side of the main step up and reserve auxiliary transformers cannot drop from the pre-trip steady state value by more than 15 percent." It didn't say that's the worst case. Just says it cannot drop below that.

MR. CHOPRA: But, yes --

MEMBER BROWN: In order to meet the three second requirement.

MR. CHOPRA: Right.

MEMBER BROWN: So the 20 percent didn't come in. And what that means I have no idea. I just, but they're right up against the edge or do they have some margin to it. That's all.

MR. CHOPRA: Well --

MEMBER BROWN: So if it was 2.9999 seconds then that's not within the margin of uncertainty of your analysis techniques.

MR. CHOPRA: But if it indeed for their FSAR they are indicating that in normal conditions the voltage variation is only five percent, plus/minus five percent, it's just --

MEMBER BROWN: That's when operating.

MR. CHOPRA: When they're operating.

MEMBER BROWN: You haven't subtracted

load, it doesn't get past that. But that's not when you've lost steam.

MR. CHOPRA: Right but this --

MEMBER BROWN: In this case you're coasting down.

MR. CHOPRA: Okay. I evaluated there, I know they had done worst cases and if the applicant tells me it doesn't go below 15 percent, I --

MEMBER BROWN: He didn't say it doesn't. He says it cannot drop. In order to meet the 20 percent. So there's a difference that's all.

CHAIRMAN RAY: You had an RAI and a response on this one, right?

MR. CHOPRA: Yes, I do.

CHAIRMAN RAY: Maybe if we could see the RAI it would take care of this.

(Simultaneous speaking)

MEMBER BROWN: It'd be nice to see it, that's all.

MR. CHOPRA: Yes, okay. We can do that.

CHAIRMAN RAY: All right, can you get that for us this morning still? It should be easy to retrieve, the RAI and the response?

MR. CHOPRA: Well, I have to think.

CHAIRMAN RAY: It's a big job? Okay,

typically we have access. Brian, could you?

MR. ANDERSON: We can find that RAI response this morning once the presentation's done, not -

CHAIRMAN RAY: Yes, obviously not now.

MR. CHOPRA: I guess the point I'm trying to make is, you're right, the grid has to be stable. But on a turbine trip or a generator trip, generator stays on line for 15 seconds.

What it does is immediately when the turbine trips it motors and becomes a synchronous motor. And it provides that additional water support to the --

MEMBER BROWN: I understand that.

MR. CHOPRA: Okay. All right, I'll dig that up. Is it 7?

PARTICIPANT: You're on Slide 7.

MR. CHOPRA: Yes, applicant has adequately addressed the grounding grid system design and the lightning protection using acceptable matter consistent with IEEE 80 and IEEE 665. Next slide, please.

The applicant has adequately addressed the standard departure related to periodic testing of voltage regulating transformer. This is one of the

conformity item we have.

That concludes my presentation.

MEMBER BROWN: I did have one other question that I didn't ask the applicant and I don't, because I forgot. It's in a table. There's a table that's provided in the FSAR relative to grid stability and interface evaluation, goes to all like steady state load in rush, nominal voltage, et cetera down the table.

And there's one DC, the table item where the limiting under-frequency value for the reactor cooling pumps, the Westinghouse acceptance criteria is 57.7 hertz.

And they have a similar, the rest of the table is the same. It's got an AC, you know, Westinghouse requirement and a leading nuclear plant value assumed.

And in all the other circumstances the value assumed equals the Westinghouse requirement for whatever reason, for whatever application. In this particular one, instead of assuming a criteria of 57.7 hertz as being the bounding, the value, they used 59.5 hertz. I didn't understand how that was applied.

Is there an analysis they used that they don't use the bounding value, and they assume based

another analysis that the pump never goes below 59-1/2 in some other accident analysis in terms of flow criteria?

MR. CHOPRA: I think if it doesn't go below 59.5 that's more conservative.

MEMBER BROWN: I couldn't find what they meant by, you know, everything else they assumed the Westinghouse values for whatever purpose analyses they were doing. This one they didn't.

I didn't understand it, so that's why I asked the question. And I meant to ask the question of the applicant and didn't.

(Simultaneous speaking)

MR. CHOPRA: I think it's conservative so I didn't question it.

MEMBER BROWN: Okay. All right, well, I'll think about that one since I don't know what it's used for.

MR. PIGG: I might be able to help with that. My name is Ken Pigg. I'm an electrical engineer on the Levy Project Development Team. And I think the intent was as Om said, it's 59.5.

Basically, our design criteria for the plant for that generator is around at plus or minus a half hertz all the time. So we viewed that as a more

stringent requirement which would bound the requirement of, I think it was 57.7 that Westinghouse required.

MEMBER BROWN: Well, you've got that listed up in the other part of the table. It says allowable frequency fluctuation for normal plant operation.

MR. PIGG: Yes.

MEMBER BROWN: But then for this limiting value, I guess the only way I could assume this was that you all were assuming that you never go below 59-1/2 based on that particular plus or minus half a hertz.

But I didn't know what application you were using it for that's why. But that's for normal operation when you're fully powered and everything else.

MR. PIGG: Right.

MEMBER BROWN: And the 57-1/2, I don't remember what the DCD value is based on, whether that's a normal operation value or whether that was some other transient value based on some other, you know, condition that occurs in the plant.

MR. PIGG: Off the top of my head I don't remember what that's based on either.

MEMBER BROWN: Well, I didn't ask it and still don't know what it is.

CHAIRMAN RAY: Yes, let's move on.

MR. ANDERSON: That's the end of the Chapter 8 presentation. Before I let Om get up and walk away, I want to try to address the earlier question related to salt deposition in the switchyard.

In the staff's meteorology review there was a statement made that modeling that was run from a meteorological perspective determined that salt deposition in the switchyard would be minimized or neutralized through natural washing of rain.

And that I believe that the time period was two months of salt deposition, two months of continuous salt deposition was what was required in order to impact the switchyard operability.

Om, correct me if I'm wrong. In the Chapter 8 review, the staff's electric power review, we do not specifically review the loss of offsite power event that's caused by salt deposition, and we do not specifically review and evaluate the applicant's proposed maintenance and operations practices that they discussed during their part of the presentation.

Chapter 8 obviously considers a failure

modes effects analysis that the applicant provides, the staff evaluates that. And the loss of offsite power is obviously considered as part of the PRA analysis that occurs in Chapter 19.

But I think the short answer to the question is there's not a specific staff evaluation to the consideration of switchyard failure due to salt deposition specifically.

CHAIRMAN RAY: That's fine. You know, by experience, they'll figure out what needs to be done. And I was just reacting to the proposition that it something that you could rely on the rainfall to deal with, and I'm not sure that's always going to be the case.

But whatever it is, it's not something I think we need to be worried about.

MR. ANDERSON: Understood.

CHAIRMAN RAY: Okay, anything --

MR. ANDERSON: That concludes the staff's Chapter 8 presentation. We'll move on to presentations of Chapters 9 and 10. In fact, the next, I think, five slides just provide an overview of the site-specific evaluations that the staff performed in Chapters 9 and 10.

The focus of our presentation and what

Larry Wheeler is going to speak to you about is the raw water system. So the next few slides simply show tables of site-specific evaluations in Chapters 9 and 10.

These are all items that the staff performed in evaluation and documented in its safety evaluation. You'll also note that a variety of the items are standard content or incorporated by reference from the DCD.

But I'll just slowly scroll through these next slides, and if there are any questions related to topics other than raw water, offer the committee the opportunity to ask.

And with that I will turn things over to Larry Wheeler.

MR. WHEELER: Good morning.

CHAIRMAN RAY: Good morning.

MR. WHEELER: Parts of this slide were previously described by the applicant, but the emphasized raw water system is non-safety related and non-seismic.

The raw water or fresh water subsystem provides makeup to the service water cooling towers, water treatment, potable water and fire protection. Raw water supports the service water system which has

availability controls in the AP1000 DCD, it's in Section 2.4. For the service water system that's for modes 5 and 6.

The other subsystem salt water supplies raw water to the circ water system and provides alternate water for the liquid radwaste discharge in the event that the circ water normal blowdown is not available for the discharge path. Next slide, please.

Focusing on the details of the fresh water subsystem includes two 100 percent capacity well pumps, four 50 percent capacity booster pumps, automatic strainers, media filters, 150,000-gallon storage tank.

We have a diesel, standby diesel generator supports for the raw water well pumps, the booster pumps, discharge valves, and this design also includes the HDPE materials for the underground piping system for raw water. Next slide.

Being passed around is a sample of the HDPE. This happens to have a wall thickness of about an inch, inch and a quarter.

CHAIRMAN RAY: Larry, I think your papers may be impacting on the microphone there. If you can just pull them back.

MR. WHEELER: Thank you.

CHAIRMAN RAY: Thank you.

MR. WHEELER: So I would like to pass this around just in case some of the members have not seen what HDPE looks like. Next slide, please.

MEMBER RYAN: Is there any plan to, maybe you're going to cover it in a minutes, on monitoring the pipe, outside the pipe as life goes on? I understand this is a fairly robust welded pipe, but I always think the, your monitoring wells along the length of the pipe --

(Simultaneous speaking)

MR. WHEELER: My understanding, the groundwater monitoring program would be the, what is utilized at the site to measure leakage. If the applicant could clarify that?

MEMBER RYAN: Yes, I would like to hear a little more detail. Maybe we can get that from them later. Thank you.

MR. WHEELER: Next slide, please. Focusing on the details of the salt water subsystem, this includes three 50 percent capacity makeup pumps, trapping screens, three screen wash pumps and automatic strainers. The salt water subsystem has a cross connection between units. Next slide, please.

The staff's review summary, the raw water

system is non-safety related, non-seismic, fresh water system supports the RTNSS functions for both 5 and 6. Fresh water subsystem has redundancy, 150,000-gallon storage tanks, pumps and discharge valves are diesel backed.

Fresh water subsystem pumps, wells, well exceeds the service water base and makeup requirements. Fresh water well pumps are two at 1,040 gpm each, and the fresh water booster pumps are at four at 500 gpm each.

Reliable materials are being utilized consistent with industry good practices applicable codes and standards. Raw water system is non-radioactive, contamination is not feasible due to its configuration relative to potential sources of contamination. Next slide, please.

GDC 2 and 4 have been satisfied. Pipe breaks associated with the raw water system are bounded by the circ water line break analysis.

Postulated breaks in the raw water piping will not impact safety related components, because the raw water system is not located in the vicinity of safety related equipment and the water from the postulated break will not reach any safety related equipment.

RTNSS systems that are located in the turbine building are not expected to be affected by the flood. The staff concludes the raw water system meets all applicable regulations. It's considered highly reliable to support cold shutdown functions.

That is my presentation.

CHAIRMAN RAY: All right, any questions? Okay, Brian, that finishes this segment of your presentations, does it?

MR. ANDERSON: It does, yes.

CHAIRMAN RAY: All right, we'll take a break now until 10 o'clock, and then we'll resume. The basic game plan will be to take a look at anything we should bring forward from this afternoon prior to taking, going into closed session for the discussion that's planned for the agenda.

That discussion was scheduled here for 15 minutes. Is that what we think it's going to take?

MR. ANDERSON: The closed session should take no longer than 15 minutes.

CHAIRMAN RAY: All right, then if we get back at 10:00, or let me go ahead and say five minutes after 10:00 given that we should allow people 15 minutes here.

At five minutes after 10:00, then it looks

to me like we can bring forward anything that's available from this afternoon and thereby, and that includes applicant's, I don't know if you've got your resources for the response that you wanted to make to us today or not.

MR. KITCHEN: We'll check during the break to see if we can move that up.

CHAIRMAN RAY: Okay.

MR. KITCHEN: If not, we can certainly move some presentations.

CHAIRMAN RAY: All right, in any event my expectation is that we will as I say come back briefly after lunch. I don't want to try and jam everything into before lunch, but then we should be able to finish up earlier this afternoon it looks to me like.

Okay, five minutes after 10:00.

(Whereupon, the foregoing matter went off the record at 9:46 a.m. and went back on the record at 10:03 a.m.)

CHAIRMAN RAY: On the record. Brian, what do you want to do?

MR. ANDERSON: My suggestion would be that we move the presentations on Chapters 6, 11 and 12 forward. We think that's a relatively short discussion, but we also think that might help address

some of the groundwater monitoring questions that were asked before the break.

CHAIRMAN RAY: Yes.

MR. ANDERSON: And if we progress smoothly through that I would suggest that following that discussion we move into the emergency planning, Section 13.3 discussion.

CHAIRMAN RAY: Yes, that's all fine. If you guys are ready for that we are too.

MEMBER BROWN: Don't we need Mike for the groundwater?

CHAIRMAN RAY: Got Mike right now as we speak.

MEMBER BROWN: Oh, okay.

CHAIRMAN RAY: It takes awhile to get people up there and actually moving, so I had every confidence. Let's then proceed as you suggest, Brian, and we begin as usual with the applicant if he's ready.

But it doesn't look like -- well, maybe I shouldn't speak so soon. You guys ready?

MR. KITCHEN: I guess we will go ahead.

CHAIRMAN RAY: Okay.

MR. KITCHEN: Okay, we'll go ahead and get started. I'm Bob Kitchen. I'm Manager of Licensing,

and I'm going to discuss 6, 11 and 12. Paul Snead will address questions that come up on groundwater monitoring.

It might be best, we'll just go ahead and do that first to go ahead and try to hopefully address questions that the committee has.

CHAIRMAN RAY: Sure.

MR. KITCHEN: Paul?

MR. SNEAD: Yes. Is this thing on? Paul Snead. Can you hear me?

CHAIRMAN RAY: Yes.

MR. SNEAD: Basically in FSAR Section 12AA, 5.4.14, the groundwater monitoring program. Per standard for new licensees, that section adopts NEI 08-08A with regard to the groundwater monitoring program description.

In general, we would be doing groundwater monitoring like we do at our existing plants with regard to groundwater protection initiatives, where we would have shallow wells in close proximity to the pipeline.

And then occasionally we would have, you know, more emphasis say at a valve or somewhere where there might be more likelihood of an event as opposed to that.

But the purpose of those wells would be to confirm that there's no pipeline leakage or to, you know, provide early detection if any such leakage were to occur.

CHAIRMAN RAY: Okay, so you're meeting the standard, and in this case it would involve the use of monitoring wells near the discharge pump?

MR. SNEAD: Correct.

CHAIRMAN RAY: Okay, well, I think that satisfies the question then.

MR. KITCHEN: Okay, we'll go ahead and discuss Chapter 6. And Chapter 6 says, if you've seen much of the presentation, it's very standard. We've incorporated the DCD.

We've also, this Chapter includes the hazardous chemicals table for the plant. FSAR Section 2.2.3, which we presented, discussed the offsite hazards analysis which we discussed earlier this morning.

Onsite chemical use would be maintained for pH adjustment, corrosion inhibitors, scale inhibitors, biocide algaecides, chemicals that we would plan to use for Levy for these applications are all standard chemicals and have been evaluated for the AP1000. Yes, sir?

MEMBER RYAN: Chairman Ray just suggested the answer to my question. I'm sorry I had to jump out for a minute. They'll be monitoring along the discharge fault line or at the --

(Simultaneous speaking)

CHAIRMAN RAY: Can we ask you to come up to the microphone again, Paul?

MEMBER RYAN: I'm sorry, I apologize.

MR. SNEAD: No, that's quite all right. No, they won't be monitoring along the pipeline to confirm.

MEMBER RYAN: So you're confirming the leakage.

MR. SNEAD: Confirming the leakage, or if leakage were to occur it would be an early detection.

MEMBER RYAN: Perfect, just the answer I was looking for, thank you.

MR. KITCHEN: That's really the extent of Chapter 6 that's outside of -- Chapter 11.

CHAIRMAN RAY: These SCOLAs are nice, aren't they?

MR. KITCHEN: They are, yes, sir. The pattern seems to be helpful. Chapter 11, radioactive waste management, again, standard material and DCD incorporated.

There are some site-specific items of interest here, first is liquid radwaste and the waste water system we'll talk about just a little bit. And also gaseous waste management.

Also discuss briefly effluent monitoring and long term onsite storage, really is, we thought it might be a matter of interest because we have a contention in that area.

Section 11.2 and 11.3 is, addresses liquid and gaseous waste management. We, like I believe most if not all others, use the LADTAP code for the analysis for liquid waste.

This is based on Reg Guide 1.109, which is calculation of annual doses demand. We use that to calculate the estimated dose and dose rates. The GASPAR computer code was used for gaseous waste calculations. It is also per Reg Guide 1.109, and both of those were determined acceptable limits.

Doses to individuals due to liquid and gaseous waste discharges were determined to be within 10 CFR Part 50 Appendix I. We also did cost benefit analyses for liquid system augments or gaseous waste system augments.

Basically determined that were no augments that were beneficial in terms of the cost of the

augment compared to the man rem savings that we could achieve both in the gaseous and liquid waste. And that was evaluated for whole body and thyroid.

Looking at 11.4, solid waste management. Of course we do have long term onsite storage plans. We have a contingent plan which is very similar to the Vogtle plan that was developed, a little more detail than you might see in a standard COLA.

This really stems from, the question we had was with regard to contention is the challenge that we wouldn't have adequate storage facility beyond two years due to the restriction on shipment of radwaste or long term storage I should say.

Our plans would be to develop an outside storage pad which would be located onsite outside the protected area within the owner controlled area. Of course it would be located in high integrity containers that would not degrade and those would be stored within shielded containers.

