ORIGINAL

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

IN RE: FLORIDA POWER AND LIGHT COMPANY BOBWHITE-MANATEE 230 KV TRANSMISSION LINE PROJECT TRANSMISSION LINE SITING APPLICATION NO. TA07-14,

Petitioner,

DOAH Case No.: 07-0105 TL

and

OGC Case No.: 07-0026

SCHROEDER-MANATEE RANCH, INC.; LAKE CLUB INVESTORS, LLC; GUM SLOUGH PRESERVATION FOUNDATION, INC.; MANASOTA-88, INC.; JOHN FALKNER; TAYLOR AND FULTON, INC.; MYAKKA RANCH HOLDINGS, LLC; FC, LLC; CONCESSION LAND DEVELOPMENT, LLC; CONCESSION GOLF CLUB, LLC; KITTIE L. CHAPMAN; PACIFIC LAND, LTD, JOHN CANNON HOMES-EASTMOOR, LLC; SCHWARTZ FARMS, INC.; MICHAEL D. and JOANNE SCHWARTZ; SARASOTA ONE, LLC; EAST COUNTY HOMEOWNERS ORGANIZATION, INC.; MICHAEL HUNSADER, DAVID HUNSADER, and DONALD HUNSADER; and HI HAT RANCH, LLLP,

Intervenors.
_____/

VOLUME 9

TRANSCRIPT OF HEARING, October 29, 2007

BEFORE: HONORABLE BRAM D. E. CANTER
ADMINISTRATIVE LAW JUDGE

Stenographically Reported by:
Mary Jo Armour McGill
Registered Diplomate Reporter

DATE TAKEN: October 29, 2007

TIME: 8:37 a.m.- 11:49 a.m.

PLACE: Sarasota Cay Club Resort and Marina
Harborside Room
7150 North Tamiami Trail
Sarasota, Florida

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I N D E X

E X H I B I T S

P R O C E E D I N G S

THE COURT: All right. This is a continuation of DOAH case number 070105 TL, Florida Power and Light Company Bobwhite-Manatee 230 Kilovolt Transmission Line Project, Transmission Line Siting Application.

Does any party wish to raise a preliminary matter before we begin the presentation of evidence?

All right. Ms. Raepple, I see you have a witness.

Sir, will you raise your right hand?

ROBERT HAHN, called as a witness by the Florida Power and Light, having been first duly sworn, testified as follows:

THE WITNESS: I do.

THE COURT: State your name, please.

THE WITNESS: My name is Robert Hahn, H-a-h-n.

DIRECT EXAMINATION

BY MS. RAEPPLE:

Q. Mr. Hahn, where are you employed?

A. I'm employed with Florida Power & Light.

Q. What is your position there?

A. I am currently the manager of generation interconnection for Florida Power and Light.

Q. What was your position prior to that?

A. Prior to that, I was a transmission engineer in the transmission siting and permitting group. On this project I was the project engineer for the Bobwhite-Manatee project.

Q. Would you please describe your educational background?

A. I have an associate's degree in electrical engineering technology and a bachelor's degree in electrical engineering from Penn State University, and a masters of science in engineering management from the University of South Florida.

Q. Do you have any professional work experience related to electrical transmission line siting, permitting, and engineering?

A. Yes. I have been in the electric utility business with Florida Power & Light for 27 years. Since 1997 -- from 1997 to 2002, I was a transmission line engineer and working on designing and engineering transmission facilities throughout all of Florida Power & Light's service territory. From 2000 to June of 2007, I was in the transmission line siting and permitting group.

Q. What were your duties in the transmission line siting and permitting group?

A. My duties were to identify appropriate

locations for transmission lines, usually as a member of a multidisciplinary team, to assist in the design of new transmission lines throughout the FPL service territory, to obtain or to work with permitting agencies to obtain permits, to construct, operate, and maintain transmission facilities, and to provide support for construction of new transmission lines.

Q. Can you give us a number, an idea of the number of miles of transmission lines that you have been involved in, either designing, siting, or permitting?

A. Around 200 miles.

Q. Have you ever been involved in a transmission line project, certified under the Transmission Line Siting Act?

A. Yes, I have.

Q. Which one was that?

A. I was a -- assisted on two projects that were certified under the Transmission Line Siting Act. The first one was the Collier Orange River project in 54-mile TLSA project, siting of the 230kv line in Collier and Lee Counties. The second was the St. Johns Pellicer Pringle, which was a 26-mile 230kv line that was sited up in Flagler and St. John's Counties.

Q. Do you belong to any professional organizations related to transmission line siting, permitting and

engineering?

A. I am a member of the IEEE, the Institute of Electrical and Electronic Engineers.

Q. Would you please refer to Exhibit FPL 59, which has already been received into the record, and tell me -- tell us, is this an accurate copy of your resume?

A. Yes, it is.

MS. RAEPPLE: Your Honor, at this time, Florida Power & Light offers Mr. Hahn as an expert in the field of electrical transmission line siting, permitting, and engineering.

THE COURT: All right. Consistent with my earlier ruling with Ms. Mayes, I would -- I think the offer would be -- well, it's your offer, but my acceptance would be in the area of electrical engineering and his experience specifically in the areas of electrical transmission line siting and permitting and engineering would be his -- would be an emphasis within his expertise for which I would give greater weight to his answers.

MS. RAEPPLE: Thank you.

THE COURT: Is there any objection?

MR. HALL: With the limitation you just stated, Your Honor, no.

THE COURT: All right. He's accepted in those

areas I just mentioned.

MS. RAEPPLE: Thank you.

THE COURT: In that one area with those specialties.

BY MS. RAEPPLE:

Q. Mr. Hahn, would you please describe your role in the Bobwhite-Manatee project?

A. I was the transmission line engineering member of the three-member multidisciplinary team that identified the alternative segments and ultimately identified FPL's preferred corridor. I assisted in the preparation of the application for corridor certification and evaluated the constructability of all of the segments and alternately the routes that were presented. I also provided the cost analysis for the project.

In addition, I was a member of the community outreach team, attended all three of the community advisory panel, and two of the open houses that were presented within the study area.

In addition, I attended numerous homeowners associations and individual property owners' homes throughout the study area to discuss the project with them and to listen to their concerns as a part of the outreach process.

After the alternate corridors were filed, I provided the -- I determined the constructability of the alternates and provided the cost analysis for those alternates.

Q. Were you also the primary person responsible for answering e-mails that were directed to the project web site?

A. Yes, I was. I was the primary contact for the e-mails that were sent in.

Q. Would you now, please, refer to Exhibit FPL 2 and tell us if that accurately reflects the sections of the site certification application, which is FPL 1, that you prepared?

A. Yes, it does.

Q. Do all of those applications sections for which you were responsible contain accurate information, or do you have any update you would like to provide us?

A. I do have an update. If I could refer you to page 1-1.

The third paragraph where it says, the width of right of ways of the new -- width of the new right of way to be located within the corridor will typically range from 15 to 75 feet. Upon investigating the route, the corridors itself, I think the corridors can be as small as ten feet along road right of way. So that is a

slight change to the package.

Q. That's the right of way can be as small as ten feet?

A. Yes.

Q. When the line is placed adjacent to a public road?

A. Correct, yes.

Q. Could you now, please, refer to the document that's been received into the record that is marked Exhibit FPL 47 and tell us what this shows?

A. Can you put that up on the screen?

This figure that's up on the screen represents a transmission network that I typically use to explain how power systems work.

Q. And could you please describe for us the primary functions of an electrical transmission system?

A. If we start up in this upper left-hand corner, you have a power generation plant. The power is stepped up in the station, and for this project's purpose, this is the Manatee Energy Center. From the Manatee Energy Center, the power is transmitted down the transmission line, and the transmission line is used for bulk power transfer. It's transmitted at 230kv.

One of the ways I typically like to describe the way it works is if you can think of your water

system in your house. The 230kv is the pressure that is exuded on the water, and the water is the current that transmits down through the line.

The transmission line system here is for transmitting bulk power, or large quantities of power between transmission stations, typically.

Q. Could you tell us what is a substation in the context of an electrical transmission project?

A. Within the context of the Bobwhite-Manatee line, we have two transmission substations; one at Manatee Energy Center, and the other one at Bobwhite.

The second type of distribution station that you would find are typically connected between those two sites, and they're distribution stations.

The transmission station is where transmission lines come together, essentially, for distribution across great distances, the different regions within the state.

At Manatee Energy, for example, there are several transmission lines that intertie us with Tampa Electric that go east over to the east coast of Florida, and then south into the Ringling Bobwhite area.

The same is true for Bobwhite, once we tie it into the system, it will serve the same functions.

Distribution stations, on the other hand, are

where the voltage is stepped down, in this case from 230 kilovolts down to something like 13 or 23kV for distribution out into the neighborhoods where the load is needed.

It's sent out along the distribution feeders along the roadways or through developments, and then it is stepped down within the development one more layer, to where it can be used to feed the individual homes and customers in those areas.

Q. And does that final step down of the power occur at the transformer in the neighborhood?

A. Yes. The transformer in the neighborhood is where it would go from either 23kv or 13kv down to 220 or 240 that's needed for the homes to function with.

Q. And in your response describing this system, you are using the word "station." Is that a synonym for substation?

A. Yes, it is, substation.

Q. Do you know whether the Public Service Commission identified the starting and ending point for the Bobwhite-Manatee transmission line?

A. Yes, they have.

Q. Do you know what those end points are?

A. Can we refer to FPL Exhibit 22?

Q. Sure.

A. The starting and end points are at the northern end of the Manatee Energy Center and at the southern end of the Bobwhite-Manatee substation site.

Q. In the application for corridor certification which is Exhibit FPL 1, is the Public Service Commissions' need determination order found in Appendix A?

A. Yes, it is.

Q. Could you please briefly describe Florida Power & Light's objectives for this Bobwhite-Manatee transmission project?

A. There are three main objectives for this project: To provide for additional transmission reinforcement between the Manatee Energy Center and Ringling substation -- there was a day in my life I could read all of that over there. It should be right about here -- Ringling substation to -- that's the first objective.

The second objective is to serve the increased load and customer base south of the Manatee Energy Center, north of the Bobwhite substation, and east of I-75.

And the third objective is to provide for another electrical feed between the Manatee Energy Center and Ringling substation to provide for a diverse

path.

Q. Are there any intermediate substations planned for the Bobwhite-Manatee transmission line?

A. If I can refer you back to Page 1-1 of the application.

Q. Which is FPL Exhibit 1?

A. Yes. The bottom sentence is that FPL is proposing no intermediate substations for this project.

Q. Are you aware of any plans by Florida Power & Light or others for future substations in the project area?

A. We are aware of three FPL distribution substations planned within this area. One PRECO distribution substation, and one PRECO transmission substation within this area. Their locations have yet to be determined and won't be determined until sometime in the future. And it's going to depend on the growth pattern within the area, and that analysis won't be conducted until a later time.

The locations of these substations did not play a major -- a primary role in the development of the FPL preferred corridor.

Q. When you refer to PRECO, is that the Peace River Electric Co-Operative?

A. Yes, the Peace River Electric Co-Op.

Q. Does Florida Power & Light provide power that is distributed by PRECO?

A. It provides transmission service to PRECO.

Q. So it delivers the power to PRECO that PRECO then distributes; is that correct?

A. Yes, it does.

Q. Can the Bobwhite-Manatee transmission line be used to integrate future substations into the transmission grid?

A. Yes, it can. And so can all of the alternatives proposed. But it is my opinion that the FPL preferred corridor will provide for the best opportunity to make those connections in the future, based on Ms. Mayes' testimony on the density within this service area.

Q. And you're pointing to the area south of State Road 64 down to the Bobwhite substation; is that correct?

A. That is correct.

Q. Did you participate in the study described by Ms. Analee Mayes that was performed to determine the appropriate location for this new transmission line?

A. Yes, I did.

Q. Were you a member of the multidisciplinary team?

A. I was the engineering member of the multidisciplinary team.

Q. Would you please generally describe your role on that multidisciplinary team in the early steps of the route selection process?

A. In the early steps of the route selection process, I was involved with determining the study area boundaries, ensuring that each of the segments that were determined were buildable. I also determined that right of way width that would be required within each of the segments and estimated the costs to construct each of the segments.

Q. After the preferred corridor was selected, did you participate in drawing the corridor boundaries around a preferred route?

A. Yes, I did.

Q. Referring to this map in Exhibit FPL 22, did you have any primary considerations from an engineering perspective in the drawing of those corridor boundaries?

A. One of the main themes you will hear from an engineering perspective from me is flexibility, and the ability to maneuver around within the corridors to construct the line in the future. If I can point out at the north end.

Q. That is north of where the corridor first

intersects County Road 675 proceeding north of town?

A. Right. We'll start up here at the Manatee Energy Center, you will notice that the corridor is large in this area. And this box up in this area is this size to allow for flexibility and the ability for us to either come down an existing corridor that's up at the northern end of here, or come out on the State Road 62 over to this north-south run that runs between State Road 62 and County Road 675.

The corridor is wide in this, in the area between State Road 64 and County Road 65 for flexibility, the ability to avoid both natural and manmade constraints within the area, the ability to work with the underlying landowner to determine where the line could be, and the ability to minimize environmental impact that we may run into within that area.

When you get to the County Road 675 and State Road 64, the corridor narrows to about 200 feet either side of the center line of that corridor. The intent along road rights of way would be to place the structures either just within or just outside of the road right of way.

Another engineering issue that we looked at was the crossing of the Manatee River. It was important that we crossed at a location that minimized the impact

at an existing impact so that we would minimize that effect.

When you run from -- when you get over here to where -- on State Road 64, this area between State Road 64 and University Parkway is, again, wide to allow for flexibility to collocate with the proposed Dam Road extension, and for the same reasons as in the other cross-country area, to, again, have the flexibility to minimize impact with natural and manmade issues.

One other key point of the service territory is this is State Road 70. And we talked about the Peace River Electric Co-Op. And essentially what happens is north of State Road 70 is the Peace River Electric Company's service territory. And they have distribution facilities along many of the roads in that -- in that region north of State Road 70. South of State Road 70 is Florida Power and Light service territory.

One of the advantages to the road south of State Road 70 is that it affords us, from an engineering perspective, the opportunity to consolidate with the FPL distribution facilities within the FPL service territory.

And the final engineering constraint is that here at Bobwhite substation, you will notice that the corridor expands to include the existing transmission

corridor that runs from the northwest to the southeast, and that's an important consideration in the location of Bobwhite substation. It was an important factor in determining that ultimate location so that we have the ability to incorporate Bobwhite, the Bobwhite-Manatee line and the Bobwhite substation into the rest of the transmission grid system.

Q. You mentioned that flexibility was needed, among other things, to minimize impacts to natural features.

Would a wetland be such a natural feature?

A. It would, but in the terms of -- I have tended to functionalize, calling the environmental aspects of it a different criteria that we looked at.

From my perspective, I was thinking more like drainage ditches, fences, people -- some of the landowners in this area have wells and sheds. Those types of -- well, natural -- I guess those would be considered more man-made.

So the natural facilities might be trees or wetlands, yes.

Q. You mentioned, also, the need for flexibility at the crossing of the Manatee River. Is the corridor widened at that location to provide additional flexibility?

A. The corridor goes from 400 feet wide typically along the state roads to 500 feet wide in that area. It was placed in there to give us a little bit more flexibility in the placement of the structures across those bridges.

Q. In the -- at the intersection of University Boulevard and Lorraine Road, Ms. Mayes described that angle of the intersection as a sharp angle. Can that angle be accommodated in the construction of this Bobwhite-Manatee transmission line?

A. Yes, it can. There are several engineering approaches that can be used to make a turn greater than 90 degrees. I believe Ms. Mayes had talked about the corridor being wider in this area to allow for guying of the structures.

Another potential that can be used with the corridor being wide in this area is turning someplace else other than at that intersection with Lorraine Road and University.

We may have the ability to turn back in this area here east, east of Lorraine Road. And depending -- and once we get into the detailed engineering and look at the soil conditions, it may be possible to build that corner without guying. But in all cases, there are technical solutions for turns whose angles are greater

than 90 degrees.

Q. If the solution was to turn east of the University and Lorraine intersection, would Florida Power & Light work with the landowner in identifying an appropriate location?

A. Yes, it would. And that holds true throughout all of these routes, we would work with the underlying landowner as a part of determining where the route would ultimately be placed within the corridor.

Q. Was the presence of existing distribution lines within the FPL preferred corridor another engineering consideration?

A. Yes. As I had mentioned, north of State Road 70, the distribution facilities that run alongside of the roads are Peace River Electric Co-Op.

In general, Florida Power & Light does not want to collocate their facilities with another utility company, in this case, Peace River Electric Co-Op.

It creates operational concerns that are difficult to overcome, and we would prefer to avoid it, if we could.

THE COURT: Would you help me know where that is?

THE WITNESS: This is State Road 70, sir.

THE COURT: Uh-huh.

THE WITNESS: And essentially, everything north of State Road 70, 675, I guess the other corridor we're talking about is 70 and 675 and State Road 64 for the purposes of this hearing are where the Peace River Electric Co-Op facilities are.

BY MS. RAEPPLE:

Q. And there are overhead distribution lines on State Road 70, County Road 675, both south and north of the river?

A. Yes.

Q. As well as State Road 64; is that correct?

A. Yes. State Road 62 is Florida Power & Light's service territory. So up near the Manatee Energy Center on State Road 62 is Florida Power & Light.

Q. Is there a similar concern with underbuilding Florida Power & Light distribution lines on the Bobwhite-Manatee transmission line?

A. No, we are the same operating company, so we have control of the transmission and the distribution component.

Q. Would you please look at the application for corridor certification, which is FPL 1, and look at the drawings in Figures 1.3-1 through 1.3-4, as well as the drawing in Figure 1.3-7, and tell us, please, what those drawings show.

A. You don't have the ability to put up split screens, do you?

Q. No, we don't. We'll have to show them one at a time.

A. Figures 1.3-1, 1.3-2 represent what we refer to as a vertical, single pole vertical construction -- single pole spun concrete vertical design.

Figures 1.3-3 and 1.3-4 are also spun concrete poles. We'll refer to this as a triangular design.

They are essentially the same structures, except for the way the insulator hardware are installed, this triangular configuration versus the vertical. And if we could, I'll talk from the vertical configuration, because it is likely it will be the more prevalent design used on the Bobwhite-Manatee project.

Like I said, this is a spun concrete pole. Essentially what this is is a steel reinforced cage with concrete spun into it, high strength concrete.

The poles are, in general, we're representing it as 100-foot tall out of the ground, and it ranges anywhere from 18 to 25 feet below ground, depending on the soil conditions.

When they install these in the ground, they auger out a hole. In general, a hole ranges anywhere from 54 inches to 60 inches wide. The hole is dug down

20 feet, let's just say for discussion purposes. The pole is installed into the hole, and then a rock backfill is put in around the hole, around the pole and compacted.

The poles are tapered. So at the bottom they could be 48 inches or so wide, you know. Typically for a project like this, 43 to 48 inches wide. And as you go up the pole, the pole funnels down or tapers, and the top may only be 16 inches or so wide at the top.

At the top of the pole are the hardwares. I actually have some toys to look at, if you want. Always bring toys along.

The insulator material -- and, Your Honor, I can bring these up to you, if you would like to look at them.

The insulator material are the devices that hold the conductor off from the pole. They're a polymer or a rubber-filled insulator that holds the conductor and that away from the pole. These insulators are about 10 feet long, so needless to say, I didn't bring the whole thing with me.

And they are a polymer. In the past we used to use porcelain insulators, but these are a much more -- these are much better design and much -- they hold up a lot longer than the old porcelain insulators. And we

went to these a number of years ago.

You will notice that there's a second insulator that shows on these diagrams, and one of the things that I wanted to point out, and nobody can read that, but on the drawings themselves, these are called braces. And you may hear me refer to them as braces.

We show them on a bundle design conductor, because on very long spans, probably in the 600 to 750-foot range, we may need these struts to be installed on the structures. For shorter spans and lower structures, they may not be needed. So we show them just in case we need them. It's possible that we won't.

At the end of the insulator are the conductors.

And we're going to refer to this as a bundle conductor. And this is the conductor that will be used on the project. It's an aluminum conductor with a steel core in the middle, and the bundle represents the fact that there will be two of them, one on top of the other, clipped to the end of the insulator.

Are you interested --

THE COURT: There are two of them?

THE WITNESS: Yes, sir, there will be two of them or a bundle at the end of the insulator.

THE COURT: Is that typical? I mean, in the illustrations that we saw of other lines, was that

how it's done?

THE WITNESS: There may have been some of those lines that had two conductors on them. I don't recall the exact details of the picture, but on a circuit of this nature, it is typical for this type of a structure.

There is an example of it.

BY MS. RAEPPLE:

Q. Mr. Hahn, if you would look at FPL 9, which is a photograph. Does that photograph show a bundled conductor?

A. Yes, that is a bundle conductor. That's actually one of the projects that I designed in the past. That is the Charlotte Widden 230kv line, and it uses this exact same structural design.

Q. And is this the photo that was used during public outreach to show the public what this project would like look?

A. Yes, it was.

THE COURT: Does each line carry 230 kilovolts?

THE WITNESS: Sir, the 230 kilovolt is a measurement of the voltage. And the measurement takes place from this point to this point or from this point to this point, so it's a measurement of voltage between those wires.

What the two wires do, it allows for a doubling of the current or a doubling of the amount of water you can push down the line. The pressure is related to the 230 kilovolts.

So the advantage of a bundled circuit is that in lieu of having a second circuit on the back of this, you put on a second set of conductors, and you get double the capacity capable of running down the lines.

BY MS. RAEPPLE:

Q. Mr. Hahn, would you now look at Figures 1.3-1 and compare it to 1.3-2 and similarly compare figure 1.3-3 to 1.3-4 and tell us what the differences are between those figures, those sets of figures?