We also looked at operational considerations. Of course the primary concern here is Class B and C waste, not Class A. Concern with Class B and C, or the reality is that most of that waste discharge is very predictable in terms with alignment with outages because it's primarily resin discharge.

So in terms of planning, preparation, understanding of what to expect, we have a good handle on that during operational periods, and we would of course implement actions to minimize waste generation.

So if you look at that we have actually considerable storage that we could take advantage of onsite. For example, the auxiliary building provides more than a year of storage if needed for spent resin.

We actually do have vendor services available. Currently right now, there's even for Class B and C there's a vendor in Texas, for example, that we could use to ship Class B and C waste for storage.

They don't have the ability to dispose of it but they do have long term storage. So we believe just in terms of dealing with the waste situation we have a very good ability to handle that.

And also the belief that certainly as we proceed through time there will be even better solutions. So we believe that the solid waste management is well under control.

MEMBER RYAN: On the resin, you said you're going to have those in probably, I guess high integrity containers and then overpacks which would be concrete overpacks for outdoor storage, is that right?

MR. KITCHEN: Let me let Tony Pilo address that, Tony? Tony Pilo is actually is an Emergency Planning Supervisor at Robinson plant, but in his previous life he worked with us.

MR. PILO: Tony Pilo, Progress Energy. And that's correct, we would use concrete overpacks for the --

MEMBER RYAN: Okay. I'm guessing you'd have some sort of a pad, you know, concrete pad and that kind of thing to --

MR. PILO: Yes, concrete pad, a fence for security and personnel restrictions, operations control.

MEMBER RYAN: Okay. Have you evaluated any kind of a weather impact or a hurricane event or is that factored into your safety analysis in any way?

MR. KITCHEN: We haven't actually done a detailed analysis in terms of design.

MEMBER RYAN: Yes.

MR. KITCHEN: So we haven't done a hurricane analysis, but if we needed, and this is contingency so that's why we haven't done a full analysis on it. It's really, in a sense, very standard for storage.

MEMBER RYAN: Oh, sure I know that.

MR. KITCHEN: So if we needed to do this, this is the approach that we would take. We also looked at, one of the questions I think where you're going is, would you have enough time to plan, design, construct a facility if you determined you needed longer term storage than we had.

And our answer is, yes. Because it's very predictable, it's tied to an operational discharge, the manner that we would locate and store the waste is very common. And at that point we would do those analysis.

Tony, in fact, did a review to look at the time required to plan, design, and construct, to confirm that we could meet that within an operating cycle, which is the most that we think would be needed.

MEMBER RYAN: Yes, that sounds pretty reasonable. I guess at this point you're not really worried about irradiated hardware or anything like that, really at plant life.

MR. KITCHEN: No, sir, not for --

MEMBER RYAN: Yes.

MR. KITCHEN: -- many years I would hope. You talking about like a steam generator or something?

MEMBER RYAN: Or any other kind of

irradiated hardware.

MR. KITCHEN: No, --

MEMBER RYAN: I can't imagine that would be on the near term horizon.

MR. KITCHEN: Right, and that's the reality even of this, is years away to have to deal with. Thank you.

DR. HINZE: Tentatively, is there a site selected?

MR. KITCHEN: There is a waste control specialist, Tony, for shipment of waste. We're talking primarily, I guess in Class B and C waste?

MR. PILO: Correct. Tony Pilo again, Progress Energy. Currently our Progress Energy is a fleet. The contracts, we actually do use the vendor in Texas to send our Class B NC waste to, for long-term storage.

So they have licensed a long-term storage just not to bury it at this point. That's being pursued, so contracts are set up that Levy, the chemical site would fall right into that contract.

So reality, our first option would be to send our Class B and C waste offsite for long-term storage versus the pad. But if that contract or vendor is no longer available, we would have

contingencies to pursue our own type of --

MEMBER RYAN: Just so the other members got a feel for it. What's long-term storage?

MR. KITCHEN: We can provide onsite storage for the full operating life.

MEMBER RYAN: No, at your contractor, what would it need to be long-term?

MR. PILO: Currently for the contract, the long-term storage is indefinite. There's no definitive time period so it's basically forever, current contract.

MEMBER RYAN: That's interesting.

(Off microphone discussion)

MEMBER RYAN: I guess I'm just curious, is that something spelled out in your arrangement, that they're going to take it and you don't have to worry about taking it back?

MR. PILO: That's correct. It's in the contract and part of their license for long-term storage itself.

MEMBER RYAN: Okay. Thank you.

MR. KITCHEN: Thanks, Tony. We'll move on to Chapter 12 unless there, Chapter 12 is largely standard. One area that we did do a site specific evaluation was dose to construction workers.

Of course, Levy being a greenfield site, first unit there's no dose to consider, no near onsite operating plant. With Unit 2, of course, we'd have to do an analysis which we did.

The direct radiation from both liquid and gases, influenced from Unit 1 during the construction period, I think remained well below the 10 CFR 20.1301 limits for public dose.

Excuse me, construction workers would be classified as members of the public. In fact, when we looked at both the total effective dose for the RAD, for the construction workers during that period, it's about less than one and a half percent of the dose that occurs from background, just due to the dose.

We also factored into that considerations, the Crystal River 3 releases and how that might affect construction workers. And it's really not significant.

I might also mention that analysis included the worst case, chi/Q sector, even though the workers, for example, are constructing Unit 2 North as we showed in the location earlier, north of Unit 1.

We used the worst case sector which was the west/southwest sector, and that alone adds a margin of factor of six in terms of dose calculations.

But they were very small. So we don't see that as significant. And that's all I have on Chapter 12. Thank you.

CHAIRMAN RAY: Thank you. So you'll tee up the staff presentation. We'll move to that.

(Off microphone discussion)

MR. HABIB: Okay. My name's Don Habib and I'll be presenting Chapter 6, 11, and 12 for the staff review. And for these three chapters, there were no site specific areas we wanted to give a presentation on.

What I'm going to do is just give an overview, what was standard, what was site specific in the review. And then if you all have questions, we do have staff here who can address them.

For Chapter 6, the only site specific items appeared in the control room habitability review. And the applicant used the, accepted the standard chemicals and did not have any site specific chemicals.

And there were two items. One is the site specific chemical list, which there was none. And then also a statement about the usage of gas dispersants. And that's all for Chapter 6.

For Chapter 11, RAD Waste Management,

source term is an IBR section. The other sections, the solid, liquid, and gas all have considerable site specific information, cost benefit analysis, the compliance with the part 50 limits, accidental release for the liquid tank failure, and then a liquid discharge pipe. But we didn't have any specific items for that.

CHAIRMAN RAY: Any questions on that, discharge line? Okay, no.

MR. HABIB: Okay. And then in Chapter 12, two site specific items. The discharge pipe from Chapter 11 is actually reviewed in Chapter 12. And then there's the construction worker dose, which the applicant just talked about. And that's the review. If there's any questions.

CHAIRMAN RAY: All right.

MEMBER RYAN: Sounds good.

CHAIRMAN RAY: Hearing none, we'll thank you again. And it looks like then we'll be easily able to accommodate emergency planning before we close, take a break for lunch, and then wrap up after lunch with whatever additional information is remaining at that point in time.

MR. KITCHEN: Larry Taylor is going to present our emergency planning. Larry is a licensed

senior reactor operator, actually worked at Harris, he now works with us in Operational Readiness in New Generation programs and projects. Larry?

MR. TAYLOR: Thank you. For Levy emergency planning, I chose majority of my presentation to point out some things that are unique or unique to Levy or potentially different from global and standard that you heard about previously.

You can go to the first slide, it looks like. The Levy nuclear site, you've already been presented as essentially separate from the Crystal River site, so the emergency plan addresses the two units at Levy.

We will point out to you that there is some overlap on Emergency Planning Zones. And I'll cover that a little bit later. The emergency plan for Levy nuclear plant was developed in accordance with NUREG-0654 10 CFR 50.47 and 10 CFR 50 Appendix Echo. Next slide.

One thing that is standard, but a little bit different than some of the other AP 1000s are onsite emergency facilities. The Levy site will have the technical support center and operation support center in the AP 1000 DCD designated location. Okay, next.

For offsite emergency facilities, the Emergency Operations Facility, EOF for Levy, we plan to consolidate facilities with Crystal River and have a common EOF in the location of the current Crystal River nuclear plant EOF. That EOF will be established consistent with NUREG-0696 guidelines.

MEMBER RYAN: How far away is that from the site?

MR. TAYLOR: It's around 14 miles from Levy and just outside the ten mile Emergency Planning Zone for Crystal River.

CHAIRMAN RAY: And does it exist now and is --

MR. TAYLOR: It currently exists.

MEMBER RYAN: Do you have to make any changes if there's, god forbid, an emergency at both facilities?

MR. TAYLOR: I'm going to talk a little bit about the ability to handle simultaneous emergencies in the next slide. But it will be able to accommodate that.

MEMBER RYAN: Okay.

MR. TAYLOR: All right, yes. For a case where there is a simultaneous emergency, both Crystal River and Levy have emergency classifications at the

same time, the EOF will be able to accommodate that, and basically emergency response personnel from both sites will report to the EOF.

There will be two separate staffs. The facility lead for the EOF which is termed the EOF Director, there will be an EOF Director for each site.

One of those individuals, during facility activation, will be designated to be the single point of contact to interface with state, counties, and federal agents.

MEMBER RYAN: For both emergencies?

MR. TAYLOR: For, right. So if you think about it, rather than there's some efficiency to be gained and less confusion if you have both facilities' EOF trying to make communications to the state and county when there may be common things, such as PAR communications, that would be consolidated from the emergency.

So you would have one point of contact, less confusion on things coming from two different sites.

CHAIRMAN RAY: Yes, and the EOF, that doesn't seem problematic to me. It's when you have a single TSC supporting multiple units.

MR. TAYLOR: Right.

CHAIRMAN RAY: Or different, diverse units, there's more question that I have.

MEMBER RYAN: It's just interesting to think about and I'm not challenging a decision, but it puts a burden on that one point of communication to keep it all straight, I guess.

MR. TAYLOR: Right.

MEMBER RYAN: So really it sort of raises the bar for the level of support from each, and I can see it to support that communicator.

MR. TAYLOR: Okay. I think Tony, you wanted to elaborate?

MR. PILO: Tony Pilo, Progress Energy. The one thing I would like to add is in the state of Florida, in Crystal River specifically, the state and county individuals who are associated with all site communications are actually in the Emergency Operations Facility with the utility.

And so that carries over with the Levy. So it'll help reduce the communications because there are decision makers for the local counties and state are actually in the facility together. And so they'll all hear everything together. And they meet and decide what the appropriate actions are to take.

MEMBER BLEY: Three counties, right, that

are --

MR. PILO: Yes, that's correct.

MEMBER BLEY: And that was the same, you've always had three counties involved with Crystal River as one?

MR. PILO: Marion County is a new county for Levy that's not currently in with Crystal River, so there will be one additional county for the Levy plant that's not for Crystal River.

MEMBER BLEY: Thanks.

MR. TAYLOR: Okay, next slide. And you guys are moving me right in, leading me into the next portion of the slide. Next I want to talk about the overlapping Emergency Planning Zones associated with Crystal River and Levy.

As previously stated, Levy is approximately nine miles, I think closer to nine and a half from Crystal River, the existing site.

Because of that proximity and you have a ten mile Emergency Planning Zone, they overlap. As part of our evacuation time estimate, we did take into account potential simultaneous emergencies at both sites. And that was addressed.

And next slide is the best thing I can use to explain the overlap. As Tony just mentioned,

Marion County is new. It is not in the Crystal River Emergency Planning Zone.

But if you'll look at the, for the Levy Emergency Planning Zone, the red and blue encompass Levy. Your red and green encompass Crystal River. So Citrus 2, the green is the only thing that's not in Levy that currently exists with Crystal River.

The other thing to point out here is, you can see these are labeled identical. So if you look at the Crystal River Emergency Planning Zone and there's a member of the public that's in Citrus 1 for Crystal River, that individual is also in Citrus 1 Protective Action Zone for Levy. So those are aligned to be the same.

MEMBER BLEY: I guess a dual event might limit some of your evacuation routes but probably not very much, it looks like.

MR. TAYLOR: Yes, from what I've read there were some slightly different routes potentially and more congestion, but there weren't routes mentioned that were eliminated. But maybe that's what they meant by different routes.

CHAIRMAN RAY: But you have done time study that involves emergencies, evacuation from both units?

MR. TAYLOR: Yes.

CHAIRMAN RAY: Okay.

MR. PILO: Tony Pilo, Progress Energy. Yes, the time studies include evacuation, full evacuation of Levy, strictly Levy, strictly Crystal River, and then a combined full evacuation of Levy and Crystal River simultaneously, and that's correct.

MEMBER BLEY: Much difference in the estimates?

MR. TAYLOR: They like to talk in percentile.

MEMBER BLEY: Yes.

MR. TAYLOR: So at 95 percent, there's a five minute difference between individual or simultaneous. At the 100 percentile, it's about a ten minute difference.

MEMBER BLEY: Not bad.

MR. TAYLOR: Barely insignificant.

CHAIRMAN RAY: Okay.

MR. TAYLOR: That's everything I had planned to present. Any other questions?

CHAIRMAN RAY: No. It's looking pretty good place to site a plant from that standpoint. Seen another, have seen worse. A lot worse.

MR. MISENHIMER: Okay, this is the staff's

presentation for the Levy, Section 13.3 on Emergency Planning. My name is Dave Misenhimer. I'm an NRO and a project manager. And to my right is Tony Bowers, the person who prepared Section 13.3 and he's going to present today. Tony?

MR. BOWERS: Good morning.

CHAIRMAN RAY: Morning.

MR. BOWERS: My name is Tony Bowers. I'm the Emergency Preparedness Specialist with the Office of Nuclear Security and Incident Response, Division of Preparedness and Response. I'm a Levy P reviewer for the Levy COLA Section 13.3 on Emergency Planning.

I'd like to share some information with you regarding the staff's evaluation of the emergency plan and supporting information provided in the application.

My presentation is going to include a brief overview of some of the key regulations and guidance important to the staff's findings regarding emergency planning.

I intend to highlight a number of outstanding confirmatory action items and briefly describe the Applicant's proposed post-COL activities.

I'll also provide an overview of the Levy Emergency Planning Zone, emergency response

facilities, and discuss the staff's overall conclusions regarding evaluation of this information. Next slide.

Our current regulations under Part 52 require that an applicant for a combined license include information on emergency planning in its application that complies with the requirements of 10 CFR Part 50.

Applicant Progress Energy Florida provided its emergency plan for Levy nuclear Units 1 and 2 in Part 5 of the COL application, which also included supplemental information such as the evacuation time estimate analysis for Levy County, and emergency plans for the state of Florida and local Governments of Levy, Citrus, and Marion Counties.

It's also important to note that Part 50 regulations require that no initial combined license be issued unless a finding is made by the NRC, and there is reasonable assurance that adequate protective measures for the public can and will be taken in the event of a radiological emergency.

Part 50.47(a)(2) requires that the NRC base its findings in part on the review of Federal Emergency Management Agency findings, and determinations as to whether state and local emergency

plans are adequate and whether there is reasonable assurance that they can be implemented.

A FEMA finding will be based primarily on its review of plans, but will also require a demonstration of state and local emergency response capabilities during a full participation exercise with the licensee.

The NRC will also base its findings on NRC staff's assessment as to whether the applicant's onsite emergency plans are adequate, and whether there is reasonable assurance that these plans can be implemented.

The NRC will make an overall determination of reasonable assurance of the emergency plans, taking into account both the onsite and offsite reviews.

In addition to the existing regulations, the staff used endorsed guidance to complete its review of the emergency planning information provided by the Applicant.

Regulatory Guide 1.101 states that criteria on recommendations and NUREG-0654, FEMA-REP-1 Revision 1 are considered by the NRC staff to be acceptable methods for complying with the 16 planning standards in 10 CFR 50.47(b), and will be used for the basis for evaluating the adequacy of emergency plans.

Next slide.

The staff conducted its review of the emergency plan in accordance with NUREG-0800 Section 13.3 Emergency Planning, which is the standard review plan.

Staff's review of the emergency plan focused on whether the plan represented an overall concept of operations for how the Levy emergency organization would respond to a radiological emergency at the LNP site, including provisions to protect the public health and safety.

Specifically the staff reviewed and evaluated the evacuation time estimate analysis provided by the Applicant, dose assessment capabilities, adequacy of the emergency response facilities, ability to communicate with staff among its facilities and federal, state, and local Governments.

In addition, the staff reviewed the Applicant's proposed emergency classification and action level scheme, siren system, and response to hostile action-type events.

Currently there are no open items with regards to the staff's review of the emergency plan. There are approximately 30 confirmatory action items

which will require NRC staff to validate various revisions being made by the Applicant to the emergency plan and EP ITAAC.

And I'd also like to note on that point, that we have actually received Revision 3 to Part 5 of the COL application for which the staff has not reviewed, but should resolve these confirmatory actions.

CHAIRMAN RAY: Well, it seems like a large number, I don't know whether it is or not in this category, but is it because of the only existing plan for Crystal River that requires modification, what's --

MR. BOWERS: The answer is no. Crystal River was not necessarily factored into the staff's review of the Levy emergency plan. It really just had to do with the information presented by the Applicant and my review of the regulations and guidance.

So there was information that I felt was important, should've been considered and represented in the emergency plan, and I requested the Applicant provide justification for why that information either wasn't in the plan or make the appropriate revisions.

CHAIRMAN RAY: Okay, but no open items is the main --

MR. BOWERS: No open items.

CHAIRMAN RAY: -- status point here?

MR. BOWERS: Correct. The staff has reviewed the information provided by the Applicant and its responses to requests for additional information. And found that information to be acceptable. The staff will confirm that that information is, in fact, incorporated into Rev 3 of the COL application at a later time.

CHAIRMAN RAY: Okay.

MR. BOWERS: The Applicant has proposed several license conditions including EP ITAAC to address items that can not fully be addressed at this time, such as emergency planning implementation milestones, to include submittal of emergency plan implementing procedures, emergency action levels, finalized --

PARTICIPANT: I think it was a static or something on the phone line.

MR. BOWERS: Okay. Finalized letters of agreement by state and local Governments, an exercise to demonstrate response capabilities in the event of a simultaneous emergency at Levy and Crystal River 3, and the initial distribution of emergency information to the public. Next slide.

Current regulations require the Applicant to define Emergency Planning Zones for which advanced planning shall be performed to adequately respond to an emergency.

This figure is a simple illustration which shows that the Levy ten mile plume exposure pathway EPZ overlaps the Crystal River 3 EPZ, encompassing the Crystal River 3 plant within its boundaries. Levy nuclear plant is conversely included within the Crystal River 3 EPZ.

Levy nuclear plant's plume exposure pathway includes portions of Citrus, Levy, and Marion Counties.

The Applicant states in its emergency plan that the state in Florida, and the respective counties within the ten mile EPZ have prepared plans for responding to an emergency at the Levy site, describing their respective responsibilities, authorities, capabilities, and emergency functions.

The emergency plan further states in part, the demographical data, topographical information, land characteristics, access routes, and jurisdictional boundaries. We're taking into consideration in the Applicant's determination of the ten mile and 50 mile Emergency Planning Zones.

The Applicant provided supplemental information in response to our request for additional information by the staff.

Confirming that the exact sizes and configurations of the Emergency Planning Zone surrounding the Levy site were discussed and coordinated with representatives from the State of Florida Division of Emergency Management, and Citrus, Levy, and Marion County emergency management directors for the ten mile EPZ counties. Staff found the size of the Levy EPZ to be acceptable. Next slide.

Emergency response facilities, I'd like to provide a general overview of the site emergency response facilities, TSCs, OSCs, and the EOF.

The proposed locations of the TSCs and OSCs at the Levy nuclear plant are consistent with the TSC and OSC locations identified in the AP1000 DCD.

Staff's evaluation of the TSC location size, habitability, and ventilation is contained in the staff's evaluation of the DCD NUREG-1793 and its supplements.

I'd like to highlight the proposed EOF. The proposed EOF is to be located at Crystal River Training Center on West Venable Street in Crystal River, Florida.

The facility is a shared facility with Crystal River 3. It's an existing facility approved for use by the NRC for Crystal River 3. The EOF is outside the ten mile emergency planning zone, but within 20 miles of the Levy control rooms and TSCs.

EOF provides approximately 21,000 square feet of working space, will serve as an assembly point for EOF staff and representatives of federal, state, county, and industry emergency response agencies.

The Levy emergency plan states that the EOF is capable of supporting an extended emergency operations including simultaneous activation with Crystal River 3.

The emergency plan states in part, that the EOF will have sufficient space and equipment to accommodate response to a simultaneous emergency at both sites.

And stated the equipment will be available and adequate in number with connection capability to facilitate unimpeded communication with offsite agencies, onsite emergency response facilities, and the emergency news center.

The Applicant stated the EOF will have the capability to acquire, display, and evaluate radiological, meteorological, and plant system data

essential for recommending offsite protective measures for both Levy and Crystal River 3 sites without any decrease in effectiveness.

The staff's evaluation of the existing EOF as a shared facility included the consideration of past implementation practices for shared facilities pertaining to operating reactors and associated commission requirements for operation.

In addition, the staff's evaluation focused on the potential impact of functionality and capability of the existing facility with the addition of the two new units.

The Applicant proposed EP ITAAC to verify that the EOF equipment and data displays will identify and reflect the various effected units during an emergency.

In addition, as briefly described prior, the Applicant provided a license condition to demonstrate its integrated capability and functionality of the EOF for simultaneous activation by the Levy and Crystal River emergency response organizations for a simulated emergency condition.

This will include the demonstration of voice and data communications with site emergency response facilities, the NRC, and other federal,

state, and local coordination centers. Next slide.

The results of the staff's technical evaluation of the information incorporated by reference in the Levy COL application are documented in NUREG-1793 and its supplements.

Staff's conclusions for Section 13.3 Emergency Planning, are subject to the successful closure of confirmatory action items identified in the SER.

FEMA has reviewed the emergency plans for the state of Florida, Levy, and Citrus, Marion Counties, and provided its interim finding report for reasonable assurance dated February 17th, 2010.

FEMA has concluded that based on its review of the offsite plans and procedures, the offsite plans are adequate, and there is reasonable assurance that the plans can be implemented with no corrections needed.

NRC staff has reviewed the FEMA report and based its overall reasonable assurance finding on the FEMA findings and determinations regarding offsite emergency planning.

The LNP COL application includes post-licensing commitments including EP ITAAC that are necessary and sufficient to provide reasonable

assurance for onsite plans.

Based on the staff's evaluation of the Applicant's emergency plan for proposed Units 1 and 2, the staff finds the additional information and proposed textual revisions provided in response to the staff's requests for additional information.

The onsite emergency plans meet the planning standards in 50.47(b) and Appendix E to Part 50. And that concludes my presentation.

CHAIRMAN RAY: Okay, that sounds like a complete and comprehensive review. Any questions anyone had? Thank you very much.

MR. BOWERS: Thank you.

CHAIRMAN RAY: Now I turn to the Applicant and ask, do you want at this time to talk about things that we had open at the end of the day yesterday, Bob?

MR. KITCHEN: Chairman, we've got that planned at 1 o'clock.

CHAIRMAN RAY: All right.

MR. KITCHEN: And I think somebody is out trying to contact them. But right now, I'd have to say we're not ready until after lunch.

CHAIRMAN RAY: That's fine. No problems at all in that regard. Then that leaves 14, 16, and 18, doesn't it?

MR. ANDERSON: That's right. The remainder of Chapter 13 is also part of that because that would be the last remaining item before our closed session.

CHAIRMAN RAY: All right. Well, let's do that then. And that way then after lunch we'll just have the completion items, plans for the full committee meeting, and any discussion that remains to be had. Yes, Charlie?

MEMBER BROWN: I spoke with, where is he, what's his name?

MR. ANDERSON: Om.

MEMBER BROWN: Om, thank you. And he gave me some information out of the SC. I was able to find that. I went back to the volt for the DCD, and it's a voltage issue not a frequency issue and they've got plenty of margin on that, so I'm satisfied.

CHAIRMAN RAY: Thank you, Charlie.

MEMBER BROWN: Thank you. If the Applicant didn't hear that, they should take note.

PARTICIPANT: They don't need to do anything to the targets.

MEMBER BROWN: Okay, thank you.

CHAIRMAN RAY: I'm sure they're paying close attention.

MEMBER BROWN: They don't miss that much.

MR. KITCHEN: I'm Bob Kitchen, Licensing Manager. We're going to discuss Chapters 13, 14, 16, and 18 which as you've seen, much are largely standard.

Chapter 13, of course, as everyone's aware does not include 13.3 which we just discussed, the emergency plan. So it is a standard chapter and the standard material is incorporated, but you'll see a lot of text in Chapter 13 with regard to organizational structure.

There's really nothing unusual here. Typically this is titles. There are also some differences in alignment as you might expect, for example how our construction organization is aligned within our corporate structure, as opposed to maybe another utility.

So there's really nothing in terms of how the organization structure that's really out of line, let's say. That is really the only difference in Chapter 13, other than the emergency plan.

Looking at 14, Chapter 14 is Initial Test Program. Site specific material really related to looking to see what ITAAC, for example, might need to be incorporated because of site specific systems

unique to the Levy plant.

Also things such as emergency plan and security plan. The emergency plan was looked at in terms of ITAAC based on Reg Guide 1.206, generic ITAAC recommendations, and then modified to reflect anything that would be Levy specific. Similar for security ITAAC, is based on NRC and NEI generic ITAAC.

Systems, structures, and components. We looked at in terms of classification of the system, the importance of classification A, B, C, et cetera, whether the system was related, required for defense in depth.

For non-safety systems, were there any features or functions that were credited for mitigation of the design basis events.

And anything which was identified in the Chapter 16.3 is for additional regulatory oversights. We did a screen on systems to see if any of the items fell out requiring that.

The only system that was identified for unique, shouldn't say unique, for ITAAC were transmission switch yard and offsite power, and the words from ITAAC, developed for that system.

More significant for Levy in terms of this would be the roller compacted concrete, waterproof

membrane which is standard, but the drill shafts for the turbine building, RAD waste, and annex building, which we discussed at length yesterday.

Those systems being unique or should it say non-systems, being unique for Levy required ITAAC. And we did help ITAAC for each of these areas. That's all I have for 14.

CHAIRMAN RAY: Bob, since we talked about it before, what's the deal on the waterproof membrane, ITAAC, anything out there?

MR. KITCHEN: The waterproof membrane has an ITAAC for sliding coefficient.

CHAIRMAN RAY: Yes.

MR. KITCHEN: And specifically that we demonstrate that the waterproof membrane would meet a coefficient friction of .55.

CHAIRMAN RAY: Okay.

MR. KITCHEN: Which is the standard DCD.

CHAIRMAN RAY: Right. Seen that before. Okay.

MR. KITCHEN: Okay. Chapter 16, there are a lot of words up here, it's really not different. We incorporated the tech specs without exception as the standard tech specs. We did replace bracketed information. It was the generic with the site

information, of course.

Part of that involves a set point control program or, for example, for set point development as systems are designed.

The Section 2 and 3, which are the design and reliability assurance program and investment protection, it was nothing different at Levy. Then the tech specs that would be issued for the plant are actually contained in Part 4 of the application.

Chapter 18 is standard. Nothing Levy unique there. It just reflects the activities that would be done to insure that human factors are incorporated appropriately in design change or a new design in terms of lessons learned, in terms of operating experiences, et cetera, so those are related back to Chapter 18. That's all I have on those things.

CHAIRMAN RAY: It's hard to find something to talk about on a unique basis, isn't it? Okay, any questions? If not, we'll now hear corresponding sections from the staff perspective and then we'll take another break to close the meeting. We'll conduct the closed portion of the meeting and then we'll recess for lunch.

(Off microphone discussion)

MR. MISENHIMER: Okay, we are here to present Chapters 13, 14, 16, and 18 for Levy COL application. It will be presented by both me, David Misenhimer, I'm an NRO and a project manager and Tom Galletta. It's a very abbreviated presentation.

For Chapter 13, we highlighted here are site specific evaluations that had to be done, otherwise everything was incorporated by reference or was standard content. Are there any questions on any of these? Same thing for Chapter 16, there was just one site specific item highlighted on this slide. Any questions?

CHAIRMAN RAY: No.

MR. MISENHIMER: Okay, I'd like to turn it over to Tom for Chapter 14.

MR. GALLETTA: Okay. Well, I'm Tom Galletta with again, with Division of New Reactor Licensing AP 1000 Branch. The staff doesn't have a prepared presentation on Chapter 14.

Sections 14.1 and 14.2 are IBR or IBR standard. And 14.3 contains certain site design material that's evaluated in other chapters. The Applicant mentioned some of the things in Chapter 3, Chapter 13. Does this committee have any questions?

Okay, turning to Chapter 18, just one

clarification on that opening slide, it says and I don't know if you caught that, it said, steam powering, steam and power conversion system, it's actually human factors. It should say human factors.

CHAIRMAN RAY: I did catch that. But I hadn't figured out yet what the problem was. But you explained it now.

MR. GALLETTA: Confusing Chapter 10 with Chapter 18.

CHAIRMAN RAY: Yes, okay.

MR. GALLETTA: Okay. Oh, we don't have a prepared presentation for Chapter 18. The slide indicates that Section 18.2 has the only site specific evaluation regarding the location of the EOF.

The remaining sections are IBR or IBR standard and the Applicant did speak extensively about the location of the EOF. Are there any other questions?

CHAIRMAN RAY: No.

MR. GALLETTA: That's the end of our presentation.

CHAIRMAN RAY: Yes, that's actually why I was talking to Weidong, I was trying to figure out, did he talk about steam and power conversion systems because he it went past me, without realizing it.

Okay, thank you.

All right, we'll take a ten minute break and come back in closed session, conduct the closed session portion of the meeting. And we may have some further stuff just for this afternoon to make sure we're all on the same page. And then we'll take a break and return.

Let me advise for any who leave now, the schedule shows returning from lunch at 1 o'clock. I'm not sure we want to wait until 1 o'clock, I'll consult with the Applicant to see if he'd be ready any earlier than that. So we may come back from lunch a little earlier than 1 o'clock. And I just want to make note of that.

MR. KITCHEN: Mr. Chairman?

CHAIRMAN RAY: Yes.

MR. KITCHEN: Just so you can maybe set a time. We can be available for the follow-up from yesterday from 11:30 on, so whatever time you want to set for it would work for us.

CHAIRMAN RAY: I see, all right. Well, then let's, I don't want to cause too much confusion among people that might not be part of the closed session, so let's say that right now we plan to come back from lunch at 12:30?

So that anybody who's interested in hearing the wrap-up, because I think that will give us an hour lunch easily after we're done with the closed session from what I understand any way, or it may turn out I'm mistaken about that.

We'll take a ten minute break now. Come back at 11:10. We'll go then until probably 11:30, take our lunch break. Yes, Joy?

MEMBER REMPE: Okay, just out of curiosity, is it possible to do the closed session and then come back at 11:30 and hear your response and be done before noon?

CHAIRMAN RAY: Well, it's certainly conceivable we can do that. I was just concerned about folks who might leave and then not know when we're going to resume the open session. Is there anybody who objects to doing what she's recommended we consider? What's your feeling about that, Bob?

MR. ANDERSON: I don't have any objection. Staff can support closing the session and then returning for follow-up before lunch.

CHAIRMAN RAY: All right. You guys have any, anybody have any objection? Hearing none then, what we'll do is we'll close the session. Resume at 11:10. We will then do the material that's called for

then.

We'll reopen the session and see if we can finish before lunch so that those of you who, this is not a particularly great travel day and anybody that has to worry about that, I'm sure would be glad to get an earlier start rather than a later one. I know that's not why you asked --

MEMBER REMPE: I have a meeting with another staff member from 12:00 to 1:00 that's why --

CHAIRMAN RAY: Oh, I see.

MEMBER REMPE: -- I'm suggesting it.

CHAIRMAN RAY: Well, in any event, that's the general outline. We'll close, we'll then reopen, see if we can finish before lunch.

(Whereupon, the meeting in the foregoing matter went off the record at 11:00 a.m. and went back on the record at 11:10 a.m.)

CHAIRMAN RAY: Okay, we've got our phone line open it sounds like. We're back in open session.

PARTICIPANT: Can I take these back? You offered to --

CHAIRMAN RAY: Yes, yes you may. And we're prepared to address or receive applicant's response with regard to items that we discussed at the end of the day yesterday, and then we'll see where we

stand.

Now, basically, it's no surprise, I don't believe, to anyone, that in the entire agenda for this two-day meeting that where we began is where we return to now, and that is things that are really unique about this site and which can be more challenging sometimes, than most other things are.

And that has to do with the seismology and geology type issues that are site-specific. And this being a greenfield site, then there's, perhaps, even though it's nearby to an existing operating plant, the plant was licensed quite some time ago, and therefore we have to look at this entire area with fresh eyes, which is what we're doing.

With that having been said, are you ready now, Bob, to begin?

MR. KITCHEN: I hope so. I need some people on the phone. Keep feeling lonely up here.

PARTICIPANT: Go ahead.

MR. KITCHEN: Bob Youngs, are you on?

MR. YOUNGS: Yes, I am.

MR. KITCHEN: Okay. Kathryn Hanson?

MS. HANSON: Yes, I am.

MR. KITCHEN: Okay, we have two presentations, basically, to try to address the

questions that the committee left with us yesterday.

Specifically, on the 2008 Charleston update with the USGS, I should say, and also on the question regarding the fault types with regard to furthering documentation.

I'd like to start with Bob Young's. Bob, we have your slides up.

MR. YOUNGS: Okay.

MR. KITCHEN: So as you step through, we'll just page through the slides.

MR. YOUNGS: All right. Can everyone hear me all right?

CHAIRMAN RAY: Yes, we can.

MR. YOUNGS: Okay. I have a brief presentation on the comparison of the USGS 2002 -- Sorry I can't, there's some, I can't quite hear. Is there something by the phone?

CHAIRMAN RAY: Well, I don't know. We're trying hard to listen to you. This is a third world country, after all, and communications are intermittent, accordingly.

(Off the record comments)

MR. KITCHEN: Kathryn, are you on a land line?

MS. HANSON: Yes, I am. Can you hear me

okay?

CHAIRMAN RAY: Yes.

MR. KITCHEN: We can. I think maybe we'll just move to you first.

MS. HANSON: Okay.

(Off the record comments)

MR. KITCHEN: We have your first slide up, Kathryn. Go ahead and start.

MS. HANSON: Okay. In response to some questions that were raised yesterday about the faults that had been populated by Vernon, 1951, I put together a series of slides to go over some of the basic populations that Vernon used to hypothesize the fault, and then our assessment of those faults.