A. The difference between 1.3-1 and 1.3-2 is that on 1.3-2 we show that these poles can be designed to accommodate underbuilt distribution facilities, FPL distribution facilities, or underbuilt communications cable, such as telephone or TV cable.

Generally, you will see this type of design used on road right of way alternatives to allow for collocation opportunities with the underlying -- the other facilities along the route.

The same holds true for the triangular configuration, the difference between 1.3-3 and 1.3-4 is

the same. The difference is one is illustrated without underbuilt facilities. And then this one, the 1.3-4, has the underbuilt distribution facilities.

Q. Thank you.

Would you now refer to Figure 1.3-7 as well as Figures 3.1-2 and 3.1-3 and describe the typical access road and structure pad that will be used for the Bobwhite-Manatee transmission line?

MR. HALL: Could we get a page number, please, Ms. Raepple, for the figures that begin with 3.

MS. RAEPPLE: Yes. It's page 3-4 and page 3-5 contain Figure 3.1-2 and 3.1-3.

MR. HALL: Thank you.

A. Figure 1.3-7 is a representation of a typical access road that Florida Power & Light would use on cross-country segments. The typical access road is about 14-foot wide, and it's constructed with -- it's a dirt fill. It is an unpaved surface.

One of the things that we look at is -- that's important in constructing access roads is that the natural water flow underneath or near these access roads is maintained. So there are provisions for culverts to be installed under access roads where -- where necessary to maintain the natural flow within the area.

They are typically about six inches -- one of

the alternatives that we use is typically about six inches above the road surface. Another alternative that we have been working with the DEP on, or we call them at grade roads, where you go in and you lower the area, and then you put in a hard pan type of surface, and you build the road back up to the existing grade that was there originally.

In both cases, the important aspect of any of these access roads is to maintain the existing water flow pattern within the area.

If I can refer you then to Figure 3.1-2, we talk about access roads and structure pads. That was the access road component of it.

And the access road would typically be represented by the area over here, the access road. At locations where the soil conditions don't warrant the ability to hold our maintenance vehicles up, soft soil conditions or wet, there may be a need for what's called an access pad.

And, in general, they are a work area around the structures that enable the crews to set their vehicles up, like bucket trucks or cranes, whatever they may need to both, first to construct the line, and then to maintain them in the future.

These areas are typically about 20 feet around

to allow for the outriggers to be set up on the equipment. So that's the key.

They are kept to a minimum. The key is during the detailed design when we are laying these out is that the crews have the ability to install the pole and maintain them in the future.

As is the case with the access road, the structure pad locations can and would be designed with culverts underneath them to maintain the natural flow.

In addition to that, there are options to build these at grade, so long as they dig out the area and put in an at grade subbase that would hold the vehicles up. And that would be another alternative that we could use in these areas for the structure pads.

Q. And you mentioned the culverts maintaining preconstruction flows, will the location and sizing of culverts be subject to regulatory review in the post certification review by the Department of Environmental Protection under the conditions of certification?

A. Yes, they will.

Q. With regard to pole height that you described in referring to these figures, are there circumstances when the pole height may be something other than 100 feet?

A. Yes. One of the things you are going to hear

consistently is the flexibility of the design throughout these areas. Pole heights can vary, depending on both natural and man-made constraints along the route. For example, when you are crossing a road or the Manatee River, for example, it's possible in order to minimize or mitigate any wetland impacts, that the spans may have to increase, therefore, the height of the pole would go up to maintain the height -- the minimum height requirements as required by the permitting agencies.

Q. That's the minimum height requirements of the conductors?

A. Correct. And -- correct. So the height of the pole may be higher in areas like that.

Or if they wanted to -- if there was a bridge being built over some other road and we needed to get over a bridge or distribution facilities that were fairly high, the pole height could vary in an upward direction.

The other side of that is, for example, along Fruitville Road where there are airstrips along Fruitville Road. In areas like that, the poles would be shorter in order to allow for the ability for the airstrips to continue their use. So the variability in heights will depend on ultimately where the route is and what the conditions are to maintain all of the

applicable height requirements.

THE COURT: Ms. Raepple, I wonder if we could have Mr. Hahn tell us what that range is.

BY MS. RAEPPLE:

Q. Sure. Could you tell us the approximate range of heights that the Bobwhite-Manatee transmission line poles could be on any of the corridors under consideration in this proceeding, recognizing that it has not been finally designed. So give us approximations, please.

A. Again, based on the actual design not being completed, the range from what I've looked at being at the -- along the airstrips near Fruitville Road in the range of 55 to 60 feet, in that range, to 100, 105 feet probably is where we would be on the high end, based on what's there today.

THE COURT: Thank you. That helps.

BY MS. RAEPPLE:

Q. When the pole is lower to address something like an airstrip, does that minimize or eliminate the ability to underbuild distribution on the pole?

A. Whenever you get much lower than about 85 feet, it's going to become very difficult to allow for underbuilt facilities on it.

The other aspect of lowering poles or raising

poles, it's sort of like a three-dimensional model. When you raise poles, spans can be made bigger. When you lower poles, you need more poles in order to maintain the minimum height. So the lower you go, the more poles there will be along the route.

And in addition to that, the right of way may get wider in order to assure that you comply with all of the applicable requirements for the line, such as EMF and NESC codes. So, generally, there are tradeoffs associated with every aspect of it.

Q. And the EMF requirements are the electric and magnetic field standards that have been adopted by the Department of Environmental Protection; is that correct?

A. Yes.

Q. And NESC is the National Electrical Safety Code, which you are required to comply with pursuant to Public Service Commission regulations; is that correct?

A. That is correct.

Q. Can a 138kV structure be similar in height and design to a 230kv structure?

A. Yes, it can. As is the case with 230kV, there's a lot of variability depending on where the 138kV line is placed and what type of constraints it's trying to avoid or mitigate. The range of 138kV heights overlap with 230kv for any application you can consider.

Q. Did you see the photographs that Ms. Mayes presented during her testimony?

A. Yes, I did.

Q. Were the structures that were depicted in those photographs generally representative of the visual presentation of the Bobwhite-Manatee design?

A. Generally, yes.

Q. Are there any advantages of using a bundled conductor, which is, as you have explained, the two wires per phase, rather than a single conductor per phase?

A. As I had stated earlier, the main benefit to the bundle is the ability to double the current through the line.

Q. What will be the typical span length between the Bobwhite-Manatee transmission line structures?

A. What we've modeled in the application are 450 foot spans along road rights of way, and 600 foot spans on the cross-country rights of ways. Those will likely vary, depending on what we find -- where the ultimate route is placed and what the underlying constraints will be within that area. There is flexibility in those sizings.

Q. Will the typical range of spanned length be between 250 feet and 750 feet?

A. Yes, that's what we placed in the application.

Q. What are some of the design considerations that could cause the span length to vary between structures?

A. The main item that will control the span length are the types of underlying constraints that you are faced with, the ability to span wetlands or avoid wetlands by adjusting the spans longer or shorter, the ability to avoid drainage ditches or farm operations or wells on underlying landowners, the ability to move in different directions within the corridor, that flexibility exists in adjusting span length. The heights of the poles that are requested could also affect the spans.

Q. Can the distance between poles be shortened or lengthened to accommodate the crossings of other transmission lines or highways, waterways, distribution lines in other aerial utilities?

A. Yes. In this study area, it's predominantly going to be used for crossing roads and distribution facilities, adjusting -- for example, at the airstrips along Fruitville Road, as the poles would come down in our earlier discussion, those spans will get to be very short in those areas, probably in the 250 foot range. Down there would be an example of what we would do there.

Q. You showed us the typical access road and structure pad designs. Do you anticipate constructing such access roads and structure pads throughout the Bobwhite-Manatee transmission line?

A. No. Based on my observations of the majority of the study area, I think there will be some, but there will be minimum.

We will do all that we can to minimize where those types of structure -- structure pads and access roads go. In general, the majority of the area is relatively high and dry.

Q. Can you tell us where you anticipate the need to build access roads and structure pads for the Bobwhite-Manatee transmission line?

A. In general, along road rights of way there would be no need for access roads. It is possible at some locations along -- even along road rights of way where the drainage ditches alongside of the road prevent access, that we may need to construct an access pad, even along road rights of way. But based on my observations, I think there may be only a -- two or three locations where that may even be possible.

On the cross-country routes where the soil conditions are good, dry, and it has the ability to support our vehicles, no structure pads or access roads

would be built. And that is the majority of this study area. In areas where the soil is not good or it's wet, then access roads would need to be built in areas like that. But it is my opinion that those will be rare on this project.

Q. Where the soil is wet or soft, do you also have an option of spanning those areas without the placement of an access road?

A. Yes. And in all cases, it will be our intent to avoid, to span, or relocate around and avoid wetland type of areas.

Q. Next, I would ask you to please refer to Exhibit FPL 48, which has been received into the record, and have you describe for us what this document shows.

A. This document, FPL Exhibit 48, is a schematic drawing that illustrates the steps in constructing a 230kv line.

Q. Using FPL 25, would you please describe those stages of transmission line construction?

A. We're going to start in this upper left-hand corner.

Q. Excuse me. It's FPL 48?

A. 48.

We're going to start in this upper left-hand corner, and this all takes place after the corridor is

certified.

What will start first is that we'll start surveying the area. They will look for property lines, corners, existing easements and right of ways that may be out there that we may be able to utilize.

They will document natural and manmade facilities, such as ditches, barns, homes, buildings along the -- along the proposed route within the corridor.

Concurrently, we will be working with the underlying landowners to determine where the right of way should be and where the poles should be located within the right of way.

Easement documents will be created to establish the legal rights to utilize the ultimate right of way. In addition to that, we'll be determining at that point where and if access roads and structure pads are needed, and where there would be -- where they would be located within that area.

And that's all representative in this upper left-hand corner. There's a lot of activities that take place once the certification begins.

Q. What is the next step of transmission line construction?

A. Once the right of way is established, right of

way prep is what takes place, and that's this little wording up here. That's this little area up here.

Right of way prep along road rights of way is fairly minimum. It's essentially trimming back -- tree trimming, and removal of trees that may interfere with the operation and maintenance of the line.

Similar to that along cross-country routes, you have that same activity where trees, in general, that will be greater than 14 feet in height would be removed from the right of way and upland type of areas, and the width of an access road, 14-foot wide, may be cleared to allow for the access vehicles to get in.

Beyond that 14-foot, trees and vegetation that won't exceed 14 feet in height will likely remain. So there will just be the 14-foot strip, and trees that won't grow greater than 14 feet in height.

Access roads would be constructed where they're needed. Culverts installed in areas where they are needed, also.

In wetland areas, herbaceous vegetation generally lower than 14 foot is left alone. We don't do much with the vegetation in wetland areas.

Similarly, though, any trees or brush that may get greater than 14 feet is selectively removed from wetland areas, so that it won't interfere with the

operation and maintenance of the line.

Q. Would you next describe the construction of the access roads and structure pads?

A. What happens with access roads and structure pads is the boundaries of the access road and the structure pad would be surveyed and staked out. The natural flow of the water, of the wetland areas that they are traversing would be mapped, and fresh fill would be hauled in from off set -- fresh clean fill would be hauled in from off site, the culverts installed, and the roads built over the culverted material.

Q. You mentioned the trimming and removal of some vegetation. What right of way clearing methods would be used for uplands and wetlands?

A. For uplands, chain saws would predominantly be used, and the work would be predominantly out of bucket trucks for that clearing.

For wetland, it's much more selective. In general, the herbaceous vegetation is left alone. Any trimming that does take place is done selectively by hand, in general, with very low pressure type of vehicles within the wetland areas.

Q. Will any techniques be used in wetlands to minimize the potential for erosion of fill that is used

in construction?

A. In all cases where we're constructing structure pads or roads, sedimentation control will be utilized. You see a lot of the little black strip paper along construction sites; turbidity control is one example of something we may use. In some situations we've used hay bales to control runoffs and spillage of the dirt from getting into the wetland areas.

Where we create slopes or banks, sodding or mulching will take place to control the sedimentation.

Q. Are the black strips referred to as "silt fences"?

A. I have heard them called turbidity screening, silt fences. I think it's a matter of who you talk to what they are called.

Q. Referring again to Exhibit FPL 38, what is the next step of construction?

A. The next step is called the material hauling and spotting. What generally happens in that case is the pole structures are brought out within the right of way and spotted along the right of way where they're going to be placed.

In some instances the crews come out and they will install the hardware while the -- the insulators and the clamps that hold the conductor at the end of the

insulators while the structures are on the ground.

Some crews, some companies will install the pole up in the air and then come back and put that hardware on at a later time. So it generally depends on the company that ends up doing the work.

The next piece is where you install the pole. And what happens then is a digger truck comes out, and it augers the hole. Again, it's, in general, a 60-inche wide hole. A hole is dug down about 20 feet, anywhere from 18 to 25 feet. The pole is stood up and then installed into the hole, rock backfill is placed around the pole and then vibrated in.

So now the pole is up in the air, and the insulators and the end clamps are hanging on the end of the insulator.

Q. On this FPL 48, the pole setting appears to be occurring at a heavy angle. Would anything further need to be installed at such a heavy angle?

A. Well, we'll make reference to the drawing. If this is the angle or the turn where the pole is going in, if it's a heavy angle, in general, guys will be installed out from the pole to accommodate the turn for the conductor.

And what the guys do is back up the conductor. The tension of the conductor has to be supported, and

the function of the guy is to support the tension of the wire in the opposite direction of the wire.

Q. What is done after the structures are erected?

A. Once the structures are up, the rest of it happens in fairly rapid succession. What you will see is the crews will install little rollers on the edge of the insulators. And these rollers -- sometimes you will hear the terminology dolly blocks or rollers. And they will be installed on all of the poles along where they are going to string in the conductor and the overhead ground wire.

You will see rope. At one end of the operation will be spools of wire. And, in general, the distance associated with this is about 10,000 feet. The magic of 10,000 feet is that is about how much wire you can get on to a reel.

So at one end you will have the reels. At the other end you will have what is called tuggers or pullers.

Ropes will be rolled through the wheels, and then the ropes will pull the conductor through the wheels down to the other end where the tugger is.

The same thing with the overhead ground wire, it's pulled down to the far end where the tuggers are.

Once the wire is installed and it's all in

place, what they do to it is they tension it to the design standard for the conductor, and then they clip it into the end of the insulators, to the clamps on the end of the insulators, and then they move on. After that the line is tested and placed in service.

Q. You mentioned the overhead ground wire. Is that the very top wire on the transmission line?

A. Yes, the overhead ground wire is the top conductor. It's generally a smaller wire than this. It's typically an aluminum wire, and its function is to protect the line from lightning. It's essentially a lightning shield is what it is.

Q. When you say it is typically smaller than this, you are saying it's typically smaller in diameter than the conductor wire?

A. Yes. It's much smaller than the diameter of a conductor wire. I don't know exactly what size that will be. It will be determined during the final design stage. But it will definitely be smaller than this.

Q. While not shown on FPL 48, although I guess I see the words clean up. Is there another step to construction once the conductors and overhead ground wire are installed?

A. Once the line is completed, what the crews come back and do is they clean up the right of ways within

where -- on cross-country routes, for example, we may have rutted up the area. The ruts will be smoothed, smoothed out. Areas that need to be sodded will be sodded or seeded. And essentially what happens is the right of way is put back into its natural state.

Q. For a typical mile along the Bobwhite-Manatee transmission line, how long would a construction crew be in the area to complete each stage of construction, approximately?

A. The time any one area will see construction activities will vary. From a surveying perspective, it may be a couple of days. The right of way prep area may be a few more days here and there. The installation of the poles, typically they will do two or three in a day. So they will be moving along the right of way as they proceed.

The stringing operation may be a two-week process in where you may see the crews periodically throughout that two weeks.

In general, a good rule of thumb is about a month a mile is typically what you will see.

Q. In those locations where the preferred corridor is collocated with a state or county road within it, where would Florida Power & Light propose to place the Bobwhite-Manatee transmission line in relation to that

road?

A. If I can refer you back to this exhibit and this little road here at the bottom will be the state or county road.

Q. That exhibit being FPL 48?

A. Yes, ma'am. FPL 48. The poles would either be placed just inside road right of way, not on the road surface, or just outside of road right of way. In general, they will closely abut the edge of the right of way one side or the other.

Q. During construction along existing public roads, will Florida Power & Light comply with the Florida Department of Transportation's maintenance of traffic rules?

A. Yes, in all cases we will comply on state and county roads, we will comply with the FDOT, Florida Department of Transportation Utility Accommodation Guidelines for Traffic Control.

Q. In those areas where the transmission line is placed just immediately inside or outside of road right of ways, do you anticipate there to be any impact on vehicular traffic adjacent to those roads during construction?

A. Yes, I do. Most of the roads within the study area are narrow, are two-lane roads with small

shoulders. It is likely that there will be traffic impact during the installation of the poles where one lane of traffic will need to be blocked during the setting operations for the structures along the routes.

Q. Will that occur along -- do you anticipate lane closures along every two-lane road within the study area?

A. Yes, I think there will be -- there will be lane closures along all of the two-lane roads. Some of the areas, the shoulders are a little wider than others. But for the most part, there will be intermittent closures along all of the alternatives, along roads.

MR. HALL: Your Honor, would it be possible to take a short break at this point?

THE COURT: Okay. Let's take a ten-minute break.

(Recess.)

THE COURT: You may continue.

BY MS. RAEPPLE:

Q. Mr. Hahn, how long will the entire construction process take for the Bobwhite-Manatee transmission line?

A. Around 13 to 15 months it will take to construct the line.

Q. If the Bobwhite-Manatee transmission line is placed across agricultural land, will Florida

Power & Light be able to locate its poles to avoid drainage ditches, irrigation pipes, wells, and other farming infrastructure?

A. Yes, it will. The key theme is the flexibility. The corridors, especially on the cross-country segments are wide, so you have the ability to move, we'll call it from east to west.

The other aspect of flexibility was the span line. So we have the ability to adjust north to south, so to speak, also. That ability will allow us -- afford us the opportunity to work with the underlying landowners to avoid conflicts with drainage ditches and culverts, as you had mentioned.

Q. As well as the other farming infrastructure?

A. Yes.

Q. Will the Bobwhite-Manatee design allow farm equipment to pass beneath the conductors?

A. We will work with the underlying landowners to determine what their height requirements may be. We have similar types of situations in citrus groves and in sugar cane fields throughout the state where we actually went in and determined what the maximum height of their equipment was, and we designed the line to accommodate that equipment in light of OSHA type of requirements.

So, yes, we will work with the underlying

landowners to assure that works.

Q. Do you also have similar transmission lines that run through tomato fields elsewhere in Florida?

A. Yes, in fact the lines that come out of the Manatee Energy Center and go towards the west traverse tomato fields and...

Q. Would Florida Power & Light work with the underlying owners of the agricultural operations, similar to the way you said they have done in the past, to ensure that the farm equipment could pass beneath the conductors?

A. Yes, we will.

Q. Okay. If agricultural land is currently fenced with locked gates, will Florida Power & Light do anything to ensure that the secure nature of that agricultural area is maintained once the Bobwhite-Manatee transmission line is in place?

A. As is the case with the ability to work with the farm equipment, we will also work with the underlying landowners to assure that the security of their property is kept intact during the construction operation and maintenance of the Bobwhite-Manatee line.

Q. Does Florida Power & Light do that with any parcel of land that is fenced and then crossed by a new transmission line?

A. Yes. We do that with all the underlying landowners. We are cognizant of what their uses are, and we work -- we do -- we work to assure that we comply with their needs to the best of our ability.

Q. Will Florida Power & Light coordinate with any agricultural operations crossed by the Bobwhite-Manatee transmission line to ensure that utility personnel do not come on the agricultural land in a manner inconsistent with the label instructions for any pesticides used on the farm to the extent feasible?

A. Yes, we will.

Q. Will the transmission line, the Bobwhite-Manatee transmission line, be constructed, operated and maintained in compliance with any codes, standards or industry guidelines?

A. Yes. Several of the codes and standards that would be used, would be like the National Electric Safety Code. Where we cross the Manatee River will have to be in compliance with the Army Corp of Engineers. North of State Road 64, we have the Southwest Florida Water Management District lands that we're going to be crossing. The Florida Department of Environmental Protection standards for electric and -- electric and magnetic fields, any applicable Manatee and Sarasota County ordinances, such as the noise requirements, the

Florida Department of Transportation Utility Accommodation Manual, IEEE, the Institute of Electrical Electronics Engineers, and many of Florida Power & Light's own numerous design standards will all be adhered to.

Q. Are there any applicable design codes, standards, or industry guidelines for this type of a facility with which the Bobwhite-Manatee transmission line will not comply?

A. Not that I'm aware of.

Q. Would you next, please, describe for us the maintenance techniques that are proposed for the Bobwhite-Manatee transmission line?

A. Maintenance on these new structures is -- they're very low maintenance. These are concrete poles with polymer insulators. There's not a lot that happens to these new lines.

Periodically, there would be patrols sent out along the route, either by small pickup truck or by air. They would look to see if there were any conflicts starting to arise, such as trees or other encumbrances growing in towards the line.

If problems were found, crews would be sent out to make repairs, but very low maintenance.

Q. What about maintenance of the right of way as

opposed to the transmission line itself? Could you please describe that?

A. Well, the key importance to the maintenance of the right of way is two-fold. To maintain -- to continue the operation of the line in a safe and reliable manner and to assure that the crews have access to the facilities. Those are the two main reasons for right of way maintenance.

In general, right of way maintenance would consist of along road rights of way, general tree trimming types of activities along road rights of way. On cross-country, similar tree trimming type of activities for anything that may present an operational or reliability issue to the line.

In addition to that, the roads and culvert systems, if they needed to be repaired or maintained to assure that they were kept in the state that they were originally designed to function as.

Q. Will the transmission line -- will the Bobwhite-Manatee transmission line comply with good engineering practices for the design of such a facility?