We described the information on the Vernon fault in FSAR Section 25114-34, and then some additional detail in Section 25124.

Basically, Vernon inferred a number of faults as steeply dipping, normal dip slip sheer faults that sounded graben depressions and horst ridges associated with a, what he inferred to be a tectonic uplift, referred to as the Ocala uplift.

He acknowledged that was no direct observations regarding the dip or down-dip extent of these faults. He did assume a very steep dip for

these features, based on the fact that they had very linear traits.

They were expressed as topographic features, and vegetation lineaments that cut across the relief, suggesting a steep dip. The question was raised yesterday about what the vertical displacement is on the individual faults.

For the faults that they did provide, or he did provide some information, which was not all of the faults, including several of the small faults that projected into the study area, the site area, but the vertical displacements range from 20 feet, six meters, to 160 feet. The field evidence he sited for the apparent displacements on these faults were based on very widely spaced outcrops and limited subsurface information from Wells, one of the faults that projects into the site area.

The control points on the displacement are over three kilometers apart, so these were not well-constrained vertical displacements. Next slide, please.

PARTICIPANT: We're there, Kathryn.

MS. HANSON: All right. So we evaluated these faults. One of the issues that came up, that the Florida Geological Survey provided was the

assessment of what the Ocala Uplift really represents, and, in fact, the general consensus is that this is not a true uplift. That, in fact, the Florida Geological Survey refers to it as the Ocala platform.

It's relatively stable feature, the deposit, the depth, the pre-Middle Eocene units are not warped or deformed, and the apparent deformation or folding of some of the younger units is attributed to differential compaction or possibly some sedimentological processes in the Middle Eocene.

So the, kind of, tectonic association of these features, these proposed faults with a tectonic structure is not valid.

The Vernon Fault parallel, and they're not particularly distinct from other regional lineaments that have been interpreted be joint sets of curves throughout the site region and, in fact, throughout most of the state of Florida.

And we looked at these features in a little more detail in the site vicinity, and we compared them to regional scale Landsat and digital elevation model data that we had for this site, and the lineaments are not particularly apparent in the data sets. Next slide.

PARTICIPANT: We're there.

MS. HANSON: Also, we talked at length with the Florida Geological Survey. The survey does not show these faults on any geologic map.

There are recent structure, contour maps on Tertiary subsurface units that were presented by Arthur et al. 2008 in a regional hydro-stratigraphic volume, and these also do not show evidence for these faults.

The Florida Geological Survey also has looked at these features in several of the quarries that Vernon cited as evidence for surface displacement and infers these to be the deformation features in those quarries could be attributed to localized karst-related deformation features.

They also noted that many of the offsets in the top of the Ocala that were postulated to be faults, may also be related to the fact that the Ocala surface we talked about over the past day or so, is a karstified, unconformable material and there can be significant relief on the surface on tectonic. Next slide.

So, in conclusion, as we outlined in Section 2.5.3, the postulated faults that Vernon hypothesized, likely, do not exist.

There's no evidence to suggest that they

exist or propagate into the site area, or that they've been active in the Quaternary, and, therefore, we concluded that they were not capable tectonic sources, as defined by Red Guide 1208.

Therefore, we did not feel there were any specific features or targets in the site area that would warrant additional investigations, you know, more detailed subsurface studies, geophysical surveys growing.

And that was, basically, what we concluded and summarized in the FSAR.

CHAIRMAN RAY: All right. Thank you. Dr. Hinze will have questions.

DR. HINZE: Kathryn, your usual very comprehensive job and I want to congratulate you on putting this together.

I just, really, have one question, and that is, in the pre-Tertiary rocks, or in the Tertiary rocks, looking at the drilling logs that are available, is there any chance that there is vertical displacement. Can it accommodate vertical displacements as suggested by Vernon?

MS. HANSON: I think that there's some potential evidence for possibly karstelated features along some of these features, that may, in some of the

cross sections that he presented.

Based on our discussions with the Florida Geological Survey and their assessment of the subsurface stratigraphy, there has been no suggestion or evidence for displacement or the existence of these faults.

We -- at the site, there was no indications in any of the site-specific borings or any defamation features that would suggest that there had been faulting in the vicinity, or near the borings.

We also don't see between the deeper borings, between the LNP 1 and 2 units seem to show consistent dip to the deepest units, the peak beds that were observed at the bottoms of the deeper borings under the nuclear islands in both sites. The dip on that seems to be consistent with the regional dip.

So, to my knowledge, we don't see any evidence from either our studies or from more recent studies by researchers in Florida.

DR. HINZE: You focused, in your last comments, on the more local geology associated with the two LNP units. What, on a more regional basis, did you look at some of these deep drilled, I mean, logs on a more regional basis outside of the LNP site?

MS. HANSON: Yes. We did go and collect all of the logs for the deeper oil and gas exploration wells that were available in the site vicinity.

Three of those deeper wells borings that had velocity profiles were used to assess the velocity profile at depths between the 500 feet to basement.

The question was raised yesterday about the location and the information from those wells. Those three wells are shown on the site vicinity map.

The general stratigraphy that you saw in all of those wells suggested a fairly uniform or a uniform slight southward dip to the bedding, which is consistent with the regional hydro geologic cross-sections by Miller and others. So we did look at that well data, as well.

DR. HINZE: Well, it would be difficult, if I understand correctly, to get 150 feet of relief on a fault, vertical relief on a fault to be accommodated by this drilling result, so, if I understand you correctly.

I have no further questions, Mr. Chairman. In fact, I want to go on record as congratulating Kathryn for putting this together, and I agree with her.

CHAIRMAN RAY: All right. Well, this will become part our record. Before we go to Dr. Youngs,

let me ask about one of my colleagues, here. Joy, do you anticipate you'll be wanting to put anything on the table when we have our final go-around?

MEMBER REMPE: I think I'm good. I'm fine.

CHAIRMAN RAY: What?

MEMBER REMPE: No.

CHAIRMAN RAY: No.

MEMBER REMPE: Yes.

CHAIRMAN RAY: Okay. Well, we'll continue on then. My expectation now is, because I don't want to rush our conclusion because the next thing we do is we go to a full committee meeting, is that we will take a lunch break and resume at 1 o'clock to do that, but now that we're set up the way we are, we'll go ahead with Dr. Youngs' presentation, make sure that that's satisfied, then we'll have a chance to make sure we're all organized.

We'll come back at 1 o'clock, we'll decide exactly what we want to ask for at the full committee meeting. I just don't want to do that in a rush and then wind up being incomplete in what we plan to do, then.

So we will meet again at 1 o'clock, and you can come back and join us and we'll decide. So

let's go ahead with Dr. Youngs, and we'll get his presentation and then we'll recess for lunch and come back at 1 o'clock. Go ahead.

MR. KITCHEN: Bob, are you on the line?

MR. YOUNGS: Yes, I am.

MR. KITCHEN: Bob, we have your introductory slide up, so we'll go ahead and start.

MR. YOUNGS: Okay. So, again, this is Bob Youngs. If we go to Slide 2, I have summarized here that there is only one difference between the 2002 and 2008 USGS models for Charleston, and on the slide in the two columns, I've summarized the characteristics of the USGS models for the Charleston earthquake source, and at the bottom, in red, is the only difference, which is description of the seismic source zones they used for modeling the location of future Charleston-like earthquakes.

In 2002, they used two alternative geometries, a narrow zone along the Woodstock lineaments and a broad areal zone which has limited off-shore extent.

And in 2008, they again used the same two weighted alternatives. A narrow zone along the Woodstock, and then the off-shore broad zone with extended off-shore to the Helena Banks.

And if you go to Slide 3, those two source zones are shown side by side. On the left is 2002, on the right is the 2008 model. And you can see on the right model, where they've widened out the source zone to encompass the Helena Banks.

But in terms of the extent of the source zones to the southwest, towards the Levy site, they both extend to the exact same place, which is the northern edge of the St. Helena Sound.

So if we go to Slide 4, the conclusion is that the only difference between the 2002 and 2008 USGS models is that the shape of the large zone, and the difference of the shape does not affect the distance to the Levy site from the USGS source zone.

There's a couple other points. The 2002 USGS model was reviewed as part of the development of the, what is called the UCSS, or Updated Charleston Seismic Source model, that was developed for the Vogtle DFP, and that was used in the Levy PSHA calculations to the FSAR.

The Vogtle UCSS, or Updated Charleston Seismic Source model, allows for the potential for the Charleston source to be closer to the Levy site than the USGS model, and the next two slides illustrate that.

Slide 5, again, shows USGS 2002 source zone, which is the black small rectangle is their narrow zone, and then the blue larger shape is their large source zone, and you can see off-shore to the southeast, those red lines, which are the area of the Helena Banks.

If we go to Slide 6, what you see are the source geometries used in the Vogtle Updated Charleston Seismic Source zone, and there, they have four options.

And you can see that the two options, one option that goes off-shore, which is shown by the black rectangle, and then another option which is along the shore, but it's the black hatched area, those both extend further to the southwest towards the Levy site.

And then the red rectangle encompasses the peak to the southwest, the same as the USGS model.

So, again, in conclusion, the difference between the 2002 and 2008 USGS models has no impact on the hazard at the Levy site.

DR. HINZE: Bob, thanks very much. This is Bill Hinze. Thanks very much for your review here, and I think it's appropriate and important that you point out that, even with including the Helena Banks

in 2008 model, that the distribution of magnitudes did not change, nor did the weighting of the two seismic source zones in the Charleston area change.

So those are the critical items, and as you point out, this does not change the hazard evaluation at the Levy site. I agree.

CHAIRMAN RAY: All right, well, again, that'll be part of the record of this sub-committee meeting. While we have this gathering here, did you want to talk further about bedrock topography?

DR. HINZE: Well, I would still like to see bedrock topography, not -- but I think it would be helpful to understand the basic underpinnings of the site, and it may provide some insight into solutioning zones, and I'd like to know where those paleochannels are that are referred to as a cause of some of the changes in the bedrock topography.

I realize that the coverage of the depth of bedrock is not uniform, and therefore that certainly complicates contouring, and may even suggest that some areas can't be contoured.

But, there are areas where one should be able to contour that data, in my view. And I think it should be available.

CHAIRMAN RAY: Okay, now, everybody

understands, Dr. Hinze is a consultant to the ACRS. This is just a sub-committee meeting so this is just an issue that has been raised.

You can respond to it as you wish, but I want you to be aware that it's something that, you know, without some more input, we'll probably talk about, and if there's something that you want to offer, describe in response, why, this is a good time to do it.

MR. KITCHEN: All right, thank you, Chairman.

We had four items from yesterday. We just talked about two. The bedrock topography was the third.

CHAIRMAN RAY: I'm sorry. I thought --

MR. KITCHEN: And the fourth was the uncertainty regarding the dissolution rate.

CHAIRMAN RAY: Right.

MR. KITCHEN: And we talked this over last night, and we've presented what we feel, we hope closes two of the items. The other two, we really just need a little more time to put together something that we would want to present to the committee.

CHAIRMAN RAY: All right.

MR. KITCHEN: And so, I guess, our option

there is a full committee, or possibly there's something else. But we probably, they could prepare it and go through the reviews that we would want to do. We're looking at, at least, a couple weeks before we'd be ready.

CHAIRMAN RAY: All right, well that's understandable, and that's fine. And right now the full committee meeting on December 15th is the thing that we would --

MR. WANG: December 1st.

CHAIRMAN RAY: What?

MR. WANG: December 1st, the full committee meeting.

CHAIRMAN RAY: December 1st. Why did I say December 15th? December 15th doesn't make any sense, obviously. Thank you, thank you Weidong. December 1st, yes. I have another meeting on the 15th. It's Watts Bar 2 again. That's the problem. Okay, anyway, December 1st.

So let's go ahead and have lunch and that'll be, at least, one topic that we'll plan to talk about. Now you said there was a fourth. Did you want to touch on it now, or --

MR. KITCHEN: No sir. Both of those, the uncertainty in the dissolution rate was the fourth --

CHAIRMAN RAY: Okay.

MR. KITCHEN: -- item, and we would --

CHAIRMAN RAY: All right.

MR. KITCHEN: -- need a little more time on that, as well.

CHAIRMAN RAY: Okay, so both of those, then, will be ones that we'll revisit. We'll do that at 1 o'clock. We'll decide, try to lock down what we're going to do at the full committee meeting, and that'll be all, I think, that we'll need to talk about.

Go around and find out what the members want to add to the list, but for now, we'll recess to 1 o'clock.

MR. KITCHEN: Bob and Kathryn, thanks.

(Whereupon, the meeting in the foregoing matter went off the record at 12:02 p.m. and went back on the record at 12:59 p.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

12:59 p.m.

CHAIRMAN RAY: Okay, we're back to wrap up here, now. The only chore I think we have now, is to make sure we're aligned for what comes next. Brian, did you want to say anything before I make a few comments here.

MR. ANDERSON: I believe that we've completed everything on the agenda, and just want to make sure that the staff and applicant can support the full committee meeting in December.

CHAIRMAN RAY: All right. It's very rare, and undesirable from everybody's standpoint, for us to see new information at a full committee meeting, as I'm sure you're aware.

Therefore, the material that you, although we also do this rarely, but I think it's the only choice, under the circumstances, the material that you would present to us that's outstanding, you mentioned the two items earlier, and anything else.

But anything that we haven't seen, we really should get in our hands and look at before the full committee meeting, so we don't come in the full committee meeting seeing this information for the first time, and we can also give you any feedback that

will help that meeting.

Now that won't put it on the record. We'll still have to present it at the full committee meeting, but if we've seen it, we can be more confident that we'll be able to receive whatever information it is you provide to us, without it resulting in any unintended or unexpected consequences. Is that okay with the applicant?

MR. KITCHEN: Yes, we'll send it to you prior to the ACRS meeting for sure.

CHAIRMAN RAY: Yes. So that's what we'll look for. Now, would you, I'll ask the applicant again, to identify what, we will certainly do this in response as well, but tell us what it is, then, that you would expect to, want to be sure, from your standpoint, is covered in the full committee meeting.

MR. KITCHEN: Well, we would think, certainly, a brief overview of the sites, that there's an understanding of the layout and site. Certainly, geotech and foundation design.

The only other area that I wondered about, just in light of Fukushima, and other concerns with the emergency plan, if there's anything to present for that.

CHAIRMAN RAY: Well, that's a fair

question. We're trying not to get ahead of the commission as it wrestles with lessons learned from Fukushima, insofar as it involves applicants such as yourself.

Anybody on the sub-committee here have any comment as to whether this application should address any of the things that we currently recognize as what -- we got, for example, the discussion of the spent fuel pool cooling changes that the referenced COL is making. That, probably, is something that's quite of interest and pertinent and responsive and helpful. Anything else?

MR. BROWN: I'm probably going to get a question on extended SBO. I may or may not, I don't know.

CHAIRMAN RAY: Well, but that's just a sales pitch, when it comes to AP1000, isn't it?

MR. BROWN: I was just, all I'm saying is it, we'll have the full meeting there, and liable to hear that question, because it's been on the table.

CHAIRMAN RAY: Yes.

MR. BROWN: So the Fukushima issues, that's all.

CHAIRMAN RAY: I forget, this is the COL meeting, not a DCD meeting, so --

MEMBER BLEY: That's why I think it there's not much to talk about on those areas.

CHAIRMAN RAY: Yes, I think we ought to stick with site-related items.

MEMBER BROWN: So I'm not going to bring in --

MEMBER RYAN: I think we had a pretty thorough discussion of seismic, you know, issues that would relate to flooding or any kind of --

CHAIRMAN RAY: Well --

MEMBER RYAN: -- related events, so I think we're caught up on that.

CHAIRMAN RAY: I do too, Mike. The information that was presented this time, and from my standpoint, particularly the 2008 USGS discussion --

MEMBER RYAN: Yes.

CHAIRMAN RAY: I don't think discounting this 50-year-old hypothesis about faulting is something you need to be concerned about.

It was something that we needed to do, but we don't need to do it at the full committee. But on the other hand, the full committee is somewhat aware, because of Vogtle and Summer, of the USGS thing, and the fact that you have gone ahead and presented to us this information we received today is probably worth

mentioning, that, even though the application was submitted prior to the 2008 USGS, we've looked at it, presented it to sub-committee, and demonstrated that it didn't have any affect on discipline requirements.

As far as emergency planning is concerned, I guess I would suggest that the fact that Crystal River is located in proximity, is something that someone might be interested in.

And it's not Fukushima, necessarily, but certainly the relationship of the plant to Crystal River and the fact that you've fully considered, in a conservative manner, emergencies that could occur at both sites, and looked at evacuation times with that in mind.

Things like that, I think are worth noting. Again, that's a site-related matter. Yes.

MEMBER BLEY: I think that the issue you brought up somebody else will bring up, and that's the use of salt water in your cooling towers, and that your company has had experience with that, I think, will surely come up.

CHAIRMAN RAY: Okay.

MEMBER BLEY: So it's probably worth, just --

CHAIRMAN RAY: Yes. I mean, just, make it

clear that you're confident that you -- Now, I think it was mentioned, this is an environmental contention, is it, that we don't get into, of course, but it is --

MR. KITCHEN: It is --

CHAIRMAN RAY: All right, so you need to be cognizant of that, in terms of what you say to us. Anything else from applicant? Any trial balloons you want to float here?

MR. KITCHEN: Well, I don't know if there's anything particularly, for the full committee. I believe the hydrology that I feel is pretty solid. I'm not sure there was anything, really, of interest, there for the full committee. I --

CHAIRMAN RAY: Well, I think the unique foundation design and the fact that you're located in a place that calls for something like that, and it, at least, seems to me as if you've addressed it in a very robust way.