A. Yes, it will.

Q. Next, I would like to ask you to compare the Florida Power & Light preferred corridor to the alternate corridors offered by intervenors.

First, are you familiar with the alternate corridors proposed by Schroeder-Manatee Ranch and Lake Club Investors, as well as those proposed by Taylor and Fulton?

A. Yes, I am.

Q. I'm directing your attention to FPL 7 where those alternates are depicted; the SMR corridors in red, and the Taylor and Fulton in blue.

From an engineering perspective, are the alternate corridors proposed by SMR and Taylor and Fulton appropriate for placement of the Bobwhite-Manatee transmission line?

A. Yes, all the corridors available for certification are appropriate for transmission lines.

It is my opinion, however, that the Florida Power & Light provides for the best overall balance.

Q. Are you familiar with this Exhibit FPL 21, which is a chart comparing the FPL preferred corridor to the alternate corridors?

A. Yes, I am.

Q. Did you participate in the preparation of this chart?

A. I participated in Row E, Row F, Row G, and Row H.

Q. That's on the first page of FPL 21?

A. Yes, it is.

Q. Using this exhibit, could you please describe the differences from an engineering perspective between Florida Power & Light's preferred corridor and the SMR Alternate Number 1?

A. Yes, I could. The way I think, from an efficiency perspective, if we can go back to FPL -- is it FPL 7? And what I will do is I will compare them side by side.

Q. Thank you.

A. And what we are going to compare first is the first sheet, which is the FPL preferred corridor. And primarily, the comparison will take place from where they differ.

So the FPL preferred runs along State Road 64, the cross-country piece for the collocation with the Dam Road extension, University Parkway, and then Lorraine Road, versus SMR 1 that comes down County Road 675, State Road 70, Verna Road, and then Fruitville Road back into the substation.

First of all, the FPL preferred corridor, from an engineering perspective, is about 4.1 miles shorter than SMR 1.

On State Road 64, SMR 1, one of my concerns with State Road 64 is two-fold. Along State Road 64,

this is the Peace River Electric Co-Op service territory. And there are Peace River facilities on the north side of State Road 64, and they serve houses along the south side of State Road 64 and the park on the north side.

One advantage to SMR Number 1 is that it departs from State Road 64 just to the west of the crossing of the Manatee River. On the south side of this Manatee River, there are no PRECO distribution facilities. So PRECO avoids my concern with the collocational constraint of PRECO in this area.

Next --

Q. I'm sorry. I didn't understand that.

Where is the constraint with PRECO avoided?

A. Essentially, on the south side of this bridge, where we cross the bridge, there are no distribution facilities on the south side of that bridge. What is there are communications cables, telephone lines. The PRECO distribution facilities are on the north side of this area.

Q. This area being the east-west run of the FPL preferred corridor?

A. Correct. The east-west run of State Road 64 of the FPL preferred corridor.

It is my intention or my preference to cross

the river on the south side of the bridge in that area, and on the south side of that bridge in that area there are no PRECO distribution facilities.

So SMR along State Road 64 avoids the PRECO distribution facilities before it turns south on County Road 675. The FPL preferred corridor does not.

The next comparison is from State Road 64 to University Parkway, a cross-country segment for Florida Power & Light is in a -- first of all, the corridor is very wide, and there's a lot of flexibility to minimize and mitigate conflicts that we run into, such as environmental conflicts and other natural or manmade areas down through there. We have the ability to be in a wide four-lane right of way down through that segment through here.

On the FPL -- on the SMR corridor, this is an existing two-lane road with relatively narrow shoulders. As I had stated earlier, and that goes true for State Road 70, for both of these roads, there will be road blockage during construction when we are installing the line.

PRECO distribution facilities essentially run the entire length of both of these runs. In fact, it's on the west side to just south of an area near what's called Hunsader Farms. And then it jumps back and forth

down the road the rest of the way down County Road 675.

In addition, the PRECO distribution facilities serve both sides of the road. It is likely that FPL will avoid collocating with PRECO distribution facilities.

So what this would afford is that the FPL facilities would be on one side of the road, and the PRECO distribution facilities would be on the other, or the FPL facilities would jump back and forth.

It is very unlikely that our operations group will agree to collocate with the distribution facilities, the PRECO distribution facilities.

The same holds true for --

MR. HALL: Your Honor, I am going to make a belated objection to his testimony about what other people in the operations may or may not agree to. I don't think a foundation has been laid for that, and it is hearsay.

THE COURT: Well, his answer -- his answer seemed to contain both an engineering aspect of what -- of an engineering concern and likely -- and the engineering practice, as well as futuristic concept. But I'm going to overrule, because I think it does.

I took it to be an engineering analysis of the

problem and FPL's past practice with regard to that problem.

BY MS. RAEPPLE:

Q. Mr. Hahn, would you continue with your description of the State Road 70 situation with regard to existing PRECO distribution lines?

A. On State Road 70, the PRECO distribution facilities run along the north side of the road for about a half mile, and then they transfer back over to the south side and run along the south side.

In this area here, the PRECO distribution facilities do also feed both sides of the road.

From a construction perspective and an engineering perspective, State Road 70 has, I believe it's a 55 mile an hour speed limit. A lot of heavy truck traffic running along this road, and the shoulders are relatively narrow, and they drop off pretty rapidly in this area.

For all the pole locations constructed within this area, we will need to block one lane of traffic along State Road 70 within this area.

Q. Now, I want to ask you a couple of follow-up questions. You mentioned Hunsader Farms in your description of County Road 675. Is that located a little north of the mid point from north to south on

County Road 675?

A. It's, in general, in this area, if you would follow the Taylor and Fulton alternative back to the east, it essentially is in this area east of the Taylor and Fulton alternative.

Q. So it's east of the notch in the Taylor and Fulton Alternate 2; is that correct?

A. Yes, it is. And I was using it more as a point of reference to where the PRECO lines transition back to the other side of the road.

Q. I understand. You were pointing to it, though, and I wanted to make sure the record was clear about where that transition occurred.

Also you've mentioned County Road 675 and State Road 70 right of ways in this area being narrow, and the shoulders being narrow and the need to close one lane of traffic.

Could you please compare those road rights of way to the right of way that exists in State Road 64 in the east-west run within the FPL preferred corridor?

A. Along State Road 64, one of my preferences is to be on the north side of State Road 64. And the reason for that is two-fold; the shoulders of the road along the north side of State Road 64 are larger than they are on the south side of State Road 64.

Our ability to construct the line on that north side would lessen the opportunities for having to have road closures. It may not eliminate the need for road closures, but I think there are a lot of opportunities along the north side of that road to construct the facilities and stay off of the road.

That differs from 675 in that the shoulders are more narrow along this portion of 675 south of State Road 64. There may be situations where we can install a pole without road closures, but it is my opinion that the majority of the locations will require one lane to be closed through this area.

And along State Road 70, I believe that all of the locations will require lane closures as we install along State Road 70.

On the FPL preferred corridor, the traffic situations aren't there, because the road is not there yet. We have an opportunity to work with the underlying landowner and the county to layout the location of the road and the location of the poles and the lines throughout this area.

Q. All right. Would you please continue with your comparison of the FPL preferred corridor and SMR 1 from an engineering perspective?

A. The next area we want to talk about is I want

to compare University Parkway and the Lorraine Road segment to Verna Road and Fruitville Road.

One of the advantages to both the FPL preferred corridor and SMR 1 in this area is that we are now south of State Road 70. So we have the opportunity to consolidate the existing distribution lines on to the structures that will be used for the transmission line.

FPL distribution runs along the east side of Verna Road and the south side of Fruitville Road. We would consolidate those facilities onto the same structures that would be used for the line.

Verna Road and Fruitville Road are two-lane roads. The shoulder along Verna Road is fairly wide. And although I still believe some locations will need -- will require intermittent road closures, there are a number of locations that will not require road closures, one-lane closures.

Fruitville Road, on the other hand, is -- exists as a fairly narrow road right of way, and the shoulder on the south side of Fruitville Road is fairly small.

For the first two miles in particular --

Q. That's the eastern two miles?

A. From the eastern end, the first two miles from the eastern end will likely require every location to

have a one-lane closure.

Once you get past that point, the shoulder on the south side does get bigger, and the opportunities for not closing the shoulder get better as you move west.

The other aspect of SMR 1 is that there are two airstrips in this area. We'll refer to one of them as Plank Airstrip and the other one is the Schwartz farm airstrip.

Q. And you said the two airstrips are in this area. Is that in the eastern half of the Fruitville run of SMR 1?

A. It is just to the east of this curve in Fruitville Road. In this general vicinity east of this curve.

The airports are in the area of Oakford Road, I believe is the name of the road that's out there that they are near.

Along University and Lorraine --

Q. Excuse me. Before you leave the airstrips, what is the other airstrip?

A. The other airstrip is Schwartz Farms. It's just to the west of Plank, and it -- both airstrips run perpendicular to the road. And what they present to me is an increased reliability risk to the line. From an

engineering perspective, we do have the ability to construct underneath their respective glide slopes, but it introduces a reliability risk to the project that does not exist on the segment from University Parkway to Lorraine.

Q. And what is that reliability risk?

A. Well, I met out there with the owner of Plank airstrip, and he told me that he utilizes that airstrip on occasion.

MR. HALL: Object to the hearsay; move to strike.

THE COURT: Sustained.

BY MS. RAEPPLE:

Q. Mr. Hahn, did you observe the Plank airstrip and the Schwartz farm airstrip?

A. Yes, I did.

Q. Are there windsocks at those airstrips?

A. There is a windsock at the Plank airstrip. I do not recall one at the Schwartz airstrip.

Q. Does the presence of that windsock indicate anything to you?

A. It is what caught my attention that there was an airstrip there when I was riding on the road. But beyond that, you know --

Q. Would you expect a windsock to be hanging at an

inactive airstrip?

MR. HALL: Object to the leading.

THE COURT: It's not leading, although I don't know what his special knowledge of windsocks would be.

MR. HALL: I will amend my objection to include that, Your Honor.

BY MS. RAEPPLE:

Q. Mr. Hahn, when you are siting transmission lines, is an airstrip or airport something that you routinely look for in the field?

A. Yes, it is.

Q. And do you, when you find an apparent airstrip or airport, do you do anything to determine if that airstrip is in active use?

A. We, in general, like -- we talk to the owner of the facility to determine its usage.

Q. And did you do that in this case?

A. Yes, I personally met with Mr. Plank and talked to him about how he utilizes that airstrip.

Q. When you routinely look at airstrips in the field, do you look for signs of usage?

A. I look at it more from the perspective that it could be used. And that's the approach that I take with them. Whether they are used or not at the time that I

find them, I have no way to determine whether they wouldn't be used later. So my assumptions are based on the fact that there's a physical presence there that could be used as an airport, either in the future or now.

Q. You said that the presence of airstrips perpendicular to the Bobwhite-Manatee, in your judgment, presented a reliability risk.

Could you explain what that reliability risk is, please?

A. When you are looking for the balance between, for example, these two corridors, the presence of an airstrip introduces a variable of risk to that segment where, to say the least, they could miss and hit the line as they are landing on the strip.

Q. And could that cause damage to the transmission line resulting in it being taken out of service?

A. Yes, it would take the line out of service.

Q. Could you continue with your comparison of SMR 1 and the FPL preferred, please?

A. I'm trying to remember where I was.

Q. I believe after you spoke about the airstrips, you were going to go and talk about University and Lorraine.

A. On University and Lorraine, as is the case with

SMR 1, FPL distribution facilities follow the south side of University Parkway, and then they run along the west side of Lorraine.

The FPL corridor is wide down through this area to afford flexibility and working with the underlying landowner and to minimize environmental impacts along those routes.

The SMR Number 1 corridor is more narrow and doesn't afford for a lot of flexibility to minimize or mitigate environmental impacts along the edges of the roads.

The SMR 1 Alternative is about 4.1 million dollars -- let me make sure of that -- it's about four million dollars less expensive than the FPL corridor.

One other aspect of Verna Road that's sort of a little mix is there's some consternation over the ownership of Verna Road.

The way we have modeled Verna Road in our costing estimate is to assume that it is a county-owned road. There is some debate as to whether it is a private ownership that we would -- and that -- the difference would mean we would need to expand the size of the easement requirements along Verna Road. If we did, it would add about 1.3 million dollars more cost to the SMR 1 Alternative.

But for now, we've left it as a ten-foot wide strip until we can get the final ruling on what kind of road that actually is.

Q. If Verna Road is physically there, but it is in private ownership as opposed to being a public road, why would you need to expand the right of way width adjacent to it?

A. Along private roads, I may -- or excuse me. Along public roads I'm allowed to take advantage of that public road to account for a lot of the code requirements that I have to adhere to.

In particular, the Florida -- the Florida Department of Environmental Protection Standards on EMF, electromagnetic fields.

What I have to be able to do is fit, if it's a private road, I have to be able to fit all of those requirements in my -- inside my easement. So my easement will need to be wider in this area. Instead of ten-foot, it may need to be 60, or some function of that 60, in order to make it all fit inside the easement in that area.

But for now the model that we are using is that it is road right of way, and that we are able to utilize a ten-foot strip. But that is a variable that we still aren't 100 percent sure of. And I believe that's my

comparison of FPL --

Q. You mentioned that SMR 1 is, I believe you said 4.1 miles longer than the FPL preferred, but it's about four million dollars less expensive than the FPL preferred. Could you explain why the longer line is less costly?

A. It's two main -- there are two main reasons for the difference. The SMR 1 runs along road right of way. So the size of the easement required along road right of way is ten foot.

Along the cross-country segments, even though there are proposed roads in this area, we assume the easement to be 60-foot wide, because likely we would be there before the road. So we assumed in our cost models that it was a 60-foot wide road right of way.

In addition, the SMR 1 being along road right of way, there is no need for access roads in the costing model along there. The FPL preferred from Bobwhite sub to University, and then again from University up to State Road 64, assumes an access road for half of the distance between those two points.

It is unlikely that we would need that amount of road right of way, but embedded in the initial estimate was access road for half of the distance on cross-country routes.

Q. And by cross-country, does the model assume any place where a public road is not present to be a cross-country route?

A. Correct. And the example of that would be this section here where we are looking at it to collocate with Dam Road. The Dam Road extension, it's not there yet. So we assumed that cross-country 60-foot wide easement through that area in the model.

Q. And similarly even though Lorraine Road is physically there, at least as an unpaved road for its entire distance, the model assumes that's a cross-country route; is that correct?

A. Yes, it does.

Q. You also mention the presence of airstrips along Fruitville Road in SMR 1, and you previously had mentioned in the vicinity of an airstrip you would -- you may have to use shorter structures and more structures to accommodate getting beneath a glide slope for an airstrip.

Was the -- would that be more expensive than the typical design of the Bobwhite-Manatee transmission line, to have shorter and more frequent structures?

A. The fact that they are shorter would not have a significant, if any, effect on it. But the additional structures would add cost to that area.

The other aspect of lowering those structures in that area, in fact, lowering them as low as we had to do, we have to widen the right of way about another ten additional feet.

So in that area near the airport, the right of way would go from a ten-foot strip to a twenty-foot strip for one or two spans within the area of the airport.

Q. In the cost comparison that you provided, does it reflect the added cost from additional poles in the area of the airstrips or the wider right of way in the area of the airstrips?

A. No, it does not.

Q. Let me ask you, please, to refer to FPL 49, which has been received into the record, and ask you if you can tell us what this chart shows.

A. This is a roadway comparison chart that --

Q. Excuse me. I'm asking you to refer to FPL 49.

A. Tabs are on the wrong side. I'm sorry.

This is a summary document of the costs that were used for each of the segments for the routing of the FPL preferred corridor and the four remaining alternatives.

Q. Can you tell us, please, what is included in these cost estimates?

A. These cost estimates include the costs associated with engineering, labor and materials for the physical line itself. It includes easement sizing and the costs to acquire those easements. It includes an estimated value for mitigation costs. It assumes survey costs. Underground exploration costs along road right of way where pole locations may be. Access road construction throughout the project area.

They are based -- these estimates are based on engineering estimating model that FPL uses for projects of this type throughout its system.

Q. Does this FPL 49 reflect the cost estimates that you previously described when you were comparing the FPL preferred corridor and SMR Alternate 1?

A. Yes. The numbers are reflective on the final column.

The final column here, the 2008 total route cost between FPL and SMR 1; SMR 1 at 21.7 million, and FPL at 25.5 million.

Q. Was there a cost estimate used during the quantitative comparison of the 1,275 alternates when the multidisciplinary team was narrowing down the number of alternates to carry forward to the detailed analysis?

A. Yes. They --

Q. How does the cost estimate in the right-hand

column of FPL 49 compare to the cost estimate used during that quantitative analysis?

A. The cost estimates that were used during the GENCOR runs or the cost analysis are the ones that are reflected in the 2006 columns. And those were the numbers that we used in all the GENCOR runs.

In about July of 2007, the transmission engineering department came out with their 2008 estimating model. And what I wanted to do was take that model and just see how it affected the original numbers and how it affected the relative ranking of the routes that were remaining.

So what the new numbers represent are the utilization of that 2008 model. And incorporated into that, I took the right of way on cross-country segments from 75 feet down to 60 feet for the cross-country segments, and from 15 feet down to 10 feet along the road rights of way.

In addition, based on having viewed a large amount of the area, I took the roads -- initially, we had assumed roads for the entire length of the cross-country segments. And after viewing most of the area, I cut the roads -- the road requirement in half. It's likely we will still need roads in certain areas throughout the route, but it wasn't going to be the

entire route.

So to assure enough flexibility in the -- when they go to design, I have left half of the road distance in there.

Q. And in that discussion of roads, you are talking about access roads that Florida Power & Light would construct?

A. Access roads that Florida Power & Light would construct, essentially on the cross-country segments.

Q. And you said you left in the cross-country segments an estimate of 50 percent requiring access roads. In your judgment, will there be 50 percent -- will access roads be required in 50 percent of the length of cross-country segments within the FPL preferred corridor?

A. I don't believe so, no.

Q. Do you think it will be more or less?

A. I think it will be significantly less, but I wanted to make sure I left enough in there to allow for that flexibility in case they were needed.

Q. You also said that in the updated numbers, which are reflected in the last column of FPL 49, you reduced the right of way acquisition need from 15 feet to 10 feet along public roads and from 75 feet to 60 feet in cross-country segments. What was the basis for

making that reduction?

A. Along road rights of way, in the initial summary we were looking at 600 foot spans along the road right of way. We approached it from a more generic perspective. When you ride the road rights of way in this area, there are a lot of trees and encumbrances like trees along the route.

So we will likely shrink the spans up to about 450 feet. And when you shrink the spans to 450 feet, it shrinks the amount of easement that you need. So from 600 foot down to 450, the right of way went from 15 foot adjacent to the road back down to 10.

On the cross-country segments, initially when we were looking at this, I allowed for guyed structures. We talk guyed structures on the corners. Corner structures will still stay guyed. But in the initial look at this area, not having a feel for the soil conditions, I had assumed that the tangent structures, the intermediate structures between the corners would also have guys to them.

Most of this area is high and dry. The need for tangent structures that are guyed, likely very few, if any of them, will be guyed.

So as a result, needing a 75-foot wide easement to accommodate guys, we don't need that size any more.

We shrunk it down to 60-foot wide. And we would expand it only in areas where we would need guy wires on the tangent structures. So those were the two reasons for the shrinkage of the right of ways.

Q. Does the cost differential that is estimated on FPL 49 between the FPL preferred corridor and SMR Alternate Number 1 make SMR Alternate Number 1 preferable to the FPL preferred corridor, in your opinion, from an engineering perspective?

A. No.

Q. Why not?

A. These costs, at this stage of the process, these costs are used as relative comparisons of segment to segment and route to route.

The actual costs won't be known until we know where the route, actual route of the line is going to be and detailed engineering takes place.

Q. That's the actual right of way?

A. The actual right of way is determined and the detailed design is complete.

In addition to that, the corridor selection team determined that costs were not as important in determining what -- which route to ultimately work on. And the cost differential is not substantial in light of the overall costs for this project.

The important portion of this part is that they -- the estimates are applied consistently across all of the segments so that you have a fair, relative comparison of what is going on within the different routes.

Q. Is the relative length of SMR Alternate Number 1 compared to the FPL preferred corridor important in your judgment from an engineering perspective?

A. Yes.

Q. Why?

A. From my perspective, it relates to two issues: Greater line loss because of the distance of the line, it's a 4.1 additional miles of line lost; and secondly, it's 4.1 miles more of greater exposure to reliability related issues, such as lightning or tree impact.

Q. You mentioned line loss. What is line loss?

A. Line loss is any -- there are losses associated with transmitting electric energy across any distances. And the longer that distance, the greater the losses that there are to the electric system.

It's an engineering component. One of the advantages to the FPL preferred corridor is that it is a shorter route. And that is a consideration that I looked at.

Q. Would you please refer to Exhibit FPL 26, which

is a roadway comparison chart that's already been received into the record.

Were you responsible for the preparation of any portion of this chart?

A. I was responsible for the final column, the location of the PRECO distribution facilities.

Q. Does this final column of FPL 26 accurately reflect the presence of distribution lines along the roadways in the FPL preferred corridor and the alternate corridors under consideration in this proceeding?

A. Yes, it does.

Q. Thank you.

Actually, I stand corrected, this document has not yet been received into the record, because I was waiting for you to testify about that final column.

MS. RAEPPLE: At this time I would offer FPL 26 into the record.

MR. HALL: No objection.

THE COURT: FPL 26 is admitted.

(FPL EXHIBIT NO. 26 FOR IDENTIFICATION was received in Evidence.)

BY MS. RAEPPLE:

Q. Turning back to FPL 21, the corridor comparison chart, have you explained all of the engineering considerations comparing the FPL preferred corridor to

SMR Alternate Number 1?