Those are things that are responsive to the natural concerns that people would have. This thing is almost a floating vessel in this environment that it's in, and I'd like to say it seems to be very robust with regard to the foundation design.

MR. ANDERSON: I'd feel, at least from my perspective, that, you know, most of the rest of the

FSAR is pretty much standard, or reference to the DCD, and --

CHAIRMAN RAY: Yes, and I would urge, that is almost as simple as you put it, is that because we've done Vogtle and Summer, the only thing that we should be talking about, I think, are differences or uniquenesses.

But taking time with recitals one by one by one, that don't really add anything to the information is not something, we have to do it here, but we shouldn't do it in the full committee. Okay, same questions of staff.

MR. ANDERSON: I don't think the staff would have any new or different topics from what's been previously discussed. Our focus would be on the site characteristics, seismic and geotechnical engineering aspects, the unique foundation design.

And we think that the greenfield nature of the site makes emergency planning an appropriate topic, as well. So seismic, geotech and emergency planning topics would be the focus of the staff's presentation.

CHAIRMAN RAY: Okay, I think overall --

MEMBER RYAN: -- water source, hydrology.

CHAIRMAN RAY: What?

MEMBER RYAN: Because water source, hydrology, that kind of stuff, is unique to a site.

CHAIRMAN RAY: Okay.

MEMBER REMPE: Would the stuff -- emergency planning, I didn't hear you explicitly say the location of the technical support center, and should that be mentioned?

MEMBER RYAN: Sure.

CHAIRMAN RAY: Well, I, yes, sure, we can mention it. The fact that it is consistent with the DCD, in other words, it's not like Vogtle or Summer in which they're consolidating the tech support center outside the power block, makes it almost an informational item, because it's part of the design certification that way.

MEMBER REMPE: Also, just as a counter opinion, since the Commission hasn't decided what they're going to do about the action items for Fukushima, I'm not sure it's worth bringing it up.

CHAIRMAN RAY: Well, I wouldn't have --

MEMBER REMPE: It's up to people that are wiser than me to make recommendations that --

CHAIRMAN RAY: Yes. I agree with you, Joy. That's why I said we're still, we're trying not to plow new ground in a --

MEMBER REMPE: Right. And I think all you do is opening up, well I only reviewed some of the things, and that's great, but someone's going to start asking about the other things.

CHAIRMAN RAY: The only thing I suggested was this increased spent fuel pool cooling capability that the staff talked about today, or --

MEMBER REMPE: Yes.

MEMBER BLEY: And that's site specific.

CHAIRMAN RAY: What?

MEMBER BLEY: That is site specific, so that's --

CHAIRMAN RAY: Well, no, but he was talking about reference COLA, Vogtle, and of course, these guys will follow that.

MEMBER BLEY: Okay.

CHAIRMAN RAY: We didn't focus too much on status of staff's review completion, outstanding items or anything. I'm not talking about confirmatory action. I'm talking about open items.

We didn't focus on that during these two days here. It was just part of the mix, but, probably, we should have something that boils that down into something more visible by that point in time. Where do we stand, in terms of completing the

review?

MR. ANDERSON: Okay, we can certainly provide remarks to that effect. I can confirm for you, right now, that there is no additional technical review that the staff intends to perform for the Levy County application.

CHAIRMAN RAY: All right.

MR. ANDERSON: All that remains is the closure of confirmatory items, which, I think, as you know, is administrative tracking to ensure that information the staff has already reviewed does actually appear in the final revision of the FSAR.

CHAIRMAN RAY: All right. So basically, there are no --

MR. ANDERSON: That's correct.

CHAIRMAN RAY: -- open technical issues.

MR. ANDERSON: There are no open items.

CHAIRMAN RAY: Okay. Well, that's worth saying.

MR. ANDERSON: Okay.

CHAIRMAN RAY: Okay, and the confirmatory items are administerial and not anything we need to take up the full committee's time on.

Well, you know, I'm going to make the point at the full committee that this is the first chance we

have, really, to see the standardization applied at a greenfield site, and it seems to have the effect that was advertised for it, in terms of the review process. I assume the staff would concur on that, and say something similar. Correct?

MR. ANDERSON: The staff would say something similar, yes.

CHAIRMAN RAY: Correct.

MR. ANDERSON: : We agree. The staff --

CHAIRMAN RAY: You agree. All right. Well, that's the only thing I would say is, you know, noteworthy, sort of, is this is their first SCOLA/greenfield site, and no ESP, so it's different in that sense than anything we've seen before.

But, anyway, it seems to have gone well, and I'm sure that reflects the applicant's effort, as well as a good site they appear to have selected, and so on.

Okay, is there anything else that we need to discuss in connection with this sub-committee meeting, because this will be the only one held, as far as we know, before the full committee meeting, and we will look forward to getting a couple of items from the applicant, so that when we go into the full committee meeting, those of us on the sub-committee

will not have to say I've never seen this before.

MEMBER REMPE: It seems a couple of those items are primarily things that Dr. Hinze should review and, perhaps, give us comments on --

CHAIRMAN RAY: He will --

MEMBER REMPE: -- if possible.

CHAIRMAN RAY: And I should mention it, it should come to us through the staff. The items that the applicant are going to provide should be provided to you as well as to us.

MS. MCGOVERN: If you provide them to us, we will make sure that they get into the hearing file appropriately --

CHAIRMAN RAY: Okay.

MS. MCGOVERN: -- and we will share them with ACRS.

CHAIRMAN RAY: That's right. So, we're not having any side dialog with the applicant here. It's just a matter we need to get them and look at them before the full committee meeting, so that we -- like you say, we're not saying, I don't know what that is.

All right. Well, with that, I'm about ready to adjourn this meeting. If anybody has anything else they'd like to say, speak now.

MR. ANDERSON: Mr. Chairman, I have one question, just in terms of the time on the agenda for the full committee, do you have any insight as to, for our planning purposes for presentations, how much time would we spend in front of the full committee? What should we plan and prepare for?

CHAIRMAN RAY: Shorter rather than longer is my opinion, but that should be something to discuss with the staff that does the full scheduling. I don't know what else is on the full committee agenda.

MEMBER REMPE: The agenda has been issued.

CHAIRMAN RAY: But I don't feel like we need a lot of time. Yes? What did you say Joy?

MEMBER REMPE: They sent a draft agenda to us.

CHAIRMAN RAY: Oh, it's probably two hours.

PARTICIPANT: Well, is it for December?

MEMBER REMPE: Yes. No, you're right, I'm sorry. Yes, you're right.

CHAIRMAN RAY: December 1st, yes, I was going to say, that's a long way away.

MEMBER REMPE: You're right.

CHAIRMAN RAY: In any event, no, I don't feel compelled to say we need sufficient time. I

don't, assuming that there isn't a concern that arises from either of these things that we haven't yet seen, and if there is, we'll do what we can to make sure it's given adequate attention at the full committee meeting, because I certainly don't want to go over, beyond that. I don't see any reason for that to occur.

MEMBER BROWN: Wouldn't you expect this to be a bit, no more than about a half of the middle, first part of a day, something like one-and-a-half hours or so? I mean that --

CHAIRMAN RAY: Well, that's why I said, Charlie, that I think that --

MEMBER BROWN: I'm just saying, that's roughly what we've seen on some --

CHAIRMAN RAY: Yes, that ought to be, yes. As a -- no, I -- whether it's an hour-and-a-half, two hours, one hour, it should be worked out with the guys who schedule the full committee meeting.

MR. ANDERSON: Understand.

CHAIRMAN RAY: All right. Going, going --

(Whereupon, the meeting in the foregoing matter was concluded at 1:15 p.m.)

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

Presentation to the ACRS Subcommittee

Levy County Units 1 and 2 COL Application Review

NRC Action Items from October 18, 2011

- χ/Q values – margins to DCD values
- Groundwater – clarification of radionuclide activity at receptors

Levy Nuclear Plant
FSAR 2.0 – 2.3
Site Characteristics, Demography Nearby Facilities and Meteorology

Paul Snead
Supervisor – Environmental Services

NGG
Think Fleet.

Progress Energy

FSAR 2.0 Site Characteristics

- DCD incorporated by reference
- Table 2.0-201 compares site-specific characteristics to the AP1000 required site parameters found in DCD Table 2-1
- All site-specific characteristics are bounded by AP1000 site parameters for LNP

FSAR 2.1 Geography and Demography

- DCD incorporated by reference
- COL information items addressed
  - COL 2.1-1 Geography and Demography
- Population Density in 2000 within 20 miles of LNP was 97 ppsm
- Population Density projected in 2020 within 20 miles of LNP is 146 ppsm

FSAR 2.2 Nearby Industrial Hazards

- DCD incorporated by reference
- COL information items addressed
  - COL 2.2-1 Identification of Site-Specific Potential Hazards
- Evaluated nearby industrial hazards in accordance with Standard Review Plan
- Sources of potential hazards within 5 miles:
  - Road transportation of explosive material
  - Failure of nearby natural gas pipeline
  - Toxic material release from water treatment plant
- No design basis events identified requiring mitigating actions

FSAR 2.3 Meteorology

- DCD incorporated by reference
- COL information items addressed
  - COL 2.3-1 Regional Climatology
  - COL 2.3-2 Local Meteorology
  - COL 2.3-3 Onsite Meteorological Measurement Program
  - COL 2.3-4 Short-Term Diffusion Estimates
  - COL 2.3-5 Long-Term Diffusion Estimates
- All AP1000 DCD site parameters are met

Major Items of Interest

- Onsite “calm wind” Observations
- Operating Basis Wind Speed Site Parameter
- Maximum LNP Site Characteristic Temperatures

Onsite "calm wind" Observations

- Site located ~8 miles inland
- Diurnal "sea-breeze" wind effects are consistently observed at the site using an onsite meteorological tower (2 years of data)
- Onsite meteorological tower meets all NRC guidance in RG 1.23 *Meteorological Monitoring Programs for Nuclear Power Plants*
- Calm winds were observed in our data that required further evaluation

Analysis of Two Years of Onsite Meteorological Data

- Most of the observed “calm” winds were actually light winds
- True calm winds exhibit erratic and meandering wind directions
- Observed winds had measurable directions
- Actual observations of true calm winds (i.e., near zero wind speed and variable wind direction) were rare and infrequent

Resolution of Light Wind Speeds in X/Q Modeling Analysis

- Standard PAVAN dispersion modeling approach is not designed for treatment of light winds
- PEF performed a detailed sector-by-sector assessment
  - Analysis was consistent with NRC guidance in RG 1.145 *Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants*
  - *Maximum possible* sector-dependent 2-hour X/Q's were substituted for PAVAN extrapolations in light wind cases

Resolution of Light Wind Speeds in X/Q Modeling Analysis (cont'd)

- Conclusion: Projected worst-case impacts of routine and accidental releases do not exceed AP1000 DCD criteria at or beyond the Exclusion Area Boundary (EAB)

Operating Basis Wind Speed Site Parameter

- DCD Operating Basis Wind Speed Site Parameter is 145 mph (3-sec gust)
- DCD procedures were followed to determine the 50- and 100-year recurrent LNP site characteristic wind speeds (including hurricanes).
  - 50-year: 120 mph
  - 100-year: 128 mph
- Conclusion: Maximum winds speeds in the LNP site region will not exceed the DCD Wind Speed Criteria

Maximum LNP Site Characteristic Temperatures

- Maximum Safety Temperature Criteria
  - 115^0F dry bulb/86.1^0F coincident wet-bulb
  - 86.1^0F non-coincident wet-bulb
- Analysis based on long-term historical records from the region surrounding the LNP site
- Statistical regression analysis procedure was used to estimate 100-year recurrence temperatures for the site, based on historical temperature records

Maximum LNP Site Characteristic Temperatures (cont'd)

- No projected maximum site temperatures exceeded criteria
- Conclusion: Maximum ambient temperatures in the LNP site region are below the DCD Ambient Temperature Criteria

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Protecting People and the Environment

Presentation to the ACRS Subcommittee

Levy County Units 1 and 2 COL Application

Section 2.0 – Site Characteristics

Sections 2.1/2.2 – Geography, Demography, & Nearby Facilities

Section 2.3 – Meteorology

October 18-19, 2011

Staff Review Team

- Technical Staff
  - Rao Tammara (Siting & Accident Consequences Branch)
  - Kevin Quinlan (Siting & Accident Consequences Branch)

- Project Manager
  - Brian Anderson

Site Characteristics

- **2.0 – Site Characteristics**
- FSAR Section 2.0 describes the characteristics and site-related design parameters of Levy County (LNP) Units 1 and 2.
- FSAR Table 2.0-201 provides a comparison of the LNP site characteristics and the AP1000 DCD site parameters.
- All LNP site characteristics have been found to be acceptable.
- The LNP site characteristics are bounded by the site parameters specified in the AP1000 DCD.

Geography and Demography

- **2.1 – Geography and Demography**
- DCD Incorporated By Reference
- Site specific information
  - Site Location
  - Exclusion Area Boundary (EAB)
  - Population Distribution, Projections
  - Population Center and Population Density
- Conclusions

Nearby Facilities

- **2.2.1 - 2.2.2 – Location and Description**
- DCD Incorporated By Reference
- Site specific information
  - Nearby Industrial, Transportation, and Military Facilities
  - Pipelines
- Conclusions

Nearby Facilities

- **2.2.3 – Evaluation of Potential Accidents**
  - The evaluation of potential hazards to new units 1 and 2 due to potential accidents from nearby facilities, pipelines, and transportation routes.
  - The evaluation of potential toxic chemical releases from nearby facilities, transportation routes and onsite storage for the control room habitability of new units 1 and 2.
- DCD Incorporated By Reference
  - Onsite storage of AP1000 DC chemicals
- Site Specific Evaluations
  - Explosions
  - Gas pipelines
  - Aircraft hazards
  - Toxic chemicals (MCR habitability)
  - Fires
  - Collision with intake structures
  - Liquid spills
- Conclusions

Meteorology

- **2.3 – Meteorology**

- DCD Incorporated By Reference

- COL items and Supplemental Information
  - LNP COL 2.3-1 – Regional Climatology
  - LNP COL 2.3-2 – Local Meteorology
  - LNP COL 2.3-3 – Onsite Meteorological Measurements Program
  - LNP COL 2.3-4 – Short-Term Diffusion Estimates
  - LNP COL 2.3-5 – Long-Term Diffusion Estimates
  - LNP SUP 2.0-1 – Comparison of Site Parameters Versus Site Characteristics

Meteorology

- **Technical Topics of Interest**
  - **2.3.1 Regional Climatology**
    - All LNP site characteristic values presented in FSAR Section 2.3.1 have been found to be acceptable
      - 50-year/100-year Wind Speed (3-second gust)
      - Maximum Tornado Wind Speed
      - Maximum Roof Load (Winter Precipitation)
      - Air Temperature and Humidity
  - **2.3.2 Local Meteorology**
    - Addressed cooling tower-induced effects on ambient temperature, moisture, and salt deposition
    - Provided detailed information showing that the LNP meteorological data are representative of the site area

Meteorology

- **Technical Topics of Interest**
  - **2.3.3 Onsite Meteorological Measurements Program**
    - COL applicant described the onsite meteorological measurements program and provided a copy of the resulting meteorological data
    - Applicant met RG 1.23, Revision 1 criteria for siting of the tower in relation to Units 1 & 2

Meteorology

- **Technical Topics of Interest**
  - **2.3.4 Short-Term (Accident) Diffusion Estimates**
    - All LNP site characteristic values presented in FSAR Section 2.3.4 have been found to be acceptable
      - EAB & LPZ χ/Q values
      - Control Room χ/Q values
  - **2.3.5 Long-Term (Routine) Diffusion Estimates**
    - All LNP site characteristic values presented in FSAR Section 2.3.5 have been found to be acceptable
      - COL FSAR 2.3-5 verified release points and receptor locations

Meteorology

- **Conclusion**
  - All LNP site characteristics presented in FSAR Section 2.3 have been found to be acceptable and bounded by the corresponding AP1000 site parameters
  - All regulatory requirements for Section 2.3 have been satisfied
  - No open items
  - No exemptions or departures
  - Seven confirmatory items

Levy Nuclear Plant Units 1 and 2 FSAR Chapter 8, 9 and 10

Electrical Power, Auxiliary Systems and Power Conversion

Jeremy Baksh – Senior Engineer
Mike Franklin – Supervisor Site Engineering

NGG Think Fleet.