A. I believe so, yes.

Q. During the public outreach program that you participated in, were there any concerns expressed by members of the public for traffic impacts during construction?

A. Yes. One of the things we did hear from -- at many, if in not all of the public outreach meetings, was a concern of the general public for --

MR. MOYLE: This is all hearsay. Object on the ground this is hearsay.

THE COURT: He can say what he did. He can't say what he heard. Sustained.

BY MS. RAEPPLE:

Q. Mr. Hahn, do you have a concern for traffic impacts during construction?

A. Yes, I do.

Q. And what are those concerns?

A. Well, I've traveled Fruitville Road and Verna Road many times, and there are construction activities going on along those roads now with the improvements that they are making to the eastern end on the north side of the road. And it's a narrow -- it's a narrow two-lane road. And the ability to --

There are no alternatives, once you get on that

road as you are traveling it, you are on it, and if a lane is blocked, there are no places to go. You just sit and wait.

And it's going to create public impact along that road, if we were to construct it along Fruitville Road, Verna, State Road 70 and 675. There will be traffic impact.

Q. Did members of the public express similar concerns to you during the public outreach program?

MR. MOYLE: Objection; hearsay.

MS. RAEPPLE: Your Honor, in Chapter 120 of Administrative Proceeding, hearsay is allowed to corroborate other competent evidence. And I believe statements of the members of the public do corroborate Mr. Hahn's own concerns.

THE COURT: That's not how I apply the term "corroborate" in my ruling. So it has to corroborate the statement made and not -- the statement is what he does. What somebody else does is not corroboration.

But what I was trying to say is he can say what he -- what changes he might have made in response to his view of the -- at the public participation, any changes he made because he was incorporating his perception of public concerns. That's different

than saying, here is what the public concerns were that I heard.

BY MS. RAEPPLE:

Q. All right. Well, let me ask you this question, Mr. Hahn.

Is your assessment of the FPL preferred corridor as compared to SMR Alternate Number 1 based in part on input that you received from the public during the public outreach program?

A. Yes, it is.

Q. And can you tell us what some of that input was that formed the basis for your opinion of preferring the FPL preferred corridor over SMR Number 1?

A. If I can refer back to FPL 7 as an exhibit.

One of the things that it forced me to consider or that it enabled me to consider was that from this area south of State Road 64 down to the Bobwhite substation area, the traffic impacts through this segment, this portion of the corridor, will be significantly less than they will be on this corridor.

Q. "This corridor" being?

A. The SMR 1 from State Road 64 down 675 across 70 and Verna and Fruitville Road. It was -- it played a role in my decision to put forth the FPL preferred corridor.

Q. Put it forth in preference to the SMR Alternate Number 1?

A. Yes.

Q. Would you now turn to Page 2 of FPL 21 and tell us what portions of this page you were responsible for?

A. I was responsible for C, D, and E on this -- Page 2 of this exhibit.

Q. Would you summarize your comparison of the FPL preferred corridor to the SMR Alternate Number 10 from an engineering perspective?

A. Can we put back up Exhibit 7, please?

Q. Yes.

THE COURT: Let's take a ten-minute break. I want to talk to hotel management about an issue. So ten-minute break.

(Recess.)

THE COURT: You may continue, Ms. Raepple.

BY MS. RAEPPLE:

Q. Mr. Hahn, referring to the second page of Exhibit FPL 21, could you please provide us a comparison from an engineering perspective of the FPL preferred corridor and SMR Alternate Number 10?

A. Can we put up FPL Exhibit 7?

Q. Yes.

A. From an engineering perspective, the

differences between the FPL preferred corridor and SMR 10 are a close call. There are not a lot of difference between these corridors. They are the same corridor down to where they contact University Parkway. At that point, SMR 10 goes cross-country through the -- this development on the south side of this section north of Fruitville Road, and then it runs for about two miles along Fruitville Road into Bobwhite substation.

I have three main issues of difference between these two corridors. One, the FPL preferred corridor along University Parkway and Lorraine is wider and allows for greater flexibility within the corridor to work with the underlying landowners.

The FPL preferred -- excuse me -- the SMR 10 is a narrow corridor and does not afford for a great deal of flexibility in avoiding environmental impacts within it.

Secondly, the SMR corridor will have the traffic impacts for a short distance along Fruitville Road, about two miles. In this area the shoulders are relatively wide, and the need for blocking of traffic will be less. There are locations within that area that it's likely that we would be able to construct, install the poles without blocking traffic. The road gets more narrow as you progress east. But in

this area west of where SMR 10 intersects Fruitville Road, it's a wider area, although the traffic counts are higher in that area, also.

From a cost perspective, the differences are almost equal. The FPL preferred corridor is around 25.5 million. The SMR alternative is 25.8 million. They are essentially the same costs. So from an engineering perspective, those are the three differences that I see between the two corridors.

Q. Turning to the third page of Exhibit FPL 21, could you please describe the comparison of the FPL preferred corridor with the Taylor and Fulton Alternates 1 and 2 from an engineering perspective?

Excuse me. On the third page of FPL Exhibit 21, what rows are you responsible for, please?

A. I was responsible for B, G, and H.

Q. All right. Now, would you provide the comparison, please?

A. All right. If we can go back to FPL Exhibit 7.

Q. Yes.

A. The Taylor and Fulton -- I want to talk in terms of Taylor and Fulton 1, initially.

Taylor and Fulton 1 is this area marked in blue from State Road 64. It traverses about three miles south straight down through to a point about -- it's

actually 15,500 feet south, or about three miles south, and then it turns west for about 8,000 feet back into the FPL preferred corridor.

It is essentially a mirror image of the FPL preferred corridor from a distance perspective. So the distances are essentially the same. And the costs for those two alternatives, the FPL preferred in that region and the Taylor and Fulton Number 1, are essentially the same costs.

The main differences between Taylor and Fulton 1 and FPL preferred is that the FPL preferred corridor is wide. It has that, the term, flexibility, the ability to minimize and mitigate environmental impacts; the ability to work with the underlying landowners; and all of those same issues that were mentioned earlier about the wide corridor.

The Taylor and Fulton corridor is 500 foot wide, and it doesn't afford for a great deal of flexibility and placement of the transmission structures.

One of the things -- one of the other things that Taylor and Fulton Alternate 1 and 2 really do is they get us off of State Road 64 sooner.

They turn south prior to the entrance to the state park. From an engineering perspective, it reduces

that constraint in dealing with PRECO along State Road 64, and it also minimizes the traffic impacts along State Road 64.

Q. Minimizes the potential for traffic impacts along State Road 64?

A. Yes, it does. Because it shortens the distance along State Road 64 by 8,000 feet, about a mile and a half.

Taylor and Fulton Number 2 has that same effect. It shortens the distance along State Road 64. It has the same issue with the comparison between the wide FPL preferred corridor versus the narrow preferred corridor. Taylor and Fulton --

Q. Excuse me. You mean the narrow Taylor and Fulton Number 2?

A. Taylor and Fulton Number 2 is the same 500-foot wide corridor. The main difference between Taylor and Fulton Number 1 and Taylor and Fulton Number 2, and you may have heard it described as the notch. And what that notch does is it goes around -- it prevents the bisecting of adjacent property owners. Taylor and Fulton Number 2 is entirely on Taylor and Fulton property.

Q. It's entirely on Taylor and Fulton property, other than the one property owner just south of the

State Road 64; is that correct?

A. You're right. The Desoto County Speedway owns a small Section of the northern end of the corridor where Taylor and Fulton 1 and 2 intersect with State Road 64.

THE COURT: It's Number 2 that stays on Taylor and Fulton property?

THE WITNESS: Yes, sir.

MS. RAEPPLE: Yes.

A. Taylor and Fulton Number 1 bisects the adjacent property owners. Taylor and Fulton Number 2 is on -- or the notch alternative is on Taylor and Fulton property.

Unlike Taylor and Fulton Number 1 where it was a mirror image, essentially the same distance and the same cost, the notch creates an additional one mile of line length for Taylor and Fulton Number 2. And that line length translates to about an additional million dollars worth of costs associated with the construction of that line.

In addition to that, there's 16 acres additional easement required for Taylor and Fulton Number 2 compared to Taylor and Fulton Number 1.

BY MS. RAEPPLE:

Q. And why is that?

A. The main difference is when you are traversing

along State Road 64, the easement is only ten-foot wide along road right of way. When you're transversing the distance associated with both Taylor and Fulton Number 1 and Taylor and Fulton Number 2, the easement is set at 60-foot wide for the cross-country components.

Q. Perhaps I misunderstood, but let's make sure the record is clear.

The 16 additional acres required for Taylor and Fulton Number 2, is that compared to the preferred corridor, FPL preferred corridor, or to Taylor and Fulton 1?

A. It is compared to the FPL preferred corridor.

Q. Thank you.

A. All of our comparisons are FPL preferred to Taylor and Fulton Number 1, or FPL preferred to Taylor and Fulton Number 2. I do not compare Taylor and Fulton 1 to Taylor and Fulton 2.

Those are the differences from an engineering perspective.

Q. Do you have an opinion as to which of the corridors under consideration in this proceeding best meets the electrical energy needs of the state in an orderly, economical, and timely fashion?

A. Yes, I do.

Q. And what is that opinion?

A. It is my opinion that the FPL preferred corridor provides -- that meets the electrical energy needs of the state in the most affordably and economical manner.

All of the corridors will -- all of the corridors meet the needs for reinforcing of the network between the Manatee Energy Center and Ringling substation. All of the corridors will serve the increased load within the study boundaries. And all of the corridors will create another electrical feed via a diverse path.

All of them can also be accomplished by December of 2011, which is put forth in the need determination.

The difference mainly is that the FPL preferred corridor is a more direct route. The line length is shorter. And it's closer to what would be the future load center of this area in the future. And that's the main difference between them, from an engineering perspective.

Q. And when you say closer to the load center, are you saying that a route that's further to the west is closer to the load center?

A. Yes, based on Ms. Mayes' testimony for the -- for where the density will be in the future, the load

center would be further to the west.

Q. Are you familiar with the stipulated conditions of certification attached to the prehearing stipulation in this proceeding?

A. Yes, I am.

Q. In your opinion, will the design, construction, operation and maintenance of the Bobwhite-Manatee transmission line be able to comply with the stipulated conditions of certification in any of the proposed corridors?

A. Yes, I do.

Q. What is that opinion?

A. Would you repeat the question, please?

Q. Well, in your opinion, will the design, construction, operation and maintenance of the Bobwhite-Manatee transmission line be able to comply with the stipulated conditions of certification in any of the proposed corridors?

A. Yes, it will.

Q. Do you have an opinion as to which of the corridors proffered for certification for the Bobwhite-Manatee transmission line will have the least impact upon the public from an engineering perspective?

A. Yes, I do.

Q. What is that opinion?

A. It is my opinion that the FPL preferred corridor will have the least impact on the public. The issues raised about the traffic concerns, the collocation constraints with the PRECO distribution facilities, the potential for there to be structures on both sides of the road in area where the PRECO distribution facilities are, the FPL proposed corridor is proposed for collocation along roads with wider rights of way than the other alternatives. We avoid the airstrip concerns along Fruitville Road. The shorter overall length of the line as compared to the other alternatives, and the consolidation opportunities with FPL distribution in the area south of the State Road 70.

MS. RAEPPLE: At this time, FPL would move Exhibits FPL 21 and 26 into the record. I'm sorry. I have already done 26. It's just 21.

THE COURT: 21 is the --

MS. RAEPPLE: 21 is the corridor comparison chart.

THE COURT: Any objection?

MR. HALL: Your Honor, I have one relatively minor objection to 21, and that is on the first page in Row G, in the right-hand column, second from the bottom there's a reference to unsettled ownership of Verna Road.

And I understand Mr. Hahn testified that his understanding is that there is such a question, but I don't believe that there's been any evidentiary basis to establish that as a matter of fact at this point, and I don't want to not object to this exhibit and have that taken to be that we concede at this point or agree that there's an unsettled ownership of Verna Road. We've seen no surveys. We've heard no one who did a title search or reviewed the documents. That's my only objection.

THE COURT: Do you wish to be heard?

MS. RAEPPLE: Yes. Perhaps let me ask Mr. Hahn a couple of questions and see if we can clear this up.

BY MS. RAEPPLE:

Q. Mr. Hahn, can you explain to us the basis for your understanding that the ownership is unsettled with regard to Verna Road?

A. The information that I have received on Verna Road, it comes from our corporate real estate department. They are in the process of researching what the underlying ownership of the road is. And that's where my information comes from, based on my understanding of that road.

Q. And is that the type of information that

transmission line engineers evaluating various routes for a new transmission line relies on in formulating their opinion as to which route is preferable?

A. Yes, it is one of the factors that we look at for determining where transmission lines should be constructed.

THE COURT: That inquiry, which works with technical data, I don't think will work in this for a legal -- a legal issue, Ms. Raepple.

I'm accepting the testimony exactly as it was given, which is that this is -- these comparisons were made with the information provided by others that there is unsettled ownership of Verna Road. I'm accepting it as reasonable. It was reasonable for him to rely on it. Whether or not it's true that it's unsettled or not, I don't think this witness could say.

MS. RAEPPLE: All right.

THE COURT: So with that understanding, Number 21 is admitted.

(FPL EXHIBIT NO. 21 FOR IDENTIFICATION was received in Evidence.)

BY MS. RAEPPLE:

Q. Mr. Hahn, in his opening statement, Mr. Moyle stated that it is hard to locate a transmission line

along a meandering road. Do you agree with that statement?

A. In the case of this study area, no.

Q. First of all, why don't you tell us, in giving that answer, what you interpret to be a meandering road.

A. Well, the term meandering can mean lots of things. From an engineering perspective, my understanding of what the definition of meandering is in the context of this project is the ability to follow roads of similar construction that are already in use within this development, and in comparing the project planning documents that Ms. Mayes have presented, the curvy nature of the roads.

And in looking at that definition for meandering, in light of what I have seen on those drawings and the roads, such as Lakewood Ranch Road that I have driven inside the development, roads of those nature do not present any particular design difficulties for following or being built adjacent to, in my opinion.

Q. Given that definition, do you consider Lorraine Road to be a meandering road as it presently exists?

A. Lorraine Road is of similar construction to the other roads, such as Lakewood Ranch Boulevard. I guess the definition, yes, it could be considered a meandering

road in light of what we've seen.

Q. Do you consider it a meandering road in giving your opinion that this transmission line can be constructed -- that it is not hard to construct a transmission line adjacent to a meandering road?

THE COURT: Let me interrupt, because I think meander is kind of a worthless term in this context.

If you saw the In-Laws -- I think it was called the In-laws -- remember "serpentine"? That to me with hairpin turns, that starts to -- you know, I can visualize potential problems with the transmission line turning, unless the spans are almost next to each other.

So I think the question needs to be related to the aerial specifically and not to the term meander, which in different people's minds could be anything from any road that makes a couple of turns to, you know, extremely serpentine.

MS. RAEPPLE: I understand. I was trying to use the term that Mr. Moyle used in his opening statement, that's why I was having Mr. Hahn define it. But I can certainly move --

THE COURT: Who knows what Mr. Moyle meant. We don't.

MS. RAEPPLE: Who knows.

THE COURT: We don't know what's in his mind. So that's the only way that's going to be useful to me.

BY MS. RAEPPLE:

Q. Okay. Mr. Hahn, would it be difficult to locate the Bobwhite-Manatee transmission line along Lorraine Road?

A. No, it would not.

Q. Would it be difficult to locate the Bobwhite-Manatee transmission line along the Dam Road extensions as depicted on the plans in FPL 35 or 36, which were discussed by Ms. Mayes during her testimony?

Ms. Dailey, could you put those up so he can look at them?

Dam Road is on the east side of this FPL 35.

A. No, that presents no design challenge.

Q. What about the Dam Road extension shown in FPL 36?

A. No, that doesn't present any design challenges either.

Q. Would it be hard to collocate the Bobwhite-Manatee transmission line along any of the existing roads in the FPL preferred corridor?

I'm sorry. Existing or proposed roads in the FPL preferred corridor?

MR. HALL: I'm going to object to the extent this has been asked and answered, and now it's being asked in a broader context, and I think it's vague in that context.

He's already addressed State Road 64 and other roads in the FPL preferred corridor. I think address those in more detail than simply ask if it would be hard.

THE COURT: I do agree that I think I heard his answer to be already generalized to the corridors. But if you intended something different, I will allow it. My memory isn't great on that.

In other words, my understanding of the record and Mr. Hahn's testimony is that there is no proposed route or corridor that cannot be followed by the transmission line.

MS. RAEPPLE: That's right. I will move on.

BY MS. RAEPPLE:

Q. Mr. Hahn, in the public hearing, there were some suggestions by members of the public that the Bobwhite-Manatee transmission line should be placed underground.

Have you evaluated the possibility of placing all or a portion of the Bobwhite-Manatee transmission line underground?

A. No, I have not.

Q. Why not?

A. Undergrounding of the Bobwhite-Manatee transmission line was not in the case presented before the Public Service Commission. It was -- it is not a part of the application that we present for a corridor certification now.

Q. Does Florida Power & Light have any underground 230kv transmission lines?

A. Yes, it does. But underground transmission lines, in general, account for just a little over one percent of the transmission network that Florida Power & Light has.

Q. Do you have an opinion as to whether placing the Bobwhite-Manatee transmission line underground would be practicable?

MR. MOYLE: Let me object. I think he just testified he hasn't done any analysis. I'm not sure how, given the fact he hasn't done any analysis, whether he can answer whether it's practicable or not.

THE COURT: I don't know. That's usually a good indicator. But perhaps there's -- perhaps there are some engineering constraints that are so obvious to an electrical engineer that you don't do

any further analysis, so I will allow that kind of question.

MS. RAEPPLE: Yes. This is a general question as opposed to specifically has he evaluated placing this specific transmission line.

BY MS. RAEPPLE:

Q. Do you have an opinion as to whether undergrounding a line such as the Bobwhite-Manatee transmission line in this study area would be practical?

A. Yes, I do.

Q. What is that opinion?

A. It is my opinion that placing a 230kv line of this nature would be impractical to place it underground.

Like I said earlier, about one percent of FPL's transmission network is underground. And that concept holds true throughout Florida. Overhead is the standard in Florida.

The design construction and maintenance of underground facilities are much more complex than overhead facilities.

To install this type of facility in this area would be a -- it would take two forms. It would generally be an open-cut type of an installation where you cut the ground open, ten-foot hole, and you place

the conductors and pipe cable inside that hole.

The other aspect of it for, like, the river crossings or wetland crossings, would be a directional drill.

In both cases, those applications are much more -- will cause much more damage to the -- to the environment.

Unlike overhead lines where you can span wetland areas, undergrounding of transmission facilities does not allow for that. And even the directional drilling has environmental impacts.

The impact to the communities are significantly greater during the construction of underground facilities.

Unlike pole locations where you are at one location that's throughout certain times during the construction process, when you open-cut an area for an underground installation, that construction takes place over a wider area and lasts in terms of weeks and months for the construction of those components.

The other -- from a technical perspective, conflicts with other underground utilities, such as water and sewer pipes along the way, create technical difficulties that are sometimes difficult to overcome.

The easements associated with underground

transmission facilities need to be exclusive. And by exclusive, I mean that the ability to collocate other heat-generating sources in the same easement with the underground transmission is very unlikely.

And from an encumbrance perspective also on an easement, you can't place anything on top of that easement that would interfere with the ability to get at the line in the future.

Although reliability of distribution -- of underground transmission and overhead transmission facilities are somewhat comparable, outages associated with underground lines, the repair times for outages for underground lines are in terms of weeks and months, as compared to overhead facilities, which are in terms of hours or days.

There's always a risk of dig-ins from other utilities; phone, cable, water, sewer, in the area, digging in and causing outages for underground facilities.

In addition to all of those, costs are very high for underground facilities. In most cases, the cost differential between overhead and underground is 10 to 15 times what an underground -- what an overhead facility would be.

Underground costs cannot be passed on to the

rate payer, as ordered by the Public Service Commission, since there is no benefit to the rate payer.

Any person or entity that wishes to have something underground has to pay for the studies and then pay the cost differential between the overhead and underground.

It is my opinion that it's a very expensive tradeoff between overhead and underground facilities.

Q. In what type of area does Florida Power & Light consider using underground construction for a line such as Bobwhite-Manatee 230kv?

A. The majority of FPL's underground facilities are in metropolitan areas, such as downtown Miami. In fact, I believe all of the 230kv facilities are in downtown Miami.

Q. And what is the significance of --

What is the characteristic of downtown Miami that led to the underground placement of the 230kv lines?

A. In general, what leads to the decision to underground a transmission facility is that there are no -- no viable above-ground solutions. In the case of downtown Miami, you have large, multi-story buildings that are right up against the edge of road right of way, and there's a great deal of underground conflict; water,

sewer, fiber optics, cable in the ground.

So when you look to place transmission structure into the ground in a metropolitan area, there's no place to put it. And you run into clearance issues with the building.

So, in general, FPL has put transmission lines underground, but the way it occurs is when there are no viable, above-ground technical solutions.

MS. RAEPPLE: Thank you. I tender the witness for cross examination.

THE COURT: Let's take our lunch break. One hour. Be back here at ten to 1:00.

THEREUPON, a luncheon recess was had at 11:49 a.m.

CERTIFICATE OF REPORTER

STATE OF FLORIDA

COUNTY OF SARASOTA

I, Mary Jo Armour McGill, Registered Diplomate Reporter, do hereby certify that I was authorized to and did report in Stenotypy and electronically the foregoing proceedings and evidence in the captioned case and that the foregoing pages constitute a true and correct transcription of my recordings thereof.

IN WITNESS WHEREOF, I have hereunto affixed my hand this OCT 29 2007, at Sarasota, Sarasota County, Florida.

Mary Jo Armour McGill, RDR

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LAWYER'S NOTES

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