Progress Energy

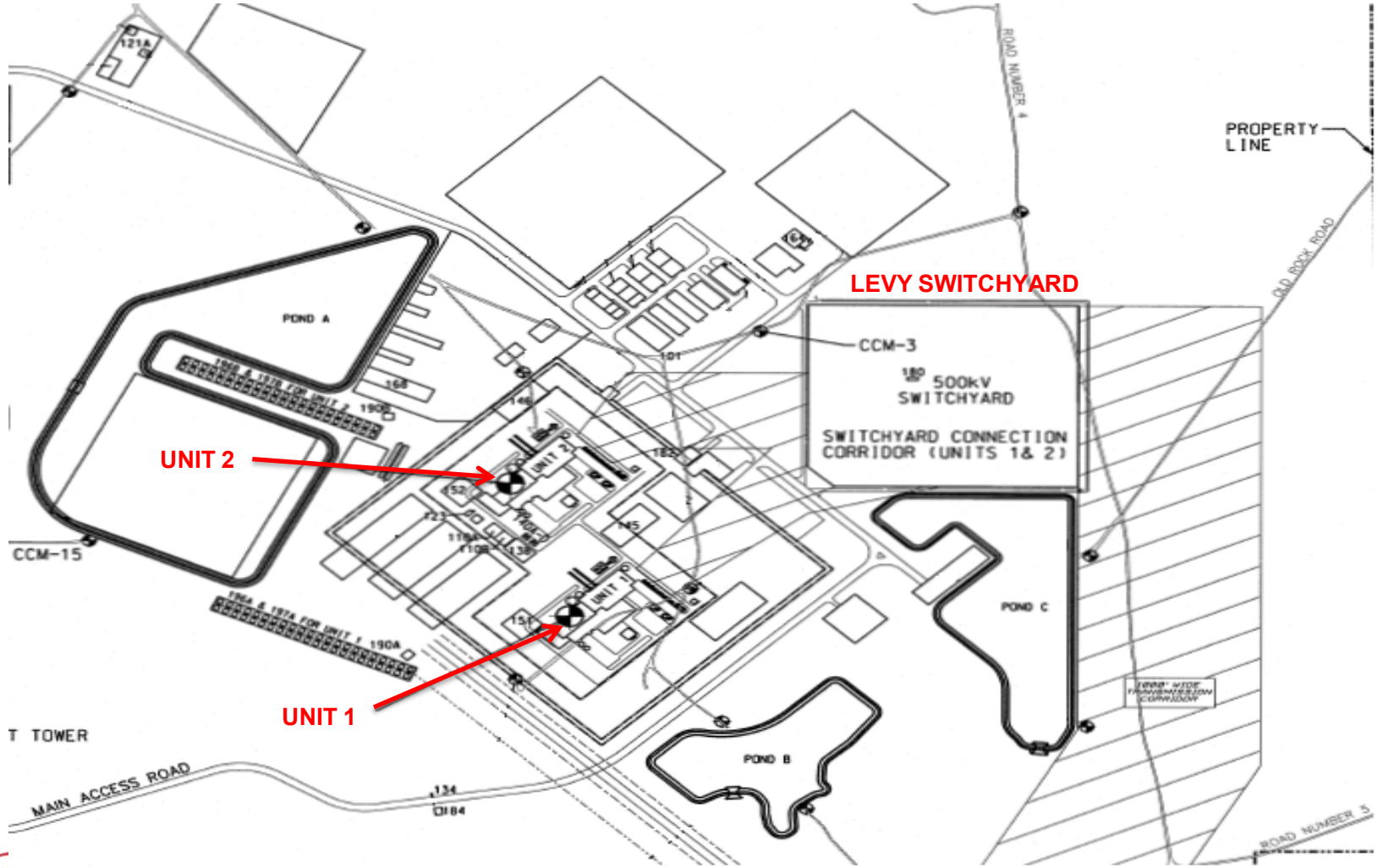
Chapter 8 – Electrical Power

- DCD incorporated by reference
- Standard material incorporated (including standard departure)
- Site specific off-site power description

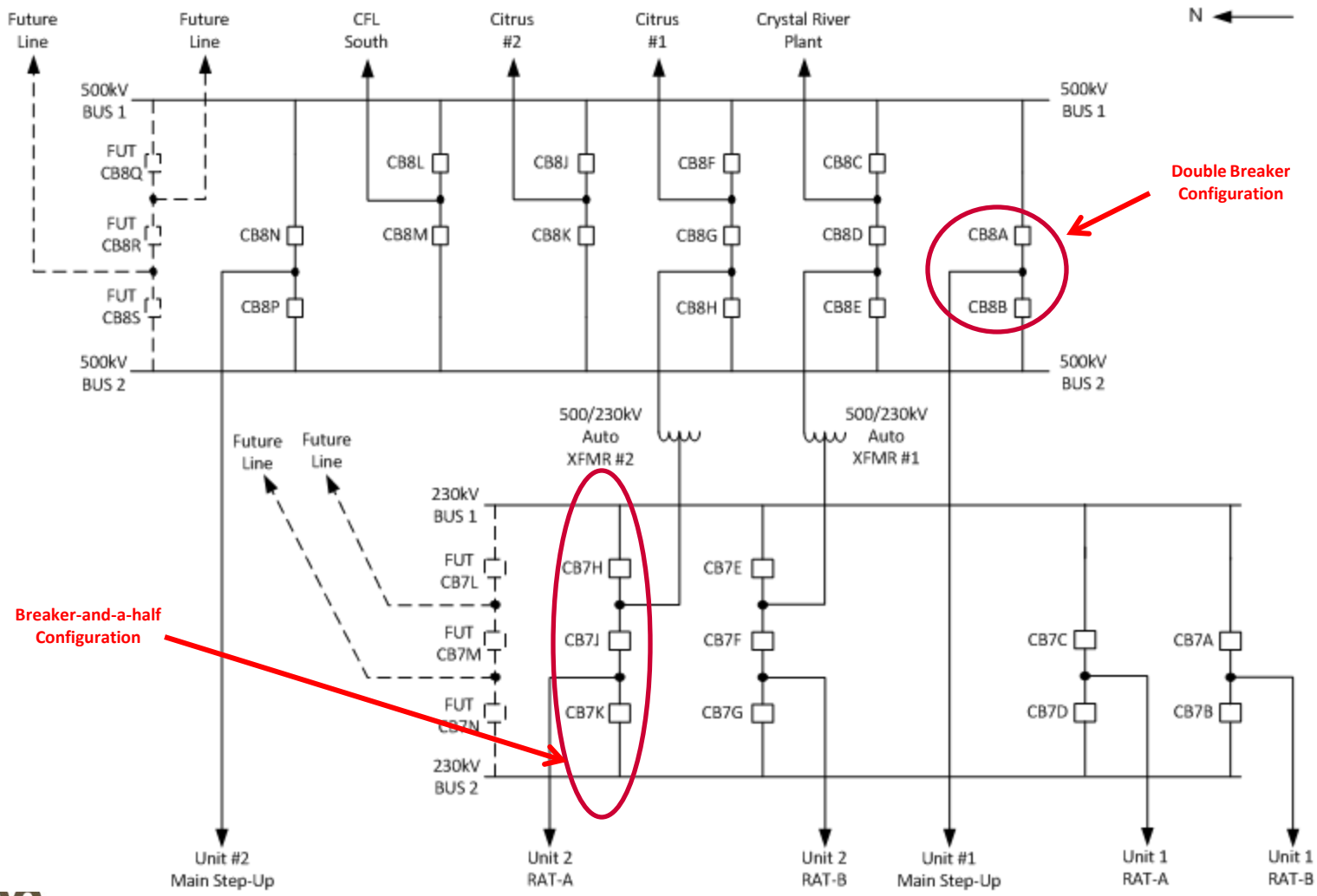
Section 8.2 – Offsite Power

- Four planned 500kV transmission lines will connect the Levy switchyard to the Progress Energy Florida (PEF) transmission system. (COL 8.2-1)
- Upgrades to existing PEF facilities (COL 8.2-1)
- Failure Modes and Effects Analysis performed (SUP 8.2-1)
- Grid stability study performed (SUP 8.2-3)
  - Includes Westinghouse interface requirement for maintaining Reactor Coolant Pump voltage for three seconds after a turbine trip

Levy Switchyard



Switchyard Single-Line Diagram



Levy Switchyard FMEA

- Failure Modes and Effects Analysis (FMEA) for the switchyard confirms that no single initiating event results in the failure of more than one off-site transmission line or a loss of off-site power to either LNP 1 or LNP 2

Chapter 9 – Auxiliary Systems

- DCD incorporated by reference
- Standard material incorporated (including standard departure)
- Site-specific Raw Water System

Raw Water System (RWS)

- Site Specific – Saltwater and Freshwater Separate Subsystems
- Saltwater Subsystem provides makeup to:
  - Circulating Water System Mechanical Draft Cooling Tower Basins
- Freshwater Subsystem provides makeup to:
  - Service Water System Cooling Tower Basins
  - Fire Protection System Fire Water Storage Tanks
  - Potable Water Storage Tank
  - Demineralized Water Treatment System

Raw Water System (RWS) - Continued

- Neither Raw Water Subsystem serves a safety related function
- The RWS does not have an interconnection with any system that contains radioactive fluids
- Flooding from RWS is bounded by Circulating Water System failure analysis (DCD 3.4.1.2.2.3)

Chapter 10 – Steam and Power Conversion

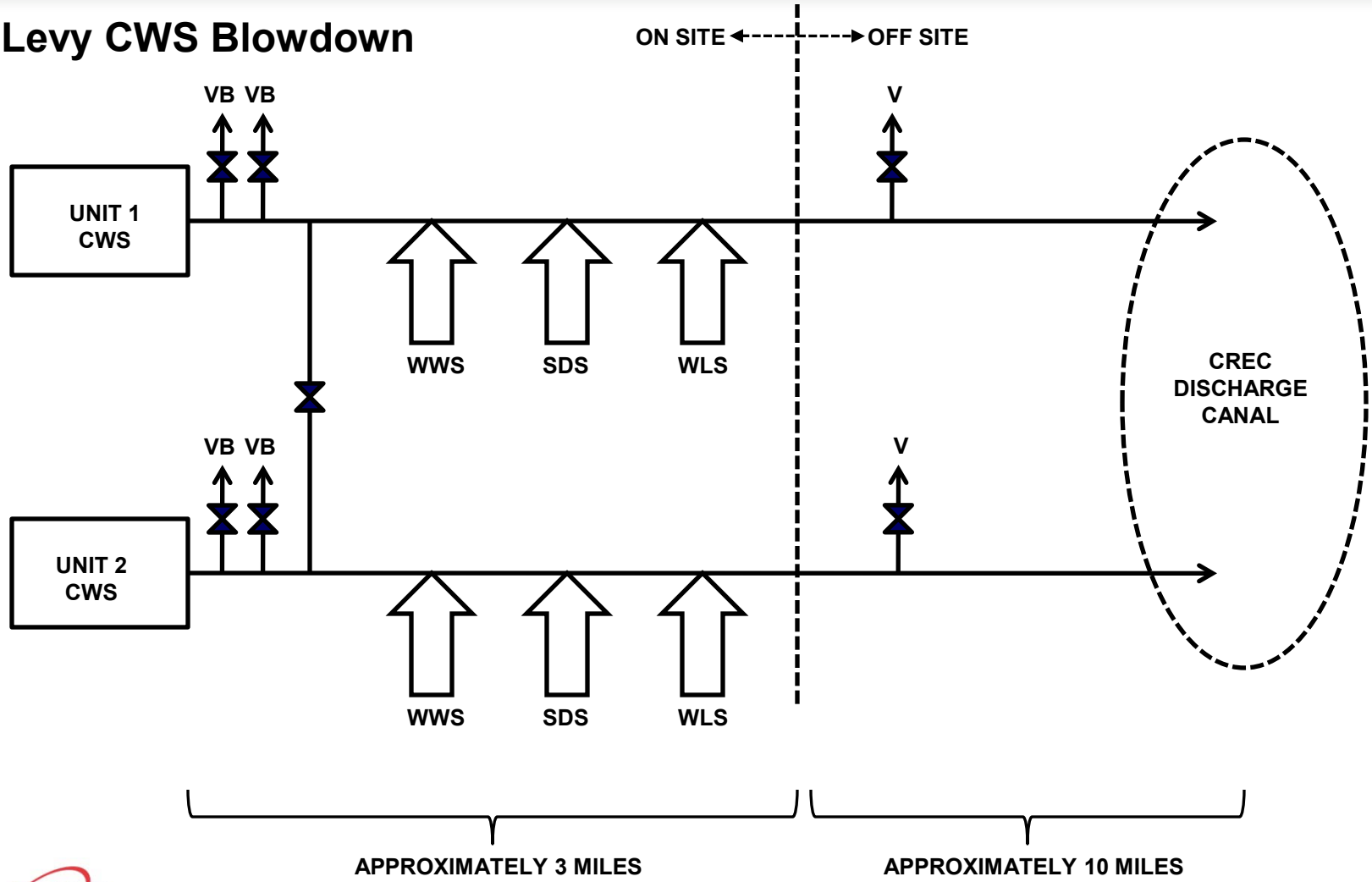
- DCD incorporated by reference
- Standard material incorporated (including standard departure)
- Site-specific Cooling Towers and Circulating Water System blowdown

CWS Cooling Tower:

- Mechanical Draft Linear Towers
- Tower collapse does not affect safety related SSC's
- Failure of tower could rupture RWS, CWS, CWS-Blowdown
  - A rupture of any system does not result in flooding of safety related SSC's.

Chapter 10 – Steam and Power Conversion

Levy CWS Blowdown



Levy Nuclear Plant
FSAR 6, 11 & 12
Engineered Safety Systems
Radioactive Waste
Radiation Protection

Bob Kitchen - Manager

NGPP Licensing

NGG Think Fleet.

Progress Energy

FSAR CHAPTER 6
Engineered Safety Systems

- DCD Incorporated by reference
- Standard Material Incorporated
- FSAR 2.2.3 discusses offsite hazardous materials
- Onsite - DCD standard chemicals

Chapter 11
Radioactive Waste Management

- DCD Incorporated by Reference
- Standard material incorporated
- Site-specific information of interest
  - Liquid Radwaste System (WLS) and Waste Water System (WWS)
  - Gaseous Waste Management
  - Effluent Monitoring
  - Long-term Onsite Storage

Section 11.2 and 11.3
Liquid & Gaseous Waste Management

- LADTAP code utilized for liquid waste to determine estimated dose and dose rates
- GASPAR computer code used for gaseous waste to calculate dose and dose rates
- Doses to individuals due to liquid & gaseous waste discharges are within the limits of 10 CFR Part 50 Appendix I
- Based on estimated population doses cost benefit analyses were performed and no augments were determined to be cost beneficial

Section 11.4 - Solid Waste Management

11.4.6.3 Long Term On-Site Storage Facility

- Contingent storage plan - Identical to Vogtle
- An outside storage pad will be located on-site
- Storage would be in high integrity containers (HICs) or other suitable containers.
  - Will not degrade over time
  - Stored within shielded containers
- Operational considerations also addressed
  - Discharge during outages
  - Actions to minimize

Chapter 12
Radiation Protection

- DCD Incorporated by Reference
- Standard material incorporated
- Site –specific evaluations of dose to construction workers
  - Significantly below the 10CFR20.1301 public dose limit

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United States Nuclear Regulatory Commission

Protecting People and the Environment

Presentation to the ACRS Subcommittee

Levy Nuclear Plant Units 1 and 2
COL Application Review

ASE Chapter 8 – Electric Power
ASE Chapter 9 – Auxiliary Systems
ASE Chapter 10 – Steam and Power Conversion Systems

October 18 - 19, 2011

Staff Review Team

- Technical Staff
  - Om Chopra (Electrical Engineering Branch)
  - Larry Wheeler (Balance of Plant Branch)

- Project Management
  - Brian Anderson, Lead PM

Levy County FSAR Chapter 8

Electric Power

FSAR Section	Site-Specific Evaluations
8.1 Introduction	• LNP SUP 8.1-1 Description of the Utility Grid • LNP SUP 8.1.2 Levy Units 1 and 2 connection to the utility grid • LNP SUP 8.1-3 Additional information on regulatory guidelines and standards
8.2 Offsite Power System	• LNP COL 8.2-1 Transmission system description, and its testing and inspection plan • LNP COL 8.2-2 Transmission system requirements and studies • LNP SUP 8.2-1 FMEA of the switchyard • LNP SUP 8.2-2 Transmission system Protective relaying • LNP SUP 8.2-4 Transmission system planning • LNP SUP 8.2-3 Stability and reliability of the offsite transmission power system • Interface Requirements
8.3.1 AC Power Systems (Onsite)	• LNP COL 8.3-1 Grounding system and lightning protection
	• LNP SUP 8.3-1 Site-specific switchyard and power transformer voltage • LNP SUP 8.3-2 EDG rating based on site conditions
8.3.2 DC Power Systems (Onsite)	• STD DEP 8.3-1* Class 1E voltage regulating transformer periodic testing

* This section is entirely IBR or IBR/Standard

Staff Review Summary

- **Section 8.1 – Introduction**
  - Applicant has adequately addressed LNP SUP 8.1-1 regarding Levy County Units 1 and 2 connection to the Progress Energy Florida Transmission system
  - The applicant has adequately described the connection of auxiliary and startup transformers to the switchyards
  - The applicant has adequately addressed LNP SUP 8.1-3 regarding additional information for regulatory guidelines and standards

Staff Review Summary

- **Section 8.2 – Offsite Power System**
  - The staff finds COL information items LNP COL 8.2-1 involving the design details of the plant site switchyard and its interface with the local transmission grid adequately addressed
  - The staff concludes that the applicant's condition monitoring program for underground or inaccessible cables satisfies the recommendations of GL 2007-01,and the guidance in NUREG/CR-7000 and NUREG-0800

Staff Review Summary

- **Section 8.2 – Offsite Power System**
  - The applicant has adequately addressed LNP SUP 8.2-1 thru 8.2-4 involving the offsite power system adequacy and availability, testing and inspection of switchyard components and failure modes and effects analysis
  - The applicant provided sufficient information regarding the interfaces for standard design from the generic AP1000 DCD, Table 1.8-1, Items 8.1, 8.2, and 8.3

Staff Review Summary

- **Section 8.3.1 – AC Power System (Onsite)**
  - The applicant has adequately addressed LNP SUP 8.3-1 involving the site-specific switchyard and transformer voltage
  - The applicant has adequately addressed LNP COL 8.3-1 related to the grounding grid system design and lightning protection

Staff Review Summary

- **Section 8.3.2 – DC System (Onsite)**
  - The applicant has adequately addressed STD DEP 8.3-1 related to periodic testing of voltage regulating transformers pending closure of Confirmatory Item 8.3.2-1.

Levy County FSAR Chapter 9

Auxiliary Systems

FSAR Section	Site-Specific Evaluations
9.1.1 New Fuel Storage	• None*
9.1.2 Spent Fuel Storage	• None*
9.1.3 Spent Fuel Pool Cooling System	• None*
9.1.4 Light Load Handling System	• None*
9.1.5 Overhead Heavy Load Handling Systems	• None*
9.2.1 Service Water System	• LNP COL 9.2-2 provides additional information regarding the service water system cooling tower potential interactions
9.2.2 Component Cooling Water System	• None*
9.2.3 Demineralized Water Treatment System	• None*
9.2.4 Demineralized Water Transfer and Storage System	• None*

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 9

Auxiliary Systems

FSAR Section	Site-Specific Evaluations
9.2.5 Potable Water System	• LNP COL 9.2-1, Potable water system description outside the power block
9.2.6 Sanitary Drains	• LNP SUP 9.2-1, Sanitary waste system discharge description
9.2.7 Central Chilled Water System	• None*
9.2.8 Turbine Building Closed Cooling Water System (TCS)	• LNP CDI provides the source of cooling water for the TCS heat exchangers
9.2.9 Waste Water System	• LNP COL 9.2-2 provides information on the waste water settling basin and associated discharge flowpath
9.2.10 Hot Water Heating System	• None*
9.2.11 Raw Water System	• LNP SUP 9.2-2 provides site-specific information related to the raw water system

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 9

Auxiliary Systems

FSAR Section	Site-Specific Evaluations
9.3.1 Compressed and Instrument Air System	• None*
9.3.2 Plant Gas System	• None*
9.3.3 Primary Sampling System	• None*
9.3.4 Secondary Sampling System	• None*
9.3.5 Equipment and Floor Drainage Systems	• None*
9.3.6 Chemical and Volume Control System	• None*
9.4.1 Nuclear Island Nonradioactive Ventilation System	• LNP COL 9.4-1b provides local toxic gas evaluations
9.4.2 Annex/Auxiliary Buildings Nonradioactive HVAC System	• None*
9.4.6 Containment Recirculation Cooling System	• None*
9.4.7 Containment Air Filtration System	• None*

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 9

Auxiliary Systems

FSAR Section	Site-Specific Evaluations
9.4.8 Radwaste Building HVAC System	• None*
9.4.9 Turbine Building Ventilation System	• None*
9.4.10 Diesel Generator Building Heating and Ventilation System	• None*
9.4.11 Health Physics and Hot Machine Shop HVAC System	• None*
9.5.1 Fire Protection System	• LNP COL 9.5-1, qualification requirements for the fire protection program • LNP COL 9.5-2, site-specific hazards analysis of the yard areas and outlying buildings
9.5.2 Communication System	• LNP COL 9.5-9, offsite interfaces • LNP COL 9.5-10, emergency offsite communications • LNP COL 9.5-11, security communications
9.5.3 – 9.58	• None*

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 10

Steam and Power Conversion

FSAR Section	Site-Specific Evaluations
10.1 Summary Description	• None*
10.2 Turbine Generator	• None*
10.3 Main Steam Supply System	• None*
10.4 Other Features of Steam and Power Conversion System	• LNP CDI, relating to COL Section 10.4.2 for the site specific cooling water source for the vacuum pump seal water heat exchangers. • LNP CDI, relating COL Section 10.4.5 for the site specific Circulating Water System design information. • LNP COL 10.4-1, relating to the Circulating Water System design parameters. • LNP COL 10.4-2 and 10.4-3, relating to Condensate, Feedwater and Auxiliary Steam System Chemistry Control

* This section is entirely IBR or IBR/Standard

RWS Description

- **RWS is non-safety and non-RTNSS**

- **RWS consists of two subsystems:**
  - Freshwater subsystem pumps from ground wells
    - Makeup to SWS cooling towers
    - Demineralizer water treatment system
    - Potable Water System
    - Fire protection

  - Saltwater subsystem supplies from the Cross Florida Barge Canal
    - Makeup to CWS mechanical draft cooling tower basins

RWS Description

- **Freshwater subsystem (each unit)**
  - 2 – 100% capacity well pumps
  - 4 – 50% capacity booster pumps
  - Automatic strainer and media filters
  - ~150,000 gal storage tank (~30’ diameter x 30’ tall)
  - Standby diesel generator supports (manually loaded)
    - Raw water well pumps
    - Raw water booster pumps
    - Discharge valves
  - HDPE underground piping materials

RWS Description

- **HDPE underground piping material**

RWS Description

- **Saltwater subsystem (each unit)**
  - 3 – 50% capacity makeup pumps
  - Traveling screens
  - 3 screen wash pumps
  - Automatic strainers

Staff Review Summary

- RWS is nonsafety-related, non seismic, freshwater subsystem supports RTNSS function for Modes 5 and 6
- Freshwater subsystem has redundancy, a ~150,000 gallon storage tank, pumps and discharge valves are diesel backed
- Freshwater subsystem pumps well exceed the SWS basin makeup requirements
  - Freshwater well pumps ~ (2) at 1,040 gpm
  - Freshwater boosters pumps ~ (4) at 500 gpm
- Reliable materials are being utilized consistent with industry good practices and applicable codes and standards
- RWS is non radioactive and contamination is not feasible due to its configuration relative to potential sources of contamination

Staff Review Summary

- **GDC 2 and GDC 4 have been satisfied**
  - Failure of the RWS/components will not affect the ability of any risk-significant systems to perform their intended safety functions
  - Failure of the RWS/components will not affect any RTNSS considerations

- **Staff concludes that RWS:**
  - Meets all applicable regulations
  - Considered highly reliable to support CSD

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Protecting People and the Environment

Presentation to the ACRS Subcommittee

Levy Nuclear Plant Units 1 and 2
COL Application Review

ASE Chapter 6 – Engineered Safety Features
ASE Chapter 11 – Radioactive Waste Management
ASE Chapter 12 – Radioactive Protection

October 18 - 19, 2011

Levy County FSAR Chapter 6

Engineered Safety Features

FSAR Section	Site-Specific Evaluations
6.1.1 Engineered Safety Materials Features, Metallic Materials	• None *
6.1.2 Engineered Safety Materials Features, Organic Materials	• None *
6.2 Containment Systems	• None *
6.3 Passive Core Cooling System	• None *
6.4 Habitability Systems	• LNP SUP 6.4-1, states that the site does not plan to use any gas dispersants • LNP COL 6.4-1, related to toxic chemical habitability
6.5 Fission Product Removal and Control Systems	• None *
6.6 Inservice Inspection of Class 2, 3, and MC Components	• None *

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 11

Radioactive Waste Management

FSAR Section	Site-Specific Evaluations
11.1 Source Term	• None*
11.2 Liquid Radioactive Waste Management	• LNP COL 11.2-2, Liquid waste discharge cost-benefit analysis • LNP COL 2.4-5 and LNP 15.7-1, Doses from accidental release from liquid waste tank failure • LNP COL 11.5-3, Compliance with 10 CFR Part 50, Appendix I, Sections II.A for liquid waste discharges • LNP SUP 11.2-1, Liquid waste discharge pipe
11.3 Gaseous Radioactive Waste Management	• LNP COL 11.3-1, Gaseous waste discharge cost-benefit analysis • LNP COL 11.5-3, Compliance with 10 CFR Part 50, Appendix I, Section II.B and II.C for gaseous waste discharges
11.4 Solid Radioactive Waste Management	• LN P COL 11.4-1 and Proposed LNP COL 11.4-2, Alternatives for B and C waste •LNP SUP 11.4-1, Long term onsite storage facilities for low-level waste
11.5 Radiation Monitoring	• LNP COL 11.5-2, QA for effluent and environmental monitoring program

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 12

Radiation Protection

FSAR Section	Site-Specific Evaluations
12.1 Assuring ALARA	• None*
12.2 Radiation Sources	• None*
12.3 Radiation Protection Design Features	• LNP SUP 11.2-1, Liquid waste discharge pipe
12.4 Dose Assessment	• LNP SUP 12.4-1, Construction worker dose
12.5 Health Physics Facility Design	• None*

* This section is entirely IBR or IBR/Standard

Levy Units 1 and 2
FSAR Section 13.3
Emergency Planning

Larry Taylor
Progress Energy – Emergency Preparedness

NGG
Think Fleet.

Progress Energy

Levy Nuclear Plant
Emergency Plan Design

- Single Emergency Plan for two Levy Nuclear Plant units on a green field site.

- Developed in accordance with:
  - NUREG-0654/FEMA-REP-1 Rev 1
  - 10 CFR 50.47
  - 10 CFR 50 Appendix E

Levy Nuclear Plant
On-site Emergency Facilities

- Technical Support Center (TSC)
  - The Levy Unit 1 and Unit 2 TSCs will be in the control support area (CSA) in the Annex Building, which is adjacent to the main control room area.
- Operations Support Center (OSC)
  - The Levy Nuclear Plant OSC is located inside the Protected Area on the second floor of the Annex Building of each unit, adjacent to the control room.
- These are AP1000 Design Control Document (DCD) designated locations.

Levy Nuclear Plant
Emergency Operations Facility (EOF)

- A single EOF location is intended to be used for both the Levy Nuclear Plant (LNP) and Crystal River Nuclear Plant (CRNP).

- The Emergency Operations Facility will be established consistent with NUREG-0696 guidelines.

Levy Nuclear Plant

Off-site Utility Emergency Response

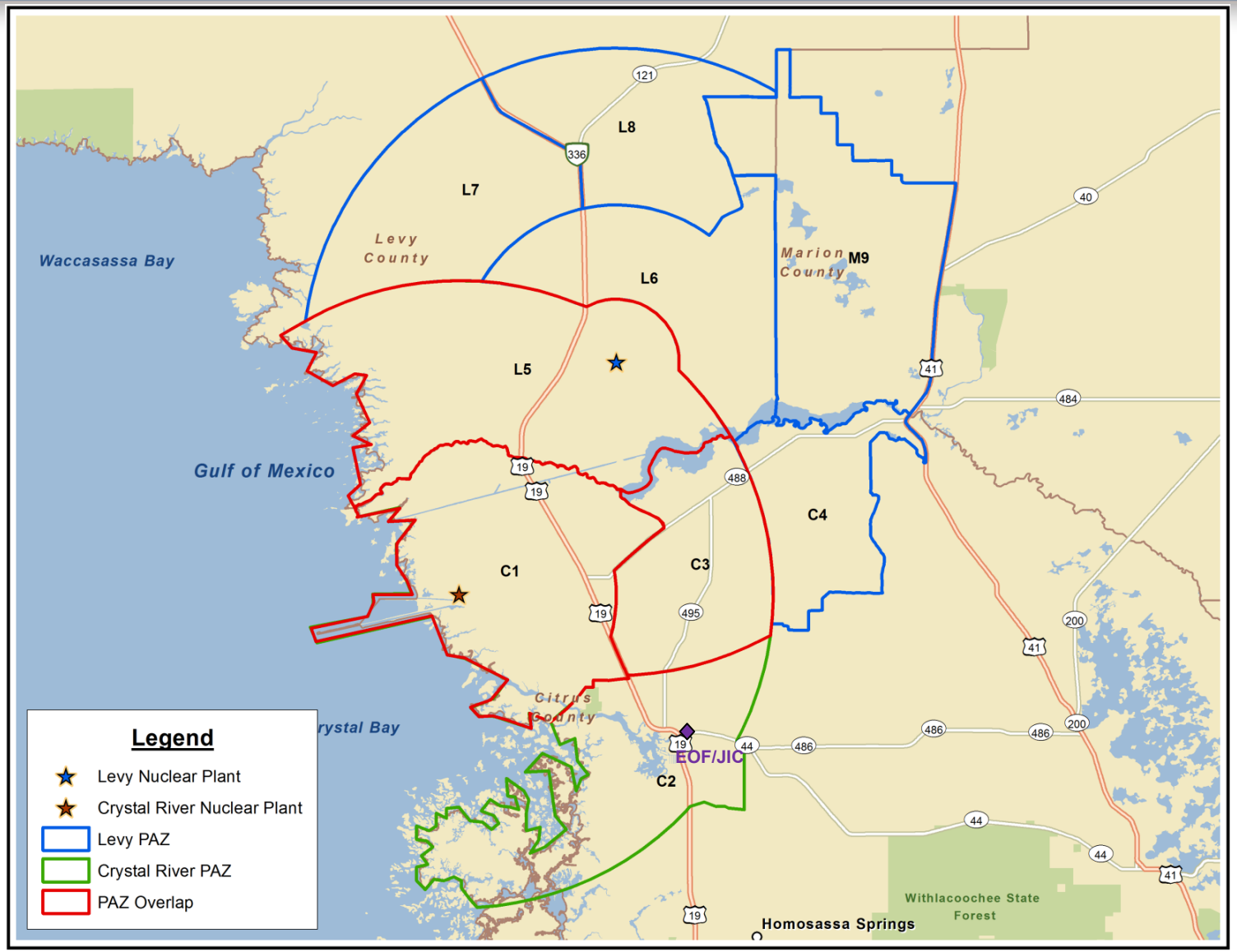
- In the event of a simultaneous emergency at both LNP and CRNP, personnel assigned to each site's EOF Emergency Response Organization (ERO) will respond to the EOF.

- One of the site's EOF Facility leads (EOF Director) will be assigned to be a single point of contact to interface with State, County, and Federal agencies.

Levy Nuclear Plant
Overlapping EPZs with CRNP

- LNP is located approximately 9 miles northeast of the existing CRNP.
- Simultaneous evacuation of the EPZs for both LNP and CRNP are addressed in the LNP Evacuation Time Estimate (ETE).
- Emergency Planning Zones (EPZs) for CRNP and LNP overlap.

Levy and Crystal River EPZs



United States Nuclear Regulatory Commission

Protecting People and the Environment

Levy County COL
ACRS Subcommittee Meeting
Staff Presentation

Section 13.3 - Emergency Planning

October 19, 2011

U.S.NRC
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- Technical Staff (New Reactor Licensing Branch, NSIR)
  - Tony Bowers, Emergency Preparedness Specialist

- Project Manager
  - David Misenhimer

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Emergency Planning

- Regulations and Guidance
- Open Items/Confirmatory Items/Post COL Activities
- Emergency Planning Zones
- Emergency Response Facilities
- Conclusions

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Emergency Planning

- Regulations
  - 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
  - 10 CFR 50.33(g) – State and local emergency plans and EPZ
- Guidance
  - Regulatory Guide 1.101 - EP
  - NUREG-0654 / FEMA-REP-1 (Rev 1) – Criteria for 16 planning standards
  - NUREG-0396 / EPA 520/1-78-016 – Planning Basis
  - NUREG-0800 SRP – Section 13.3 EP

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Emergency Planning

- No Open Items
- Approximately 30 Confirmatory Action Items
- Post-COL Activities
  - EP ITAAC
  - EP Implementation Milestones (i.e., schedule for submittal of Emergency Plan Implementing Procedures)
  - Emergency Action Levels (NEI 07-01)
  - Finalized Letters of Agreement
  - Exercise to demonstrate response capabilities in the event of emergency at LNP and CR3
  - Initial distribution of emergency information to the public

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Emergency Planning Zones

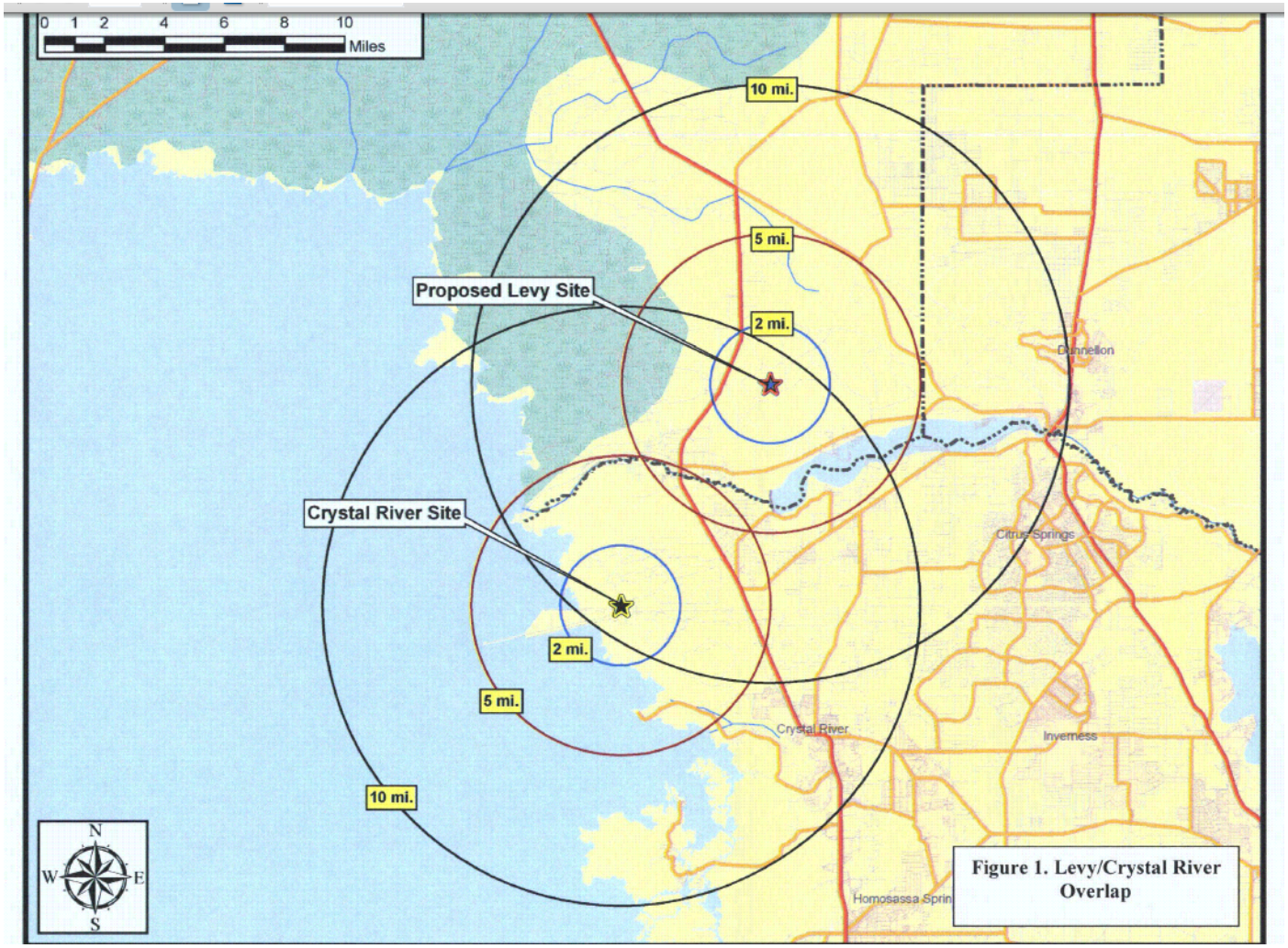

Figure 1. Levy/Crystal River Overlap

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Emergency Response Facilities

- Technical Support Center
  - No Departure from AP1000 DCD
- Operational Support Center
  - No Departure from AP1000 DCD
- Emergency Operations Facility
  - Existing facility approved for use by CR3
  - Proposed shared facility between LNP and CR3

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Emergency Planning

- Conclusions
  - Reasonable assurance exists for the offsite plans
  - LNP COL application includes post-COL activities, including EP ITAAC that are necessary and sufficient 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

Levy Nuclear Plant
FSAR 13, 14, 16 & 18
Conduct of Operations
Initial Test Program
Tech Specs
Human Factors

Bob Kitchen - Manager

NGPP Licensing

NGG Think Fleet.

Progress Energy

Chapter 13 Excluding 13.3 Conduct of Operations

- DCD Incorporated by Reference
- Standard material incorporated
- Site-specific
  - Organizational Structure

Chapter 14
Initial Test Program

- DCD Incorporated by reference.
- Standard Material Incorporated
- Site specific ITAAC identified
  - Emergency Plan and Security
  - Structures, systems and components
  - Non-system based design

Section 14.3
Certified Design Material

- Site Specific System Based ITAAC added per STD SUP 14.3-1
  - Transmission Switchyard and Offsite Power System
- Non-system Based Site-specific ITAAC
  - Roller Compacted Concrete Bridging Mat
  - Waterproof Membrane
  - Drilled shafts for Turbine Building, Radwaste Building and Annex Building

Chapter 16
Technical Specifications

- 16.1 – Technical Specifications
  - DCD Incorporated by Reference
  - Integrated Generic and Plant-Specific Technical Specifications and Bases provided in COLA, Part 4
- 16.2 Design Reliability Assurance Program (DRAP)
  - DCD Incorporated by Reference
- 16.3 Investment Protection
  - DCD Incorporated by Reference
  - Standard material incorporated
- Part 4 of the LNP COLA reflects the LNP Technical Specifications
  - Standard and site specific material incorporated

Levy Chapter 18
Human Factors

- DCD Included by Reference
- Standard material incorporated

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United States Nuclear Regulatory Commission

Protecting People and the Environment

Presentation to the ACRS Subcommittee

Levy Nuclear Plant Units 1 and 2
COL Application Review

ASE Chapter 13 – Conduct of Operations

ASE Chapter 14 – Initial Test Programs

ASE Chapter 16 – Technical Specifications

ASE Chapter 18 – Steam and Power Conversion System

October 18 - 19, 2011

Levy County FSAR Chapter 13

Conduct of Operations

FSAR Section	Site-Specific Evaluations
13.1 Organizational Structure of Applicant	• LNP COL 13.1-1, Organizational Structure • LNP COL 9.5-1, Fire Protection • LNP COL 18.6-1, Qualifications of the nuclear plant technical support personnel • LNP COL 18.10-1, Responsibilities of the manager in charge of nuclear training
13.2 Training	• None*
13.3 Emergency Planning	• Presented (10/19/11)
13.4 Operational Programs	• None*
13.5 Plant Procedures	• LNP COL 13.5-1, Position Titles
13.7 Fitness for Duty	• None*
13.8 Cyber Security	• None*

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 16

Technical Specifications

FSAR Section	Site-Specific Evaluations
16.1 Technical Specifications	• LNP COL 16.1-1 related to technical specifications for use as a guide in development of the plant-specific technical specifications.
16.2 Design Reliability Assurance Program	• None*
16.3 Investment Protection	• None*

* This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 14

Initial Test Program

FSAR Section	Site-Specific Evaluations
14.1 Specific Information To Be Included In Preliminary/Final Safety Analysis Reports	• None*
14.2 Specific Information To Be Included In Standard Safety Analysis Reports	• None*
14.3 Certified Design Material	• LNP SUP 14.3-2 ITAAC Screening Summary for Additional Site-Specific Systems • LNP SUP 14.3-3 Roller Compacted Concrete Bridging Mat ITAAC • LNP SUP 2.5-17 Waterproof Membrane ITAAC

*This section is entirely IBR or IBR/Standard

Levy County FSAR Chapter 18

Human Factors Engineering

FSAR Section	Site-Specific Evaluations
18.1 Overview	• None*
18.2 HFE Program Management	• LNP COL 18.2-2, Location of the Emergency Operations Facility
18.3–18.7	• None*
18.8 Human-System Interface Design	• None*
18.9–18.14	• None*

* This section is entirely IBR or IBR/Standard

Response to Queries Related to Vernon Faults

K. L. Hanson (AMEC Geomatrix)

October 19, 2011

Vernon (1951) Postulated Faults

- FSAR Sections 2.5.1.1.4.3.4 and 2.5.1.2.4
  - Vernon (1951) inferred faults to be steeply-dipping, normal dip-slip shear faults bounding graben depressions and horst ridges associated with the Ocala “Uplift” (inferred to be tectonic structure)
  - No direct observations regarding dip or downdip extent. Steep dip inferred from linear trace of topographic and vegetation lineaments used to map the faults.
  - Vertical displacements on individual faults range from 6 m (20 ft.) to 49 m (160 ft.)
  - Vernon cited field evidence including apparent displacements inferred from widely-spaced outcrop and subsurface data from boreholes and wells, and limited field observations due to the minimal exposures along the fault traces.

Vernon Postulated Faults (cont.)

- LNP FSAR Observations:
  - Ocala “Uplift” is not a true uplift (tectonic uplift)
    - Florida Geological Survey (FGS) refers to it as the Ocala platform
    - Pre- Middle Eocene units are not warped or deformed.
    - Apparent deformation of younger units are currently interpreted to be due to sedimentalogic processes or differential compaction of Middle Eocene units.
  - Vernon faults parallel and are not distinct from other regional lineaments (joint) sets that are observed throughout the site region
  - The postulated faults identified by Vernon in the site vicinity are not apparent in regional scale Landsat imagery or in more detailed aerial photograph mosaics (1949 black and white, 1:20,000 scale) that cover the site vicinity and area, respectively.

Vernon Postulated Faults (cont.)

- LNP FSAR Observations (cont.):
  - Recent geologic maps and structure contour maps on Tertiary subsurface units (e.g., Arthur et al., 2008) do not show evidence for faulting.
  - FGS concluded that many features observed in quarries inferred to be evidence for surface faulting were karst-related deformation features.
  - FGS also noted that many of the Vernon faults were inferred based on apparent offsets in the top of the Ocala Formation, a karstified unconformable surface that may have as much as 50 m (164 ft.) or more of relief.

Vernon Postulated Faults

- LNP COLA conclusion:
  - The postulated faults identified by Vernon likely do not exist, and there is no evidence to suggest that they have been active in the Quaternary. Therefore, none of these postulated faults are considered to be capable tectonic sources, as defined in Regulatory Guide 1.208, Appendix C.
  - Specific features or targets in the Site Area that would warrant additional investigation (e.g., subsurface geophysical surveys or drilling) were not identified.

Levy Nuclear Plant
FSAR Section 2.5.2
Comparison of USGS 2002 and 2008 Seismic Source Models for Charleston

Dr. Robert Youngs
AMEC Geomatrix

NGG Think Fleet.

Progress Energy

Only One Difference between 2002 and 2008 USGS Models

USGS 2002 Model

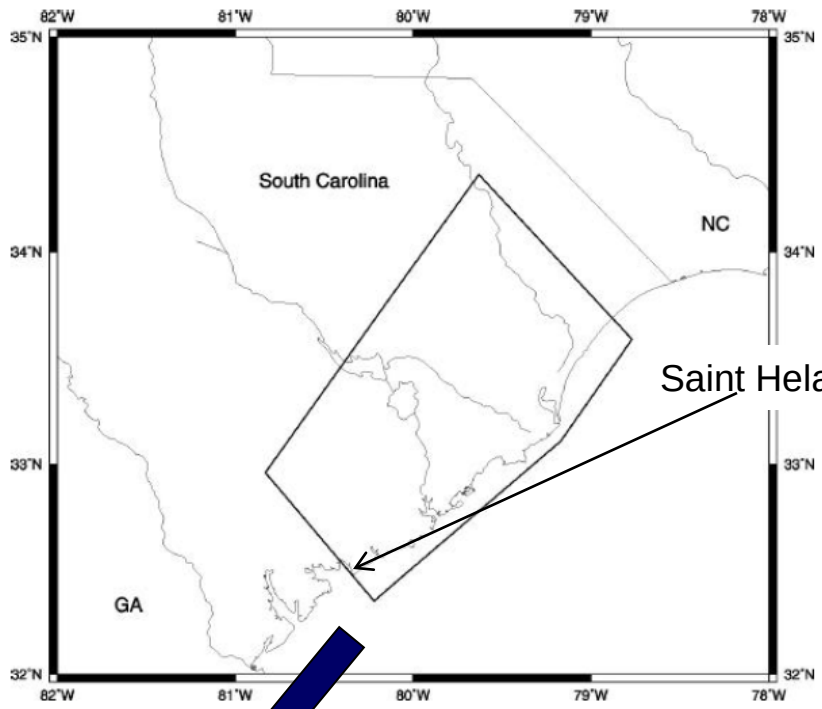
- 550 year mean repeat time of earthquakes
- Maximum magnitude distribution 6.8 [0.2], 7.1 [0.2], 7.3 [0.45], 7.5 [0.15]
- Two equally weighted alternative seismic source geometries
  - Narrow areal zone along Woodstock lineament
  - Broad areal zone with limited offshore extent

USGS 2008 Model

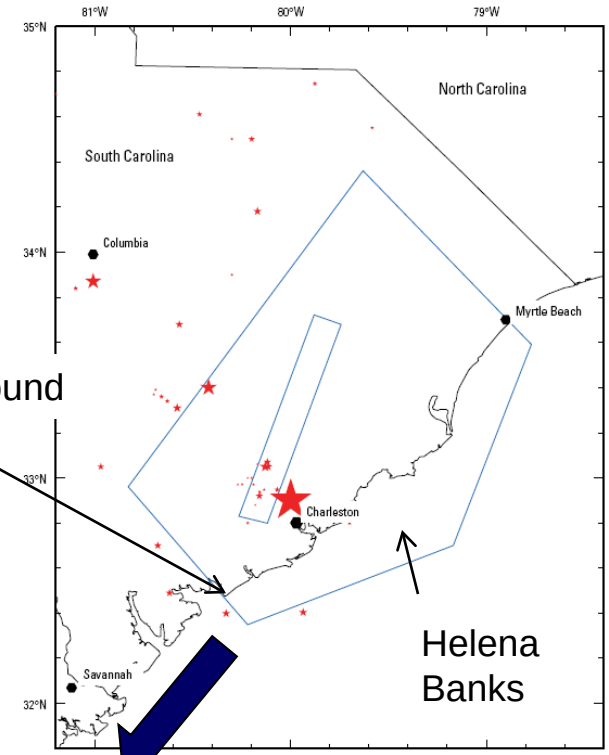
- 550 year mean repeat time of earthquakes
- Maximum magnitude distribution 6.8 [0.2], 7.1 [0.2], 7.3 [0.45], 7.5 [0.15]
- Two equally weighted alternative seismic source geometries
  - Narrow areal zone along Woodstock lineament
  - Broad areal zone extending offshore to the Helena Banks faults

Source Zone Difference between 2002 and 2008 USGS Models

2002



2008



Saint Helana Sound

Helena Banks

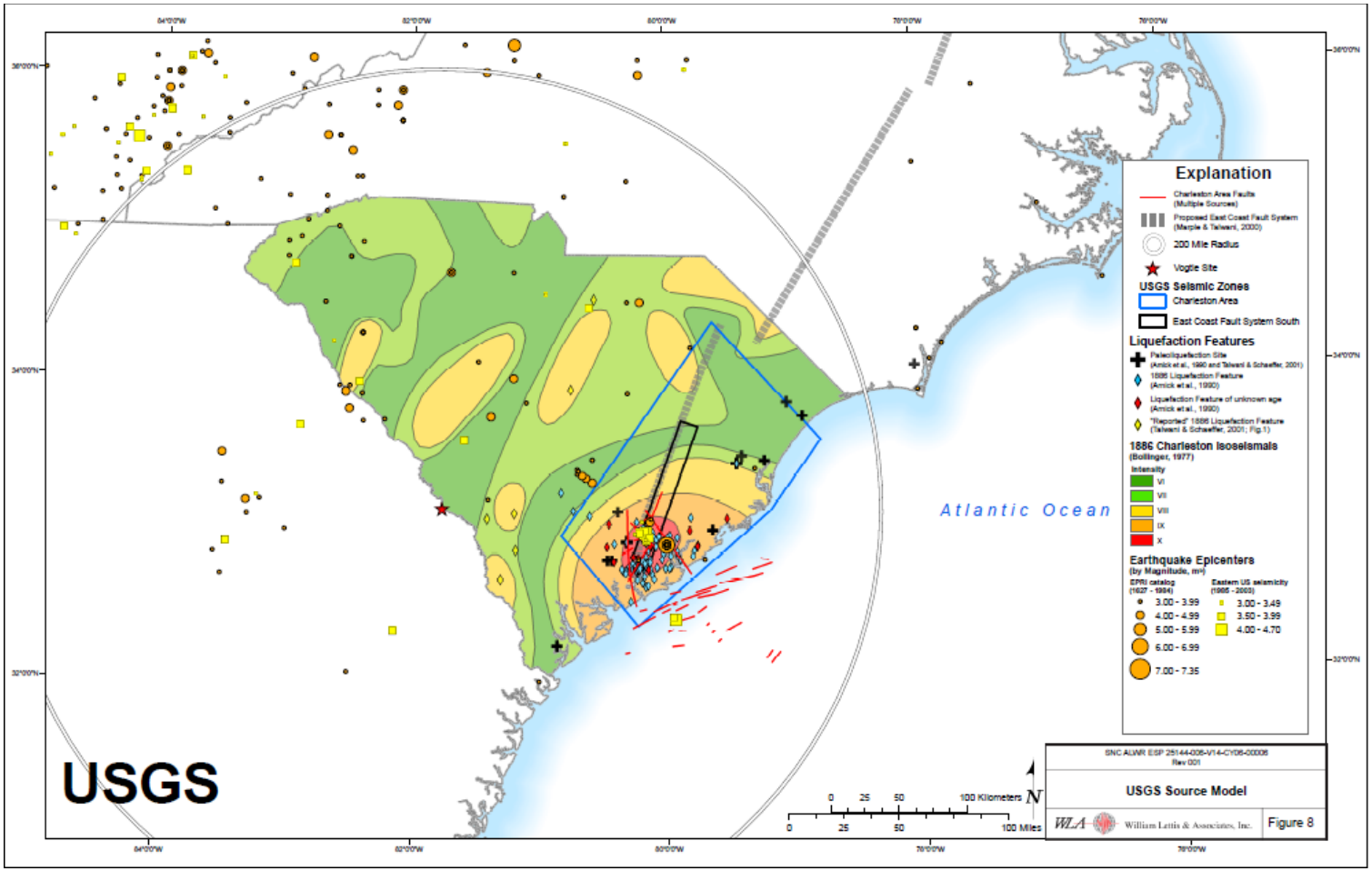
To Levy Site

To Levy Site

Conclusion

- Only difference between 2002 and 2008 USGS models is shape of large source zone
- Difference in shape does not affect distance to Levy Site
- 2002 USGS model was reviewed as part of the development of the UCSS model developed for Vogtle ESP and used in Levy PSHA
- Vogtle UCSS model allows for Charleston source to be closer to the Levy site than the USGS model

USGS 2002 Source Zone



Vogtle UCSS Source Zone